Velar fronting in German dialects

A study in synchronic and diachronic phonology

Tracy Alan Hall

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T. A. Hall
Bloomington,
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Notes on maps

This book contains forty-six maps. Several of those maps are called locator maps because they indicate with a series of markers the location of the varieties of High German and Low German discussed in this book and show where those markers are in terms of the major dialect regions from Appendix A. Others are called areal distribution maps because they depict various properties involving velar fronting spatially. Map 16.1 portrays Old Saxon and Old High German dialect areas in around the ninth century and Map 17.1 the various modern realizations of diminutive suffixes. Map A.1 indicates all major dialect areas for High German and Low German, and Map B.1 is a historical map which illustrates the administrative divisions in pre-World War I Germany.

The borders between the major dialect areas from Appendix A on the locator maps correspond to the ones on the maps in Wiesinger & Raffin (1982). No attempt has been made to include the transition zones separating those major dialect areas (Wiesinger 1983b: Map 47.4) on any of the maps in this book.

Country borders on many of the areal distribution maps and on locator Maps 11.1 and 11.2 depict pre-World War I country borders because a significant number of sources were written during that era or before.

Since many of the markers indicated on the maps reflect sources from the late nineteenth century to the present day the reader must be cautioned not interpret those maps as the correct depiction of the state of velar fronting at any one point in time.

Abbreviations

Dialects (Varieties) of German and historical stages of German

Almc	Alemannic
Bav	Bavaria
Brb	Brandenburgish
CBav	Central Bavarian
CFr	Central Franconian
CG	Central German
CHes	Central Hessian
CPo	Central Pomeranian
ECG	East Central German
EFr	East Franconian
EGmc	East Germanic
EHes	East Hessian
ELG	East Low German
ENHG	Early New High German
Eph	Eastphalian
EPo	East Pomeranian
Gmc	Germanic
Go	Gothic
HAlmc	High Alemannic
Hes	Hessian
HG	High German
HPr	High Prussian
HstAlmc	Highest Alemannic
IE	Indo-European
LAlmc	Low Alemannic
LFr	Low Franconian
LG	Low German
LPr	Low Prussian
LRG	Lower Rhine German
Lxm	Luxembourgish
ME	Middle English
MeWPo	Mecklenburgish-West Pomeranian
MFr	Moselle Franconian
MHG	Middle High German
NBav	North Bavarian
NGmc	North Germanic
NHes	North Hessian
NLG	North Low German
NUSax-SMk	North Upper Saxon-South Markish
OE	Old English
OHG	Old High German
ON	Old Norse
OSax	Old Saxon
PGmc	Proto-Germanic
RFr	Rhenish Franconian
Rpn	Ripuarian
SBav	South Bavarian
Sln	Silesian
StAG	Standard Austrian German
StG	Standard German
StSwG	Standard Swiss German
Swb	Swabian
SwG	Swiss German
Thrn	Thuringian
Tyr	Tyrolean
UG	Upper German
USax	Upper Saxon
WCG	West Central German
WGmc	West Germanic
WLG	West Low German
Wph	Westphalian

Grammatical categories

1	first person	fem	feminine	nom	nominative
2	second person	gen	genitive	part	participle
3	third person	imp	imperative	pl	plural
acc	accusative	infl	inflected	pret	preterite
adj	adjective	obl	oblique	sg	singular
dat	dative	gen	genitive	subj	subjunctive
dim	diminutive	loc	locative	wd	word

Features

cons	consonantal	dors	dorsal	son	sonorant
cont	continuant	nas	nasal		
cor	coronal	per	peripheral		

Other abbreviations

Ba	back sound	LBV	low back vowel
BV	back vowel	LFTV	low front tense vowel
C	consonant	LFV	low front vowel
CC	coronal sonorant consonant	MBV	mid back vowel
Fr	front sound	MFTV	mid front tense vowel
FV	front vowel	MFV	mid front vowel
HBV	high back vowel	Pa	palatal
HFTV	high front tense vowel	V	vowel
HFUV	high front unrounded vowel	Ve	velar
HFV	high front vowel		

Symbols

[…]	phonetic representation
/ … /	underlying representation
⟦ … ⟧	phonetic representation in an original source
| … |	intermediate synchronic phonological representation
$_{\mathrm{wd}}[$ A	A is at the left edge of a word
σ	syllable
C_0	zero or more consonants

___ C_0 $]_\sigma$	coda position of a syllable
{A B}	the set of A and B
A > B	A is realized in the next historical stage as B
B < A	
A ~ B	A and B are morphophonemic alternants
A ⟶ B	A is realized as B as the output of a synchronic phonological rule
A . B	syllable boundary between A and B
A - B	morpheme boundary between A and B
Ã	A is nasalized
A̟	A is fronted
A̠	A is retracted
ˈA	A is stressed
⁺A	A is reconstructed
*A	A is ungrammatical
Aʰ	A is aspirated
x̟	prevelar fricative

Table 1 (p. xx) lists the phonetic symbols for those consonants and glides referred to in this book. The rhotics [r] and [ʀ] can surface as trills, taps or approximants. The distinction between those articulations is not important and is therefore not expressed in phonetic representations. The fricatives [s z ʃ ʒ ɕ ʑ] and the affricates [ts tʃ dʒ] are sibilants. All other sounds – in particular the fricatives [ç ʝ x ɣ] and the affricate [kç] – are nonsibilants. [h ɦ] are assumed to be obstruents. Many of the obstruents in Table 1 occur in pairs, e.g. [p b], [f v], [ç ʝ], [x ɣ]. I refer to the first sound in each pair (e.g. [p f ç x]) as fortis and the second (e.g. [b v ʝ ɣ]) as lenis.

Table 2 (p. xx) lists the phonetic symbols for the most important vowels referred to in the following chapters. Full vowels are all vowels listed above with the exception of schwa ([ə]). The glide in diphthongs is not indicated with a diacritic, e.g. [ai] in *Zeit* ‘time’ (as opposed to [ai̯]). The sound [ɐ] is not included in the chart for vowels. It represents the phonetically upper-low glide/vowel in words like *Tier* ‘animal’ and *Vater* ‘father’, often referred to as the vocalized-r. The distinction between phonetically back vowels and phonetically central vowels is not important and hence all nonfront vowels are classified as back. The difference between vowel pairs like [i] and [ɪ] is referred to throughout this book in terms of tenseness (e.g. [i] is tense and [ɪ] is lax]). The tense-lax pairs [e ɛ] and [ø œ] are assumed to be mid, although the lax members ([ɛ œ]) are phonologically low in some dialects. If there is only one low back vowel then that vowel is

Table 1: Phonetic symbols for consonants and glides

	bilabial	labio-dental	dental	alveolar	post-alveolar	alveolo-palatal	palatal	velar	uvular	glottal
stop	p b			t d			c ɟ	k g		
affricate	pf			ts	tʃ dʒ		kç	kx		
fricative	β	f v	θ ð	s z	ʃ ʒ	ɕ ʑ	ç ʝ	x ɣ	χ ʁ	h ɦ
nasal	m			n			ɲ	ŋ		
lateral				l						
rhotic				r					ʀ	
glide	w	ʋ					j			

transcribed as [ɑ]. The symbol [a] is used to represent a low back vowel distinct from [ɑ]; those two articulations are assumed to differ in terms of tenseness.

Table 2: Phonetic symbols for vowels

	front		back	
	unrounded	rounded	unrounded	rounded
high	i ɪ	y ʏ		u ʊ
mid	e ɛ	ø œ	ə ʌ	o ɔ
low	æ		a ɑ	ɒ

1 Introduction

> Man betrachte auch eine beliebige Gruppe von verwandten Mundarten; man wird sehen wie die Bedingungskreise der Lautgesetze sich von Ort zu Ort mannigfach verändern, man wird hier gleichsam die räumliche Projection zeitlicher Unterschiede erkennen.[1]
>
> Hugo Schuchardt (1885: 24)

> … *Ortsgrammatiken* provide enormous potential for detailed work by historical linguists and phonologists … Although much seminal analytic work has already been carried out, there is great need for the individual dialects and their interrelationships to be studied within broader well-grounded theoretical and typological frameworks.
>
> Robert Murray (2010: 82)

1.1 An unfortunate gap

The distribution of German dorsal fricatives – palatal [ç] and velar [x] – has preoccupied linguists of diverse theoretical persuasions for over ninety years. Scholars who have discussed the patterning of those sounds include the following: Jones (1929), Hermann (1932), Bloomfield (1933), Trubetzkoy (1939), Moulton (1947), Leopold (1948), Jones (1950), Trim (1951), Dietrich (1953), Trost (1958), Heike (1961), Freudenberg (1966), Pilch (1966), Adamus (1967), Vennemann (1968), James (1969), Ungeheuer (1969), Bluhme (1970), Wiesemann (1970), Wurzel (1970), Kufner (1971), Zacher & Griščenko (1971), Werner (1972), Scholz (1972), Werner (1973), Issatschenko (1973), Standwell (1973), Philipp (1974), Dressler (1977), Griffin (1977), Kohler (1977b), Russ (1978b), Cercignani (1979), Wurzel (1980), Russ (1982), van Lessen Kloeke (1982a,b), Meinhold & Stock (1982), Vennemann (1982),

[1]"Just consider any particular group of related dialects. You will see how the conditional environments of the sound laws change from place to place. You will, as it were, perceive the spatial projection of temporal differences". Translated by Vennemann & Wilbur (1972).

Cercignani (1983), Wurzel (1983), Lenerz (1985), Benware (1986), Lieber (1987), Jessen (1988), Ronneberger-Sibold (1988), Hall (1989), Macfarland & Pierrehumbert (1991), Hall (1992), Yu (1992), Iverson & Salmons (1992), Borowsky (1993), van de Weijer (1994), Wiese (1996b), Merchant (1996), Noske (1997), Grijzenhout (1998), Scheer (2004), Fox (2005), Halle (2005), Glover (2014), Hall (2020), and Kijak (2021).[2,3]

It would be fair to say that the works cited above have concerned themselves primarily with the distribution of [ç] and [x] in the standard language of Germany, namely Standard German (StG) – defined here as the pronunciation encoded in the pronouncing dictionaries (de Boor et al. 1969, Krech 1982, Mangold 2005) – but that they have said very little about the occurrence of those fricatives in regional German dialects. Two notable exceptions to that trend are Herrgen (1986) and especially Robinson (2001), who both stress that much light can be shed on the correct analysis of the StG facts by considering the patterning of [ç] – the so-called ich-Laut ("ich-sound") – and [x] – the so-called ach-Laut ("ach-sound") – in non-standard varieties of German.

I contend that the cross-dialectal approach advocated by linguists such as Herrgen and Robinson represents a step in the right direction but that neither of those linguists goes far enough. In fact, it will be clear in the following chapters that those works merely scratch the surface of a deceptively complicated beast by failing to consider enough case studies from geographically-diverse regional dialects.

The topic addressed in this book has not only been neglected by phonologists, but also by dialectologists. To cite one recent example, volume 4 of the *Handbücher zur Sprach- und Kommunikationswissenschaft* (Herrgen & Schmidt 2019) provides an impressive 1200 page overview of German dialects. That survey includes all of the dialect areas depicted on Map A.1, including varieties of German spoken in North and South America, Africa, Australia, and Oceania. Given the breadth of that state-of-the-art work, it is surprising that none of the chapters discuss the distribution of [ç] and [x] in any detail.

[2] To the best of my knowledge, the earliest work examining German [ç] and [x] from the point of view of phonology was Jones (1929). Many pre-1929 linguists – especially those operating in the Neogrammarian (Junggrammatiker) tradition – have discussed the dorsal fricatives of German and are cited throughout this book. For some general discussion on the status of [ç] and [x] among linguists in the nineteenth and early twentieth centuries see §1.5.

[3] The patterning of German [ç] and [x] has also been discussed at length in textbooks written in both German and English, e.g. Hyman (1975: 9–10), Lass (1984: 36–37; 96), Ternes (1987: 75–80; 104–106), Ramers & Vater (1991: 98–101), Kenstowicz (1994: 308–309), Cowan & Rakušan (1998: 7–8; 31), Hall (2000: 62–64), Féry (2001: 62–70), Gussmann (2002: 59–63), Fagan (2009: 25–28), and O'Brien & Fagan (2016: 115–117).

The goal of the present study is to fill that gap. I consider over three hundred original sources for all of the major dialect regions spoken over a period of about one hundred sixty years (1860 to 2020) throughout the German-speaking world as it existed before 1945 up to the present day. In doing so I uncover a wealth of new data (hinted at in the Murray quote given above) involving the patterning of velar and palatal sounds. It is my hope that the data and my analysis thereof will redefine the kind of research question future works will address with respect to the patterning of German dorsal fricatives.

In the case studies presented below I demonstrate that the phonology of palatals (such as [ç]) and velars (such as [x]) can differ from one dialect to the next in subtle but also predictable ways. The synchronic differences among dialects referred to here will be argued to mirror the way in which the original rule relating those sounds progressed historically from a low-level phonetic process to a phonological rule. The latter process has subsequently undergone changes in some varieties resulting in various idiosyncrasies not discussed in previous research that only make sense when those dialects are compared with other dialects without those quirks.

The remainder of this chapter is structured as follows. In §1.2 I provide a brief overview of the patterning of dorsal fricatives in StG and summarize some of the contentious research questions that have been the object of debate in the past. §1.3 explicates the title of this book as it relates to StG and to the new data from German dialects, which are outlined briefly in §1.4. The latter section also poses a series of new research questions regarding the new patterns exemplified in German dialects. §1.5 justifies the assumption made in the present work – echoed in the extensive literature referred to earlier – that the phonology of German need only refer to two dorsal articulations (velar and palatal) but not to finer-grained distinctions. In §1.6 I provide some remarks on the data and sources thereof. Finally, §1.7 gives a brief outline of the structure of the remaining chapters.

1.2 Standard German facts and summary of previous research

The words listed in (1) reveal that [x] surfaces after back vowels (e.g. [uː] in 1a) and [ç] after front vowels (e.g. [ɪ] in 1b), the two coronal sonorant consonants ([l] and [n] in 1c), or the dorsal rhotic, which surfaces in coda position after a short vowel as the uvular consonant [ʁ] or the vowel [ɐ]. No native word has a dorsal fricative in word-initial position. See Chapter 17 for more extensive discussion on the patterning of StG dorsal fricatives.

(1)	a.	[buːx]	Buch	‘book’
	b.	[lɪçt]	Licht	‘light’
	c.	[dɔlç]	Dolch	‘dagger’
		[mœnç]	Mönch	‘monk’
	d.	[dʊʀç], [dʊɐç]	durch	‘through’

The data in (1) show that [x] and [ç] stand in complementary distribution: The former sound occurs after a back vowel and the latter one after a front vowel, a liquid, or /n/.

The German language also possesses many instances of alternations involving [x] and [ç]. For example, if a noun in the singular has a back vowel followed by [x], and if that back vowel is fronted in the plural, then [x] is realized as [ç], e.g. [buːx] ‘book’ vs. [byːçɐ] ‘book-PL’.

The examples in (2) illustrate that there are morphemes displaying an alternation between [g] and [ç]. That type of morpheme is usually captured in the literature by positing an underlying lenis stop (/g/) that shifts to the corresponding fricative and surfaces as [ç]. Note that the [ç] derived from /g/ in (2a) – like the [ç] in (1b) – surfaces after a front vowel ([ɪ]).

(2)	a.	[køːnɪç]	König	‘king’
	b.	[køːnɪgə]	Könige	‘king-PL’

The generalizations described in the preceding paragraphs need to be amended in light of the additional examples (3), which show two additional contexts for palatal [ç]. First, [ç] surfaces as the first segment in the diminutive suffix -*chen* even if a back vowel precedes that suffix in (3a). Second, [ç] occurs word-initially in loanwords in (3b).

(3)	a.	[tɑuçən]	Tauchen	‘rope-DIM’ (cf. [tau] Tau ‘rope’)
	b.	[çemiː]	Chemie	‘chemistry’

The StG data presented above – especially those involving palatal [ç] in -*chen* in (3a) – have spawned a sizable literature couched in a wide variety of theoretical frameworks, some of which was cited in §1.1. Due to the near complementary distribution of [x] and [ç], there is widespread agreement that the two fricatives are positional variants, in which case one of the sounds derives from the other.

One question discussed at length in the literature is whether or not the underlying sound – the TARGET – is velar or palatal. Thus, if /ç/ is taken to be basic then the rule creates [x] – the OUTPUT – after back vowels – the TRIGGERS –, as in (4a). Note that the underlying palatal treatment also accounts for the occurrence of [ç] in (1c) and (3b) as well as [x] in (1a). However, that treatment needs to account for the fact that [ç] surfaces after the back vowel [ɐ] in items like [dʊɐç] 'through' in (1d) and in the diminutive suffix -*chen* in (3a), e.g. [tɑuçən] 'rope-DIM'. If /x/ is taken as the target segment and [ç] is derived from that sound, then the rule apparently necessitates two disjunct contexts, as in (4b). Although the two sets of triggers in (4b) can account technically for the data in (1), it is not clear how that rule generates the palatal in (3). What is more, if the rule involved is an assimilation, then (4b) is incomplete at best because it needs to provide a convincing argument for the occurrence of the palatal after the dorsal rhotic [ʀ] and its non-front variant [ɐ] in (1d).[4]

(4) a. /ç/ → [x] / {back vowels} __

b. $/\text{x}/ \rightarrow [\text{ç}] \;/\; \left\{\begin{matrix}\text{front vowels}\\ \text{sonorant consonants}\end{matrix}\right\}$ __

In an important study, Robinson (2001) defends an analysis in which the underlying segment in the rule relating [x] and [ç] is /x/ and not /ç/. He argues at length that it is possible – and desirable – to analyze the two disjunct groups of triggers in (4b) featurally in a unified way so that the change expressed is an assimilation. In addition, he sees palatal [ç] in (3b) as a nonnative phoneme /ç/, which is also his treatment of the palatal [ç] (/ç/) in the loan suffix -*chen* in (3a).

Robinson makes a compelling case for deriving palatals from velars; in fact, I adopt that position and criticize the "palatal to velar" alternative in (4a). A consequence of the approach with underlying velars is that it necessitates an answer to the question of how the two categories "front vowels" in (1b) and "/n l ʀ/" in (1c, 1d) can be united as the set of triggers. It needs to be stressed that Robinson's analysis of German dorsal fricatives – his argument for underlying velars being one example – hinges crucially on data from regional varieties of German not usually discussed in the published literature. This is a significant point because the implication is that Robinson's claims can potentially be falsified by data from German dialects he might not have considered.

Robinson makes two assertions I strongly dispute. First, his analysis of dorsal fricatives implies that there is a single pandialectal rule (p. 113), according to which a palatal fricative is derived from a velar. Second, Robinson opines that his rule is "completely automatic" (p. 19) and that it is a "low-level, phonetic rule" (p. 77).

[4] In my comparison of (4a) and (4b) I abstract away from how the [g]~[ç] alternations in (2) are analyzed.

In the present book I evaluate and reject the two claims described in the preceding paragraph. I do so by investigating the patterning of dorsal fricatives in a number of regional German dialects discussed neither by Robinson (2001) nor – to the best of my knowledge – by any of the other linguists cited above. In the course of that discussion I uncover new data and develop a program of research involving those data, which I summarize briefly below.

1.3 Definition of velar fronting

As noted in the previous section I adopt the position asserting that the distribution of [x] and [ç] in StG requires an underlying velar (/x/) to be realized as a palatal ([ç]) and not the reverse. The rule relating those two sounds – stated provisionally in (4b) – is referred to throughout this book as Velar Fronting, which can be thought of as a subtype of velar palatalization (e.g. Bateman 2007). See §2.3 for more in-depth discussion.

I define velar fronting henceforth as the realization of any velar consonant – and not simply [x] – as the corresponding fronted sound. The change in question can be diachronic or synchronic. The way in which velar fronting is characterized is necessarily determined by the German dialect data summarized briefly in §1.4 – data revealing that the targets can be drawn from the sounds listed in the velar column in Table 1.1(a). The output of velar fronting is the corresponding palatal sound, as indicated in the final column of Table 1.1(a). The term velar fronting also refers to the realization of the fricative [x] as the alveolopalatal (sibilant) fricative [ɕ], as in Table 1.1(b). As indicated below, I classify both the target (velar) and the output (palatal/alveolopalatal) as dorsal.[5]

Velar fronting triggers typically consist of front vowels – a change I interpret as an assimilation; recall (1a) vs. (1b). However, the set of triggers can also include front (coronal) sonorant consonants like [n] and [l]; recall (1c). A surprising finding is that velar fronting is not always assimilatory because it can occur in many varieties of German in the context of any segment, front or back.[6]

An important finding in this book concerns the directionality of velar fronting. If a target for velar fronting is situated between two sonorant sounds then

[5]In my description of the phonology of velar fronting I have intentionally refrained from providing phonetic detail, e.g. the exact position of the tongue or the formant structure of velars and palatals/alveolopalatals. See §1.5, where I conclude that a proper understanding of velar fronting in German dialects does not (and should not) require reference to fine-grained phonetic detail.

[6]A claim I justify at length in the following chapters is that the assimilatory change from velar to palatal is never triggered by (dorsal) sounds like [ʀ] or [ɐ]; recall (1d).

Table 1.1: Velar fronting targets and outputs

(a) Palatal output

	dorsal	
	velar (target)	palatal (output)
Stop	[k]	[c]
	[g]	[ɟ]
Fricative	[x]	[ç]
	[ɣ]	[ʝ]
Affricate	[kx]	[kç]
Nasal	[ŋ]	[ɲ]

(b) Alveolopalatal output

	dorsal	
	velar (target)	alveolopalatal (output)
Fricative	[x]	[ɕ]

the trigger for velar fronting is always to the left of the target. This means that velar fronting involves assimilation from left-to-right (PROGRESSIVE) and not from right-to-left (REGRESSIVE) assimilation.

In sum, velar fronting is defined according to the four properties listed in (5).[7]

(5)
a. Targets: Any velar consonant
b. Triggers: Typically (but not always) a front segment
c. Outputs: Palatal or alveolopalatal
d. Direction: Left-to-right

The preceding discussion should reveal the inappropriateness of the term DORSAL FRICATIVE ASSIMILATION, which is probably the most common way of referring to the rule of StG in (4a, 4b) in the recent literature. First, the process in question is not always assimilatory, and second, the target segments need not be fricatives.

[7] The data I discuss in this book (summarized in §1.4) also involve velar fronting in word-initial position. As stated below, property (5d) only holds if the target is not word-initial.

1.4 New data and new research questions

1.4.1 Parameters of variation and opacity

1.4.1.1 Overview

This book offers an in depth investigation of velar fronting (as defined above) in German dialects. That change can involve either the diachronic fronting of a historical velar or the synchronic realization of an underlying velar as fronted (palatal).

Before introducing the new data referred to above, I clarify the object of investigation, namely "dialects of German". In this book I refer to both High German (HG) and Low German (LG) under the same category label ("German"), although it needs to be stressed that those two groups are different enough that they should be probably considered separate, but closely related, Continental West Germanic (WGmc) languages. My view of HG and LG as separate languages – and not as dialects of the same language – is also implicit in the family tree in Appendix E. I offer no new definition of "dialect" and therefore simply assume without argument that that term refers to any regionally distinctive variety of a language (in this case either HG or LG). Thus, Westphalian (Wph) and Eastphalian (Eph) are two LG dialects, while Swabian (Swb) and Bavarian (Bav) are two HG dialects. On the other hand, I also employ the word "dialect" to refer to very specific regional varieties within any one of those larger categories. For example, there may be two towns in the Swb-speaking region of Germany separated by a mere 10 km, and yet I refer to the HG (Swb) language spoken in those two towns as two separate "dialects". The dialects discussed below are almost always defined in terms of space (regionally), but "dialects" in the present context may also be distinguished in terms of socio-linguistic variables. Seen in that light, my usage of the term "dialect" is equivalent to the more general term "variety", and for that reason I often employ "dialect" and "variety" interchangeably.

The new data investigated in the present work involve velars and palatals in two contexts: (i) after a vowel or a sonorant consonant (henceforth POSTSONORANT POSITION), or (ii) word-initial position. Examples exemplifying (i) are listed in the final column of (6). The corresponding WGmc reflexes for the modern-day velars and palatals are provided in the first column. Appendix F summarizes those developments into HG varieties on which StG are based. Phonetic representations for the words listed below are not indicated because those realizations differ from dialect to dialect. The phonetic representation for the vowels in these words can be inferred on the basis of the orthography. In many regional varieties velar fronting can also affect the lenis velar fricative (WGmc $^{+}$[ɣ]), as in (6c), and in others velar stops and the velar nasal, as in (6d, 6e).

(6) a. WGmc $^{+}$[k] > [x]/[ç] Sache 'thing', brechen 'break-INF', Dolch 'dagger'

b. WGmc $^{+}$[x] > [x]/[ç] Nacht 'night', dicht 'dense', fechten 'fence-INF'

c. WGmc $^{+}$[ɣ] > [ɣ]/[ʝ] Wagen 'car', liegen 'lie-INF', folgen 'follow-INF'

d. WGmc $^{+}$[kk] > [k]/[c] Rock 'skirt', dick 'fat'

e. WGmc $^{+}$[ŋg] > [ŋg]/[ɲɟ] Zunge 'tongue', Finger 'finger'

Word-initial velars (=context ii) can also show the effects of fronting. I list below typical lexical items and their WGmc reflexes for the word-initial fricatives [x ç] in (7a) and for [x ç] after a word-initial sibilant in (7b). Some varieties also front velar stops, as in (7c).

(7) a. WGmc $^{+}$[ɣ] > [x]/[ç] Gast 'guest', gestern 'yesterday', Glück 'fortune'

b. WGmc $^{+}$[sk] > [sx]/[sç] Schaf 'sheep', schöpfen 'ladle-INF', schlafen 'sleep-INF'

c. WGmc $^{+}$[k] > [k]/[c] Kuh 'cow', Kind 'child'

Individual varieties of German can possess either postsonorant velar fronting in (6), word-initial velar fronting in (7), or both. Those fronting processes exhibit variation along the three parameters listed in (5a–5c).

1.4.1.2 Targets

In many varieties the set of target sounds consists of all and only velar fricatives (both [x] and [ɣ]); hence, palatals occur in *brechen* 'break-INF', *dicht* 'dense', and *liegen* 'lie-INF' and velars [x ɣ] after back vowels, e.g. *Sache* 'thing', *Wagen* 'car'. However, in other dialects (e.g. Wph) the target for fronting consists solely of [x] but not [ɣ]; hence, we have palatal [ç] in *brechen* 'break-INF' and *dicht* 'dense' and velar [x] in *Sache* 'thing', but velar [ɣ] surfaces in both *Wagen* 'car' and *liegen* 'lie-INF'. In another set of dialects (e.g. High Prussian (HPr)), velar fronting affects not only [x] and [ɣ], but also velar stops and the velar nasal; hence, [c] surfaces in *dick* 'fat', [ɲ] in *Finger* 'finger', [k] in *Rock* 'skirt', and [ŋ] in *Zunge* 'tongue'.

A similar generalization involving targets holds for word-initial position; hence, some dialects (e.g. Wph) have [ç] in *gestern* 'yesterday' and *schöpfen* 'ladle-INF' and [x] in *Gast* 'guest' and *Schaf* 'sheep', while others also have [c] in *Kind* 'child' and [k] in *Kuh* 'cow'.

1.4.1.3 Triggers

The set of front vocalic triggers for velar fronting exhibits variation according to the height dimension: In some systems the triggers consist only of high front vowels, in others high and mid front vowels but not the low front vowels (e.g. [æ]), and in yet others all front vowels, regardless of height. For example, in some dialects (e.g. Highest Alemannic (HstAlmc)) [ç] surfaces after the high front vowel in *dicht* 'dense' but [x] after the mid front vowel in *fechten* 'fence-INF' and after the back vowel in *Nacht* 'night'.

The fronting of velars can also be induced by a coronal sonorant consonant ([r l n]). In one commonly occurring system (e.g. Wph), that change is triggered by all front vowels and all of those consonants, e.g. [ç] in *gestern* 'yesterday' and *Glück* 'fortune', but [x] in *Gast* 'guest'. However, in other varieties (also Wph) only front vowels, but not coronal sonorant consonants trigger fronting; e.g. [ç] in *gestern* 'yesterday' and [x] in *Glück* 'fortune' and *Gast* 'guest'.

In many localities, velar fronting has no segmental trigger at all. That type of system is particularly common in word-initial position, e.g. palatal [ç] or [ʝ] occur in *Gast* 'guest', *gestern* 'yesterday', and *Glück* 'fortune', while the corresponding velars are absent from word-initial position entirely. In this type of dialect (e.g. Ripuarian (Rpn)), velar fronting is therefore not an assimilation.

1.4.1.4 Outputs

The segment created by the fronting of velar /x/ in StG and in most German dialects investigated below is a (nonsibilant) palatal fricative [ç], although there is also a well-attested pattern whereby [ç] is realized as a (sibilant) alveolopalatal fricative [ɕ] (e.g. Rpn); recall Table 1.1(b). For example, a word like [ɪç] 'I' is pronounced in Rpn as [ɪɕ]. I refer to the change to the [ɕ] output as ALVEOLOPALATALIZATION.

1.4.1.5 Transparency/opacity

A major theme of this book is the ways in which velar fronting interacts with synchronic and diachronic changes creating or eliminating structures which can potentially undergo it or trigger it. The types of interaction referred to here are categorized in terms of the criterion referred to as TRANSPARENCY/OPACITY.

In many dialects the relationship between velars (e.g. [x]) and the corresponding palatals ([ç]) is TRANSPARENT in the sense that velars only occur in the back vowel context and palatals only when adjacent to front sounds. In that type of system, independent processes can interact with velar fronting in two ways: (a) They can FEED velar fronting (by creating additional structures which the latter can undergo); or (b) they can BLEED velar fronting (by eliminating potential structures to which the latter could apply). For example, in one Central Bavarian (CBav) dialect historical /r/ is now realized as [x] after back vowels (e.g. *schwarz* [ʃwɔxts] 'black') and [ç] after front vowels (e.g. *Herz* [hɛçts] 'heart'). The change from /r/ to a dorsal fricative therefore feeds velar fronting. In another dialect the historical front vowel (diphthong) [ei] is now realized as the back vowel (diphthong) [ɔə]. Significantly, the historical fricative after that new back vowel is realized as [x] (e.g. *Zeichen* [tsɔəxə] 'sign'); hence, the change from [ei] to [ɔə] bleeds velar fronting. When [x] and [ç] have a transparent relationship they stand in complementary distribution and are classified as ALLOPHONES.

The transparent relationship between velars and palatals described above does not obtain in other dialects. For example, in many varieties, both dorsal articulations occur in the context of front segments. Thus, in addition to expected sequences like [iç], there are also unexpected ones like [ix]. In other systems velars and palatals both occur in the context of back segments; hence, expected sequences such as [iç] occur in addition to unexpected ones like [ɑç]. Both types of system exhibit OPACITY (e.g. Kiparsky 1982a, McCarthy 2009, Baković 2011); in particular, sequences like [ix] in the first set of dialects and [ɑç] in the second set are OPAQUE. A sequence like [ix] illustrates UNDERAPPLICATION because the fronting of velars fails to affect [x]. By contrast, a sequence like [ɑç] displays OVERAPPLICATION because the process fronting velars in the context of front vowels apparently even applies after certain back vowels.

1.4.1.5.1 Underapplication

There are two types that need to be distinguished:

In one system velar fronting can be shown to be an active synchronic process creating palatals (e.g. [ç]) from velars (e.g. /x/). The opaque velar ([x]) in the front vowel context (e.g. [ix]) is derived – both synchronically and diachronically – from an independent segment (represented with the abstract symbol /A/). Significantly, the only instances of opaque [x] involve [x] created from /A/. For example, in some varieties of Central German (CG) there are words like *Licht* [lɪçt] 'light' and *Bach* [bɑx] 'stream', where [ç] is the product of velar fronting from /x/. The same varieties have opaque words like *Hirsch* [hɪxʃ] 'deer', in which the surface [x] is the realization of /ʀ/. Words like [hɪxʃ] illustrate underapplication and the rule creating [x] from /ʀ/ COUNTERFEEDS velar fronting.

In another type of system (HstAlmc), velar fronting is active synchronically, but [x] surfaces unexpectedly in the context of front vowels in certain diphthongs. For example, [ç] (from /x/) occurs in *weich* [weiç] 'soft' and *leicht* [liːçt] 'easy', and [x] in *nah* [nɑːx] 'near'. However, [x] (/x/) also occurs after the diphthong [øi] (/øi/), e.g. *Rauch* [røix] (/røix/) 'smoke'. An important generalization is that [øi] was historically a back vowel ([ou]; cf StG [ʀɑux]). Opaque velars like [x] occur after segments like [øi], which are referred to below as NEUTRAL VOWELS. Since [øi] is synchronically /øi/ and not /ou/, systems with neutral vowels do not involve a counterfeeding order, as described in the preceding paragraph. However, the fronting of that originally back sound [ou] to [øi] does exemplify the historical underapplication of velar fronting.

1.4.1.5.2 Overapplication

Two types are discussed below:

In one frequent pattern, palatals (e.g. [ç]) occur in the context of front vowels and certain nonfront sounds – represented here as [Bk] – and velars (e.g. [x]) in the context of nonfront sounds with the exception of [Bk]. Observe that palatal ([ç]) and velar ([x]) stand in complementary distribution. All instances of the palatal ([ç]) in the context of front vowels derive – both synchronically and diachronically – from the corresponding velar, but the opaque palatal ([ç]) in the context of [Bk] is underlying (/ç/) and not derived. Underlying (opaque) palatals in that type of system are referred to throughout this book as QUASI-PHONEMES. For example, in one North Hessian (NHes) dialect [ç] occurs after front vowels, e.g. *brechen* [brɛçə] 'break-INF', and [x] after all back vowels with the exception of [ɑː], e.g. [bux] 'book'. After [ɑː] the palatal surfaces, e.g. *schlecht* [ʃlɑːçt] 'bad'. Significantly, the back sound adjacent to all palatal quasi-phonemes ([Bk]) was historically front, e.g. the [ɑː] in [ʃlɑːçt] was once [e], but it is now synchronically back (/Bk/).

In another type of system, velars and palatals both surface in the neighborhood of back sounds. Since they can occur in the context of the same back vowels, velars and palatals CONTRAST in that context; hence, velars and palatals are both underlying sounds (e.g. /x/ and /ç/). Underlying palatals in that type of system are referred to throughout this book as PHONEMIC PALATALS. In dialects where palatals and velars are both phonemic, velar fronting can still be shown to be active synchronically in order to capture regular (i.e. exceptionless) alternations between velars and palatals. For example, in several varieties of Central Hessian (CHes), [x] and [ç] contrast after the back vowel [ɑ], e.g. *Dach* [dɑx] 'roof' (/dɑx/) vs. *Deich* [dɑç] 'dike' (/dɑç/). The same dialects also have regular alternations involving [x] and [ç], e.g. *Buch* [bux] 'book' vs. *Bücher* [biçər] 'books'. In that type of alternation, /x/ is the underlying dorsal sound and [ç] is created by velar fronting after a front vowel. Significantly, the back vowel adjacent to the opaque (underlying) palatal was historically a front sound (e.g. the [ɑ] in [dɑç] 'dike') was once [ei]; hence, velar fronting overapplies in words like [dɑç] 'dike' from the diachronic perspective.

1.4.2 Interpretation of the dialect data

In the following chapters I present case studies for specific varieties of German illustrating the range of phenomena described above. From the synchronic perspective several versions of velar fronting are posited, which can differ according to the parameters listed in (5a–5c). Synchronic velar frontings in German dialects have a historical interpretation, which I summarize briefly here:

At a very early stage (West Germanic (WGmc)) velar fronting was not present at all; hence, velars like [x] surfaced as velar ([x]) even in the neighborhood of front vowels. That earlier stage is represented by a modern WGm language (Dutch). It is hypothesized that velars in the high front vowel context were realized in early stages of Old High German (OHG) and Old Saxon (OSax) as slightly more front than in the elsewhere context where they surfaced as true velars but that this type of fronting was phonetic (GRADIENT) and not phonological (CATEGORICAL). At a later stage of OHG/OSax the difference between velars in the high front vowel context and velars in the elsewhere case became exaggerated to the point where the former were realized (categorically) as palatal, while the latter remained velar. This is the stage at which velar fronting was PHONOLOGIZED. At that phonologized stage, velar fronting was present as a synchronic (allophonic) process, and the set of targets consisted solely of the fortis velar fricative [x] and the triggers consisted of the high front vowels like [i].

Phonologization occurred at a particular place (see below). The original rule of velar fronting then spread temporally and geographically to include a greater set of targets and/or triggers; see Bermúdez-Otero (2015) for a similar conception of language change. For example, the targets could spread to include not only fortis [x] but also lenis [ɣ]. The set of triggers could likewise later grow to subsume high and mid front vowels and then all front vowels.

Variation in terms of space (regional dialects) directly reflects changes along the temporal dimension (recall the Schuchardt quote from the beginning of §1.1). That interpretation of spatial variation is applied in the present book to velar fronting. Hence, I demonstrate that the various patterns displayed by modern dialects gives important clues telling us which regions have had velar fronting longer than others.

The evidence is strong that the phonologization of velar fronting and the subsequent expansion of triggers and targets occurred independently at more than one place (POLYGENESIS). Evidence against a single point of origin (MONOGENESIS) is that there are innovative velar fronting varieties surrounded by conservative varieties preserving velar sounds even in the front vowel context (VELAR FRONTING ISLANDS).

When velar fronting was expanding through time and space to include more and more targets and triggers, the velar ([x]) and the corresponding palatal ([ç]) stood in a transparent (allophonic) relationship. Changes affecting the velar fronting target could interfere with the original allophonic nature of velar fronting and then produce opaque forms. For example, when original front vowel triggers shifted to back vowels, overapplication effects could set in, i.e. palatal quasi-phonemes and/or contrasts between velars and palatals in the back vowel context. Likewise when original back segments were realized as front, underapplication might ensue, i.e. counterfeeding opacity or neutral vowels.

1.4.3 Velar fronting from the typological perspective

Rules fronting velar consonants to palatal (or palatal-like) sounds have been intensively investigated in previous research, e.g. Bhat (1978), Guion (1998), Bateman (2007, 2011), Kochetov (2011), and Recasens (2020). That typological literature has concerned itself with the ways in which the parameters in (5) can vary from language to language. A natural question to ask is how the data from velar fronting in German dialects fit into that typological research.

For example, a significant finding in the literature cited above is that the front vowels inducing the fronting of a velar can refer to the height dimension, whereby high front vowels are more favorable triggers than nonhigh front vowels. As described at length below, that finding is corroborated in my survey of German dialects. Therefore, one of the goals of this book is to consider the extent to which claims made in the typological literature are correct for the velar fronting material from German dialects. Conversely, some of the findings from German dialects cannot be confirmed in the typological works cited above. For example, that literature typically asserts (or simply assumes) that the fronting of velars is always assimilatory; however, that claim cannot be correct for the German dialects alluded to earlier in which velar fronting occurred in the context of front and back vowels.

1.4.4 Research questions

I have referred to a number of issues and problems that are dealt with in the following chapters, the most important of which are stated below. The questions posed in (8) pertain to the new data described in §1.4.1 and to their interpretation in §1.4.2. The two general typological questions in (9) were described above. (10) is a very general question of interest to dialectologists. Three of the most significant questions pertaining to the patterning of [x] and [ç] in the synchronic phonology of StG discussed in §1.2 are presented in (11).

(8) a. Targets/triggers: What do the targets and triggers for velar fronting in German dialects tell us about the various stages of the historical rule of velar fronting?
   b. Opacity: How did opaque velars and opaque palatals arise historically? To what extent can that type of opacity help determine when velar fronting was phonologized?
   c. Outputs: What is the historical origin of alveolopalatalization, and how did it spread through time and space?

(9) a. How can the rules relating velar and palatal sounds in German dialects shed light on typological work done on similar rules in other languages?
   b. How can the typological work done on languages fronting velars be applied to velar fronting in German dialects?

(10) How are varieties of German reflecting the various options listed under (8a–8c) distributed geographically?

(11) a. What is the correct underlying sound for the rule relating [x] and [ç], i.e. /x/ or /ç/?
   b. How does one unite the two categories "front vowels" and "n, l, r" given that [ç] surfaces after a back (dorsal) sound ([ʁ]/[ɐ])?
   c. Why does the palatal fricative [ç] in the diminutive suffix *-chen* occur after a back vowel?

Note that question (11a) can also be posed with respect to any German dialect in which velar fronting is active synchronically. (11b) is a specific question that can be subsumed into general questions regarding triggers in (8a) and opacity in (8b). Question (11c) can rightfully be extended to German dialects with *-chen*, although, as stressed by Robinson (2001), the question is moot for LG dialects in the north of Germany (which have some variant of [-kən]) and for Upper German (UG) dialects in the south of Germany as well as Switzerland and Austria (which have some variant of [-lɑin]). In the present book I restrict my discussion of the status of *-chen* to StG.

1.5 Phonology vs. phonetics

The dorsal segments that form the object of investigation in this work have been referred to above in terms of two discrete place categories, namely "velar" and "palatal"; recall Table 1.1(a). The respective phonetic symbols for those fortis and lenis dorsal fricatives are repeated in (12):

(12)	Velar:	[x]	[ɣ]
	Palatal:	[ç]	[ʝ]

The phonetic symbols in (12) express broad phonetic representations, and the terms "velar" and "palatal" are likewise mere names for two phonological categories that could also be labeled "back dorsal" and "front dorsal" respectively.

From the point of view of phonetics the two-way place dichotomy in (12) is simplistic, and some phonological treatments have accordingly adopted additional place categories. Consider first the German sound transcribed broadly as "[x]". Following Kohler (1990a,b), Wiese (1996b: 210–216) observes that the back dorsal is realized as velar ([x]) after nonlow back tense vowels ([uː oː]) and as uvular ([χ]) after low vowels ([ɑ ɑː]). After nonlow back lax vowels ([ʊ ɔ]) there is variation between [x] and [χ], but [χ] predominates. Thus, words like *Dach* 'roof' and *Buch* 'book' can be narrowly transcribed as [dɑχ] and [buːx] respectively. In fact, Wiese sees [χ] as a byproduct of German phonology and not simply phonetics. Hence, he posits – in addition to velar fronting (his Dorsal Fricative Assimilation) – a rule he dubs "Dorsal Fricative Lowering", which converts velar [x] to uvular [χ] after certain back vowels (Wiese 1996b: 213).[8]

[8]To the best of my knowledge, the first reference in the literature to a velar and a uvular realization of the German ach-Laut is Forchhammer (1924: 164). It is interesting to observe that Forchhammer's discovery was ignored by many subsequent studies of German phonetics and orthoepy, which continued to maintain that the ach-Laut has only one place of articulation, e.g. Brandstein (1950: 50-51), Bithell (1952: 132-133), von Essen (1957: 76–77), Heffner (1960: 153–154), Laziczius (1961: 59), Moulton (1962: 28–32), Delattre (1964: 176), Martens & Martens (1965: 167–168; 185–199), Schubiger (1977: 88–89), Wängler (1981: 39–40), Hakkarainen (1995: 76–78), C. Hall (2003: 42–48), and Russ (2010: 76–78).

Within the palatal category, it has long been known that the exact place of [ç] differs according to the type of front vowel that precedes it. This point is clear from the palatograms presented over one hundred years ago in Scripture (1902: 309–310), who concluded that the articulation of German [ç] "… varies with the preceding vowel". It is also instructive to consider the findings of Recasens (2013), whose cross-linguistic work (which includes German) identifies four separate zones within the palatal region. No approach to my knowledge has argued that there are different surface realizations of German [ç] created by a phonological rule.

I adopt the position that velar fronting is a phonological rule which relates the two discrete categories in (12). The exact place of articulation for sounds transcribed as "[x]/[ɣ]" and "[ç]/[ʝ]" is a topic that cannot be discussed because the original sources I have consulted typically do not provide such fine-grained distinctions.

It is conceivable that the German dialects discussed below possess both back dorsals ([x] and [χ]) and that the distinction between the two was simply ignored by the linguists describing those dialects. If this plausible scenario were true then my survey of German dialects provides an excellent reason for considering the rules accounting for the distinction between velar and uvular to lie in the domain of phonetics. The reason is that no German dialect is known displaying the same kind of phonologization of [x] and [χ] as described below for [x] and [ç]; e.g. no dialect has uvular quasi-phonemes or a contrast between a velar and a uvular.[9]

The intuition behind the classification in (12) with two discrete categories is reflected in the pronouncing dictionaries (de Boor et al. 1969, Krech 1982, Mangold 2005) and in colloquial speech of modern-day German speakers, who refer the palatal [ç] as the ich-Laut and the velar [x] as the ach-Laut. Significantly, there is no colloquial term for any of the sounds referred to above within either of the two categories in (12). The fact that many grammarians describing German dialects were silent on the distinction between velar vs. uvular or between different palatals suggests that those categories were either not salient enough to be perceived or that the finer-grained distinctions were simply deemed irrelevant.

There has been a very long tradition of classifying German dorsal fricatives in terms of precisely two place categories. An example from the dawn of the nineteenth century is George Henry Noehden (1770–1826), who includes in his

[9]The same reasoning argues against considering the different front dorsal articulations to be phonological. As noted in Table 1.1(b), there are German dialects in which the output of velar fronting is an alveolopalatal (sibilant) fricative [ɕ]. That type of dialect is consistent with the "two-category only" approach endorsed here (see Chapter 10).

grammar of German an extensive discussion of pronunciation. Consider what Noehden (1800: 62–63) writes of the pronunciation of German *ch*:[10]

> The English language furnishes nothing, with which the sound of this character may be compared …. This sound is twofold guttural, and palatick. The guttural is entirely formed in the throat… and answers … to the Scotch *ch*, in *Loch* … also to the Spanish *x* in *dexar*, and the *j* of the same, in *lejos*. The German *ch* … takes place, when joined to the vowels *a, o, u*, and the diphthong *au*. Examples: *ach, alas*! *Das Dach*, the roof; *noch*, yet; *das Joch*, the yoke; *hoch*, high; *das Buch*, the book … The palatick sound arises from a strong appulse of the breath against the palate, and is assigned to *ch*, when in conjunction with *e, i, ä, ö, ü, äu*. Examples: *der Hecht*, the pike; *schlecht*, bad; *das Licht*, the light ….

In an era in which the difference between sounds and letters was far from obvious, it is remarkable that Noehden was not only aware of the fact that there are exactly two sounds represented by (postvocalic) *ch* – in his words "guttural" and "palatick" – but also that the choice of one or the other depended on the type of preceding vowel.

Noehden's intuition that there are exactly two categories of dorsal sounds is not an isolated example from that general time frame. In fact, it is more the rule than the exception for nineteenth and early twentieth century handbooks dealing with German sound structure (phonetics and orthoepy) to recognize exactly two discrete categories among dorsal fricatives. Examples include works written in English, German, and French published on both sides of the Atlantic (e.g. Render 1804: 7, Bauer 1827: 166–167, Follen 1828: 7, Götzinger 1830: 11, Bernays 1833: 7,

[10] Noehden was not the first to make these observations. Several late-eighteenth century grammarians also recognized two places of articulation for German *ch* (Jellinek 1914: 19–20, Voge 1978: 113). The first chronologically was Abraham Gotthelf Mäzke. In two of his works (Mäzke 1776: 171 and Mäzke 1780: 27) there are terse statements indicating that Mäzke recognized what we would refer to today as a velar and a palatal realization of *ch*. See also the remarks made on the ich-Laut and ach-Laut in Bürger (1798: 128–131) by the German poet Gottfried August Bürger (1747–1794). Two additional scholars of note are Carl Philipp Moritz (1756–1793) and Wolfgang von Kempelen (1734-1804). Moritz (1784: 23–24) and von Kempelen (1791: 279–285) are very impressive passages indicating that both authors were aware of the fact that the front and back realizations of German *ch* correlate with the tongue position of the preceding vowel. Johann Christoph Adelung (1732–1806), who is often considered to be the greatest eighteenth century German grammarian, only recognized one place of articulation for the fricative realization of *ch* (e.g. Adelung 1781). The most influential work on the German language in the first part of the nineteenth century was the *Deutsche Grammatik* by Jacob Grimm (1785–1863), but in that work Grimm (1821: 528) does not discuss places of articulation for German *ch*.

Götzinger 1836: 199–200, Rapp 1836: 69–70, 1841: 42–44, Fosdick 1838: 19, Gortzitza 1841: 28–29, Wertheim 1841: 2, Schwabe 1842: 6, 48–50, Becker 1845: 8, Adler 1846: 3, Bauer 1847: 35, Wendeborn 1849: 5, Mannheimer 1853: 1, Eichhorn 1854: 2, Ahn 1855: 6, Strauss 1856: 6, Brücke 1856: 48, Otto 1864: 9–10, Schmitt 1868: 12; 38–39, Humperdinck 1868: 16, Worman 1868: 23, Rumpelt 1869: 92–93, Whitney 1870: 11, Weisse 1872: 11, Sweet 1877: 134–135, Viëtor 1884: 148–149, Trautmann 1884–1886: 281, Sievers 1885: 61–62, Hoffmann 1888: 38–39, Schmolke 1890: 28–29, Soames 1891: 145; 147; 162, Grandgent 1892: 6–7, Bremer 1893: 76–77, Wilmanns 1893: 5, Valentine 1894: 21, Siepmann 1897: xxvi, Siebs 1898: 58–59, Hempl 1898: 121–122, Dannheisser 1899: 18, Viëtor 1901: 22, Behaghel 1902: 197, Trautmann 1903: 92–93, Johannson 1906: 14–16, Viëtor 1906: 14, 16, Bacon 1906: 13, Schröer 1907: xi, Sütterlin 1907: 28, Scholle & Smith 1907: 97–100; 105–106, Grossmann 1910: 7–9, Passy 1912: 87–88, Jespersen 1913: 48–49, 135, Prokosch 1916: 24–26, Paul 1916: 307–308, Leky 1917: 74–75, Richter 1922: 53, 63, Curme 1922: 29, and Sütterlin 1925: 116–118). Significantly, many of those handbooks were known to the authors of the works I cite. See the quote by Robert Murray in §1.1 and the description of the kind of original sources employed in the present book in §1.6.[11]

The "front dorsal" vs. "back dorsal" approach to the sounds in (12) may well be the dominant one these days, but a bit more needs to be said about an alternative tradition – similar to the one championed by Wiese (1996b) – which endorses a third place of articulation among dorsal sounds. The three-way place approach referred to here has its roots in late nineteenth century Ortsgrammatiken (§1.6.1). One representative of this tradition is Batz (1911), who provides a detailed description of the East Franconian (EFr) dialect spoken in Bamberg (Map 3.4). In the section on the pronunciation of consonants, Batz (1911: 16) has an ach-Laut (articulation on the soft palate), an ich-Laut, (articulation on the hard palate) and an öch-Laut (articulation between the hard and soft palate). Essentially the same type of classification has been adopted more recently by a number of linguistic atlases I cite in this book (see §1.6.2). For example, the six parts of the *Bayerischer Sprachatlas* each have a "palatal" and a "velar" category, as well as a place of articulation akin to Batz's öch-Laut which lies between the two. Those atlases consequently provide a number of very detailed maps of phonetically transcribed German words which include distinct symbols for three places of articulation among dorsal fricatives.

[11]Explicit reference to [ç] and [x] in the dialect literature (both HG and LG) was not common until the final two decades of the nineteenth century. The earliest reference to [ç] and [x] in the works I have consulted is Rapp (1841: 124–125, 1851) for HG (Swb) and Rapp (1840: 302), Krüger (1843: 26) for LG.

Given that a major goal of linguistic atlases is to document fine-grained differences in pronunciation in different regions, it is hardly surprising that the two-way place distinction in (12) is usually rejected. The six parts of the *Bayerischer Sprachatlas* consequently all provide a wide array of phonetic symbols and diacritics in order to give very narrow transcriptions which account for subtle distinctions among vowel qualities (e.g. multiple vowel heights defined in terms of degrees of openness), vowel quantity (long vs. short vs. half-long), and laryngeal dimensions (lenis vs. fortis vs. categories between the two). A three-way place distinction among dorsal sounds is therefore precisely what one would expect given the goals of linguistic atlases.[12]

In contrast to tradition among linguistic atlases, my treatment of velar fronting does not require reference to fine-grained place distinctions. In fact, I claim that this kind of detail would obscure the synchronic and diachronic treatment I propose below. But there is a much more straightforward reason for restricting my treatment of German dialects to the two place categories in (12): The vast majority of original sources for German dialects do even not mention a third dorsal place, let alone the multiple places proposed in AAS and AADG (Footnote 12). Thus, any attempt to document velar fronting in all of the dialect areas depicted on Map A.1 which takes more than two places of articulations for dorsal sounds into consideration would not be realizable.[13]

1.6 Data and sources

The German dialect data introduced below comprise etymologically native words as in (5) and (6), although occasionally older loanwords which are fully integrated into the language are included as well. Loanwords containing velars and/ or palatals (e.g. *Chemie* 'chemistry' in 3b) are not considered because most of the

[12]I am familiar with two atlases which even go beyond the narrow transcriptions for dorsal fricatives in the *Bayerischer Sprachatlas*. The first is *Atlas zur Aussprache des Schriftdeutschen in der Bundesrepublik Deutschland* (AAS), which posits five distinct places of articulation for dorsal fricatives (Volume 1: 97–99). AAS even makes the strong claim that the distribution of those five phonetic variants are defined geographically (Maps CH.1 and CH.2 in Volume 2). AAS is outdone by *Atlas zur Aussprache des deutschen Gebrauchsstandards* (AADG), which has six distinct places of articulation for the back dorsal (ach-Laut) and five for the front dorsal (ich-Laut). As in AAS, AADG shows that these articulations have geographic preferences.

[13]The three-way place approach and the multiple-place approach referred to above both have late-eighteenth century precursors. It is clear that Georg Fränklin represents the former position when he writes (Fränklin 1778: 26) that there are three types of *ch*: A low one ("tief") after *a, o, u*, a mid one ("mittel") after *e, ä, ö*, and a front one ("vorn") after *i, ü*. Jakob Hemmer (1733–1790) opines that "our *ch* is of so many kinds as we have vowels." ("das unser *ch* so filerlei ist, als wir Selbstlauter haben"; Hemmer 1776: 68).

sources do not discuss them. That point aside, the status of dorsal fricatives in word-initial position in examples like *Chemie* is controversial even in StG; see Appendix G for discussion. There are three types of sources I draw upon, which are described in the following three subsections.[14]

1.6.1 Ortsgrammatiken

1.6.1.1 General remarks

The data discussed and analyzed below have been drawn from a wide variety of works dealing with a geographically-diverse selection of German dialects spoken roughly over the last one hundred forty years. Some of those studies are recent dissertations and theoretical articles based on data drawn from introspection or phonetic analysis, but the bulk of the work cited below comes from descriptive grammars of German dialects. Much of this work fits into the tradition of German dialectology known as Ortsgrammatiken, which were written in German-speaking countries during or shortly after the Neogrammarian era. The reader is referred to Murray (2010) for discussion.

It is important to stress that the basic method adopted in this book has been common for several decades among specialists of German. One example from the mid-twentieth century is Schirmunski's (1962) lengthy survey of German dialects, which is based on data from Ortsgrammatiken. Other noteworthy examples include Wiesinger's (1970a, 1970b) tomes on German vowels and Howell's (1991) monograph on Breaking in early Gmc. More recently, Goblirsch (2018) makes extensive reference to original descriptions of German dialects in his study of the history of quantity in Gmc, and Caro Reina (2019) draws on data from the same type of sources in his phonology of Swabian (Swb).

It is also worth emphasizing that my approach of investigating small differences in closely-related dialects has a precedent in linguistics, where there is an entire field devoted to MICROVARIATION. See Brandner (2012) for an overview of microvariation in syntax and Alber (2014), who extends this approach to phonology. Microvariation applies theoretical concepts of modern generative theory to dialectal and small-scale variation, and – in doing so – it bridges the gap between traditional studies in dialectology – Ortsgrammatiken in the present context – and formal theory. Seen in this light, the present book fits into a broader contemporary enterprise involving the application of formal theory to linguistic data involving small-scale variation in German dialects.

[14] I do not discuss the well-known questionnaires developed by the late nineteenth century linguist Georg Wenker (Wenkerbogen), although data from those questionnaires are included in some of the phonetically transcribed texts I discuss below in §1.6.3. For recent discussion of Wenker's survey see Fleischer (2017).

Since many readers may not be familiar with the Ortsgrammatik tradition, I provide some background on that type of source. The typical Ortsgrammatik consists of an in-depth description of a single locality considered to be relatively homogeneous and therefore free of dialect mixture. As pointed out by Murray (2010: 80), the grammars are usually written by phonetically well-trained native speakers grounded in the Neogrammarian tradition who employ both self-analysis and fieldwork. Most of these Ortsgrammatiken have both a synchronic and a diachronic component emphasizing the phonetics and the inflectional morphology of the dialect in question. Given the general time frame of these sources it is understandable that the synchronic discussion of sound structure involves only phonetics and not phonology (e.g. the notion of the phoneme and allophones).

Many of the dialects described in the Ortsgrammatiken referred to above – especially those in the north of pre-1945 Germany – are moribund due to evacuation and forced expulsion of Germans from East Prussia (Ostpreußen), Silesia (Schlesien) and East Pomerania (Ostpommern) after 1945. Certain dialects in Northwest Germany in regions never subject to forced expulsion are nevertheless either extinct or on the verge of extinction.

There is more than one reason why it is essential to investigate the sound structure of German dialects spoken a century ago. First, as noted above, many varieties are simply no longer spoken; hence, older descriptions of those dialects are often the only sources we have available. Second, a number of older dialects often preserve structures that are absent in dialects spoken in the present day. The type of dialect referred to here can therefore be thought of as a missing link without which a complete understanding of velar fronting would not be possible.

An investigation of dialects spoken in the late nineteenth and early twentieth century has an added advantage. Dialects described a century ago were written at a time when the influence of the standard language on dialects might not have been as prevalent as today because the notion of a standard language had not yet established itself. Anyone conducting fieldwork on modern German dialects can attest to the fact that it is difficult if not impossible to find dialect speakers who have no knowledge at all of the standard language. Hence, velar fronting in many German varieties spoken today may not truly reflect velar fronting in that particular dialect, but instead velar fronting in StG. By contrast, dialect speakers with little or no knowledge of StG were probably more common a century ago and could therefore give an accurate picture of velar fronting in their respective dialects.[15]

[15] In actuality, the language situation in the late nineteenth century was more complex than what I am suggesting here. General discussion can be found in Wells (1985: 343ff.). For an assessment of the developing standard language and its influence on regional German dialects in the late nineteenth century see Ganswindt (2017).

I only cite sources which include enough data to draw conclusions regarding the issues mentioned above (e.g. the set of triggers and targets as well as opaque segments). Hence, I eschew sources in which not enough data are presented to determine the correct distribution of velars and palatals or sources in which the data involving the distribution of velars and palatals are simply unclear. As a general rule I prefer sources which express the difference between velars and palatals with distinct phonetic symbols. In certain exceptional cases I incorporate data in which a single phonetic symbol is used to distinguish two articulations (e.g. [x] vs. [ç]), but only if that source is clear on the distribution of those sounds.

1.6.1.2 Reliability of Ortsgrammatiken

An objection to data from older works often raised is that those sources may not be trustworthy. In fact, I see several reasons for considering the older sources cited here to be highly reliable in their descriptions of the sounds investigated below. Consider the following:

1.6.1.2.1 Phonetically-trained authors

It is my experience that many linguists in the present day are reluctant to accept data drawn from older sources even if those individuals have never even laid eyes on such works. Those skeptics apparently believe that writers in the late nineteenth and early twentieth century simply did not know enough about sound structure to give an accurate portrayal of the phonetics. That belief is mistaken, at least in the case of the German dialect literature cited below, because the descriptive works referred to here were written by linguists trained in the Neogrammarian tradition who had a thorough grounding in phonetics. Hence, all of the authors cited below were well-aware of the classification of consonants (e.g. in terms of place, manner) and vowels (e.g. in terms of height and backness etc). All of the older sources cited – without exception – were intimately acquainted with the distinction between "velar" and "palatal" depicted in (12) – recall §1.5 – and consequently transcribed those articulations with distinct phonetic symbols.

1.6.1.2.2 Confirmation from multiple sources

The pattern whereby velars like [x] are fronted in the context after all front vowels is uncontroversial in StG as well as some of the modern dialects discussed below. If a source written in the year 1880, for example, tells us that there is a small community in which [x] is fronted after all front vowels and not after other sounds then it is difficult to conclude that the source should be deemed untrustworthy. A similar point holds for sources describing a pattern distinct from the one exemplified by StG. For example, if three authors write independently from one another during the same general time frame that there are places in three separate regions separated by hundreds of kilometers in which historical [x] is realized as [ç] in the context of front vowels but not in the context of coronal consonants like [n l r], then the most reasonable assumption is that the three descriptions are accurately describing the triggers for velar fronting in their respective community.

1.6.1.2.3 Consistent transcriptions

The sources cited in the present book are remarkably consistent in their transcriptions of velars and palatals. For example, many authors observe that historical [x] is fronted to [ç] after certain vowels (e.g. [i e]) and remains [x] after others (e.g. [u o ɑ]) but that etymological [ɣ] remains [ɣ] after any vowel. That descriptive claim derives support from a plethora of examples in which [ç] occurs precisely after [i e] and nowhere else, [x] exclusively after [u o ɑ], and [ɣ] after [i e u o ɑ], but what is remarkable is that there are no deviant lexical items that might suggest the author has missed those generalizations. If the source were unreliable then one might expect there to be inconsistencies and/or errors obscuring the general pattern thereby casting doubt on the competence of the author. Such inconsistencies might involve [ç] being occasionally transcribed after sounds other than [i e] or [x] after sounds other than [u o ɑ]. Likewise, in an unreliable source the velar [ɣ] might occasionally be transcribed as palatal [ʝ] after front vowels, thereby causing one to question the claim that velar [ɣ] surfaces even after front vowels. The most reasonable conclusion is that [x] is the sole target for velar fronting and that the triggers consist of all and only front vowels. The same point holds for dorsal segments with an unexpected distribution, i.e. opaque sounds. For example, many writers have observed that velar fronting of historical [ɣ] to [ʝ] occurred in word-initial position before front vowels or schwa ([ə]) but elsewhere stays [ɣ]. In the type of grammar referred to here one might see dozens of words beginning with [ʝ] before a front vowel or schwa and [ɣ] before other sounds, but sequences like [ɣə] are absent.

1.6.1.2.4 Linguistically plausible data

In virtually all of the sources cited below the conditions under which velars undergo fronting correspond to natural classes in phonology. What is more, those natural classes usually support findings from typological research referred to in §1.4.3. Those natural classes are almost never explicitly identified in the respective sources as such (since the concept did not exist at the time), but they are evident from the list of segments given that undergo or induce velar fronting. For example, multiple descriptive grammars attest to the realization velars as palatals after vowels like [i ɪ e ɛ] but not after [u ʊ o ɔ ɑ] or [æ]. Instead of considering the source to be untrustworthy a more likely explanation is that authors are describing the fronting of velars after nonlow front vowels. By contrast, an unreliable source might give a list of vocalic triggers that is completely arbitrary, e.g. after [i e ɛ o] but not after [ɪ u ʊ ɔ ɑ æ]. None of the sources cited below document that kind of bizarre context for velar fronting.

1.6.2 Linguistic atlases and dialect dictionaries

In addition to Ortsgrammatiken, I draw on some data from the linguistic atlases presented in Table 1.2. There are a number of excellent regional atlases (Kleinraumatlanten) for German dialects, several of which are included here. See Scheuringer (2011) and Niebaum & Macha (2014: 35–39) for surveys of linguistic atlases for German dialects.

As suggested by the names listed in the first column, most of the atlases focus on a particular region or dialect area: ACeM for the area in North Germany around the city of Celle, ALA for Alsace, ALLG for German Lorraine (Deutsch-Lothringen), LATG for Texas (USA), LSA for Luxembourg, NOSA for North Germany, SchlSA for Silesia, SDSA for Transylvania (Siebenbürgen), SNBW for the northern part of the German state of Baden-Württemberg, SAO for Upper Austria, SDA for the Sudetenland (Czech Republic), SDS for German-speaking Switzerland, SSA for Southwest Germany, ThürDA for Thuringia, TSA for Tyrol, VALTS for Vorarlberg, Liechtenstein, West Tyrol, and the Allgäu, WSAH for the German state of Hesse, and ZFSA for German-language islands of Northeast Italy (Cimbrian and Fersentalerisch). MRhSA concerns itself with the central and southern region of the Rheinischer Fächer (= Rhenish Fan). Six atlases listed above (SBS, SMF, SOB, SNiB, SNOB, SUF) are separate parts of the *Bayerischer Sprachtlas*, which covers most of Bavaria (Freistaat Bayern). One of the atlases listed above (KDSA) has as its focus all German-speaking countries given pre-1914 borders. The four works listed in Table 1.2 which do not concern themselves specifically with German dialects are AADG, AAS, ADA, and WDU. Those works investigate regional differences in the pronunciation of contemporary German (AADG), the pronunciation of the written language (AAS), and colloquial speech (ADA, WDU).

Data from linguistic atlases are important because they make it possible to look at general patterns that might not be evident in the Ortsgrammatiken. They are also very useful because they sometimes indicate places within a broad region with the kinds of quirks regarding targets and triggers for velar fronting described above.

Table 1.2: Linguistic atlases and their abbreviations

Atlas name	Abbreviation
Atlas zur Aussprache des deutschen Gebrauchsstandards	AADG
Atlas zur Aussprache des Schriftdeutschen in der Bundesrepublik Deutschland	AAS
Atlas der Celler Mundart	ACeM
Atlas zur deutschen Alltagssprache	ADA
Atlas linguistique et ethnographique de l'Asace	ALA
Atlas linguistique et ethnographique de la Lorraine germanophone	ALLG
Kleiner Deutscher Sprachatlas	KDSA
Linguistic Atlas of Texas German	LATG
Luxemburgischer Sprachatlas	LSA
Mittelrheinischer Sprachatlas	MRhSA
Norddeutscher Sprachatlas	NOSA
Schlesischer Sprachatlas	SchlSA
Sudetendeutscher Atlas	SDA
Siebenbürgisch-Deutscher Sprachatlas	SDSA
Sprachatlas der deutschen Schweiz	SDS
Sprachatlas von Bayerisch-Schwaben	SBS
Sprachatlas von Mittelfranken	SMF
Sprachatlas von Oberbayern	SOB
Sprachatlas von Niederbayern	SNiB
Sprachatlas von Nordostbayern	SNOB
Sprachatlas von Unterfranken	SUF
Sprachatlas von Oberösterreich	SAO
Sprachatlas von Nord Baden-Württemberg	SNBW
Südwestdeutscher Sprachatlas	SSA
Thüringischer Dialektatlas	ThürDA
Tirolischer Sprachatlas	TSA
Vorarlberger Sprachatlas	VALTS
Wortatlas der deutschen Umgangssprachen	WDU
Wortgeographie der städtischen Alltagssprache in Hessen	WSAH
Zimbrisch und fersentalerischer Sprachatlas	ZFSA

Table 1.3: Dialect dictionaries and their abbreviations

Dictionary name	Abbreviation
Aachener Wörterbuch	AaWb
Dortmunder Wörterbuch	DoWb
Dremmener Wörterbuch	DrWb
Hamburgisches Wörterbuch	HaWb
Das Kölsche Wörterbuch	KWb
Mittelelbisches Wörterbuch	MiElWb
Wörterbuch der obersächsischen und erzgebirgischen Mundarten	ObersWb
Neuer Kölnischer Sprachschatz	NKSS
Neunkirchen-Seelscheider Sprachschatz	NSSS
Pommersches Wörterbuch	PWb
Rheinisches Wörterbuch	RWb
Saarbrücker Wörterbuch	SbWb
Schleswig-Holsteinisches Wörterbuch	SchlHWb
Schwäbisches Wörterbuch	SchwWb
Südhessisches Wörterbuch	SHesWb
Simmentaler Wortschatz	SiWS
Wörterbuch der Teltower Volkssprache	TeWb
Wörterbuch der Tiroler Mundarten	TiWb
Trierer Wörterbuch	TrWb
Wörterbuch der Kölner Mundart	WbKM
Wörterbuch der Mundart von Dobschau	WbMD
Wörterbuch der unteren Sieg	WbUS
Wörterbuch der westmünsterländischen Mundart	WMlWb
Wörterbuch der westphälischen Mundart	WphWb

In this book I also make some reference to dictionaries on specific dialects. I only consider those dialect dictionaries which either contain phonetic transcriptions in lexical entries or which provide a clear statement concerning pronunciation. The dialect dictionaries I cite in this book are provided in Table 1.3, which are listed alphabetically according to the abbreviations in the second column. A discussion of the importance of dictionaries as sources in dialectology can be found in Niebaum & Macha (2014: 40–42).

It can be seen that some dictionaries focus on a particular city (AaWb, DoWb, DrWb, HaWb, KWb, NKSS, NSSS, SbWb, TrWb, WbKM), state (SchlHWb), former province (PWb), former county (TeWb), region (MiElWb, RWb, SiWS, TiWb, WbUS, WMlWb), or dialect area (ObersWb, SchwWb, SHesWb, WbMD, WphWb).

Like linguistic atlases, dialect dictionaries are important for identifying broad patterns representing a particular geographic region that might not be evident in Ortsgrammatiken.

1.6.3 Phonetically transcribed texts

Considerable work on German dialects consists of phonetically transcribed texts of native speakers for a dialect spoken in a particular place. These texts might be the transcription of a conversation or the recitation of a story or fairy tale. They are also often accompanied by a written commentary. The type of phonetically transcribed text referred to here can be found in the book series *Lautbibliothek der deutschen Mundarten* (until 1969) and the successor book series *Phonai*. Several works cited in the following chapters appeared in either one of those series. Another type of phonetically transcribed text can be found in the realm of morphology. A number of works have appeared through the years on various aspects of the morphological structure of German dialects, e.g. noun and adjective declensions, verb conjugations. That type of work can be drawn upon as evidence of velar fronting for a particular place if distinct symbols are employed for velars and palatals.

If the phonetically transcribed text is long enough then it is possible to draw conclusions on the status of velar fronting. These texts are particularly useful if neither Ortsgrammatiken nor linguistic atlases are available for a particular area.

1.7 Structure of the book

The remainder of this book consists of seventeen chapters, which are summarized briefly here.

Chapter 2 introduces the theoretical underpinnings adopted in my investigation of velar fronting. That chapter includes a description of features for consonants and vowels in order to state the various versions of velar fronting in a theoretically consistent fashion, an explication of opacity, a summary of velar fronting in the context of work done on the typology of similar rules fronting velars, and a sketch of the historical model delineating the various stages of velar fronting described above.

The core of the book (Chapters 3–15) consists of detailed datasets from original sources involving velar fronting in HG/LG varieties and my analysis thereof. Those chapters are organized for the most part structurally and not according to geography in the following way:

In Chapters 3–4 I discuss dialects in which [x] and [ç] exhibit a transparent (allophonic) relationship. The former chapter concerns itself with those varieties in which velar fronting relates the two fortis sounds [x] and [ç]. Case studies are provided for dialects spoken in South Germany, Switzerland, and Austria. Chapter 4 probes a set of dialects containing the lenis velar fricative [ɣ] and/or the lenis palatal fricative [ʝ] in addition to [x] and [ç]. The dialects investigated consist of primarily moribund varieties once spoken in North Germany.

Chapters 5–9 investigate opacity. Chapters 5–6 consider underapplication and Chapters 7–9 overapplication. In Chapter 5 I discuss German dialects spoken in Central Germany in which some independent synchronic rule creating [x] counterfeeds velar fronting, and in Chapter 6 I consider neutral vowels with data drawn from two varieties of Swiss German (SwG).

Chapter 7 investigates a number of varieties not restricted to a particular region which have in common that they possess palatal quasi-phonemes. Chapters 8–9 concern themselves with phonemic palatals, i.e. palatals that contrast with the corresponding velars. In Chapter 8 I discuss dialects spoken in North Germany in which phonemic palatals surface word-initially and in Chapter 9 I discuss dialects spoken in Central Germany with phonemic palatals in postsonorant position.

Chapter 10 is devoted to an investigation of dialects spoken in Central Germany in which the post-front vowel palatal [ç] is replaced with alveolopalatal [ɕ]. It is demonstrated that [ɕ] is an allophone of /x/ in some varieties but that in others [ɕ] contrasts with [x]. I show that alveolopalatalization does not involve opacity.

Chapter 11 investigates German dialects in which the set of targets for velar fronting include velar stops and the velar nasal (recall 6d–6e). Those varieties were once spoken in the northeast of pre-1945 Germany.

Chapter 12 summarizes the findings in Chapters 3–11 on the extent to which triggers and targets for velar fronting can vary from place to place.

Chapter 13 discusses data from a linguistic atlas for Lower Bavaria (SNiB) which document velar fronting throughout that area. An important conclusion of that chapter is that velar fronting is not uniform in Lower Bavaria. Instead, there are three versions of the rule defined according to the nature of the triggers.

Chapter 14 investigates the nonassimilatory fronting of velars.

Chapter 15 documents velar fronting islands and discusses the extent to which the segments inducing that process (triggers) can differ from place to place.

Chapter 16 demonstrates how linguistic evidence can shed light on how velar fronting fits into the well-established stages in the history of German (Appendix E). In that chapter I also consider how data from modern dialects can give evidence regarding the areas where velar fronting has been active the longest.

Chapter 17 considers the status of velar fronting in StG and addresses the research questions in (11).

Chapter 18 provides a brief conclusion in which I summarize my findings and relate those findings to the research cited earlier.

This book contains supplemental information in the form of twelve appendices. Appendix A provides the reader with an overview of HG and LG dialects and also includes a map indicating the distribution of those dialects in German-speaking countries in pre-1914 Europe. Appendix B is a historical map depicting the German Empire during the time frame 1871–1918. Appendix C lists tables containing all varieties of German investigated (including sources) and classifies those varieties in terms of the dialects given in Appendix A. Appendix D gives a list of the triggers and targets for all versions of velar fronting posited in the present book. Appendix E is a family tree for Germanic languages. Appendix F provides some background information on the historical reflexes of modern-day dorsal fricatives in German dialects. Appendix G concerns itself with the status of dorsal fricatives in loanwords in StG and other varieties. Appendix H gives the inventory of consonants and glides in three broad dialects (LG, CG, UG). Appendix I provides some discussion of the status of rules fronting velar sounds in the branches of Germanic not discussed in this book, in addition to the language families spoken in the immediate vicinity of the German-speaking world, namely Slavic and Romance. Appendix J lists the names of all 221 villages, towns, and cities where data were drawn from the linguistic atlas for Lower Bavaria (SNiB). Appendix K and Appendix L list the linguistic atlases and dialect dictionaries cited throughout this book.

2 Theoretical background

2.1 Introduction

The goal of this chapter is to introduce the formal models of phonology and phonological change I adopt in this book and to discuss the findings in the typological research as they relate to velar fronting. §2.2 makes explicit several assumptions involving levels of grammar, features for consonants and vowels, and opacity. §2.3 gives a synopsis of some of the findings in the typological work on Velar Palatalization, and §2.4 presents models of historical phonology and lays out some underlying assumptions concerning historical phonology. The diachronic model for velar fronting defended in the present book is described in detail in §2.5.

2.2 Phonological models

My treatment of velar fronting in German dialects presupposes a model of grammar in which phonetics and phonology are two separate components. That model is described in §2.2.1. Since velar fronting is typically assimilatory, it is essential to adopt a theoretical framework that is able to express the correct triggers and targets for that process. To achieve that end I adopt a model of features described in §2.2.2 (for consonants) and §2.2.3 (for vowels). §2.2.4 defines the different types of rule interaction discussed in the ensuing chapters (e.g. transparent vs. opaque; underapplication vs. overapplication). That discussion provides the necessary background in order to understand the way in which velar fronting interacts with independent processes that create and eliminate potential targets and triggers.

2.2.1 Levels of grammar

I follow earlier authors in the generative tradition who posit an architecture of grammar consisting of more than one representational level (e.g. Chomsky & Halle 1968 and subsequent work by many authors). I adopt the model in Table 2.1, which is similar to the ones presupposed by other writers (e.g. Keating 1990, Cohn 1993, Keating 1996, Hale et al. 2015, Bermúdez-Otero 2015).

As indicated in Table 2.1, the input to the phonology is the underlying representation (enclosed in diagonal slashes: / … /). By definition the underlying representation contains the stored forms of morphemes or sequences of morphemes in morphologically-complex words. The segments present in underlying representation (expressed throughout this book with IPA symbols) are mere abbreviations for bundles of distinctive features (§2.2.2 and §2.2.3).

Table 2.1: Representational levels

/ … /	Underlying representation
	Phonology
[…]	Phonetic representation
	Phonetics
…	Speech

Phonology (=phonological component) is the mapping of underlying representations to phonetic representations (enclosed in single square brackets: […]). Representations in the phonology consist of the same set of units (=features) necessary to express the underlying representations. Complete phonological representations also require prosodic constituents such as syllables and feet as well as association lines connecting those units with one another and with the features.

Words in the phonetic representation consist of the same phonological units described above, e.g. features, syllables, feet. There are no units required for the phonetic representation that are not present in the underlying representation or in the phonology. The representational alphabet for the phonetic representation is therefore the same for the underlying representation and for the phonology.

The change from underlying representations into phonetic representations via the phonology takes the form of phonological rules, although the mapping described here is also consistent with an Optimality Theoretic approach with constraints instead of rules (Prince & Smolensky 2004).

The Phonetics component in Table 2.1 is the locus of PHONETIC RULES, which are characterized by gradient outputs. By contrast, phonological rules are categorical. According to Keating (1990: 452), “Phonetic rules can thus, for example, assign a segment only a slight amount of some property, or an amount that changes over time during the segment”.

I assume two types of phonetic rules, namely coarticulation and phonetic implementation. The two terms are used in the literature in slightly different ways. For my purposes I define them as follows:

Coarticulation is the overlapping of adjacent articulations. For example, Cohn (1993) demonstrates that vowels in English are gradiently nasalized before nasal consonants, e.g. the /i/ in *dean* (/din/). In that example nasal airflow on the vowel gradually increases throughout the duration of that vowel, thereby indicating that the velum lowers not at once, but instead over the course of the vowel. That type of gradient coarticulation can be contrasted with phonological Nasalization in other languages, in which the vowel is nasal over its entire duration (categorical).

Phonetic implementation is responsible for the interpretation of low-level distinctions that play no role in the phonology. Consider the following examples involving manner and place of articulation of consonants: The one rhotic phoneme – present in all German dialects – surfaces initially in items like *rot* 'red' in a number of different ways, e.g. approximant, trill. The inter- and intraspeaker variation pertaining to those manner categories is determined not in the phonology but instead in the phonetics by rules of phonetic implementation. Hence, the phonological representation of the rhotic consists of a set of distinctive features described in §2.2.2 which make no reference to categories like "approximant" or "trill". Phonetic implementation is also necessary to express the exact place of articulation of sounds like /t/ and /d/. As demonstrated below in §2.2.2 the phonology specifies that /t/ and /d/ bear the distinctive feature referring to an articulation with the front part of the tongue ([coronal]) to distinguish them from labials (/p b/) and velars (/k g/). However, the realization of /t d/ as dental or alveolar is determined by rules of phonetic implementation.

The level of grammar referred to in Table 2.1 as "Speech" is intended to express the actual phonetic realization of the word in question. Seen in this light, Speech requires a conversion of the nature of objects involved because the underlying representation, the phonology and the phonetic representation utilize phonological units such as features, association lines and prosodic constituents, but the phonetic realization of those abstract representation involves the actual organs of Speech. Thus, a phonetic representation is converted into both an articulatory act involving a coordination of muscles in the jaw, throat and lungs, as well as an acoustic output consisting of sound waves.

The example discussed in Hale et al. (2015) illustrating Table 2.1 is the English word *keep*, which has the underlying representation /kip/, where those three segments represent three distinct feature bundles. The /k/ in /kip/ undergoes a phonological rule of Aspiration, which produces the phonetic representation

[k^hip]. The phonetic representation [k^hip] is expressed in terms of phonological units, but its actual articulatory and acoustic realization (=Speech) requires reference to factors such as the exact place of contact between the tongue body and the roof of the mouth and the length in terms of milliseconds of the release of the closure of the velar stop until the onset of voicing of the following vowel.

The phonological component in Table 2.1 is often argued to be subdivided into domains of various sizes to which rules are assigned. For example, in the model of Lexical Phonology and Morphology (e.g. Kiparsky 1982b, Kaisse & Shaw 1985, Mohanan 1986, Hargus & Kaisse 1993) phonological rules can apply across words (postlexical rules) or within words (lexical rules). In Stratal Optimality Theory (Kiparsky 2000, Rubach 2000, Kaisse & McMahon 2011, Bermúdez-Otero 2015) a distinction is drawn between phrase level, word level, and stem level rules.

An example of a phrase level rule is Flapping in American English, which is responsible for the realization of /t d/ as [ɾ] both word-internally (e.g. *ci[ɾ]y*) and across words (e.g. *si[ɾ] in a chair*). Stem level rules only apply within words. They show alternations triggered by certain suffixes (stem level suffixes) but not by others (word level suffixes). For example, in English the rule of Trisyllabic Laxing creates a lax vowel in the antepenultimate syllable in words like *n**a**tional* (vs. *n**a**tion*) but not in words like *n**a**tionhood*. Trisyllabic Laxing applies in *national* but not in *nationhood* because *-al* is a stem level affix but *-hood* is a word level affix. Word level rules are similar to stem level rules in the sense that they never apply across words. Within words they are triggered only by word level affixes. For example, the English rule of n-Deletion which eliminates /n/ after another nasal applies in *damning* (from /dæmn-ɪŋ/) because *-ing* is a word level affix, but not in *damnation* ([dæmneiʃən]), which contains the stem level affix *-ation*.

The distinction between the three types of domains described above does not play a role in my treatment of velar fronting. See §5.5.1 and especially §12.8.2 for discussion.

All of the authors cited in the present section adopt the basic premise that there is a fundamental difference between phonology and phonetics. A few of the properties characterizing those two components (Bermúdez-Otero 2015) are listed in Table 2.2.

2.2.2 Featural representations for consonants and glides

The most important consonants investigated below are velars because those sounds – or a subset thereof – serve as targets for velar fronting. Velar fricatives (/x ɣ/), velar stops (/k g/) and the velar nasal (/ŋ/) all bear the place feature [dorsal], as in (1a–1c). In contrast to velars, palatals are phonologically complex seg-

Table 2.2: Phonetics vs. phonology

Component	Properties
Phonology	discrete phonological objects (e.g. segmental features, prosodic nodes, association lines)
Phonetics	continuous phonetic dimensions (e.g. formant frequencies, gesture amplitudes and durations)

ments in the sense that they are [coronal] and [dorsal]; see (1d).[1] A representation like the one in (1d) is defended by Robinson (2001) and Hall (2014a). The branching structure depicted here holds for all palatal segments, regardless of manner, i.e. palatal stops (/c ɟ/), palatal fricatives (/ç ʝ/), the palatal nasal (/ɲ/), and the palatal glide (/j/). Manners of articulation (e.g. stop vs. fricative vs. nasal vs. liquid) are expressed with the major class features [±cons(onantal)], [±son(orant)] and the manner features [±cont(inuant)], [±nas(al)].[2] The place features are privative and all other features binary, although that assumption is not justified here because my analysis does not crucially depend on that approach.

(1) a. $\begin{bmatrix} +\text{CONS} \\ -\text{SON} \\ +\text{CONT} \end{bmatrix}$ | $\begin{bmatrix} \text{DORSAL} \end{bmatrix}$

b. $\begin{bmatrix} +\text{CONS} \\ -\text{SON} \\ -\text{CONT} \end{bmatrix}$ | $\begin{bmatrix} \text{DORSAL} \end{bmatrix}$

c. $\begin{bmatrix} +\text{CONS} \\ +\text{SON} \\ +\text{NAS} \end{bmatrix}$ | $\begin{bmatrix} \text{DORSAL} \end{bmatrix}$

[1]The place features depicted in (1) ([coronal], [dorsal]) are present on velars and palatals in all dialects discussed below with the exception of two SwG varieties (Chapter 6). In those two dialects, [dorsal] in the representation of velars and palatals is argued to be replaced with [peripheral]; see Rice (1994) for the latter feature. (1d) can be contrasted with the proposal based on cross-linguistic work that palatal fricatives are simplex coronals (Hume 1994) or simplex ([−back]) dorsal sounds (Hall 1997). Since a comparison of those approaches with (1d) is given elsewhere (e.g. Hall 2014a), I do not discuss this debate here.

[2]Segments playing a minimal role in the following chapters are [labial] sounds like /p b f v/ and [coronal] sounds such as /t d s z ʃ ʒ/. In many approaches to features (e.g. Sagey 1986, Clements & Hume 1995, Hall 1997) alveolar and postalveolar [coronal] sounds (/s z/ vs. /ʃ ʒ/) are distinguished with the feature [±anterior], while Hall (1992) and Wiese (1996b) argue on the basis of StG that it is the feature [±high]. In the majority of case studies discussed in Chapters 2–9 the choice between [±anterior] and [±high] is not significant. The structure of postalveolar sounds like /ʃ/ is shown to be relevant to velar fronting in the context of alveolopalatalization discussed in Chapter 10.

d. …

CORONAL DORSAL

I henceforth adopt an abbreviatory convention whereby all features other than [labial], [coronal], and [dorsal] are listed in the topmost matrix (root node); hence, separate nodes relating to manner and/or laryngeal dimensions are not necessary. I similarly omit the place node for simplicity.

I follow earlier research which draws a distinction between underlying (phonemic) glides and derived glides (e.g. Levi 2004, Hall 2017 and literature cited therein). Underlying glides are transcribed henceforth with distinct phonetic symbols, i.e. /j/ is the underlying palatal glide and /w/ is the underlying labial glide. Of those two sounds the former is more important than the latter because it has a close synchronic and diachronic relationship with the sounds produced by velar fronting (palatal fricatives). The underlying palatal glide /j/ has the place structure depicted in (1d). It is distinct from the homorganic vowel /i/, palatal fricatives, and the palatal nasal with the major class/manner features referred to above; thus, /j/ (and /w/) are [+consonantal, +sonorant, −nasal]. Derived glides are the nonsyllabic components of diphthongs, which are often transcribed with the subscript arch in a narrow phonetic transcription, e.g. [au̯] and [ai̯]. Those glides are (synchronically) derived from the corresponding vowels in the sense that their nonsyllabicity is a function of sonority (Hall 2017). I refrain from making use of the subscript arch in diphthongs and simply transcribe diphthongs as a sequence of two distinct vowel symbols, e.g. [au] (/au/), [ai] (/ai/). Both of the components in diphthongs are [−consonantal]; see §2.2.3.

In many languages there is a contrast between a sibilant fricative and a non-sibilant fricative (e.g. /s/ vs. /θ/ in English), which is traditionally captured with the feature [±strident]. That type of contrast is absent in all of the dialects investigated in the present book; hence, [±strident] is not a distinctive feature and therefore plays no role in the phonology. The implication is that segments such as /s z ʃ ʒ/ have phonological representations consisting solely of the features described above and that the realization of those sounds as sibilants at the level of Speech is expressed with dialect specific rules of phonetic implementation (§2.2.1). The relevance of that type of rule of phonetic implementation for the topic of velar fronting is discussed in Chapter 10.

Most of the dialects discussed below have a laryngeal contrast among stops and fricatives (e.g. fortis /s/ vs. lenis /z/). In a subset of those varieties, that laryngeal contrast also holds for velar sounds, i.e. fortis /x/ vs. lenis /ɣ/. A distinctive laryngeal feature is required for that type of system, which I express with the descriptive cover feature [±fortis], e.g. /x/ is [+fortis] /ɣ/ is [−fortis]. It is assumed here that dialects in which /x/ is the only velar fricative (e.g. StG) do not mark that fricative with the feature [+fortis] because [±fortis] is not distinctive for dorsal fricatives.[3]

Velar and palatal affricates have the same place structure depicted above in (1). Those affricates are important because several SwG varieties have a distribution of velar [kx] and palatal [kç] that parallels that of [x] and [ç]. I adopt a representation of affricates in which those sounds bear [−continuant] and [+continuant], as in (2a); see Sagey (1986) and Lombardi (1990) and more recently Hall (2012).[4] Affricates are thereby distinct from stops and fricatives (2b,c). Note that the structures in (2) depart from the abbreviatory convention in (1) because [±continuant] is placed on a tier separate from the root node.

(2) a. $\begin{bmatrix}+\text{CONS}\\-\text{SON}\end{bmatrix}$

$[-\text{CONT}]$ $[+\text{CONT}]$

b. $\begin{bmatrix}+\text{CONS}\\-\text{SON}\end{bmatrix}$

$[-\text{CONT}]$

c. $\begin{bmatrix}+\text{CONS}\\-\text{SON}\end{bmatrix}$

$[+\text{CONT}]$

The treatment of affricates adopted here can be contrasted with the one proposed by linguists such as La Charité (1993), Rubach (1994), Clements (1999), Kim (2001) and Kehrein (2002) (on the basis of Jakobson et al. 1951), which sees affricates as strident stops without a [+continuant] component, e.g. /t/ is [−strident] and /ts/ is [+strident]. The strident stop representation is rejected here because it can capture neither the nonstrident affricate /kx/ nor the natural class of /x/ and /kx/.

The place features for the coronal nasal (/n/) and coronal liquids (/l r/) are important because those sounds can function as triggers for velar fronting. All dialects investigated have the three contrastive nasals /m n ŋ/, as well as two liquids, namely /l/ and the consonantal rhotic, which can be either coronal (/r/) or dorsal (/ʀ/) depending on dialect. Representations for /n l r/ are posited in (3a–3c) below. The dorsal (phonetically uvular) rhotic (/ʀ/) is depicted in (3d).

[3]The nature of the distinctive laryngeal feature in German phonology and its relationship to the phonetics has been the object of debate for many years. According to some approaches, [±fortis] is interpreted as [±voice], while others advocate an aspiration feature ([±spread glottis]) or a feature of length (singleton vs. geminate). See Iverson & Salmons (1995), Wiese (1996b), Jessen & Ringen (2002), and Beckman et al. (2009) for various proposals. The present treatment does not require a commitment to any one of those approaches.

[4]Sagey (1986) proposes a contour segment representation for affricates, while Lombardi (1990) endorses the complex segment representation. My analysis is compatible with both models.

(3) a. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\+\textsc{nas}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{coronal}\end{bmatrix}\end{array}$ b. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nas}\\-\textsc{cont}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{coronal}\end{bmatrix}\end{array}$ c. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nas}\\+\textsc{cont}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{coronal}\end{bmatrix}\end{array}$ d. $\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nas}\\+\textsc{cont}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{dorsal}\end{bmatrix}\end{array}$

It is shown below that the place features for /r/ and /ʀ/ are phonologically relevant and that rhotics cannot be analyzed as placeless. As noted in §2.2.1 the finer-grained manner distinctions among rhotics (e.g. approximant, trill) are irrelevant for the phonology.

2.2.3 Featural representations for vowels

All German dialects discussed reflect the predominant cross-linguistic pattern in the sense that they contrast front vowels and back vowels. I adopt the proposal defended in a number of works, according to which front vowels are phonologically [coronal], as in (4); see Clements (1976), Lahiri & Evers (1991), Hume (1994), and Clements & Hume (1995), as well as Robinson (2001), Glover (2014), and Hall (2014a), who have extended that proposal to German (including regional dialects). A distinction between C-place and V-place [coronal] (e.g. Clements & Hume 1995) is not crucial and is therefore ignored.

(4) $\begin{array}{c}\begin{bmatrix}-\textsc{cons}\\+\textsc{son}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{coronal}\end{bmatrix}\end{array}$

The advantage of analyzing front vowels as [coronal] is that those sounds can be grouped together with /n l r/ as the natural class of coronal sonorants, which form the set of triggers for velar fronting in many dialects. The left-to-right spreading is depicted in the template for velar fronting in (5a). The features of the leftmost segment (trigger) and of the rightmost segment (target) are omitted here because they differ from dialect to dialect. The word-initial analogue of (5a) is presented in (5b).[5]

[5] I refer henceforth to the rule in question in the upper case if it is a specific instantiation of either (5a) or (5b). To distinguish the various versions in individual dialects, I also include numerical suffixes, e.g. Velar Fronting-1, Word-Initial Velar Fronting-1 etc. By contrast, the rule is given in the lower case (velar fronting) in reference to fronting in general.

(5) a. Velar Fronting:

[…] […]

[CORONAL] [DORSAL]

b. Word-Initial Velar Fronting:

$_{\text{wd}}$[[…] […]

[DORSAL] [CORONAL]

Given the spreadings depicted in (5), the output segment is the complex corono-dorsal segment for palatals (=1d). In phonological representations there is no temporal ordering involving place features. Thus, the features [coronal] and [dorsal] can appear in that linear sequence, as in (5a), or in the reverse, in (5b), but both structures represent palatals, as in (1d).

The features for back vowels are not crucial in my treatment because they do not serve as triggers for velar fronting. There is more than one way to analyze such segments (e.g. /u o ɑ/); I posit that they are [dorsal], although it is argued in Chapter 6 that two varieties of SwG require [peripheral] instead; recall Footnote 1.

The German dialects investigated provide no evidence for drawing a distinction between back vowels and central vowels (although see §15.5 for the one counterexample). From the phonological perspective, phonetically central vowels and phonetically back vowels are [dorsal], e.g. Chomsky & Halle (1968) and Rice (2002). The treatment of central vowels as [dorsal] works well in languages like StG (and in the German dialects discussed below) because phonetically central vowels and phonetically back vowels always differ in terms of at least one other feature, one of which can be interpreted as distinctive. For example, many dialects possess a low back unrounded vowel (/ɑ/) and a mid rounded back vowel /ɔ/. Those two [dorsal] can be distinguished from one another if: (a) /ɔ/ is [−low] and /ɑ/ is [+low], or (b) /ɔ/ is [labial] and /ɑ/ lacks that feature. In dialects where /ɑ/ contrasts with a low front vowel /æ/, /æ/ is [coronal] and /ɑ/ is [dorsal]. In rare dialects there are two low nonfront unrounded vowels (/ɑ/ and /a/), but the feature distinguishing those segments is [±tense]; see §11.5. The present survey of German dialects therefore only requires [coronal] and [dorsal] but not an additional feature like [central] for capturing the frontness/backness dimension among vowels.[6]

[6] A number of linguists have pointed out that the approach to central vowels described above cannot be universally true because some languages contrast a central and back vowel that agree in lip rounding (Parker 2000, Rice 2002). For example, Norwegian (Kristoffersen 2000) contrasts three high rounded vowels, i.e. front rounded /y/, central rounded /ʉ/, and back rounded /u/. Kristoffersen consequently argues that back and central vowels are both [dorsal] and that they are distinguished with the feature [±back], i.e. /ʉ/ is [dorsal, −back] and /u/ is [dorsal, +back]. None of the German dialects investigated below has such contrasts.

One phonetically central vowel present in almost all German dialects discussed below is schwa (/ə/). A possible featural analysis for that phonetically mid central vowel is one in which it is a simplex [dorsal] sound, which is distinct from the mid back vowel /ɔ/ (=[dorsal, labial]). I alternatively adopt the proposal that schwa consists of a placeless root node, as in (6). All other vowels – referred to below as FULL VOWELS – possess place features.

(6) /ə/: $\begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \end{bmatrix}$

A representation for schwa like the one in (6) is defended by van Oostendorp (2000: 133–134) for Dutch. According to that author's first property of schwa (p. 133), that vowel bears no phonetic features. From the point of view of phonology, van Oostendorp consequently argues that Dutch schwa is not marked for any of his vocalic (phonological) features ([high], [low], [lax], [coronal], [labial], [dorsal] in his featural system).

What is significant about the structure in (6) is that schwa has no place features, in contrast to all other vowels. Representations similar to the one in (6) have been proposed in the literature on schwa in StG (e.g. Hall 1992: 208–212, Wiese 1996b: 153, 159, Trommer 2021). In contrast to the approach taken by Hall and Wiese, my treatment requires no default rule which supplies the representation in (6) with features. Thus, the structure in (6) depicts underlying schwa (e.g. in StG /gənɑu/ for [gənɑu] 'exactly' or /ʃʀɑŋkə/ for [ʃʀɑŋkə] 'barrier'), which remains placeless throughout the entire phonology. Many instances of schwa in StG have been argued to be epenthetic, e.g. [hɪməl] 'sky' from /hɪml/; see Wiese (1988), Hall (1992), Noske (1993), Wiese (1996b). Epenthetic schwa in German dialects (§5.4) – like underlying schwa – has the placeless structure in (6).

Since the system of phonemic vowels can differ considerably from dialect to dialect it is not feasible to list a single set of matrices here with distinctive features for individual vowels. Instead, the reader is referred to the beginning of each case study in which I list the phonemic vowels for the German variety under discussion. In the remainder of this section I consider the features expressing height and tenseness necessary to capture certain commonly occurring vowel contrasts present in German dialects.

Vowel height is captured phonologically with [±high] and [±low], e.g. /i u/ are [+high] and /e o ɑ/ are [−high]. /ɑ/ can be distinguished from /o/ by the feature [±low], or by the feature [labial]/[dorsal], e.g. /ɑ/ is [+low] and /o/ is [−low] or /ɑ/ is [dorsal] and [o] is [labial]. Tenseness ([±tense]) distinguishes vowels at any given height, e.g. /i ɪ/ are [+high], /i/ is [+tense] and /ɪ/ is [−tense].

Some dialects are attested with phonetically low front vowels (/æ/) in addition to mid front vowels (e.g. /e ɛ/). In that type of system, /æ/ is [+low], while /e ɛ/ are [−low] and then further distinguished with [±tense], i.e. /e/ is [+tense] and /ɛ/ is [−tense]. The majority of dialects investigated below have mid front vowels (e.g. /e ɛ/) but no phonetically low front vowel /æ/. In that type of inventory the default assumption is that /e ɛ/ are distinguished from high vowels (e.g. /i/) with the feature [±high] but that they do not bear any specification of [±low], which is not a distinctive feature. As indicated in (7a), /i e ɛ/ are assigned a plus or minus value for [±high], and then the nonhigh vowels are distinguished by [±tense]. In some dialects with /e ɛ/ and no /æ/, /ɛ/ behaves phonologically like a low vowel (/æ/). For precedent outside of German dialects see van Oostendorp (2000: 78) on Dutch /ɛ/ and Dresher (2009: 182) on /ɛ œ/ in Xibe (Manchu, Northwest China). In the type of German dialect described here, /ɛ/ is [+low], and all other front vowels are [−low]. Nonlow vowels are further distinguished by [±low], as in (7b).

(7) a.

	i	e	ɛ
[high]	+	−	−
[tense]		+	−

b.

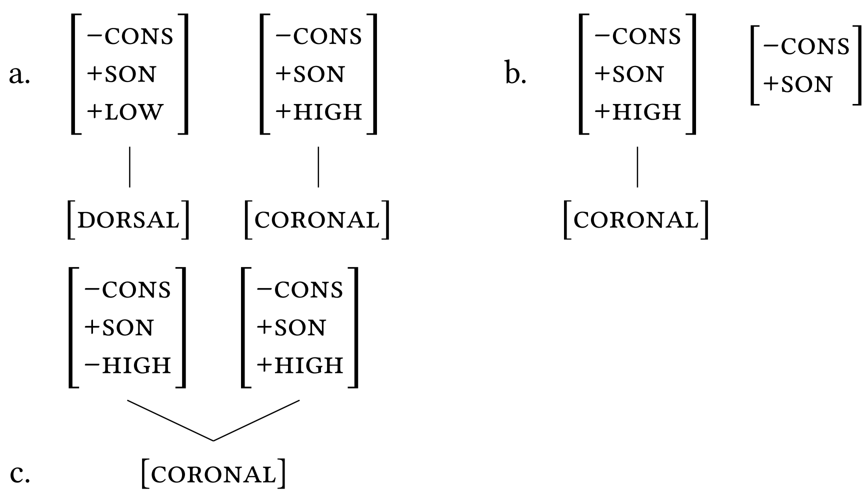
	i	e	ɛ
[low]	−	−	+
[high]	+	−	

Following Dresher (2009) I assume that distinctive features are assigned to the phonemic inventory in a step-wise fashion. For example, given the vowels in (7a) only the [−high] vowels are assigned a value of [±tense] because [±tense] is not distinctive for [+high] vowels. [±high] is likewise assigned to the two [−low] vowels in (7b) but not to the one [+low] vowel. Note that the analysis of German vowels described here eschews default rules filling in the blanks in (7a) and (7b) with plus or minus values.

Front rounded vowels and front unrounded vowels contrast in many German dialects, e.g. StG [tiːɐ] 'animal' vs. [tyːɐ] 'door'. The feature that distinguishes those two types of vowels does not play a role in most of the case studies discussed in this book. However, in certain cases a feature expressing (un)roundedness is crucial. For those few cases I adopt one of two approaches. The first one expresses front rounded vowels as complex segments consisting of [coronal] and [peripheral]; recall that the latter feature was mentioned above as one way of expressing back vowels. The complex feature approach is unique to those SwG dialects discussed in Chapter 6. The second approach captures the distinction between front rounded vowels and their unrounded counterparts with the binary feature [±round], e.g. /y/ is [+round] and /i/ is [−round]. This treatment is the one adopted for certain LG dialects (§12.6.1) and a velar fronting island (§15.3).

Diphthongs are represented as a sequence of two separate root nodes joined together under a single nucleus. That both parts of diphthongs have two separate root nodes has been defended by Schane (1995), Booij (1995) for Dutch as well as Wiese (1996b) and Hall (2002) for StG. I give representations for the diphthong /ɑi/ (e.g. StG [tsɑit] 'time') in (8a) and /iə/ in (8b). Note that the representation in (8b) for schwa lacks place features but that the representation does have a root node (=6). If both components of a diphthong are front (or back) then the place feature ([coronal]/[dorsal]) is shared by the Obligatory Contour Principle (OCP; Goldsmith 1976, McCarthy 1986, Yip 1988); see (8c) for the diphthong /ei/.[7] As mentioned in §2.2.2 the phonetic glide in diphthongs is not transcribed with a diacritic because its nonsyllabicity plays no role.

(8)



I do not include syllable structure (e.g. nucleus) in (8) or in any representation posited below for diphthongs in German dialects because that structure is not relevant for my treatment of velar fronting. The same point holds for phonological units capturing length (skeletal slots) or weight (moras).

Surface diphthongs in some languages have been argued to be derived from underlying monophthongs. For example, van Oostendorp (2000: 78) analyzes Dutch /ɛi/, /œy/, and /ɒu/ as the surface manifestation of underlying short high lax vowels. The default assumption I make is that diphthongs are phonemic unless evidence can be provided to the contrary.

[7] In earlier models [±high] and [±low] were argued to be under [dorsal], e.g. Sagey (1986). I follow later studies which have shown that those features are independent of [dorsal], e.g. Lahiri & Evers (1991).

2.2.4 Opacity (part 1)

Many languages are attested with phonetic representations that seem to contradict the phonological rules of the language in question (e.g. Kiparsky 1982a, McCarthy 2009, Baković 2011 and references cited therein). The phenomenon described here is referred to as opacity, which has the formal definition (Kiparsky 1973: 79) in (9).

(9) A phonological rule P of the form A → B / C __ D is opaque if there are surface structures with either of the following characteristics:
   a. Instances of A in the environment C __ D;
   b. Instances of B derived by P that occur in environments other than C __ D.

A rule is opaque if there are surface structures (phonetic representations) that look like they should have undergone it (9a) or surface structures that underwent the rule but look like they should not have (9b). By contrast, a rule is transparent if neither of the two conditions in (9) holds.

The two types of opacity described in (9) are referred to in the later literature as underapplication and overapplication respectively (e.g. McCarthy 2009, who adopts the two terms from Wilbur 1974). Thus, rule P underapplies in (9a) because there is a surface structure ([CAD]) in which the rule should have applied, but rule P overapplies in (9b) because is creates a structure ([B]) not specified in its structural description.

Kiparsky (1973) argues that the two types of opacity in (9) can be equated with counterfeeding and counterbleeding orderings respectively. Transparent orderings involve the converse orderings, namely feeding and bleeding.

Rule opacity and rule transparency and their relationship to the orderings referred to above can be illustrated with a simple example involving the two rules in (10) from a hypothetical language. The example discussed here (modified slightly) is drawn from Baković (2011).

(10) a. Deletion: vowel ⟶ ∅ / __ vowel
   b. /t/-Palatalization: /t/ ⟶ [tʃ] / front vowel __

Given the underlying representations /tue/ and /tio/, the respective phonetic representations are transparent if Deletion applies before /t/-Palatalization (see 11a). In (11ai), Deletion feeds /t/-Palatalization because the elimination of /u/ places the preceding /t/ before a front vowel, which is precisely the context for /t/-Palatalization. Put differently, this is a feeding order because Deletion creates a structure to which /t/-Palatalization can apply. Deletion bleeds /t/-Palatalization in (11aii) because the elided /i/ would have triggered the Palatalization of the preceding /t/ if it had not been eliminated. This is a bleeding order because there is a potential structure to which /t/-Palatalization could apply which is removed by Deletion. Significantly, neither output in (11a) is opaque; hence, [tʃe] and [to] show the transparent application of Deletion and /t/-Palatalization.

(11) a. Feeding and bleeding:

	i. /tue/	ii. /tio/
Deletion	te	to
/t/-Palatalization	tʃe	----
	[tʃe]	[to]

b. Counterfeeding and counterbleeding:

	i. /tue/	ii. /tio/
/t/-Palatalization	----	tʃio
Deletion	te	tʃo
	[te]	[tʃo]

Reversing the ordering of the two rules (=11b) yields opacity. In (11bi) Deletion counterfeeds /t/-Palatalization. The reason is that the elimination of /u/ causes /t/ to become adjacent to the front vowel /e/, but /t/-Palatalization cannot apply because that rule precedes Deletion. In (11bii) Deletion counterbleeds /t/-Palatalization because the deleted /i/ is a front vowel, which triggers /t/-Palatalization before deleting. In (11bi) /t/-Palatalization underapplies because there is a surface structure in which the rule should have applied (i.e. [te]). By contrast, in (11bii) /t/-Palatalization overapplies because there is an instance of a sound created by that rule that occurs in a context not specified by the rule (i.e. [tʃ] before the back vowel [o]).

Rules interacting with velar fronting can alter either the triggers or the targets for that process. That point can be illustrated with the hypothetical language in (11). Consider first (11ai), where Deletion feeds /t/-Palatalization by creating a new trigger for the latter process. Changes not depicted in (11) might feed /t/-Palatalization by increasing the number of targets for that rule. For example, if there were a change from /d/ to [t] in word-initial position (/d/-Fortition), and if the output of that change undergoes /t/-Palatalization, then /d/-Fortition feeds /t/-Palatalization by creating a new target; hence, /di/ surfaces as [tʃi]. In (11bi) Deletion counterfeeds /t/-Palatalization by increasing the number of potential triggers. However, if /d/-Fortition does not feed /t/-Palatalization then the latter process is counterfed by the former because it creates a new target which is immune to /t/-Palatalization; hence, /di/ surfaces as [ti].

Transparent and opaque interactions are summarized in (12), which is taken from Baković (2011: 43), who in turn bases this classification on earlier work by Kiparsky and McCarthy.[8]

(12)

transparent
- feeding
- bleeding

opaque
- type (9a) underapplication
  - counterfeeding
- type (9b) overapplication
  - counterbleeding

An additional type of interaction involves the MUTUAL BLEEDING of two rules. That refers to a situation in which a rule A bleeds a later-ordered rule B and where rule B would also bleed rule A if it were ordered before rule A (Baković 2011). That type of interaction is illustrated in two sets of German dialects in (13) modified slightly from Kiparsky (1982a: 66). (13a) represents dialects in North Germany and (13b) from another set of dialects (e.g. StG). For discussion see Hall (1992: Chapter 4) and references cited therein.

(13) Mutual bleeding:

	a. /laŋg/	b. /laŋg-ə/
Final Fortition	laŋk	----
g-Deletion	----	laŋə
	[laŋk]	[laŋə]
	‘long’	‘long-INFL’

	c. /laŋg/	d. /laŋg-ə/
g-Deletion	laŋ	laŋ
Final Fortition	----	----
	[laŋ]	[laŋə]

Final Fortition affects all obstruents in a coda, while g-Deletion eliminates /g/ after a nasal. In (13a), Final Fortition bleeds g-Deletion, while the reverse ordering

[8] Baković (2011) shows that the classification in (12) is not sufficient for several reasons. For example, a counterfeeding interaction does not always result in underapplication, and counterbleeding is not the only way to describe actual examples illustrating overapplication. What is more, a counterbleeding relationship does not always exhibit overapplication.

in (13b) shows that g-Deletion bleeds Final Fortition. Examples (13b) and (13d) illustrate g-Deletion in the context before a vowel.

Mutual bleeding – in contrast to counterbleeding – does not involve opacity. In particular, neither [laŋk] in (13a) nor [laŋə] in (13b, 13d) exhibit overapplication or underapplication of Final Fortition or g-Deletion. Mutual bleeding therefore exemplifies a transparent interaction.

The distinction between transparency and opacity as they relate to velar fronting is a significant theme in the present book. I show below that the fronting of velars is transparent in some dialects and opaque in others. From the synchronic perspective, the transparent process of velar fronting is either fed or bled by an independent process, or velar fronting and another process stand in a mutually bleeding relationship. Several dialects are attested in which velar fronting exhibits underapplication because it is counterfed synchronically by another process (as in 11bi). No dialect has been found in which velar fronting overapplies synchronically by being counterbled by another process (as in 11bii); see Chapter 5 for discussion.[9]

Opacity is defined above in synchronic terms, but it is also possible to view diachronic changes as opaque or transparent even though the sound changes are no longer active as synchronic rules. It is demonstrated in the following chapters that the historical process fronting velars has become opaque through time in many varieties and that the type of opacity referred can involve both underapplication as well as overapplication; see Chapters 6–9 for extensive discussion.

2.3 Typology of Velar Palatalization

One of my goals is to compare the patterning of velar fronting in German dialects with rules fronting velars in other languages; recall research questions (9) in §1.4.4. Processes fronting velar sounds like /k/ and /x/ to a position towards the front of the oral cavity in the neighborhood of front vowels have been studied extensively in the literature, which traditionally refers to the change in question as VELAR PALATALIZATION. I retain the term VELAR FRONTING, which can be viewed as a special type of Velar Palatalization. In the present section I clarify that assertion by examining the findings in the typological literature on Velar Palatalization. The reader is referred to Appendix I, which contains some discussion of Velar Palatalization in the branches of Germanic (Gmc) not discussed in

[9] My main concern is opacity as it relates to velar fronting. It will be seen in the ensuing chapters that synchronic counterbleeding orderings are indeed required (=11bii) but that neither of the rules involved is velar fronting. However, that counterbleeding relationship does not result in overapplication (recall Footnote 8).

this book (WGmc and North Germanic (NGmc)) as well as two language families spoken adjacent to German-speaking countries, namely Romance and Slavic.

2.3.1 Introduction

The cross-linguistic literature on Velar Palatalization is extensive. Many linguists consider the phonetics of Velar Palatalization (e.g. Guion 1998, Recasens 2020), while others examine the phonology (e.g. the featural aspects), e.g. Lahiri & Evers (1991), Hume (1994), Clements & Hume (1995). Considerable work focuses on Velar Palatalization (synchronic or diachronic) in individual languages or language families. Some of that research (listed alphabetically in terms of the language) includes Albanian (Kolgjini 2004), Greek (Newton 1972b, Manolessou & Pantelidis 2013), Old Chinese (Schuessler 1996), Polish (Ćavar 2004, Gussmann 2004), Romance (Repetti 2016, Schmidt 2016), Slovene (Jurgec 2016), and Latvian (Urek 2016), although many other language families could be added to that list. There is also a small but growing body of research investigating the typological aspects of Velar Palatalization, e.g. Neeld (1973), Chen (1973), Bhat (1978), and most recently Bateman (2007, 2011), Kochetov (2011), Krämer & Urek (2016), and Recasens (2020).[10]

This typological research – in particular Bateman (2007, 2011) – has shown that Palatalization can target velar consonants and that the outputs can be quite diverse. In Table 2.3 I present the most common targets and outputs for Velar Palatalizations as discussed in the literature. Velar fronting in German dialects has a much more restricted set of outputs, as indicated in Table 2.4.[11]

There are two significant differences between Tables 2.3 and 2.4: (a) The output of velar fronting is the corresponding palatal (i.e. [k g x ɣ kx ŋ] are fronted to [c ɟ ç ʝ kç ɲ]); hence, the manner of articulation does not change. However, Velar Palatalization often changes the manner of articulation for stop targets ([k g]), which can surface as affricates ([tʃ dʒ]);[12] and (b) Velar Palatalization changes either (i) the primary place of articulation (FULL VELAR PALATALIZATION), e.g. velar

[10]The typological literature cited above investigates Velar Palatalization in the context of Palatalization in the broad sense of the word. For example, in many languages alveolar (coronal) sounds like /t/ are realized as postalveolar ([tʃ]) in the context of front vowels (recall the hypothetical rule in 10b). The typological literature also considers the Palatalization of labial sounds like /p/, which is rare.

[11]The lenis velar fricative [ɣ] and the velar affricate [kx] are not included in Table 2.3 because the languages surveyed with Velar Palatalization do not have those sounds. I do not consider that omission to be significant.

[12]Both Velar Palatalization and velar fronting can involve a minor manner change in the case of the target nonsibilant fricative [x], which fronts/palatalizes to the sibilant fricative [ɕ].

Table 2.3: Velar Palatalization targets and outputs

	target	output
Stop	[k]	[kʲ c cʲ tʃ tʃʲ ç]
	[g]	[gʲ ɟ dʒ]
Fricative	[x]	[xʲ ç ɕ ʃ]
Nasal	[ŋ]	[ŋʲ ɲ]

Table 2.4: Velar fronting targets and outputs

	target	output
Stop	[k]	[c]
	[g]	[ɟ]
Fricative	[x]	[ç ɕ]
	[ɣ]	[ʝ]
Affricate	[kx]	[kç]
Nasal	[ŋ]	[ɲ]

[x] is realized as palatal [ç], or (ii) adds SECONDARY PALATALIZATION to a primary place of articulation, e.g. velar [k] surfaces as secondarily palatalized velar [kʲ]. By contrast, velar fronting changes only the primary place of articulation.[13]

Velar Palatalization and velar fronting differ in terms of triggers. The typological literature on Velar Palatalization demonstrates that triggers for that process consist of front vowels (or some subset thereof) and the palatal glide [j] (if present). My own study reveals that there are two ways in which velar fronting triggers are broader than Velar Palatalization triggers. First, velar fronting is typically induced by front vowels and coronal sonorant consonants ([r l n]). Second, velar fronting can occur in the context of one or more back vowel. In fact, in many dialects velar fronting affects velar sounds adjacent to any sound; hence, in that type of system velar fronting has no segmental trigger at all.

The restricted set of triggers for Velar Palatalization has led many researchers to make the following assumptions:

(14)
  a. Velar Palatalization is always assimilatory;
  b. Velar Palatalization is always triggered by one or more front vowel;
  c. Velar Palatalization cannot occur in the context of back vowels;
  d. Velar Palatalization must have a segmental trigger;
  e. Velar Palatalization is not triggered by consonants in addition to (front) vowels.

[13] My assertion that German dialects exhibit the restricted set of outputs in Table 2.4 and not the broad one in Table 2.3 is based on my scrutiny of the original sources for over three hundred varieties of German. To be clear: I do not deny that there might be dialects of German with the broad set of outputs in Table 2.3, e.g. [xʲ] for /x/ or [tʃ] for /x/. See §11.1 for brief discussion of the realization of fronted velar stops as affricates. However, based on the preponderance of the evidence discussed in the remainder of this book, the broad set of outputs in Table 2.3 clearly represents less preferred patterns.

Note that the two statements in (14c, 14d) are corollaries of (14a). Since Palatalization is considered to be a prototypical rule involving consonant-vowel place interactions, the trigger is said to comprise front vowels only (=14b), but not a set of (front) consonants and (front) vowels (=14e).[14]

The behavior of velar fronting in German dialects is significant because it demonstrates that none of the statements in (14) can be unconditionally true. First, many varieties are attested in which velars undergo fronting regardless of the nature of the following sound. That type of velar fronting is significant because it poses a clear challenge for (14a, 14b, 14d). Second, velar fronting in many varieties – including StG – consists of front vowels and coronal sonorant consonants, thereby counter-exemplifying (14e). Third, a set of dialects is attested in which velar fronting occurs in the context of a preceding back vowel, thereby calling (14c) into question.

In (15a) I provide the definition for full Palatalization (Bateman 2011) and in (15b) a parallel definition of velar fronting. The term VOCOID in (15a) is the set of vowels and glides (i.e. palatal [j]).

(15) Definition of full Palatalization in (15a) and velar fronting in (15b):
  a. "A consonant changes its primary place of articulation and often its manner of articulation, while moving toward the palatal region of the vocal tract when adjacent to a high and/or front vocoid…". (Bateman 2011: 589).
  b. A velar consonant changes its primary place of articulation, while moving toward the palatal region of the vocal tract (thereby creating palatal or alveolopalatal sounds) usually when adjacent to a front vowel or coronal sonorant consonant.

Note that the wording of (15a) accounts for the diverse set of outputs in Table 2.3 while simultaneously capturing the generalizations in (14). By contrast, velar fronting is defined in such a way to admit only the restricted outputs in Table 2.4, but it does not imply the validity of the statements in (14).[15] In any

[14] According to Kochetov (2011), Palatalization *usually* (my emphasis) arises under the influence of an adjacent front vowel (including [j]). Krämer & Urek (2016: 2) make passing reference to languages in which some kind of Palatalization occurs without a front vowel trigger, although they refrain from discussing those examples. That point aside, there is certainly unanimous agreement in the literature that a system in which Velar Palatalization is triggered by a back vowel is peculiar and possibly without precedent.

[15] In an attempt to eschew an overly wordy definition, I do not attempt to express the fact that the alveolopalatal sound referred to in (15b) is the fricative [ç] from the target [x]. It should go without saying that the properties of velar fronting described in the remainder of this section cannot be included in the definition presented in (15b).

case, the prose statement of velar fronting in (15b) is expressed formally as the spreading of the frontness feature [coronal], as in (5), or as the addition of that feature in dialects where velar fronting does not function as an assimilation.

Tables 2.3 and 2.4 and the description of triggers listed above do not give any indication of what targets and triggers are more common or whether or not there are any exceptionless cross-linguistic generalizations which can be made. In §2.3.2–§2.3.5 I discuss that type of issue.

2.3.2 Targets

According to Bateman (2007: 56ff.) the most common targets for Palatalizations (in the broad sense of the word) are obstruents (as opposed to sonorants). Languages with stops as targets outnumber those with fricatives. The next best targets are nasals followed by laterals, and finally by rhotics. It is not possible to posit implications involving the preference for stops over fricatives (e.g. "If a fricative is a target for Palatalization, then a stop is also a target") because there are too many counterexamples, i.e. languages in which fricatives but not stops serve as Palatalization targets. Bateman writes that "…there is an overwhelming tendency in most languages for obstruents to palatalize most often, followed by the other manners of articulation …".

The generalization described in the preceding paragraph concerning obstruent vs. sonorant targets also holds for velar fronting, although the only sonorant target for velar fronting is [ŋ].[16] Only a small number of dialects exhibit the fronting of a velar nasal; however, of those dialects with that change, velar stops and velar fricatives also undergo fronting. One exceptionless generalization for velar fronting is expressed in (16).

(16) Implicational Universal for Velar Fronting Targets-1:
If a velar stop (/k g/) undergoes velar fronting then the corresponding fricative (/x ɣ/) does as well.

(16) suggests that the preferred target for velar fronting is a fricative (/x/) and not a stop (/k/); recall the StG data in §1.2. Dialects lending support to (16) are discussed in Chapter 11.

One generalization concerning velar fronting targets not discussed in Bateman (2007, 2011) relates to the distinction between lenis (e.g. /g/) vs. fortis (e.g. /k/)

[16] No dialect of German is attested with a velar lateral (/ʟ/) which could potentially serve as a target for velar fronting. Since /ʀ/ is represented as [dorsal] (=2d), it is a potential target segment. No dialect of German – or any natural language to the best of my knowledge – is attested in which /ʀ/ undergoes fronting (=5).

sounds. There is strong evidence from phonetics – also reflected in typological work – that fortis sounds make for better targets than lenis sounds. That generalization apparently holds for stops at all places of articulation. For example, in their typological survey of Assibilations – the change from an alveolar stop like /t/ or /d/ to an affricate like [ts] or [dz] in the context of a front vocoid – Hall & Hamann (2006) show that lenis /d/ cannot assibilate unless the corresponding fortis sound (/t/) does. The phonetic reason for that observation is discussed in Hall et al. (2006): In a sequence like /ti/ the friction phase (which arises after the release of a coronal stop before a high vowel) has a longer duration than the one in a sequence like /di/. In her study of Velar Palatalization, Guion (1998: 20) observes the same asymmetry involving lenis ("voiced") vs. fortis ("voiceless") velar targets and concludes that "[v]oiceless velars are more likely to palatalize than voiced velars". Guion observes that the cases of Velar Palatalization discussed in Bhat (1978) involve either: (a) cases of lenis and fortis targets, or (b) fortis only targets, but no cases of lenis only targets. The studies cited here suggest the implication in (17). I state (17) with respect to velar fronting, although it is probably more general in its scope.

(17) Implicational Universal for Velar Fronting Target-2:
If a lenis sound undergoes velar fronting then the corresponding fortis sound does as well.

(17) is exceptionless in the studies cited above (for velar stops as target segments). It remains to be seen whether or not that implication can also be confirmed for velar fricatives as targets. In any case, it is demonstrated below that German dialects obey (16) and (17) for either velar stops or velar fricatives as target segments; see §4.5.1, §11.9.1, and §12.7.2 for discussion.

2.3.3 Triggers

It is undeniably the case that the unmarked context for Velar Palatalization is the set of front vowels, especially the high front vowel /i/; see Bateman (2007: 62) and Kochetov (2011). The latter author notes that Palatalization (in the general sense) is only rarely triggered by low front vowels (e.g. /æ/). In fact, there is agreement in the literature that low and mid front vowels only trigger Palatalization if high vowels trigger it as well (Neeld 1973: 37, Chen 1973: 177, Bateman 2007: 64, and Kochetov 2011). Bateman (2007: 64) posits the implication in (18), which is apparently exceptionless. The implication is also shown below to be exceptionless for velar fronting in German dialects.

(18) Implicational Universal for Palatalization Triggers:
If lower front vowels trigger Palatalization, then so will higher front vowels.

The generalization expressed in (18) has been argued to be grounded in phonetics. For example, in her perception study on the realization of velars like /k/ as postalveolar affricates ([tʃ]), Guion (1998) shows that the acoustic similarity between the target ([k]) and output ([tʃ]) is greater before high front vowels than before mid and low front vowels. The conclusion is that high front vowels are more favorable triggers for velar fronting than nonhigh front vowels.

Nonheight features seldom play a role in defining the natural class of vocalic triggers for Velar Palatalization (Bateman 2007: 62). In particular, Bateman finds that features such as vowel length, rounding, or nasality do not make a difference in a front vowel's ability to serve as a trigger. Thus, short front vowels, long front vowels, front rounded vowels, front unrounded vowels, front nasalized vowels and front oral vowels can induce Velar Palatalization. One exception to this generalization (Bateman 2007: 54–55) is Fanti (Niger-Congo, Ghana), in which /x/ palatalizes only before a front non-nasal vowel. German dialects in which velar fronting is sensitive to nonheight features are rare but attested; see §12.6 for dialects in which roundedness, tenseness, and stress can play a role in defining the set of front vocalic triggers. The role of nasality as a factor in defining the triggers for velar fronting is discussed briefly in §15.9.[17]

2.3.4 Outputs

Typological studies agree that the preferred outputs for Velar Palatalization with stops as targets (/k g/) are sibilant affricates (i.e. postalveolar [tʃ dʒ]). That type of output is more common than palatal nonsibilant stops (=[c ɟ]). Bateman (2011: 595) writes: "The most common full palatalization outcomes for the coronal and dorsal oral stops /t/, /d/ and /k/, /g/ are … [tʃ] and [dʒ]". Kochetov (2011) likewise writes: "Overall, there is a tendency for place-changing palatalizations to result

[17]One feature not mentioned above is vowel length. In a recent study, Cardoso & Honeybone (2022) show that the velar fricative derived through the lenition of /k/ in Liverpool English surfaces as palatal ([ç]) after a high, front vocalic trigger. Significantly, that trigger must be bimoraic, i.e. a long monophthong (/iː/) or a diphthong (e.g. /aɪ/), since that change does not occur after a short monophthong (/ɪ/). From the formal point of view, their rule (Dorsal Fricative Assimilation) spreads the frontness feature ([palatality] in their system) to the right, but spreading only occurs if the vocalic trigger is foot-final, which is precisely the case when that vowel is bimoraic. I do not discuss quantity-sensitivity as a trigger in this book because no parallel cases involving velar fronting in German dialects are known to me.

in sibilants rather than non-sibilants". The data in those sources (and in Guion 1998) suggest that there is a similar generalization for Velar Palatalization with fricatives as targets in the sense that sibilant fricatives ([ʃ ʒ]) are the preferred output to nonsibilant fricatives (=[ç ʝ]). These generalizations are stated in (19):

(19) a. If the target for Velar Palatalization is a stop (/k g/) then the preferred output is a sibilant affricate ([tʃ dʒ]).

b. If the target for Velar Palatalization is a fricative (e.g. /x/) then the preferred output is a sibilant (e.g. [ʃ]) rather than a nonsibilant ([ç]).

The rarity of sounds like [ç] as the output correlates with the findings in Maddieson (1984: 43–47), who concludes that the sibilant [ʃ] is the second most common fricative (behind [s]), while the nonsibilant [ç] was the second least common (before pharyngeal [ħ]).

The data from German dialects discussed below reveal that neither of the statements in (19) can be confirmed: For both velar stops and velar fricatives the preferred output is a nonsibilant (e.g. StG). However, there are some areas to be investigated below (Chapter 10) in which the target fricative /x/ surfaces as the sibilant alveolopalatal fricative [ɕ].

2.3.5 Directionality and adjacency

An additional parameter discussed in the typological literature on Palatalization is directionality. If the target (e.g. /k/) is situated to the left of the trigger (e.g. /i/) then Palatalization occurs from right-to-left (regressive), but if the target is to the right of the trigger then Palatalization occurs from left-to-right (progressive). The literature is in agreement that both options are well-attested, but that regressive assimilation is the preferred option. I refer to that generalization as the Directionality Parameter for Palatalization, which I state in (20); see Bateman (2007: 75–77). A final parameter is whether or not the target and trigger can be separated by an intervening sound (ADJACENCY). The literature is in agreement that in the overwhelming number of cases the trigger and target for Palatalization must be adjacent; see Bateman (2007: 75–77) and Kochetov (2011). I state that generalization in (21).

(20) Directionality Parameter for Palatalization: The preferred direction for Palatalization is right-to-left (regressive); hence, the trigger follows the target. Progressive Palatalization is also possible, although it is less preferred.

(21) Adjacency Parameter for Palatalization: The trigger and target for Palatalization are preferably adjacent.

The Directionality Parameter in (20) is counterexemplified by velar fronting, which applies progressively, e.g. StG [kuːxən] 'cake' vs. [kʏçə] 'kitchen'. Surprisingly, German dialects do not exhibit variation with respect to the directionality of velar fronting. I state that exceptionless generalization in (22). Finally, the data discussed below from German dialects support (21), which I restate in (23) in terms of velar fronting:

(22) Directionality of Velar Fronting: If a target for velar fronting is situated after a sonorant and before a vowel then the trigger is always the sonorant to the immediate left of that velar sound.

(23) Adjacency Parameter for Velar Fronting: The trigger and target for Palatalization are preferably adjacent.

The relevance of adjacency is discussed in the dialects investigated in Chapter 6 and Chapter 11; see also the discussion in §12.8.1. Directionality is discussed in §6.5.2 and §16.5.

2.4 Historical phonology

I adopt historical models that account for the changes involving trigger and target segments for velar fronting (§2.4.1) as well as historically opaque velars and palatals (§2.4.2, §2.4.3). Structural and nonstructural causes of velar fronting are discussed in §2.4.4.

2.4.1 Rule generalization

Sound change often begins with a highly restricted environment in which phonetic conditions are particularly favorable and then progressively spreads through time and space to include more general triggers. The name for type of development is RULE GENERALIZATION (Vennemann 1978, Bermúdez-Otero 2015, Hinskens 2021).[18]

Rule generalization can be illustrated with the material discussed Benware (1996) and more recently Ramsammy (2015), which involves the change from [s] (/s/) to [ʃ] (/ʃ/) in word-initial position before a sonorant consonant in German dialects (s-Palatalization). On the basis of orthographic evidence in manuscripts written between 1300 and 1550, Benware shows that s-Palatalization occurred

[18]The phenomenon is also frequently referred to by alternate names, e.g. PHONETIC ANALOGY (e.g. Benware 1996 from Schuchardt 1885).

first before /l/, next before /l n/, then before /l n m/, and finally before /l n m w/. Those four historical stages are illustrated in (24). Note that the [ʃ] (/ʃ/) realization is reflected in StG orthography as *sch*.

(24)
a. /s/ > /ʃ/ / $_{\mathrm{wd}}$[___ /l/ MHG *sleht* > StG *schlecht* ‘bad’
b. /s/ > /ʃ/ / $_{\mathrm{wd}}$[___ /l n/ MHG *snel* > StG *schnell* ‘fast’
c. /s/ > /ʃ/ / $_{\mathrm{wd}}$[___ /l n m/ MHG *smal* > StG *schmal* ‘narrow’
d. /s/ > /ʃ/ / $_{\mathrm{wd}}$[___ /l n m w/ MHG *swarz* > StG *schwarz* ‘black

The four contexts in (24) reflect the progressive historical stages of s-Palatalization, as illustrated in (25):

(25) Increase in triggers for s-Palatalization:

Stage A	yes	no	no	no
Stage B	yes	yes	no	no
Stage C	yes	yes	yes	no
Stage D	yes	yes	yes	yes
	↑	↑	↑	↑
	{l}	{l n}	{l n m}	{l n m w}

Rule generalization as proposed in the literature cited above is defined in terms of triggers, but other linguists have made similar claims concerning targets. In particular, the proposal has been made that sound change can involve a gradual extension in the number of segments undergoing the change.[19] For example, Davis et al. (1999) argue that there was a gradual increase in the number of target segments that underwent the historical change from /p t k/ to the corresponding affricates or fricatives in German dialects (High German Consonant Shift). See Braune (2004: 82–95) for a summary of the facts and a survey of the literature of that sound change. The generalization – according to Davis et al. (1999) – is that /t/ was affected first, followed by /p/, and then /k/. The gradual increase in target segments for affrication in word-initial position is depicted in (26). Davis et al. (1999) argue that the place asymmetry illustrated here is a consequence of phonological markedness and complexity of representation; hence, /t/ was affected first because it was the least marked (and has the least complex phonological representation), and /p/ was affected more than /k/ for the same reasons.

[19] An earlier proponent of that approach is defended by King (1969: 58–63), who discusses various changes in the history of German involving the extension of target segments (= RULE SIMPLIFICATION in his terminology). For example, King demonstrates that the historical rule of German devoicing obstruents in final position (Final Fortition in 13) was preceded by a stage in which only fricatives but not stops devoiced.

(26) Increase in number of targets (High German Consonant Shift):

Stage A	yes	no	no
Stage B	yes	yes	no
Stage C	yes	yes	yes
	↑	↑	↑
	{t}	{p t}	{p t k}

Sound change begins in a FOCAL AREA (Hock 1986: 440) and then spreads both temporally and geographically from that point of origin. Spreading typically involves triggers and/or targets, which gradually expand in the focal area to include more and more segments. The original change in the focal area also spreads geographically in the sense that outlying areas adopt it. Significantly, the change is active the longest in the focal area, and it is there where it reaches its most general form in terms of the number of triggers/targets. However, in some of the outmost areas the change never progresses to the more general contexts in the focal area. The important point is that the focal area is the place where that process has the most general the set of triggers/targets.[20]

For (26), dialects with the largest set of targets (/p t k/) reflect those areas where the change began (Switzerland), while those with the fewest targets (/t/) indicate regions where the change was most recent (parts of Central Germany). This means that the change was phonologized (in Switzerland) by affecting only /t/, and then /p/ and /k/ were eventually added to the set of targets in that order. While rule generalization was transpiring temporally in Switzerland, it also spread geographically (to the north).[21]

An examination of the material from German dialects reveals that the set of triggers and targets for velar fronting exhibits variation. I argue that that variation in terms of space (dialects) is a reflection of temporal change; hence, the set of triggers and targets initially consisted of a small number of segments, and language change involved the gradual extension of both trigger and target segments. I employ the term "rule generalization" to describe both the increase in triggers and targets.[22]

[20]This interpretation of the spread of a rule from a focal area has been endorsed by a number of linguists. One of the first was Schuchardt (1885: 61f.). See also Robinson & van Coetsem (1973: 345) and Kiparsky (1988: 393–394).

[21]Davis et al. (1999) also argue that the change from /p t k/ to the corresponding fricatives in word-internal and word-final position (High German Consonant Shift) exhibited a gradual increase in the number of triggers: In the first stage that change was induced by preceding short vowels and in the next stage the triggers were extended to include long vowels. In the final stage consonants served as triggers.

[22]Hypothetically one might argue that change involves not an extension of targets and triggers,

The way in which rule generalization works in terms of time and space is depicted abstractly in Figure 2.1. The three stages referred to here can be thought of in terms of rule generalization: The white squares illustrate the rule as it is first phonologized with a narrow set of targets and/or triggers (X). The gray squares show the same rule with an expanded set of targets and/or triggers (X, Y), and the black squares represent the same rule with targets and/or triggers that are further expanded (X, Y, Z).

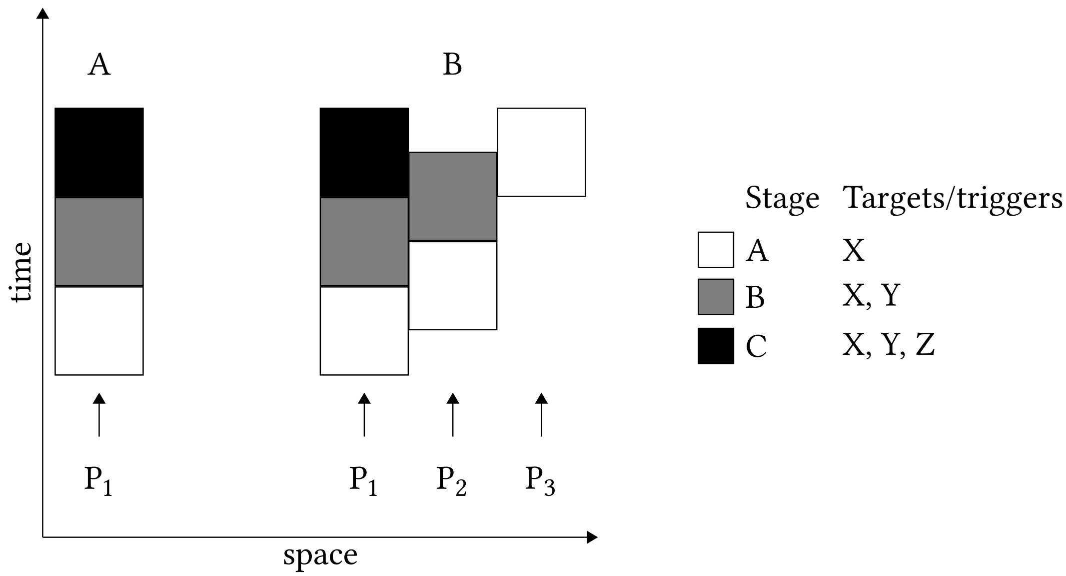


Figure 2.1: Rule generalization in time and space

Consider first column A, which illustrates how a rule (R) spreads temporally: R is phonologized in a particular place (P_1) for a certain set of targets and/or triggers which are defined as Stage A (white square). At some point in the future (gray square) R generalizes in P_1 to include more target segments and/or more triggers (Stage B), and then at a later point R is generalized in P_1 further (black square) to attain Stage C.

Now consider column B, which depicts R in time (vertically) and in space (horizontally). As in column A, R is phonologized in column B in a particular place

but instead the opposite. On that view, s-Palatalization, for example, applied first in the general environment in (24d) and then worked its way to the least specific environment in (24a). I reject that interpretation of targets and triggers in the material presented in the ensuing chapters. An advantage of the present approach is that an extension of velar fronting triggers from specific to general can be shown to be phonetically grounded; recall the discussion of the implications in (17) and (18) in §2.3. By contrast, the change from general triggers to specific ones would be phonetically arbitrary.

(P_1) for targets and/or triggers defined as Stage A (white square), and at a later point in time R generalizes its targets and/or triggers to attain Stage B in P_1 (gray square). Sometime after R has been active in P_1 at Stage 1 R also spreads geographically by phonologizing in a neighboring place (P_2; white square). When R is phonologized in P_2 its targets and/or triggers are defined narrowly as Stage A (white square). At the top of column B it can be seen that R generalizes further in P_1 to attain Stage C (black square) and that R also spreads temporally in P_2 by attaining the targets and/or triggers representing Stage B (gray square). At around the same time, R phonologizes with the narrow set of targets/triggers (white square) in a third place (P_3).

The examples presented above and throughout this book should make it clear that rule generalization is well-attested in Germanic. However, the literature is also clear that the same phenomenon can be found in other language families. Consider the history of Romance. An early study documenting rule generalization in that language family is Foley (1975), who writes (p. 47): “Many rules which apply in only a restricted environment in Latin apply with less restriction in Romance”. For example, Foley observes that the rule of Nasalization in Latin (/VN/⟶[Ṽ]) applied only before continuants but that the same process in French is triggered by a following continuant or stop. His remaining five examples involve Syncope, Vowel Shortening, Vocalization, and Vowel Lowering which all applied in Latin in specific contexts and were then generalized to applying in a broader set of contexts in modern Romance languages.

A more recent case study involving rule generalization in the history of Romance is discussed by Ramsammy (2015). His example concerns the context for Velarization – the neutralization of place contrasts to [ŋ] in word-final position – in modern varieties of Spanish. In some dialects (e.g. Peninsular Spanish, Cuban Spanish), Velarization only applies prepausally and prevocalically. However, in other dialects (Caracas dialect of Venezuelan Spanish) Velarization also occurs before a consonant. Ramsammy’s data reveal that within the latter variety there are three distinct patterns which depend on the place of articulation of the consonant following the nasal. To simplify, the three synchronic patterns support a diachronic trajectory with rule generalization: The first stage is the avoidance of a [dorsal] consonant, the second the avoidance of a [dorsal] or a [labial] consonant, and the third stage the avoidance of a [dorsal], [labial], or [coronal] consonant.

2.4.2 Opacity (part 2): Neutral vowels

Neutral vowels are defined as phonetically front (coronal) vowels that do not behave phonologically as coronal. The term “neutral” is taken from the literature on Vowel Harmony (e.g. van der Hulst & van de Weijer 1995), although my usage of the term is not exactly the same as the usage of the term in that literature. For clarity, front vowels that behave phonologically as coronal are referred to below as nonneutral vowels.

Front nonneutral vowels are represented with the feature [coronal], as in (4). That structure is repeated in (27a) with the addition of [αF], which is intended to indicate the presence of other distinctive features (e.g. [±high], [±low]). The structure in (27a) contrasts with the one in (27b) for neutral vowels. It can be seen that (27b) is a vowel marked for major class features and other nonplace distinctive features ([αF]) but not for place features. Vowels with that representation cannot behave phonologically like front vowels because they lack the feature [coronal]. Since back vowels bear at least one place feature (e.g. [dorsal]), the structure in (27b) cannot be interpreted as a phonologically back vowel. (27b) is also distinct from schwa (/ə/), which is only marked for the two major class features (recall 6).

(27) a. Front nonneutral vowel

$$\begin{array}{c}\begin{bmatrix}-\textsc{cons}\\ +\textsc{son}\\ \alpha\mathrm{F}\end{bmatrix}\\ |\\ [\textsc{coronal}]\end{array}$$

b. Neutral vowel

$$\begin{bmatrix}-\textsc{cons}\\ +\textsc{son}\\ \alpha\mathrm{F}\end{bmatrix}$$

An example of a non-Gmc language with a neutral vowel that contrasts with a nonneutral vowel comes from Inuit dialects spoken in Alaska described by Dresher (2009: 166–167), although Dresher does not use the terms "neutral vowel" or "nonneutral vowel". Dresher draws a distinction between two kinds of /i/, which he refers to as "strong i" (<$^+$/i/) and "weak i" (<$^+$/ə/). In North Alaskan Inupiaq, strong /i/ triggers the Palatalization of alveolar consonants, but weak /i/ does not. The contrast between these two /i/ sounds is illustrated in (28). The suffixes in (28a) have an initial alveolar consonant (/l n t/) following a stem ending in the vowel /u/. The suffixes in (28b) show the effects of a rule (Palatalization) changing a suffix-initial consonant following strong /i/. Note that Palatalization involves the change from /l n t/ to [ʎ ɲ s]. The examples in (28b) can be contrasted with the ones in (28c), which illustrate that Palatalization does not occur after the weak /i/. Hence, /l n t/ surface after weak /i/ as [l n t] without change. Weak /i/ can therefore be thought of as opaque because Palatalization underapplies after that sound.

(28)

	Stem	Gloss	'and a N'	'N plural'	'like a N'
a.	iglu	'house'	iglulu	iglunik	iglutun
b.	iki	'wound'	ikiʎu	ikiɲik	ikisun
c.	ini	'place'	inilu	ininik	initun

There are additional arguments supporting the distinction between the two kinds of /i/ vowels. First, only the weak /i/ changes to [ɑ] before another vowel, but strong /i/ does not. Second, only weak /i/ alternates with [u] and with zero (i.e. it syncopates).

In present terms, strong /i/ in (28b) has the nonneutral representation in (27a), and weak /i/ is a neutral vowel with the representation in (27b). This analysis is essentially the same as the one proposed by Dresher (2009: 166), who analyzes strong /i/ as [coronal] and weak /i/ as " … not coronal". Since Palatalization only applies after a [coronal] vowel, only the stem-final /i/ in (28b) will trigger the change, but not the stem-final /i/ in (28c). The discussion of neutral and nonneutral vowels is summarized in Table 2.5.

Table 2.5: Two properties of neutral and nonneutral vowels

	[coronal] present	Historically back
Neutral vowel (=27b)	no	yes
Nonneutral vowel (=27a)	yes	no

Two velar fronting islands of Switzerland (HstAlmc) are discussed in Chapter 6 with neutral vowels exhibiting the two properties in Table 2.5. As noted briefly in §1.4.1, in one of those dialects, /x/ undergoes velar fronting after /ei/ but not after /øi/. I argue that the /i/ in the former diphthong has the nonneutral representation in (27a) but the /i/ in opaque diphthongs like /øi/ has the neutral structure in (27b). Since /øi/ derived historically from the back vowel /ou/, examples in which /x/ surfaces without change as velar after /øi/ exhibit underapplication in the sense that velar fronting is counterfed historically by the rule that restructured /ou/ to /øi/.

2.4.3 Opacity (part 3): Quasi-phonemicization and phonemicization

A number of scholars in the traditional literature on historical linguistics have observed that the elimination of the trigger for a rule creating an allophone [A] from the phoneme /B/ can cause the original allophone [A] to become the phoneme /A/, which then contrasts with /B/, e.g. Hoenigswald (1960), Hock (1986). That type of change (phonemic split) is depicted in (29):

(29) Phonemic split

/B/	>	/B/	/A/
[B] [A]		[B]	[A]

One of the most celebrated examples of (29) is the historical rule of i-Umlaut in German, a process that fronted back vowels before high front vocoids ([i] or [j]) in the following syllable (e.g. Twaddell 1938, Penzl 1949, Becker 1967, King 1969, Buccini 1992, Davis & Iverson 1995, Davis et al. 1999, Fulk 2018). At an earlier stage (OHG), back vowels had front vowel allophones before sounds like [i] (/i/), but at a later stage (MHG) that front vocoid trigger was reduced to schwa ([ə] /ə/) by a change I call Vowel Reduction. The latter change triggered the phonemicization of the original front vowel allophones, e.g. OHG [hyːti] 'skin-pl' from /huːt-i/ (cf. OHG [huːt] /huːt/ 'skin-sg') > MHG [hyːtə] from /hyːt-ə/. Significantly, the new front vowel phonemes contrasted with the corresponding back vowels before schwa, cf. MHG [kruːtə] 'herb-dat.sg' from /kruːt-ə/. This example illustrates the historical overapplication of i-Umlaut in examples like [hyːtə], which is counterbled by Vowel Reduction (recall the synchronic example in 11bii).

In this book I show how (29) can be applied to the historical fronting of velars. The relevant stages are depicted in (30), where Ve and Pa represent velar and palatal respectively. It is assumed here that Stage 2 – characterized by the presence of velar and palatal allophones – was preceded by a stage without the palatal allophone (Stage 1), although assumption is not crucial for the discussion below.

(30) Three stages for velar fronting

Stage 1		Stage 2		Stage 3	
/Ve/	>	/Ve/	>	/Ve/	/Pa/
[Ve]		[Ve] [Pa]		[Ve]	[Pa]

The development in (30) needs to distinguish two types of palatals at Stage 3: In one type of system there was a phonemic split, as in (29), involving the creation of /Pa/ from the Stage 2 palatal allophone [Pa]. That split led to a contrast between the velar and the corresponding palatal (e.g. /x/ vs. /ç/); hence, the velar and palatal occurred in the context of the same vowel. For example, in the CHes dialects discussed in Chapter 9, [x] contrasts with [ç] after [ɑ] in [dɑx] (/dɑx/) 'roof' vs. [dɑç] (/dɑç/) 'dike'. The /ç/ in that type of example is referred to in the following chapters as a PHONEMIC PALATAL, and the change leading to that segment is called PHONEMICIZATION.

Phonemic palatals (e.g. /ç/) have an opaque history because they can stand next to a back sound that was originally front. For example, in the CHes varieties referred to in the preceding paragraph, the [ç] surfacing after [ɑ] (e.g. in [dɑç] /dɑç/ 'dike') derived historically from the front vowel [iː], e.g. [dɑç] /dɑç/ < [diːç] /diːx/. Since the front trigger for the original rule of velar fronting (/iː/) is no longer present, the phonemicization of palatals involves the historical overapplication of velar fronting, which is counterbled by the historical change eliminating the front vowel trigger, namely /iː/ > /ɑ/; recall (11bii).

The change affecting the palatal allophone at Stage 2 in (30) can also lead to a different type of system, namely one with a PALATAL QUASI-PHONEME (depicted in 30 as /PA/ at Stage 3).[23] Palatal quasi-phonemes were described briefly in §1.4.1: In that type of system palatals (e.g. [ç]) occur in the context of front vowels and in the context of some back vowels that were historically front (referred to here as [Bk]), but velars (e.g. [x]) surface in the context of all back sounds with the exception of [Bk]. Palatal ([ç]) and velar ([x]) do not contrast because they stand in complementary distribution. All instances of palatals in the context of [Bk] are quasi-phonemes (/ç/).

Palatal quasi-phonemes always have an opaque history because they are situated next to a sound ([Bk]) that was once front. For example, in a NHes dialect discussed in Chapter 7, [ç] occurs after front vowels (e.g. [liçt] /lixt/ 'light') or after [ɑː] (e.g. [ʃlɑːçt] 'bad') and [x] after back vowels other than [ɑː] (e.g. [bux] /bux/ 'book'). Significantly, [ɑː] (/ɑː/) derived from earlier [ɛ] (/ɛ/). The vocalic change (/ɛ/ > /ɑː/) counterbled the historical process of velar fronting; recall (11bii).

From the synchronic perspective there are two palatal categories: (a) UNDERLYING PALATALS (e.g. /ç/) and (b) DERIVED PALATALS (e.g. [ç] from /x/). Two examples illustrating (a) were discussed above, namely phonemic palatals and palatal quasi-phonemes, although a third variant is discussed below. One example exemplifying (b) was referred to above, namely allophonic palatals (depicted at Stage 2 in 29). However, there are two other kinds of derived palatals that I discuss.

[23]Quasi-phonemes play a prominent role in the treatment of German i-Umlaut proposed by Kiparsky (2015), although his definition of quasi-phonemes is not quite the same as the one adopted in the present book; see §7.4.4 for discussion.

Consider first systems with phonemic palatals. In the CHes varieties referred to above (from Chapter 9), [x] (/x/) and [ç] (/ç/) contrast after back vowels like [ɑ] in words like [dɑx] (/dɑx/) 'roof' vs. [dɑç] (/dɑç/) 'dike', but after front vowels only [ç] occurs. Since [ç] in the front vowel context is predictably palatal (because it does not contrast with [x] in that environment), it is derived from the velar /x/, e.g. [ʃlɛçt] 'bad' is /ʃlɛxt/. In that type of example, the [ç] in [ʃlɛçt] 'bad' is derived synchronically by velar fronting, which functions not as an allophonic rule, but instead as a NEUTRALIZATION. In systems with palatal quasi-phonemes there are likewise many examples exhibiting category (b) which are not allophonic palatals. In the NHes dialect with palatal quasi-phonemes described above (from Chapter 7), palatals occurring in the front vowel context are derived by velar fronting (e.g. the word [liçt] 'light' is underlyingly /lixt/). However, velar fronting is not an allophonic operation because the same system has underlying palatals (/ç/) after [Bk] segments (e.g. in [ʃlɑːçt] 'bad'), nor is velar fronting a neutralization because there is no velar vs. palatal contrast. Instead, velar fronting in the type of system just described functions as a QUASI-NEUTRALIZATION.

The overwhelming number of palatals investigated here were etymological velars. First, there are those palatals described above that continue to be derived from velars in the synchronic phonology (DERIVED PALATALS). Second, there are underlying palatals (palatal quasi-phonemes, or phonemic palatals). But a third type of underlying palatal needs to be distinguished as well, namely the lenis fricative [ʝ] in words like [ʝɑː] 'yes', which is referred to below as the ETYMOLOGICAL PALATAL. That segment is different from all of the other types of palatals discussed above because of its unique history: The etymological palatal derived from the homorganic (palatal) glide [j] (/j/) by a change referred to below as Glide Hardening, e.g. [ʝɑː] /ʝɑː/ 'yes' < [jɑː] /jɑː/. The etymological palatal [ʝ] can occur in the context of a back vowel; however, that type of [ʝ] does not reflect opacity (overapplication) because it never derived from a velar.

In Table 2.6 I summarize the four kinds of palatals discussed above. Any type of palatal can belong to the first three categories (a-c), but category (d) is always either the lenis palatal fricative /ʝ/ or the fortis palatal fricative /ç/ if that sound derived historically from /ʝ/, e.g. [çɑː] /çɑː/ 'yes' < [ʝɑː] /ʝɑː/ < [jɑː] /jɑː/.

Derived palatals (=Table 2.6a) do not contrast with the corresponding velars in the context for fronting. This is clearly the case for allophonic palatals because those palatals stand in complementary distribution with the corresponding velars, but it is also true for palatals derived by neutralizations or quasi-neutralizations. In the latter type of system there is no contrast at all between velar and palatal, which stand in complementary distribution. In the case of neutralizations there is a contrast between velar and palatal, although that contrast

Table 2.6: Four types of palatals

	Contrasts with velar	Opaque history (counterbleeding)
a. Derived palatal (e.g. [ç] from /x/)	no	no
b. Phonemic palatal (e.g. /ç/)	yes	yes
c. Palatal quasi-phoneme (e.g. /ç/)	no	yes
d. Etymological palatal (e.g. /ɟ/)	yes/no	no

is virtually always in the context of one or more back vowel, but in the context of front vowels, only palatals surface. Derived palatals have a distribution that is transparent because they are the modern reflexes of earlier velars that fronted in the front vowel context. That historical rule of velar fronting is therefore still present as a synchronic process.

Phonemic palatals (=Table 2.6b) always contrast with the corresponding velars in at least one context. Phonemic palatals have an opaque history. This point can be illustrated in dialects like the one described above (from Chapter 9), in which those sounds arose due to the elimination of the front vowel trigger for the original palatal allophone, e.g. [dɑç] (/dɑç/) 'dike' < [diːç] (/diːx/). In that type of example, the historical rule of velar fronting overapplied because it is counterbled by a vocalic change (/iː/ > /ɑ/).

Palatal quasi-phonemes (=Table 2.6c) never contrast with the corresponding velars. Like phonemic palatals, they have an opaque history which always involves overapplication. Consider once again the dialect described above (from Chapter 7) in which [ç] surfaces after front vowels [liçt] /lixt/ 'light') or after [ɑː] (e.g. [ʃlɑːçt] 'bad') and [x] after back vowels other than [ɑː] (e.g. [bux] /bux/ 'book'). In that example the historical rule of velar fronting overapplied because it is counterbled by a vocalic change (/ɛ/ > /ɑː/).

The etymological palatal (=Table 2.6d) does not have an opaque history because it was never a velar. In some dialects that palatal does not contrast with the corresponding velar because that historical velar is no longer present. For example, in a dialect discussed in Chapter 4, the original glide [j] (/j/) underwent Glide Hardening in [ɟʊŋə] (/ɟʊŋə/) 'boy', but the original [ɣ] (/ɣ/) is now fortis [x] (/x/) in [xʊnst] (/xʊnst/) 'favor'; thus, the dialect does not contrast /ɟ/ and /ɣ/ because the latter sound does not occur word-initially. However, in other varieties the etymological palatal can contrast with the corresponding velar. This is the case in which a velar ([ɣ]) and the etymological palatal ([ɟ]) surface in the context of the same back vowels, e.g. in the pair [ɣɑt] (/ɣɑt/) 'hole' vs. [ɟɑː] (/ɟɑː/) 'yes' present in a dialect discussed in Chapter 8. Since the etymological palatal contrasts with the corresponding velar in that type of system, the former sound is also a phonemic palatal.

2.4.4 Polycausality in language change

There is little question that velar fronting has a structural (phonological) motivation, a point that is hardly controversial when one examines the literature on this topic cited earlier. The structural reason for the fronting of velars is clear when one considers the targets and triggers for the process: A back sound (velar) is realized as palatal in the neighborhood of a front segment. Any assimilatory process like this one has a structural cause, which is captured in the present framework with the spreading of the feature [coronal]; recall (5).

This point aside, it has to be acknowledged that there may be nonstructural (social) factors that also contribute to the fronting of velars in the neighborhood of front sounds. For example, in a set of dialects discussed in Chapter 11 once spoken in the eastern part of pre-1945 Germany some of the palatal sounds created by velar fronting (e.g. the palatal stop [c]) also occurred in (non-Germanic) loanwords acquired from (Slavic) languages spoken in the direct vicinity of the German dialects with the palatal stops in question. In that chapter I conclude that contact with non-Germanic languages in the form of Slavic loanwords with palatal sounds probably went hand-in-hand with velar fronting. This scenario suggests that the proper explanation of velar fronting for those varieties of German needs to take social factors (language contact) into account, in addition to structural (phonological) ones. The term I use to describe this state of affairs is POLYCAUSALITY.

The connection between social and the structural factors with respect to velar fronting is mostly unexplored, although some reference to social factors can be found the literature I refer to below. For example, in one study I cite in §12.3.2 a connection is fleetingly mentioned between the choice of triggers for postsonorant velar fronting and religious affiliation (Catholics vs. Protestants). By contrast, one issue that has received considerable attention in recent years is alveolopalatalization as a marker for various ethnolects (§10.6.1).

It is not difficult to find parallel cases involving polycausality in the literature on language change. One well-known example that comes to mind is the phonemicization of lenis (voiced) fricatives in the history of English ([v z ð]); see §8.6.1 and §11.9.2. The literature on this topic is in agreement that that the structural (phonological) reason for the change from fortis to lenis was reinforced by the occurrence of French loanwords with those sounds.

Aside from the dialects referred to above the sources cited in this book do not present evidence that social factors play a role in velar fronting. For this reason, polycausality is a topic that only plays a minor role in this book.

2.5 The historical model

2.5.1 Introduction

The case studies presented in the ensuing chapters reveal that velar fronting can differ synchronically from dialect to dialect in terms of targets and triggers and in terms of the presence or absence of opacity. I argue that those synchronic areal differences reflect the ways in which the originally phonetically-induced fronting of velars was phonologized and then gradually became embedded into the grammar of individual dialects. In particular, the German dialects support a model in which velar fronting exhibits the LIFE CYCLE depicted in Figure 2.2. The claim that rules can have a life cycle is well-established, although the individual models differ from author to author, e.g. Baudouin de Courtenay (1895 [1972]), Hyman (1976), Dressler (1976), Kiparsky (1995), Bermúdez-Otero (2007), Roberts (2012), Hyman (2013), Kiparsky (2015), Bermúdez-Otero (2015), Ramsammy (2015), Sen (2016), Turton (2017), and Hinskens (2021).

$$\begin{array}{cl} \text{Stage 3:} & \text{Opaque (velar fronting under- or overapplies)} \\ \uparrow & \\ \left\{\begin{array}{c}\text{Stage 2n(n)}\\ \uparrow \\ \text{Stage 2a(a)}\end{array}\right\} & \text{Allophonic (velar fronting is transparent)} \\ \uparrow & \\ \text{Stage 1:} & \text{Phonetic (coarticulation)} \end{array}$$

Figure 2.2: The life cycle of velar fronting

Phonologization (not depicted above) refers to the change from a gradient phonetic process (Stage 1) to a categorical phonological rule producing palatal allophones (Stage 2). I describe the subscripts for Stage 2 indicated in Figure 2.2 in §2.5.3.

The focus of the present work falls squarely on Stage 2 and Stage 3. I make first some brief remarks on Stage 1.

2.5.2 Stage 1

A number of linguists have observed that it is common for a velar like /k/ to be articulated in a slightly more forward position along the palate in the neighborhood of front vowels than in the neighborhood of back vowels. An early study in which this issue is mentioned is Sapir (1921: 52), who compared the realization of English /k/ in *keep* and *cool*. The coarticulatory fronting of velars like /k/ in the context of front vowels (especially /i/) represents Stage 1. That the fronting described here is gradient is the conclusion drawn by Keating & Lahiri (1993), who consider articulatory and acoustic data involving the realization of velars in the neighborhood of various vowels in English and other languages.

I claim that there was an earlier point in the history of Germanic when velar fronting was not present (Stage 1). At that time, velar sounds like /x/ succumbed to coarticulatory fronting in the context of one or more front vowel, which probably served as the impetus for Stage 2. I refer henceforth to this phonetically fronted velar as a PREVELAR and represent it in a narrow phonetic transcription with the IPA diacritic for an advanced articulation, e.g. [k̟] for a prevelar stop and [x̟] for a prevelar fricative; see §12.9.2 for some discussion of prevelars.

It is not possible to provide evidence for coarticulatory velar fronting (prevelars) in the broad spectrum of German dialects I investigate because the sources for those dialects do not provide that information.

2.5.3 Stage 2

The difference between phonetically fronted velars (prevelars) in the context of front vowels and plain velars in the context of back vowels (Stage 1) is eventually exaggerated to the point where speakers perceive of the two consonants as different sounds. At that point (Stage 2) those two sounds are realized as palatal (e.g. ich-Laut) and velar (e.g. ach-Laut).

Since velars and palatals do not contrast at Stage 2, those segments stand in complementary distribution; thus, [ç] and [x] are allophones of the phoneme /x/, whose realization as palatal is expressed formally with a specific version of velar fronting (recall 5). Hence, phonologization (Stage 2) can be thought of as RULE ADDITION (King 1969, Ringe & Eska 2013) in the sense that velar fronting is present in the Phonology component (Table 2.1) but was absent in the Phonology component at Stage 1. Once in the grammar at Stage 2 that synchronic process remains active until it is modified in light of the various changes involving triggers and targets discussed below.

Stage 2 consists of a series of stages expressed with the subscripts in Figure 2.2, i.e. (a) and (n). These incremental steps are intended to reflect the rule generalization model described above (Figure 2.1): The newly phonologized rule of velar fronting gradually incorporates a greater number of targets and/or triggers and when it does so, it enters into the immediately following stage. Figure 2.3 illustrates how the set of triggers for postsonorant velar fronting grows from Stage 2a (high front vowels, represented here as /i/) to Stage 2b (nonlow front vowels, represented by /i/ and /e/). The vowel /ɑ/ represents all back vowels. Stage 2n represents the point with a broader set of triggers than the nonlow front vowels (see Chapter 12). Note that the output of velar fronting ([ç]) throughout Stage 2 is the derived palatal from Table 2.6(a).

Stage 2n: /ix/ [iç], /ex/ [eç] …. /ɑx/ [ɑx]

↑

Stage 2b: /ix/ [iç], /ex/ [eç] …. /ɑx/ [ɑx]

↑

Stage 2a: /ix/ [iç], /ex/ [ex] …. /ɑx/ [ɑx]

↑

Stage 1: /ix/ [ix], /ex/ [ex] …. /ɑx/ [ɑx]

Figure 2.3: Stage 1 and Stage 2 (for triggers) in the life cycle of velar fronting

Synchronically the rule of velar fronting at Stage 2a spreads the frontness feature ([coronal]) from a high front vowel ([−consonantal, +high, coronal]) to a velar target (/x/). At Stage 2b that rule is broadened, so that [coronal] spreads from a nonlow front vowel ([−consonantal, −low, coronal]).

Figure 2.4 shows that the initial target for postsonorant velar fronting (Stage 2aa) is fortis /x/ and that at a later point (Stage 2bb) the lenis counterpart /ɣ/ is incorporated as a target segment as well. Stage 2nn refers to the point when additional velar consonants serve as triggers (e.g. /k/). Dialects with the broadest set of targets are discussed in detail in Chapter 11.

From the synchronic perspective the rule of velar fronting at Stage 2aa had a target defined as the features for /x/ ([+consonantal, −sonorant, +continuant, +fortis, dorsal]), but that set of features is modified for the synchronic rule at Stage 2bb ([+consonantal, −sonorant, +continuant, dorsal]).

The changes from a narrow to broad set of triggers (Figure 2.3) and targets (Figure 2.4) need not match up. Put differently, velar fronting is phonologized at Stage 2a for triggers and Stage 2aa for targets, but some dialects extend the set of triggers at a faster rate than the set of targets. This accounts for the fact that

Stage 2nn: /ix/ [iç], /iɣ/ [iʝ] ….
↑
Stage 2bb: /ix/ [iç], /iɣ/ [iʝ] ….
↑
Stage 2aa: /ix/ [iç], /iɣ/ [iɣ] ….
↑
Stage 1: /ix/ [ix], /iɣ/ [iɣ] ….

Figure 2.4: Stage 1 and Stage 2 (for targets) in the life cycle of velar fronting

many varieties of HG/LG are attested with the narrowest set of targets (/x/) but with the broadest set of triggers (coronal sonorants); see Chapter 12.

Data documenting the gradual spread from specific to general targets/triggers (Figures 2.3 and 2.4) along the time dimension alone are not known to me. That type of evidence would consist of a description of velar fronting in a specific place at a specific time as well as a parallel set of data from the same place but at a later point in time. Since I am not aware of such longitudinal studies I focus instead on the place dimension. That type of evidence consists of a comparison of the description of velar fronting in one place with data in a neighboring place where both dialects were spoken at roughly the same general time frame. By comparing dialects spoken in different places at approximately the same time it is possible to draw conclusions on how velar fronting progressed along the temporal dimension.

As described in §2.4.1 the gradual spread of triggers and targets as depicted in Figures 2.3 and 2.4 occurred in time and space. In that section I discussed how temporal and spatial spreading go hand in hand (Figure 2.1). The extension of targets and triggers in space is not expressed in Figure 2.2, which only indicates the time dimension.

Figure 2.2 does not mean to suggest that the originally gradient fronting of velars (Stage 1) is simply replaced by the categorical rule of velar fronting (Stage 2). Instead, it is conceivable that Stage 2 has both a phonological fronting of velars which was the outgrowth of an earlier coarticulatory fronting still present in the same dialect. For example, it might be the case that /x/ once underwent coarticulatory fronting (Stage 1). Later on velar fronting was phonologized with /x/ as the sole target segment (Stage 2), but for those same speakers other velar sounds (e.g. /k/) continued to undergo gradient fronting (Stage 1). Alternatively, the gradient fronting of /x/ after front vowels (Stage 1) might have been phonologized as the corresponding palatal after front vowels (Stage 2), but word-initially /x/ is still at

Stage 1. See Turton (2017), who shows /l/ can show both gradient velarization and categorical velarization in varieties of English. Since the descriptions for German dialects on which my analysis is based do not have information on coarticulatory fronting it is not possible to draw conclusions concerning the scenario described above.

A contentious issue in historical linguistics is the locus of sound change. This topic is discussed in several chapters in Honeybone & Salmons (2015b) and summarized in Honeybone & Salmons (2015a: 8–9). One aspect of this debate involves the relationship between historical change and language acquisition. Some linguists (e.g. Hale et al. 2015) contend that all change is intergenerational. This means that children derive a grammar which is different from adults. According to this point of view, all language change occurs in acquisition. That approach can be contrasted with the one adopted by other scholars; for example, it has alternatively been argued that some (but not all) change occurs in acquisition, or that some change can occur within the lifespan of adults.

A related question is the extent to which sound change is driven by the listener, a topic discussed at length in the works of John Ohala (e.g. Ohala 1981 and numerous subsequent works). The same type of approach is adopted in various theoretical frameworks by many other linguists, including – but not limited to – Holt (1997), Hume & Johnson (2001), and Hamann (2009). The role of the listener in sound change is also a central claim in the Evolutionary Phonology framework (Blevins 2004). Although the authors cited here do not endorse exactly the same model, they agree that sound change can occur when a listener misperceives sounds uttered by a speaker.

In my treatment of velar fronting I assume a model whereby change is intergenerational and listener-driven. In particular, it involves the interaction between the speaker and the listener in acquisition. The way in which original velars like /x/ are misperceived as palatals is described briefly below. This treatment follows closely the source of sound change Blevins (2004: 32–34) refers to as CHANGE.

My approach can be applied to Figure 2.3 in the following manner: Stage 1 represents an adult speaker (P_1) and Stage 2 the child acquiring the language (P_2). P_1 utters a word with the vowel [i] followed by the dorsal fricative [x] – realized in Speech (Table 2.1) as prevelar ([x̟]), – but P_2 hears the palatal fricative [ç] and therefore pronounces the word as [iç]. The change from Stage 1 to Stage 2a therefore involves a subtle pronunciation change due to P_2's misperception of a sound uttered by P_1.

What is more significant than the change in pronunciation from Stage 1 (=P_1) to Stage 2a (=P_2) is P_2's interpretation of the new sound [ç] as a phonological unit – the ich-Laut – and not a phonetic one. This means that P_2 classifies [ç] as a palatal fricative with a unique featural representation (=1d). Since that sound has a distribution restricted to the context after [i], P_2 analyzes [ç] as an allophone of the corresponding velar ([x]), which never occurs in that context. This is accomplished by acquiring the phonological rule of velar fronting with the narrowest set of triggers (only before /i/).

The addition of triggers and targets to the newly acquired rule of velar fronting follow the same approach described above. For example, in Figure 2.4, Stage 2aa represents the grammar of an adult speaker (P_1) who has phonologized velar fronting for the target /x/ and the trigger /i/. When P_1 utters words with [i] followed by the (prevelar) lenis fricative /ɣ/, that sound is misperceived by the acquirer at Stage 2bb (P_2), who hears the palatal fricative [ʝ] and then treats it as a phonological unit on par with [ç].

In the remainder of this book I make extensive references to the various stages referred to above – stages which are made more explicit in Chapters 12 and 13. It needs to be stressed that terms like "Stage 1", "Stage 2a" etc. in Figures 2.3 and 2.4 are simply a different way of saying that sound change occurs in acquisition between speakers and listeners.

When velar fronting is phonologized at Stage 2a/Stage 2aa it enters the grammar as a regular rule that has no exceptions; thus, there is no evidence for LEXICAL DIFFUSION (Chen & Wang 1975, Kiparsky 1995, Phillips 2006). Evidence for my claim that velar fronting is regular is that the data provided in the original sources give no indication at all that velar fronting is (or that it ever was) irregular. Hence, velar fronting is a classic example of a Neogrammarian change. From the diachronic perspective, velar fronting is phonologized (acquired) at Stage 2 by the younger generation as a regular sound change. My assumption that sound change is regular and exceptionless holds not only for velar fronting, but also for the changes that interact with velar fronting which I discuss in ensuing chapters.[24]

A major topic discussed in Chapters 3–10 is the way in which velar fronting interacts with synchronic and diachronic processes increasing or decreasing the number of potential targets and/or triggers for velar fronting. Table 2.7 lists the four logical possibilities (second column), which are referred to below with the abstract designations in the first column.

In Chapters 3–10 I discuss a number of specific examples of synchronic and diachronic processes corresponding to Rule W, X, Y, and/or Z, as defined above. I describe below the most common patterns.

[24] Lexical exceptions to velar fronting are not attested in any dialect of German. For discussion see §2.5.3, §12.8.3, and §13.5.3.

Table 2.7: Rules increasing/decreasing potential targets and/or triggers for velar fronting

Abstract rule	Definition	Example
Rule W	Increases the number of potential velar targets	A non-velar segment is realized as velar in the context for velar fronting
Rule X	Increases the number of potential front segment triggers	A back sound is realized as front in the context for velar fronting
Rule Y	Decreases the number of potential velar targets	A velar target (e.g. /x/) deletes or converts to another sound in the context for velar fronting
Rule Z	Decreases the number of potential front segment triggers	A front trigger (e.g. /i/) deletes or converts to a back sound in the context for velar fronting

When velar fronting is phonologized (Stage 2) it always interacts transparently with Rules W-Z (if present); hence, velar fronting is added at the end of the grammar and is either fed or bled by Rule W-Z. This means that the palatals produced by the synchronic rule of velar fronting for Stage 2 speakers only occur in the neighborhood of front sounds, and velars in the neighborhood of back sounds. In Figures 2.5 and 2.6 I show the transparent interaction of synchronic rules for four hypothetical dialects; specific examples exemplifying those four systems are discussed in Chapters 3 and 4. In Figures 2.5 and 2.6 /i e/ and /u o ɑ/ represent front and back vowels respectively. "/A/" is a cover symbol for any segment other than /x/, and Vel Fr = (postsonorant) velar fronting.

	Dialect A				Dialect B		
	/ɑx/	/iA/	/ix/		/ɑx/	/ix/	/ux/
Rule W	---	ix	---	Rule X	---	---	ix
Vel Fr	---	iç	iç	Vel Fr	---	iç	iç
	[ɑx]	[iç]	[iç]		[ɑx]	[iç]	[iç]

Figure 2.5: Velar fronting fed by Rule W/Rule X in the synchronic phonology

Dialect A has a process converting /A/ into the fortis velar fricative. Since that synchronically derived fricative undergoes velar fronting, the latter process is fed by /A/→[x]. /A/→[x] illustrates Rule W (Table 2.7) because it increases the number of target segments for that process. Dialect B possesses a synchronic rule creating a front vowel from a back vowel. That process exemplifies Rule X (Table 2.7) because it increases the number of triggers for velar fronting. Rule X feeds velar fronting because it creates a structure ([i]) to which velar fronting can apply.[25] Figure 2.6 illustrates a synchronic bleeding relationship.

	Dialect C				Dialect D		
	/ɑx/	/ix/	/ix-ə/		/ɑx/	/ix/	/ex/
Rule Y	---	---	iAə	Rule Z	---	---	ox
Vel Fr	---	iç	---	Vel Fr	---	iç	---
	[ɑx]	[iç]	[iAə]		[ɑx]	[iç]	[ox]

Figure 2.6: Velar fronting bled by Rule Y/Rule Z in the synchronic phonology

Dialect C has a synchronic process for the example /ix-ə/, which converts a velar fronting target (/x/) into another sound ([A]) in the context between vowels. The rule /x/⟶[A] exemplifies Rule Y (Table 2.7) because it decreases the number of target segments for velar fronting. Rule Y in Dialect C therefore bleeds velar fronting. In Dialect D there is a rule converting certain triggers for velar fronting (e.g. /e/) into back sounds. That rule (/e/⟶[o]) exemplifies Rule Z (Table 2.7) because it decreases the number of potential front triggers for velar fronting. In that example Rule Z bleeds velar fronting.

The four systems depicted in Figure 2.5 and Figure 2.6 are also attested when Rules W-Z are diachronic processes that restructure underlying representations. Figure 2.7 depicts the two most common diachronic patterns, which are referred to here as Dialect E and Dialect F.

It can be seen in the three examples to the left of the wedge in Dialect E that velar fronting is active synchronically and that the outputs are transparent. Sound change occurs in Dialect E, namely /ou/ > /ei/. That change involves a restructuring of the underlying representation because there are no alternations between those two diphthongs [ou] and [ei] that would motivate treating it as a synchronic rule. The phonetic representations to the right of the wedge

[25] As indicated in Figure 2.5 the segment undergoing Rule W in Dialect A is present in the underlying representation (/iA/). It some of the case studies discussed below the target for Rule W (i.e. /A/) can itself be synchronically derived from another segment. The same point holds for the back vowel in Dialect B which undergoes Rule X. That back vowel (/u/ in Figure 2.5) can be present in the underlying representation, or it can alternatively be derived from an independent rule.

Dialect E							Dialect F						
/ɑx/	/ix/	/oux/	>	/ɑx/	/ix/	/eix/	/ɑx/	/ix/	/eix/	>	/ɑx/	/ix/	/oux/
[ɑx]	[iç]	[oux]		[ɑx]	[iç]	[eiç]	[ɑx]	[iç]	[eiç]		[ɑx]	[iç]	[oux]

Figure 2.7: Velar fronting fed/bled by Rule X/Rule Z in the diachronic phonology

reveal that velar fronting is still active as a Stage 2 rule. The significance of this example is that the sound change /ou/ > /ei/ feeds velar fronting in the final example. The diachronic change /ou/ > /ei/ exemplifies Rule X (Table 2.7) because it increases the number of triggers for velar fronting. Dialect F illustrates the opposite diachronic change, namely /ei/ > /ou/. The three examples to the left of the wedge show that velar fronting is active synchronically before the restructuring of /ei/. After the restructuring (to the right of the wedge) velar fronting is still active synchronically, but there is one less trigger because /ei/ was eliminated by the sound change /ei/ > /ou/. Since that sound change decreases the number of triggers it exemplifies Rule Z (Table 2.7).

2.5.4 Stage 3

This is a cover term referring to the point when: (a) some velars surface unexpectedly as velars in the context of velar fronting (underapplication); or (b) some palatals deriving historically from velars occur unexpectedly in the back vowel context (overapplication).

I consider underapplication and overapplication in order. There are two types of underapplication (Stage 3aa and Stage 3ab), which are described here:

2.5.4.1 Stage 3aa

An independent process (Rule W) creates new segments which can potentially undergo velar fronting. Since those new velars fail to undergo velar fronting, the latter process is counterfed by Rule W. In the case studies exemplifying Stage 3aa discussed in Chapter 5 both velar fronting and Rule W are active synchronically. Stage 3aa is depicted in Figure 2.8.

The examples /ix/ and /ɑx/ illustrate that velar fronting is active synchronically, since /x/ is realized as palatal after front vowels like /i/ and as velar after back vowels like /ɑ/. By contrast, the realization of the underlying representation /iA/ as [ix] exemplifies underapplication Stage 3aa because Rule W (/A/⟶[x]) counterfeeds velar fronting. Note the difference between Dialect G in Figure 2.8

	Dialect G		
	/iA/	/ix/	/ɑx/
Vel Fr	---	iç	---
Rule W	ix	---	---
	[ix]	[iç]	[ɑx]

Figure 2.8: Rule W counterfeeds velar fronting in the synchronic phonology

and Dialect A depicted in Figure 2.5. In Chapter 5 I discuss opaque systems like Dialect G in Figure 2.8 and show that they developed out of the transparent ones like Dialect A in Figure 2.5.[26]

2.5.4.2 Stage 3ab

A historical process (Rule X) creates new front vowels which can potentially serve as triggers for velar fronting. Since those new front vowels fail to induce velar fronting, the latter process is counterfed historically by Rule X. In the case studies discussed in Chapter 6 illustrating Stage 3ab, Rule X is no longer active synchronically. Instead, it has the effect of restructuring underlying representations for a younger generation of speakers to the ones depicted in (27b) for neutral vowels. Figure 2.9 illustrates Stage 3ab.

Dialect H						
Stage 2				Stage 3		
/oux/	/ix/	/eix/	>	/øix/	/ix/	/eix/
[oux]	[iç]	[eiç]		[øix]	[iç]	[eiç]

Figure 2.9: Rule X counterfeeds velar fronting in the diachronic phonology

In this example there is a historical process (/ou/ > /øi/) that creates new front vowels that are potential triggers for velar fronting. Since those new front vowels do not feed velar fronting, the latter is counterfed by the change from /ou/ to /øi/ (Rule X).

There are two very similar types of overapplication (=Stage 3ba and Stage 3bb), which are described in order.

[26] In Figure 2.8 it can be seen that the target segment for Rule W (i.e. /A/) is present in the underlying representation. In one set of dialects discussed in Chapter 5 it is shown that the target for Rule W can itself be synchronically derived from another sound. Recall Footnote 25.

2.5.4.3 Stage 3ba

A historical process (Rule Z) eliminates triggers for velar fronting, but that change fails to bleed velar fronting. An example of Rule Z is the change from any unstressed vowel (including crucially front vowels) to schwa (/ə/) in an unstressed syllable. This change is illustrated in Figure 2.10, which is well-attested in the varieties discussed in Chapter 7. At Stage 2 velar fronting is active in word-initial position. When /i/ changes to /ə/ the palatal remains even though schwa would be expected to be preceded by [x]. Ellipsis ("…") in the first example at Stage 2 and Stage 3 means that there is a part of the word containing a stressed vowel.

Dialect I						
Stage 2				Stage 3		
/xi…/	/xe/	/xɑ/	>	/çə…/	/xe/	/xɑ/
[çi…]	[çe]	[xɑ]		[çə…]	[çe]	[xɑ]

Figure 2.10: Opacity (overapplication) in the creation of palatal quasi-phonemes

When unstressed front vowels like /i/ are restructured to /ə/ for the next generation those speakers also reanalyze the palatal allophone [ç] from Stage 2 as an underlying palatal (/ç/) because the trigger for velar fronting has been eliminated. The underlying palatal /ç/ at Stage 3 is a palatal quasi-phoneme (=Table 2.6c) because there is no contrast between velars and palatals in the context before schwa, where only [ə] occurs.

2.5.4.4 Stage 3bb

In this type of system there is a historical process (Rule Z) which eliminates triggers for velar fronting, but that change does not bleed velar fronting. An example of Rule Z attested in the dialects discussed in Chapter 9 is the replacement of a diphthong ending in a front vowel with a back monophthong (/ɑi/ > /ɑ/); see Figure 2.11.

When /ɑi/ is restructured to /ɑ/ at Stage 3 speakers have no alternative but to reanalyze the palatal allophone [ç] from Stage 2 as an underlying palatal (/ç/) because the trigger for velar fronting is no longer present. The underlying palatal at Stage 3 is a phonemic palatal (= Table 2.6b) because it contrasts with [x] after the vowel [ɑ]. Concrete examples of German dialects exemplifying Dialect J are discussed in Chapter 9.

Dialect J						
Stage 2				Stage 3		
/ɑx/	/ix/	/ɑix/	>	/ɑx/	/ix/	/ɑç/
[ɑx]	[iç]	[ɑiç]		[ɑx]	[iç]	[ɑç]

Figure 2.11: Opacity (overapplication) in the creation of phonemic palatals

The two overapplication outcomes (Stage ba and Stage bb) do not imply that velar fronting is lost at Stage 3. This point can be illustrated by considering Stage 3 for Dialect J in Figure 2.11. [ç] is clearly an underlying palatal (/ç/) in the context after back vowels like /ɑ/; however, [ç] can still be synchronically derived from /x/ in the context of front vowels (e.g. in [iç] from /ix/) because only [ç] but not [x] occurs in that context. In Dialect J the transition from Stage 2 to Stage 3 therefore entails two changes for velar fronting. First, the original palatal allophone for the older generation is reanalyzed as an underlying palatal for the younger generation. The change from a derived palatal (=Table 2.6a) at Stage 2 to an underlying palatal (=Table 2.6b or Table 2.6c) comes about because the original trigger for velar fronting is lost. Second, velar fronting undergoes the change from an allophonic process (Stage 2) to a neutralization (Stage 3).

The four opaque systems described above (Stage 3aa, Stage 3ab, Stage 3ba, Stage 3bb) are not mutually exclusive. A single dialect can therefore have more than one opaque sound. For example, several varieties of German are attested with palatal quasi-phonemes (=Stage 3ba) and phonemic palatals (=Stage 3bb). Likewise one of the varieties of German with a counterfeeding order (=Stage 3aa) also has a palatal quasi-phoneme (=Stage 3ba).

2.5.5 Further remarks on the historical model

What is not expressed in Figure 2.2 is the phonemicization of palatal fricatives that were not the product of earlier velars. The type of segment referred to here is the etymological palatal (/ʝ/) from Table 2.6(d). Since the palatal fricative (/ʝ/) in question derives from an earlier palatal glide (i.e. [j] (/j/), the change from the latter to the former by Glide Hardening does not involve a change that counterbleeds or counterfeeds velar fronting. The change /j/ > /ʝ/ is not a part of Figure 2.2 because there is no transparency and/or opacity. However, it is shown in Chapter 8 that Glide Hardening often results in a phonemic contrast between palatals (/ʝ/ from earlier /j/) and velars (inherited /ɣ/).

One of the parameters mentioned earlier (output of velar fronting) is not indicated in Figure 2.2. Recall that there are two different outcomes for a /x/ target: nonsibilant palatal [ç] or sibilant alveolopalatal [ɕ]. Alveolopalatalization requires two modifications to the Stage 2 system with the allophones [x] and [ç]. First, [ç] is realized for innovative speakers as the new allophone [ɕ] which is phonetically and phonologically distinct from the inherited postalveolar [ʃ] (/ʃ/). Second, [ɕ] and [ʃ] merge for the next generation to [ɕ], which is phonemic (/ɕ/) because it contrasts with [x] (/x/) in the context after a back vowel. That merger does not exhibit opacity because the new phoneme /ɕ/ in the context after a back vowel did not derive historically from a velar (but instead from the coronal [ʃ]).

It is argued in Chapter 10 that alveolopalatalization ([ç ʃ] > [ɕ]) is not expressed in terms of phonological rules; hence the realization of /x/ as [ɕ] is captured formally with the same rule of velar fronting (=5a) that produces [ç] from /x/. That the output of velar fronting is realized first as a nonsibilant and then only later as a sibilant is expressed not in the phonology, but instead with rules of phonetic implementation.

In the model in Figure 2.2 change only occurs from bottom to top, where Stage 1 develops into Stage 2 and Stage 2 into Stage 3, but never in the opposite direction. However, the evidence discussed below indicates that the rule at Stage 3 must not necessarily have passed through each of the individual steps at Stage 2. For example, in one HG dialect with neutral vowels the set of triggers for velar fronting consists only of high front vowels (Chapter 6). This suggests that the opaque effects (i.e. the creation of neutral vowels) occurred at a very early point at Stage 2 (i.e. Stage 2a), before the set of triggers for velar fronting could expand to include all front vowels. Likewise in one LG dialect, velar fronting only applies after nonlow front vowels (Stage 2b), but that same rule of velar fronting is counterfed by another rule, as in Dialect C from Figure 2.6.

On the basis of the synchronic material from German dialects it can be deduced that there could not have been a single focal area for velar fronting. Instead, the evidence points to several different points of origin; see §12.5.2 and especially §16.4. This means that the historical model in Figure 2.2 (including rule generalization in Figure 2.1) occurred independently at various places in the German-speaking world. Polygenesis derives additional support from alveolopalatalizing dialects, since it can be shown that alveolopalatalization occurred in places surrounded by non-alveolopalatalizing dialects (§10.6.1).

In Chapters 5–15 I discuss the synchronic and diachronic behavior of fronted palatals in a wide selection of HG and LG dialects, although I do not show how the historical process of velar fronting fits into the established stages in the history of German (Appendix E). Linguistic evidence is adduced in later chapters that velar fronting must have been phonologized at a very early stage, namely either in OHG (750–1050) or OSax (800–1150), although phonologization in some dialects may have postdated that time frame. The dating of velar fronting is discussed in Chapter 16.

3 Allophony (Part 1)

3.1 Introduction

The present chapter investigates German dialects in which a velar (e.g. [x]) and the corresponding palatal ([ç]) stand in complementary distribution and therefore never contrast. The relationship between velar and palatal is an allophonic one, which is captured by deriving the latter synchronically from the former by specific versions of velar fronting. There are no palatal fricatives in the neighborhood of back segments, nor are there velar fricatives in the context of front segments; hence, palatals like [ç] only surface in the context specified in the structural description of velar fronting and the velar only in the elsewhere case; see Stage 2 in Figure 2.2. Velar and palatal fricatives in the dialects discussed below have a transparent distribution; hence, velar fronting is fed or bled by processes altering the number of potential targets or triggers for velar fronting.

Dialects with an allophonic distribution of [x] and [ç] are important to discuss in detail because velars and palatals pattern differently in other varieties of German. For example, many dialects are attested with palatal quasi-phonemes (Chapter 7) or phonemic palatals (Chapters 8–10). The material investigated below can therefore serve as a basis of comparison for the data discussed in later chapters.

In this chapter and in Chapter 4 I show that velar fronting applies synchronically at the end of the grammar in several diverse dialects. It is assumed here that the synchronic relationship involving rules feeding or bleeding velar fronting (Rules W-Z from Table 2.7) mirrors the diachronic relationship. Thus, if Rules W-Z feed or bleed velar fronting synchronically, then Rules W-Z were present in that dialect before velar fronting was phonologized, and the synchronic state therefore implies that velar fronting was phonologized at the end of the grammar. Independent linguistic (or philological) evidence confirming that velar fronting was phonologized later than the specific processes corresponding to Rules W-Z in the case studies discussed in this chapter and in Chapter 4 is sparse. See §5.5.2 for some discussion.

Although varieties of German displaying allophony between velar and palatal are not restricted to one particular area, it is nevertheless possible to state at the outset that such systems are particularly common in Almc and Bav. This chapter therefore focuses on several specific varieties belonging to those two broad dialects, namely Swb in §3.2, HAlmc in §3.3, §3.4, and CBav in §3.5, §3.6. I make some concluding remarks in §3.7.

3.2 Swabian

I focus on the description of a Swb dialect spoken in a specific region, although as I note below the same rule of velar fronting in that variety can be found not only in other UG-speaking communities, but more generally in many places in the German-speaking dialect continuum. The distribution of [x] and [ç] in this one corner of southwest Germany can therefore be thought of as the default pattern.

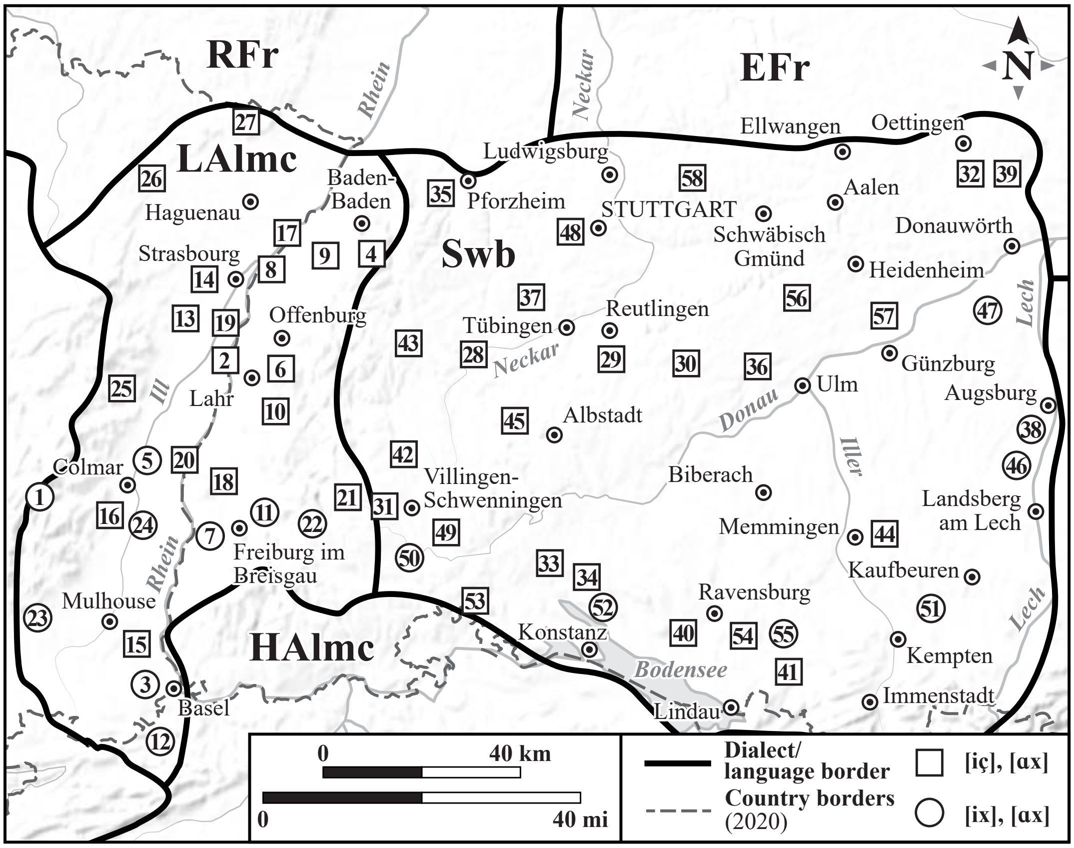
Besch (1961) provides a detailed overview of the sounds in a variety of Swb spoken in a broad area between the Neckar and Danube Rivers ("Neckar- und Donaugebiet") in the German state of Baden-Württemberg (Map 3.1).[1] The author focuses on the town of Erdmannsweiler, although he also considers other communities in the same region. For simplicity I refer to the dialect described by Besch as Erdmannsweiler.

In all of the case studies presented in this book it is essential to know the phonemic vowels. This is especially true of the front vowels, since those segments serve as potential triggers for the assimilation of an adjacent velar to palatal. For this reason, I attempt here and in all subsequent case studies to give a representative example for the realization of dorsal fricatives in the context of every phonemic vowel.

The phonemic monophthongs of Erdmannsweiler consist of the front vowels /iː i eː e æː æ/ and the back vowels /uː u oː o ɔː ɔ ɑː ɑ ə/. The two vowels /æː æ/ are transcribed in the original source as ⟦ā̈ ä⟧[2]. I interpret those two vowels as low ([æː æ]) and not mid ([ɛː ɛ]) because they are characterized by a degree of openness ("weit offen") greater than the degree of openness for vowels like

[1]The sources referred to under Map 3.1 and under all other locator maps are indicated with the corresponding number as circles (representing the absence of postsonorant velar fronting) or squares (representing the presence of some version of postsonorant velar fronting). The phonetic symbols in the legend for velars ([x]), palatals ([ç]) and triggers ([i ɑ]) are not intended to express the different types of triggers (e.g. nonlow front vowels vs. all front vowels), targets (e.g. /x/ vs. /x ɣ/), and/or outputs (e.g. [j̊] vs. [ç] vs. [ɕ]).

[2]Throughout this book I enclose phonetic transcriptions as they appear in all original sources within double square brackets ⟦ … ⟧. My own transcriptions (with a consistent set of phonetic symbols) are given in single square brackets […]. The latter transcription is important because the original sources cited in this book employ a wide variety of symbols, some of which are not obvious to linguists in the present day.



Map 3.1: Low Alemannic (LAmc) and Swabian (Swb). Squares indicate postsonorant velar fronting and circles the absence of velar fronting. 1=Mankel (1886), 2=Heimburger (1887), 3=Heusler (1888), 4=Heilig (1897) 5=Henry (1900), 6=Schwend (1900), 7=Ehret (1911), 8=Weik (1913), 9=Wasmer (1915, 1916a,b), 10=Kilian (1935), 11=Eckerle (1936), 12=Schläpfer (1956), 13=Keller (1961) (Barr), 14=Philipp (1965), 15=Bethge & Bonnin (1969), 16=Zeidler (1978), 17=Schrambke (1981), 18=Klausmann (1985a,b), 19=Rünneburger (1985), 20=Philipp & Bothorel-Witz (1989), 21=E.M.Hall (1991a,b) (Urach), 22=E.M.Hall (1991a) (Titisee-Neustadt), 23=ALA (Mortzwiller), 24=ALA (Oberhergheim), 25=ALA (Thanvillé), 26=ALA (Weiter-swiller), 27=ALA (Lembach), 28=Kauffmann (1887, 1890), 29=Wagner (1889), 30=Bopp (1890), 31=Haag (1898), 32=Schmidt (1898), 33=Müller (1911), 34=Dreher (1919), 35=Sexauer (1927), 36=Strohmaier (1930), 37=Zinser (1933), 38=Moser (1936), 39=Nübling (1938), 40=Schöller (1939), 41=Bausinger & Ruoff (1959), 42=Besch (1961), 43=Baur (1967), 44=Hufnagl (1967), 45=Bethge & Bonnin (1969), 46=König (1970), 47=Ibrom (1971), 48=Frey (1975), 49=E.M.Hall (1991a,b) (Tuningen), 50=E.M.Hall (1991a,b) (Donaueschingen), 51=SBS (Ebersbach), 52=SSA (Überlingen), 53=SSA (Büßlingen), 54=SSA (Wangen), 55=VALTS (Niederwangen), 56=SNBW (Gerstetten), 57=SNWB (Sontheim an der Brenz), 58=SNBW (Rudersberg).

[ɛ] (=⟦ę⟧), which Besch describes as half open (“halb offen”). Besch also includes nasalized monophthongs which I ignore because they do not occur in the context of dorsal fricatives. The dialect also has a number of phonemic diphthongs whose second component can be front (/ei ai/) or back (schwa), i.e. /iːə iə æːə æə uə/.

[x] and [ç] are the only two dorsal fricatives; those two sounds are only attested in postsonorant position but never word-initially.[3] As depicted in (1), [x] and [ç] stand in an allophonic relationship. I assume without argument that the underlying sound is velar (/x/) from which the palatal ([ç]) is synchronically derived. The arguments against a rule deriving [x] from an underlying palatal /ç/ – in Erdmannsweiler and in the velar fronting varieties of German dialects addressed below – cannot be evaluated until all German dialects have been discussed (§17.3.3).

(1) /x/

[x] [ç]

I consider first the distribution of [x] and [ç] from the synchronic perspective and then I examine the facts diachronically.[4]

The data presented below illustrate that [x] surfaces after a back vowel in (2a) and [ç] (=⟦X⟧ for Besch) after a front vowel in (2b) or a coronal sonorant consonant in (2c). There are no dorsal fricatives after consonants other than [l] or [r], (e.g. [n]); hence, liquids are the only coronal sonorant consonants after which [ç] surfaces. Note that [r] fails to vocalize to [ɐ] as in other varieties (e.g. StG in §1.2 and §17.2). The historical source for the dorsal fricatives in (2) and in the other UG dialects discussed in this chapter is WGmc $^{+}$[k] or $^{+}$[x]; see Appendix F.[5]

[3] In contrast to many varieties of CG/LG discussed in later chapters, velar [ɣ] and palatal [ʝ] are absent from UG dialects like Erdmannsweiler; Appendix F provides historical background accounting for those gaps. Alternations involving [g] and [ç] as in StG (§1.2) are similarly absent in the varieties of German discussed below. Appendix H provides a consonant inventory for typical UG dialects like Erdmannsweiler.

[4] One could argue that [h] is an allophone of /x/ as well, since [h] never contrasts with [x]/[ç]. ([h] surfaces only word-initially before a vowel). I do not discuss the treatment of [h] as an allophone of /x/ for Erdmannsweiler, although I return to this point in a related dialect (§3.3) which has alternations between [h] and [x]/[ç].

[5] In (2) and in all subsequent data sets, I present the transcription in the original source in the first column, my interpretation of that transcription with IPA symbols in the second column. In the third column I give the StG orthography for reference, in the fourth column the English gloss, and in the final column the page number in the original source.

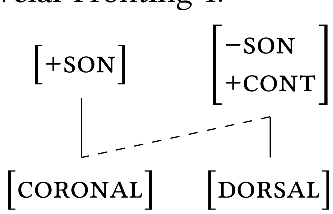
(2) Postsonorant [x] and [ç] (from /x/):

a.	sūxd	[suːxt]	Sucht	‘addiction’	30
	dsuxd	[tsuxt]	Zucht	‘breeding’	29
	hōx	[hoːx]	hoch	‘high’	38
	nǭxbər	[nɔːxbər]	Nachbar	‘neighbor’	32
	nāxd	[nɑːxt]	Nacht	‘night’	18
	laxə	[lɑxə]	lachen	‘laugh-INF’	18
	liəxd	[liəxt]	Licht	‘light’	45
	fīəxdə	[fiːəxtə]	fürchten	‘fear-INF’	31
	buəx	[buəx]	Buch	‘book’	47
	dsǫəxə	[tsɔəxə]	Zeichen	‘sign’	43
b.	filīXd	[filiːçt]	vielleicht	‘maybe’	36
	frēliX	[freːliç]	fröhlich	‘happy’	38
	nēXd	[neːçt]	gestern abend	‘yesterday evening’	21
	knǟXd	[knæːçt]	Knecht	‘vassal’	24
	häXlə	[hæçlə]	hecheln	‘heckle-INF’	21
	blaiX	[blɑiç]	bleich	‘pale’	43
	reiX	[reiç]	reich	‘rich’	37
c.	khalX	[k^{h}ɑlç]	Kalk	‘lime’	18
	kherX	[k^{h}erç]	Kirche	‘church’	17

As noted in Chapter 1, the focus in this book is on the patterning of velars and palatals in native words, although I include occasional older borrowings which I consider to be assimilated loan words. For example, [k^{h}ɑlç] ‘lime’ in (2c) was borrowed many centuries ago from Latin *calx*.

As indicated in the heading for (2), I analyze the underlying dorsal sound as /x/, which surfaces as palatal in (2b, 2c) by (3). The [ç] in (2b, 2c) therefore exemplifies the derived palatal category described in §2.4.3. I analyze front vowels and liquids (/l r/) as [+sonorant, coronal]. Given that analysis, underlying /x/ fronts to palatal [ç] after a front (i.e. coronal) vowel in (2b) or after a front (i.e. coronal) sonorant consonant in (2c) and otherwise (i.e. after a back vowel) surfaces without change as [x] in (2a).

(3) Velar Fronting-1:



(3) spreads [coronal] from a [+sonorant] sound to a [dorsal] fricative, thereby creating the complex corono-dorsal segment [ç]. It is not necessary to specify that the target segment be marked for a laryngeal feature ([−fortis]) because there are no [+fortis] dorsal fricatives that could potentially undergo the rule. The target is specified as a dorsal fricative ([−sonorant, +continuant, dorsal]) and not as a dorsal obstruent ([−sonorant, dorsal]) or dorsal consonant ([+consonantal, dorsal]) because there is no indication in the original source that other velar sounds ([k g ŋ]) show a fronted variant after coronal sonorants. Unless specific evidence is provided to the contrary, I assume in all following case studies that velar fricatives (and not velar stops or the velar nasal) undergo fronting. In Chapter 11 I discuss varieties of German in which all velar consonants undergo fronting to the corresponding palatals.[6]

The data in (2) reveal a few gaps. For example, no words were found in the original source with a dorsal fricative preceded by the front vowel [e] or the back vowels [o ɔ ə]. Unless evidence can be adduced to the contrary, I assume that [e] patterns phonologically with the other front vowels and [o ɔ ə] with the other back vowels. Hence, the expectation is that [ç] would surface after [e] and [x] after [o ɔ ə].

The front vowel triggers for Velar Fronting-1 also include segments that alternate with back vowels. The most well-known front-back alternations are the ones referred to in the traditional literature as Umlaut. For example, in StG, many singular nouns with a back stem vowel surface with the corresponding front vowel in the plural, e.g. *Stuhl* [ʃtu:l] 'chair' vs. *Stühle* [ʃty:lə] 'chair-pl'. A representative example of such front vowel vs. back vowel alternations in Erdmannsweiler is presented in (4). Example (4b) illustrates that the front vowel [ei] triggers the change from /x/ as [ç].[7]

(4)	a.	roux	[roux]	Rauch	'smoke'	44
	b.	reiXə	[reiçə]	räuchern	'smoke-inf'	44

Although the literature on Umlaut in the synchronic grammar of StG is vast and the proposals are quite diverse (e.g. Zwicky 1967, Vennemann 1968, Wurzel

[6]The velar affricate [kx] is a sound attested in many (but not all) varieties of Almc, and in a few of those varieties [kx] has a palatal allophone [kç] (e.g. §3.4). The default assumption I adopt below (reflected in my description of Erdmannsweiler) is that [kx] is absent unless I explicitly state that it is present.

[7]From the historical perspective the fronted stem vowel in examples like the one in (4b) was an etymological back vowel, cf. OHG *rouh*. The fronting of back vowels was either a consequence of i-Umlaut (§2.4.3), which was triggered by a once overt front vowel suffix [i], or by analogy. The distinction between the two (sound change vs. analogy) is not important for present purposes and is therefore not discussed below.

1970, Bach & King 1970, Lieber 1980, van Lessen Kloeke 1982a, Strauss 1982, Janda 1987, Lieber 1987, Lodge 1989, Klein 1995, Wiese 1996a,b, Trommer 2021), it is nevertheless possible to identify two contrastive approaches. According to one, the stem vowel in alternating pairs is underlyingly back and the front vowel alternant is derived from that back vowel if Umlaut is analyzed as a synchronic rule. Underlying representations for the examples in (4) according to that approach are provided in (5a). The form of the synchronic rule of Umlaut presupposed in (5a) assumes that the underlying representation for the plural form is equipped with a floating frontness feature (see the literature cited above). According to the second approach, the stem alternants are lexically listed (suppletive) allomorphs, in which case Umlaut does not have the status of a synchronic rule. Underlying representations for the examples in (4) according to that approach are given in (5b). The latter treatment derives support from the fact that alternations like the ones in (4) – regardless of dialect – are irregular because they are triggered by certain morphological categories but not by others. Thus, according to (5b), Umlaut has been morphologized. The first approach (=5a) is defended by Wiese (1996a) and Trommer (2021) and the second (=5b) by Booij (2010).

(5) a. /roux/, /roux-ə/
 b. /roux/, /reix-ə/

Both treatments in (5) are consistent with the data from Erdmannsweiler, as well as similar data from other German dialects. In the present book I adopt (5b), although the analyses I discuss are also compatible with (5a).

In the dialect of Erdmannsweiler as it was described in 1961, /x/ is realized as [ç] not only after historically front vowels (=6a), but also after etymological back vowels that underwent the historical fronting, e.g. i-Umlaut or analogy (=6b). The surface velar [x] occurs after etymological back vowels (=6c) and after back vowels that were originally front (=6d). The reconstructed examples in the second column are my own. They are intended to represent the point before velar fronting was phonologized. The etymological information in (6) has been drawn from Seebold (2011), which is my source for etymologies in all subsequent datasets unless otherwise noted.

(6)	a.	[reiç]	<	+[riːx]	‘rich’	cf. MHG *rīch(e)*	(from 2b)
	b.	[reiçə]	<	+[rouxə]	‘smoke-INF’	cf. MHG *rouch*	(from 4b)
	c.	[hoːx]	<	+[hoːx]	‘high’	cf. MHG *hōch*	(from 2a)
	d.	[tsɔəxə]	<	+[tseixə]	‘sign’	cf. MHG *zeichen*	(from 2a)

The pan-Swb vocalic development depicted in (6d) involves the change from a front sound to a back sound; see Besch (1961: 42–43). It is a specific instance of a historical shift I call Vowel Retraction, which can be defined as any change from a front vowel to a back vowel, although the particular vowels that undergo it differ from dialect to dialect. Vowel Retraction therefore decreases the number of potential triggers for velar fronting (=Rule Z from Table 2.7); recall Dialect F from Figure 2.7. The general change is stated in (7a). The vocalic change depicted in (6b) is a specific example of what is referred to throughout this book as Vowel Fronting, which has the general form in (7b). Vowel Fronting increases the number of potential triggers for velar fronting (=Rule X from Table 2.7; recall Dialect E from Figure 2.7). The specific examples illustrating Vowel Retraction and Vowel Fronting discussed below could alter underlying representations, although some examples are still active synchronically (e.g. the analysis of Umlaut in 5a as the modern reflex of the historical fronting in 6b).

(7) a. Vowel Retraction:
{ front vowel } > { back vowel }

b. Vowel Fronting:
{ back vowel } > { front vowel }

As I show in this book, dorsal fricatives behave differently in German dialects when they are in the context of a vowel that has undergone either Vowel Retraction or Vowel Fronting. In Erdmannsweiler and in many other dialects discussed below a dorsal fricative to the right of a new back vowel (=7a) surfaces transparently as velar, but in other dialects the dorsal fricative in the context of a new back vowel surfaces instead as an opaque palatal. A dorsal fricative adjacent to a new front vowel (=7b) in Erdmannsweiler is realized transparently as palatal, but in other German dialects that sound is an opaque velar.

Erdmannsweiler as it was described in 1961 was an outgrowth of an earlier stage in which /x/ was realized as [x], regardless of the nature of the preceding sound. I refer henceforth to that earlier point as Stage 1 (Figure 2.2) and postulate that the surface [x] showed the effects of coarticulatory velar fronting (to prevelar) at the level of Speech. Such non-fronting Stage 1 dialects are attested in the present day, e.g. in LAlmc, Halmc, and SBav (§3.3, §12.3.1, §12.3.2). The phonologization of Velar Fronting-1 (=Stage 2 from §2.5) is shown in (8) with three representative examples from (6). As a point of reference I give the StG forms in the bottom row. As described in §2.5 the change from one stage to the next was intergenerational, involving the interaction between the speaker and the listener in acquisition.

(8)	a.	/riːx/	/hoːx/	/tseixə/	b.	/riːx/	/hoːx/	/tseixə/	Stage 1
		[riːx]	[hoːx]	[tseixə]		[riːx]	[hoːx]	[tseixə]	
						/reix/	/hoːx/	/tseixə/	Stage 2
						[reiç]	[hoːx]	[tseiçə]	
		/reix/	/hoːx/	/tsɔəxə/		/reix/	/hoːx/	/tsɔəxə/	Stage 2
		[reiç]	[hoːx]	[tsɔəxə]		[reiç]	[hoːx]	[tsɔəxə]	
		reich	*hoch*	*Zeichen*		*reich*	*hoch*	*Zeichen*	StG
		'rich'	'high'	'sign'		'rich'	'high'	'sign'	

Two possible chronologies involving Velar Fronting-1 and Vowel Retraction (/ei/ > /ɔə/ in *Zeichen*) are depicted in (8a) and (8b). According to (8a), Velar Fronting-1 was phonologized at the same time – or perhaps even after – Vowel Retraction restructured underlying representations. As depicted in (8b) it is also conceivable Velar Fronting-1 was active before Vowel Retraction. According to that scenario, there was a stage in which Velar Fronting-1 created palatal [ç] in words like *Zeichen* before the stem vowel was restructured to /ɔə/. In later chapters I demonstrate that the chronology in (8b) must have been correct for the other German dialects because those dialect-specific changes from front vowel to back vowel led to opacity via the phonemicization of the palatal allophone [ç] (/x/) to /ç/. However, one cannot know for certain whether or not the chronology in (8b) or (8a) is correct for Erdmannsweiler because Vowel Retraction led to transparent outputs according to either scenario. Note that in both (8a) and (8b) the historical process of Vowel Retraction bleeds Velar Fronting-1 in examples like [tsɔəxə].

The descriptive literature on many of the dialects spoken in Baden-Württemberg – both Swb and LAlmc – published from the late nineteenth century up to the present suggests that the transparent distribution of [x] and [ç] is precisely the same as it is in Erdmannsweiler. For example, one can observe that [ç] only surfaces after a coronal sonorant and [x] only after a back vowel in the varieties spoken in Horb am Neckar (Kauffmann 1887, 1890), Forbach (Heilig 1897), Pforzheim (Sexauer 1927), Freudenstadt (Baur 1967), Stuttgart (Frey 1975), and the broad area around Villingen-Schwenningen (E. M. Hall 1991a: 55–56). All of those places – as well as a number of other ones in the same area – are indicated on Map 3.1.

However, the default pattern exemplified in the communities listed in the previous paragraph stands in contrast with the Swb and LAlmc varieties discussed in §14.3.2. In that section I demonstrate that several German dialects in Baden-Württemberg have been described in which [ç] occurs not only after coronal sonorants, but also after one or more back vowel, e.g. Blaubeuren (Strohmaier 1930), Mühlingen (Müller 1911), and Liggersdorf (Dreher 1919). There are also a few isolated pockets within the LAlmc/Swb dialect region in which only a subset of coronal sonorants triggers velar fronting (§12.3). The lesson to be learned from these surprising revelations is that one cannot assume a priori that the default pattern for any given dialect region is correct until one has examined the entire range of facts.

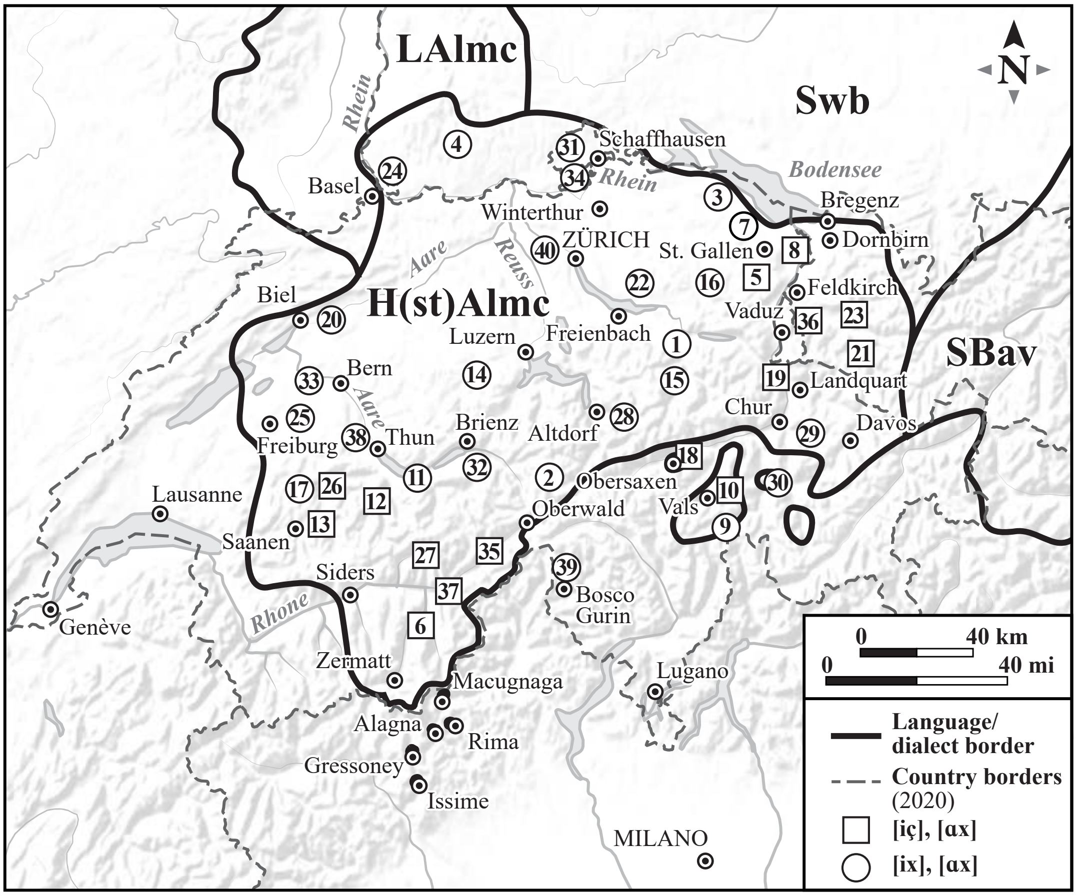
3.3 High Alemannic (part 1)

SwG is typically characterized by the presence of a dorsal fricative surfacing invariantly as back even in a front vowel context; hence, in the unmarked case, speakers of SwG have [x] but no [ç]. Descriptions of H(st)Almc dialects of Switzerland with [x] *sans* [ç] therefore represent the norm for that region. For example, in Keller's (1961) description of Bern German (Map 3.2) he writes (p. 51): "[x] is a velar fricative articulated rather far back. The place of articulation is not influenced by the surrounding sounds". An early twentieth century description of the HAlmc dialect spoken in the canton of Glarus (Map 3.2) is essentially the same (Streiff 1915). Streiff (1915: 12) writes that [x] is articulated on the soft palate ("am weichen Gaumen") and that the dialects she describes do not have a palatal articulation of that sound. ("Einen palatalen x-Laut kennen unsere Mundarten nicht …"), e.g. [tseːxə] 'toe'. Additional varieties of H(st)Almc with velars (/x/) without palatal allophones are indicated on Map 3.2.

A few H(st)Almc dialects have been described which possess both velar and palatal fricatives, and a subset of those dialects displays a parallel distribution of velar and palatal affricates. In the present section and in the following one I discuss two varieties in which velars and palatals stand in an allophonic relationship. The distribution of the velar and palatal sounds discussed below can be contrasted with the very different patterning one finds in the two HstAlmc dialects discussed in Chapter 6, which possess neutral vowels.

Meinherz (1920) offers a detailed account of the HAlmc dialect spoken in the northernmost part (Region Landquart) of the canton of Grisons (Graubünden) in East Switzerland. The region is known historically as the Bündner Herrschaft; see also §15.11 and Map 15.9.

Meinherz (1920: 20) draws a distinction between the dialect he calls H_1, which is spoken in the municipalities (Gemeinden) of Maienfeld, Fläsch, and Malans, and the dialect referred to as J, which is spoken only in Jenins. I concentrate below on H_1 because this variety has velar fronting. The dialect is referred to henceforth as Maienfeld.



Map 3.2: High Alemannic (HAlmc) and Highest Alemannic (HstAlmc). White squares indicate postsonorant velar fronting and circles the absence of velar fronting. 1=Winteler (1876), 2=Abegg (1910), 3=Enderlin (1910), 4=Kaiser (1910), 5=Vetsch (1910), 6=Wipf (1910), 7=Hausknecht (1911), 8=Berger (1913), 9=Gröger (1914c), 10=Gröger (1914e), 11=Gröger (1914b), 12=Gröger (1914a), 13=Gröger (1914d), 14=Schmid (1915), 15=Streiff (1915), 16=Wiget (1916), 17=Stucki (1917), 18=Brun (1918), 19=Meinherz (1920), 20=Baumgartner (1922), 21=Jutz (1922), 22=Weber (1923), 23=Jutz (1925), 24=Beck (1926), 25=Henzen (1927) (Sensebezirk), 26=Henzen (1927) (Obersimmental), 27=Henzen (1928, 1932), 28=Clauss (1929), 29=Kessler (1931), 30=Hotzenköcherle (1934), 31=Wanner (1941), 32=Susman Schulz (1951), 33=Keller (1961), 34=Keller (1963), 35=Schmid (1969), 36=Bethge & Bonnin (1969), 37=Werlen (1977), 38=Marti (1985), 39=Russ (2002), 40=Fleischer & Schmid (2006).

The phonemic monophthongs of Maienfeld (Meinherz 1920: 22) consist of the front vowels /iː i ɪː ɪ eː e ɛː ɛ/ and the back vowels /uː u ʊː ʊ oː o ɔː ɔ ɑː ɑ ə/. As in many other varieties of SwG, length and tenseness can be combined in the mid and high vowels to yield a system with a large number of monophthongs. Meinherz also includes several nasalized monophthongs which I ignore because they do not occur in the data I investigate below with dorsal fricatives. Meinherz (1920: 22) lists fifteen diphthongs, but the material I consider below only contains /æi/ and /uə/.

Maienfeld differs from the variety spoken in the municipality of Jenins (see above) in terms of the realization of /x/; see Meinherz (1920: 26). Jenins exhibits the default (Stage 1) pattern for SwG in the sense that that dorsal fricative is consistently realized as [x], regardless of what segment precedes or follows. By contrast, Maienfeld has a palatal realization of /x/, which occurs only after a coronal sonorant (see below). The allophonic relationship between [x] and [ç] is depicted in (1). The two surface fricatives [x] and [ç] are only attested in postsonorant position but never word-initially. Words in the Jenins dialect with word-initial [x] (<WGmc $^{+}$[k]) are realized in Maienfeld as [k^{h}], e.g. *Käfer* [k^{h}ɛːfər] 'bug' vs. Jenins [xɛfər]; Meinherz (1920: 134).

Although the vowels of Maienfeld differ from those of Erdmannsweiler the generalization concerning the distribution of [x] and [ç] is the same in both dialects: [x] surfaces after a back vowel in (9a) and [ç] after a front vowel in (9b) or a coronal sonorant consonant in (9c); see Meinherz (1920: 135). Meinherz (1920: 27) is clear that [r] is a coronal (apical) trill and not a uvular (i.e. dorsal) sound ("r ist stark gerolltes Zungen-r"). The two dorsal fricatives [x]/[ç] as in (9) derive from etymological velars (WGmc $^{+}$[k x]).

There are no dorsal fricatives after consonants other than [l] or [r], (e.g. [n]); hence, liquids are the only coronal sonorant consonants after which [ç] surfaces. No examples were found in the original source with a dorsal fricative preceded by the front vowels [œ œː] or the back vowel [ɑː]. I treat these gaps as accidental.

(9) Postsonorant [x] and [ç] (from /x/):

a.	brūx	[bruːx]	Brauch	'custom'	135
	brux	[brux]	Bruch	'fracture'	135
	hōx	[hoːx]	hoch	'high'	144
	šprɔx	[ʃprɔːx]	Sprache	'language'	135
	lɔx	[lɔx]	Loch	'hole'	135
	bɑx	[bɑx]	Bach	'stream'	135
	buəx	[buəx]	Buch	'book'	135

b.	rīχ	[riːç]	reich	'rich'	135
	štiχ	[ʃtiç]	Stich	'sting'	135
	šǖχ	[ʃyːç]	scheu	'timid'	144
	tsyχt	[tsyçt]	zieht	'move-3SG'	143
	tsεχ	[tsεːç]	zäh	'tough'	144
	frεχ	[frεç]	frech	'impudent'	135
	hȫχs	[høːçs]	hohes	'high-INFL'	143
	wæiχ	[wæiç]	weich	'soft'	135
c.	milχ	[milç]	Milch	'milk'	137
	khɑlχ	[kʰɑlç]	Kalk	'lime'	137
	wεrχ	[wεrç]	Werk	'work'	137
	štɔrχ	[ʃtɔrç]	Storch	'stork'	137

The complementary distribution of [x] and [ç] is captured by positing an underlying /x/ which surfaces as [ç] after a coronal sonorant by Velar Fronting-1 (recall 3). As in Erdmannsweiler (recall 4), the front vowel triggers for that process in Maienfeld also include alternating examples involving Umlaut like [høːçs] 'high-INFL' (cf. [hoːx] 'high').[8]

One difference between Erdmannsweiler and Maienfeld is that /x/ in all of the examples presented in (9) is in coda position; cf. (2) and (4) with several words in which [ç]/[x] are situated between vowels and are hence in the onset. There is no reason to specify that Velar Fronting-1 for Maienfeld only affects a coda sound because there is no /x/ in a word-initial onset or a word-internal onset (e.g. intervocalic position) which could potentially undergo the rule. As noted above, dorsal fricatives do not occur in word-initial onsets. The reason there are no word-internal onsets with a dorsal fricative is indicated in (10). Meinherz (1920: 26) shows that Maienfeld has debuccalized WGmc $^{+}$[x] to [h] in the context between vowels (in the first example 10a and 10b) or between a liquid and vowel (in the first example in 10c). I interpret those two contexts as onset position; in (10) and elsewhere the dot in the phonetic transcriptions indicates the syllable boundary. By contrast, WGmc $^{+}$[x] is retained as a fricative ([x] or [ç]) in coda position, as in the second and third example in (10a) and (10b) and in the second example in (10c). The consequence of the debuccalization of WGmc $^{+}$[x] to [h] in intervocalic position is that there are now synchronic alternations between [h] and [x]/[ç].

[8]Meinherz (1920) is one of the rare examples of a descriptive grammar which states explicitly that velar stops do not undergo fronting. Meinherz (1920: 25) writes: "Zwischen *g* in *gi, ig* und *ga, ag* sowie zwischen *k* in *ki, ik* und *ka, ak* konnte ich keinen merklichen Unterschied hören". ("I could not hear a noticeable difference between *g* in *gi, ig* and *ga, ag* as well as between *k* in *ki, ik* and *ka, ak*".)

(10) [x]~[ç]~[h] alternations:

a.	mɑhə	[mɑ.hə]	mache	‘do-1SG’	136
	mɑxšt	[mɑxʃt]	machst	‘do-2SG’	136
	mɑxt	[mɑxt]	macht	‘do-3SG’	136
b.	štrīhə	[ʃtriː.hə]	streiche	‘paint-1SG’	136
	štrīχšt	[ʃtriːçʃt]	streichst	‘paint-2SG’	136
	štrīχt	[ʃtriːçt]	streicht	‘paint-3SG’	136
c.	štɔrhə	[ʃtɔr.hə]	Haus zum Storchen	‘(name)’	137
	štɔrχ	[ʃtɔrç]	Storch	‘stork’	137

From the synchronic perspective, /x/ is the underlier and the historical process of Debuccalization (Debucc) remains active as a synchronic rule:

(11)

	/ʃtriːx-t/	/ʃtriːx-ə/
Debucc	------	ʃtriː.hə
Vel Fr-1	ʃtriːçt	------
	[ʃtriːçt]	[ʃtriː.hə]
	‘paint-3SG’	‘paint-1SG’

In (11) Debuccalization (/x/⟶[h] / $_{\sigma}[$ __V) bleeds Velar Fronting-1 (Vel Fr-1) in example [ʃtriː.hə]. Note that the treatment in (11) is consistent with treating [h] as an allophone of /x/ (Footnote 4).[9] The bleeding relationship in (11) is a specific instantiation of Dialect C from Figure 2.6.

Maienfeld displays the default pattern described earlier for Erdmannsweiler: /x/ undergoes fronting after any coronal sonorant. From the diachronic perspective, any front segment serves as a trigger for Velar Fronting-1, regardless of historical source. In contrast to Erdmannsweiler, there were apparently no instances of Vowel Retraction in Maienfeld (recall the change from /ei/ to /ɔə/ in 6d), although many examples illustrate Vowel Fronting (=i-Umlaut), e.g. the [øː] in [høːçs] ‘high-INFL’ which is etymologically [oː]; cf. OHG *hōh*. Thus, the front segments that trigger Velar Fronting-1 were either historically front or they were historically back and underwent Vowel Fronting (=i-Umlaut).

[9] The reader is referred to Hall’s (2009b, 2010, 2011a) treatment of [h]~[x] alternations akin to the ones in (10) in the related SBav dialect spoken in Imst (Schatz 1897; Map 3.3). Imst differs from Maienfeld because [h] and [x] contrast in word-medial position and alternations like the ones in (10) must be accounted for with a rule converting /h/ to [x] in coda position (Buccalization). In the analysis for Imst described here, RULE INVERSION has occurred (Vennemann 1972, Hall 2009b and §8.6.3) because Debuccalization has been reanalyzed as a rule of Buccalization with /h/ as the target.

3.4 High Alemannic (part 2)

Berger (1913) describes a variety of HAlmc spoken in Rheintal in Northeast Switzerland in the canton of St. Gallen (Map 3.2). Rheintal is a large area indicated in greater detail on Map 15.9, which depicts velar fronting areas in East Switzerland, Liechtenstein, and Vorarlberg. It is clear from Berger (1913) that velar fronting is active in Rheintal, but it is also evident that the facts involving velars and palatals in Rheintal differ in various ways from the distribution of [x] and [ç] in Maienfeld.

In addition to [x] and [ç], Rheintal also possesses the corresponding affricates, i.e. velar [kx] and palatal [kç]. Velars ([x], [kx]) and the corresponding palatals ([ç], [kç]) stand in an allophonic relationship: In word-initial position, the two dorsal affricates are positional variants (see 12a). In postsonorant position (see 12b) two dorsal fricatives and the two dorsal affricates are likewise allophones. The dorsal fricatives in (12b) are shown below to have prosodically-determined fortis geminate counterparts ([xx] and [çç]), which exhibit the same distribution as the corresponding lenis sounds.

(12) a. /kx/ → [kx] [kç]
b. /x/ → [x] [ç]; /kx/ → [kx] [kç]

The phonemic monophthongs of Rheintal consist of the front vowels /iː i yː y ɪː ɪ eː e øː ø ɛː ɛ œː œ/ and the back vowels /uː u oː o ɔː ɔ ɑː ɑ ə/. Diphthongs occurring adjacent to a dorsal fricative are /iːə yːə eə ɛːə ɛə œːə uə ɔːə/. Note that all of those diphthongs end in schwa.

The patterning of the fricatives and affricates in (12) requires that the mid front lax series of vowels (/ɛː ɛ œː œ/) be analyzed as phonologically [+low], as in Table 3.1; I make the additional assumption that the corresponding back vowels (/ɔː ɔ/) are likewise [+low]. [+low] front vowels include the monophthongs /ɛː ɛ œː œ/ as well as the /ɛː ɛ œː œ/ component of diphthongs. The analysis of vowels in Table 3.1 is analogous to the treatment of /i e ɛ/ described in (7b) of §2.2.3.

It can be seen that front vowels are [coronal], and back vowels are [dorsal]. All rounded vowels are [labial], while unrounded vowels are unmarked for that feature. For front unrounded vowels, front rounded vowels, as well as back vowels, either [+low] or [−low] is assigned. Among all vowels bearing specification for [−low], [+high] is assigned to the high vowels, while mid vowels receive [−high].

Table 3.1: Distinctive features for vowels (Rheintal)

	iː i	ɪː ɪ	eː e	ɛː ɛ	yː y	øː ø	œː œ	uː u	oː o	ɔː ɔ	ɑː ɑ
[coronal]	✓	✓	✓	✓	✓	✓	✓				
[dorsal]								✓	✓	✓	✓
[labial]					✓	✓	✓	✓	✓	✓	
[low]	−	−	−	+	−	−	+	−	−	+	
[high]	+	+	−		+	−		+	−		
[tense]	+	−									

The feature [±tense] distinguishes /iː i/ from /ɪː ɪ/. I omit schwa from Table 3.1, which is placeless.[10]

Data illustrating the complementary distribution of [kx] and [kç] in word-initial position (=12a) are presented in (13). The examples show that the velar occurs before a back vowel in (13a) or a [+low] front vowel in (13b). The palatal surfaces before a [−low] front vowel in (13c), or a coronal sonorant consonant ([r l n]), in (13d). Berger (1913: 11) describes the rhotic [r] as a tongue-tip trill ("Zungenspitzen-r"). There are no restrictions concerning the type of vowel that can follow the sonorant consonant in (13d).[11] The historical source for the word-initial affricates was WGmc ⁺[k], which is preserved as [k] in other dialects, cf. the StG orthography in the third column.

(13) Word-initial [kx] and [kç] (from /kx/):

a.	kxūšt	[kxuːʃt]	Kunst	'art'	134
	kxuttɩg	[kxuttɪg]	wählerisch	'choosy'	44
	kxopf	[kxopf]	Kopf	'head'	42
	kxɔ̄	[kxɔː]	kommen	'come-INF'	134
	kxɔrn	[kxɔrn]	Korn	'grain'	42
	kxɑts	[kxɑts]	Katze	'cat'	134
b.	kxɛəfər	[kxɛəfər]	Käfer	'bug'	33
	kxɛ̄ər	[kxɛːər]	Keller	'cellar'	34
	kxɛ̄ənnə	[kxɛːənnə]	Kern	'core'	34

[10] Berger (1913: 7) also lists among the monophthongs the phonetically low front vowels [æ] (=⟦æ⟧) and [æː] (=⟦ǣ⟧), but it is clear from the discussion in that source that [æ] and [æː] occur in some communities in place of the two vowels [ɛ] and [ɛː].

[11] Dorsal fricatives do not occur in word-initial position in the communities whose phonology is described below, although other places in the same region have dorsal fricatives instead of affricates in (13). Among speakers with word-initial dorsal fricatives, their distribution mirrors that of [kx] and [kç].

c.	kχittɩl	[kçittɪl]	Kittel	‘smock’	134
	kχündə	[kçyndə]	künden	‘proclaim-INF’	46
	kχȫərə	[kçøːərə]	gehören	‘belong to-INF’	17
	kχeərχχə	[kçeərççə]	Kirche	‘church’	136
d.	kχlɛəbə	[kçlɛəbə]	kleben	‘stick-INF’	134
	kχrott	[kçrott]	Kröte	‘toad’	134
	kχnoblə	[kçnoblə]	Knoblauch	‘garlic’	136

Additional evidence that only [−low] front vowels are preceded by the palatal affricate can be observed in (14). The word-initial affricate in the first item in (14a) is predictably velar because the following vowel is back. When that vowel shows the effects of Umlaut in the second word in (14a) the affricate remains velar because the front vowel ([œ]) is [+low]. That nonalternating [kx] can be contrasted with the [kx] that alternates with [kç] before a front [−low] vowel, as in (14b).

(14)	a.	kxɔrəb	[kxɔrəb]	Korb	‘basket’	108
		kxɔrbə	[kxœrbə]	Körbe	‘basket-PL’	75
	b.	kxugələ	[kxugələ]	Kugel	‘ball’	44
		kχügəli	[kçygəli]	kleine Kugel	‘ball-DIM’	65

I account for the distribution of word-initial velar and palatal affricates by positing that the underlying sound in (13) and (14) is velar /kx/, which surfaces as palatal by either (15a) or (15b). In the elsewhere case, /kx/ is realized without change as [kx]. (15a) converts a velar to the corresponding palatal in word-initial position before a [−low] front vowel, while (15b) creates a palatal before a coronal sonorant consonant. The two operations cannot be collapsed into a single one because [±low] is not a distinctive feature for consonants. The target of both (15a) and (15b) is a dorsal [−sonorant, +continuant] sound, which is either /kx/ or /x/; recall the representations in (2) of §2.2.2. This is the correct prediction because the fricatives [x] and [ç] for many speakers have a distribution that parallels the patterning of the corresponding affricates (see Footnote 11).

(15) a. Wd-Initial Velar Fronting-1:

$$
{}_{\text{wd}}[\ \begin{bmatrix}-\textsc{son}\\+\textsc{cont}\end{bmatrix}\quad \begin{bmatrix}-\textsc{low}\end{bmatrix}
$$
$$
\begin{bmatrix}\textsc{dorsal}\end{bmatrix}\quad \begin{bmatrix}\textsc{coronal}\end{bmatrix}
$$

b. Wd-Initial Velar Fronting-2:

$$
{}_{\text{wd}}[\ \begin{bmatrix}-\textsc{son}\\+\textsc{cont}\end{bmatrix}\quad \begin{bmatrix}+\textsc{cons}\\+\textsc{son}\end{bmatrix}
$$
$$
\begin{bmatrix}\textsc{dorsal}\end{bmatrix}\quad \begin{bmatrix}\textsc{coronal}\end{bmatrix}
$$

According to both (15a) and (15b) the feature [coronal] spreads leftward onto a [−sonorant, +continuant, dorsal] segment (i.e. /kx/ or /x/). Dorsal stops (/g k/) cannot undergo the change because all stops are [−sonorant, −continuant].

Velar and palatal fricatives stand in an allophonic relationship in postsonorant position (=12b), as illustrated in (16): Velars surface after a back vowel in (16a) or a [+low] front vowel in (16b) and palatals after a front [−low] vowel in (16c) or liquid in (16d).[12] No examples were found in the original source with a dorsal fricative after [l] – a gap I consider to be accidental. Due to an added complication, I delay discussion of velars and palatals after diphthongs to the end of this section. The diachronic source for the dorsal fricatives in (16) is WGmc ⁺[x k].

(16) Postvocalic dorsal fricatives (from /x/):

a.	šlūx	[ʃluːx]	Schlauch	'hose'	13
	bruxx	[bruxx]	Bruch	'fracture'	135
	rōx	[roːx]	Rauch	'smoke'	13
	dox	[dox]	doch	'however'	140
	šprɔ̄x	[ʃprɔːx]	Sprache	'language'	135
	lɔxx	[lɔxx]	Loch	'hole'	135
	tɑxx	[tɑxx]	Dach	'roof'	135
	feələxt	[feələxt]	vielleicht	'maybe'	38
b.	nɛ̄x	[nɛːx]	nahe	'near'	140
	nɛxt	[nɛxt]	gestern abend	'last evening'	140
c.	rīχχ	[riːçç]	reich	'rich'	135
	štiχχ	[ʃtiçç]	Stich	'sting'	38
	šǖχ	[ʃyːç]	scheu	'timid'	140
	flüχšt	[flyçʃt]	fliehst	'flee-2SG'	58
	löχχli	[løççli]	Löchlein	'hole-DIM'	43
d.	mɑ̄rχχ	[mɑːrçç]	(Grenz)mark	'borderland'	136
	kχeərχχə	[kçeərççə]	Kirche	'church'	136

The generalizations concerning the distribution of velars and palatals after vowels are clear from the original source (Berger 1913: 113).

Examples like [lɔxx] 'hole' vs. [løççli] 'hole-DIM' in (16) display velar vs. palatal alternations triggered by Umlaut-induced stem alternations (cf. 14b). Velar vs. palatal pairs like [lɔxx] vs. [løççli] can be contrasted with the nonalternating

[12] Dorsal fricatives surface either as lenis ([x]/[ç]) or fortis ([xx]/[çç]) depending on the length of the preceding vowel. In the analysis I present below I ignore the fortis vs. lenis distinction.

velar [x] in (17). Note that the dorsal fricative in the first example in both word pairs is velar because it follows a back vowel. The /x/ following the front alternant surfaces without change as [x] because the front vowel is [+low] (cf. 14a).[13]

(17)	a.	šprɔ̄x	[ʃprɔːxə]	Sprache	‘language’	49
		šprɔ̈̄xli	[ʃprœːxli]	reden	‘talk-DIM’	49
	b.	nɑxt	[nɑxt]	Nacht	‘night’	125
		nɛxt	[nɛxt]	Nächte	‘night-PL’	31

The distribution of postvocalic dorsal affricates mirrors the distribution of the equivalent fricatives (=12b). Thus, the velar surfaces after a back vowel in (18a) or a front [+low] vowel in (18b) and the palatal after a [−low] front vowel in (18c) or liquid in (18d). No examples were found in the original source with a dorsal affricate after [r].[14]

(18) Postvocalic [kx] and [kç] (from /kx/):

a.	trukxə	[trukxə]	drücken	‘press-INF’	137
	rokx	[rokx]	Rock	‘skirt’	137
	sɑkx	[sɑkx]	Sack	‘sack’	137
b.	ɛkxər	[ɛkxə]	Äcker	‘field-PL’	31
c.	štrikχ	[ʃtrikç]	Strick	‘cord’	137
	glükχ	[glykç]	Glück	‘fortune’	46
	trükχnə	[trykçnə]	trocknen	‘dry-INF’	137
	rökχli	[røkçli]	Röcklein	‘skirt-DIM’	43
	brökχə	[brøkçə]	Brocken	‘chunk’	62
	štrekχə	[ʃtrekçə]	strecken	‘stretch-INF’	137
d.	wolkχə	[wolkçə]	Wolke	‘cloud’	136
	milkχ	[milkç]	Milch	‘milk’	137

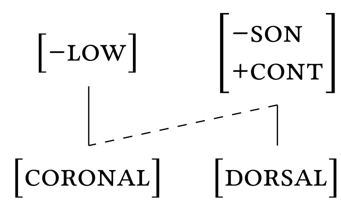
As in word-initial position, Rheintal requires two distinct rules to capture the distribution of dorsal fricatives and affricates in postsonorant position: One applies after a [−low] front vowel (=19a) and the other after a coronal sonorant

[13] Berger notes that the front counterpart of [ɑ] in Umlaut alternations like the one in (17b) can be [e] for some words. He documents some doublets, i.e. words whose fronted vowel is [ɛ] or [e]. One such example is the morpheme *Nacht* in (17b). Significantly, the pronunciation with [e] requires the dorsal fricative to surface as palatal, i.e. [neçt] (=⟦neχt⟧). The palatal realization of /x/ confirms the analysis of /e/ as a front [−low] vowel (recall Table 3.1).

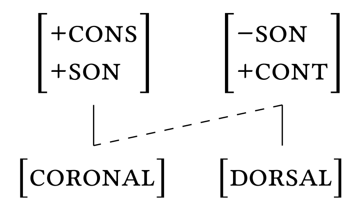
[14] Dorsal affricates also occur after a nasal, but it is not clear from the original source whether or not the nasal in question is velar ([ŋ]) or palatal ([ɲ]). For this reason I refrain from discussing these examples. See Berger (1913: 137) for discussion.

consonant (=19b). In the elsewhere case (after [+low] front vowels or back vowels) /x/ and /kx/ surface without change.

(19) a. Velar Fronting-2:



b. Velar Fronting-3:



As in (15), Velar Fronting-2 and Velar Fronting-3 cannot be collapsed into the same rule because [−low] is distinctive for vowels but not for consonants.

The data presented above illustrate that palatal fricatives and affricates surface in the neighborhood of nonlow front vowels that were originally front as well as nonlow front vowels that were originally back, e.g. the [ø] in [løççli] 'hole-DIM' from (16c), which was originally [o] (in OHG). Thus, i-Umlaut (as an instance of Vowel Fronting) fed Velar Fronting-2.

The final set of examples (=20) show the distribution of dorsal fricatives after diphthongs. The generalization is that the palatal fricative occurs after a schwa-final diphthong only if the first part of that diphthong is a [−low] front vowel, as in (20c). If the first member of a schwa-final diphthong is back (20a), or [+low] and front (20b), then the dorsal fricative surfaces as velar. There do not appear to be examples in the original source in which a dorsal affricate follows a diphthong whose first member is [−low] and front, but the expectation is that the dorsal affricates would behave like the dorsal fricatives.

(20) Dorsal fricatives (from /x/) after diphthongs:

a.	buəx	[buəx]	Buch	'book'	135
	fluəxxə	[fluəxxə]	fluchen	'curse-INF'	135
	glɔ̄əx	[glɔːəx]	Gelenk	'joint'	54
b.	štrɔ̿̄əx	[ʃtrœːəx]	Streich	'prank'	55
	frɛəxx	[frɛəxx]	frech	'impudent'	135
c.	līəχt	[liːəçt]	Licht	'light'	140
	fǖəχt	[fyːəçt]	feucht	'damp'	75
	seəχχə	[seəççə]	Sichel	'sickle'	135

The generalizations described above are also visible in word pairs with Umlaut-induced stem vowel alternations, e.g. [psuːəx] 'visit' (=⟦psūəx⟧) with [x] after a schwa-final diphthong preceded by a back vowel vs. [psyːəçç] 'visit-PL'

(=⟦psǖəχχ⟧) with [çç] after a schwa-final diphthong preceded by a [−low] front vowel.

I argue that the vowel transcribed in (20) as schwa ([ə]) is phonologically front ([coronal]) in the context after a front vowel but that it remains placeless (recall §2.2.3) in the elsewhere case, e.g. after a back vowel. The change from /ə/ to a coronal vowel is accomplished with (21). A slightly different version of the same process is posited below for a different set of dialects (§5.4). Schwa Fronting-1 is also discussed in §13.5.2 and a similar epenthetic process (Schwa Fronting-2) in §5.4 and §15.3. For general discussion see §12.8.1.[15]

(21) Schwa Fronting-1:

$$\begin{array}{ll} \begin{bmatrix}-\textsc{cons}\end{bmatrix} & \begin{bmatrix}-\textsc{cons}\\ +\textsc{son}\end{bmatrix} \\ \quad | & \\ \begin{bmatrix}\textsc{coronal}\end{bmatrix} & \end{array}$$

Schwa Fronting-1 makes sense from the point of view of phonetics because schwa is usually seen as a targetless vowel whose production does not involve an active articulatory gesture (e.g. Barry 1995 for German schwa). For that reason, schwa is therefore highly susceptible to coarticulatory influences from neighboring segments, as expressed in (21).

(21) is a specific instantiation of Vowel Fronting (=7b). The data in (20) require that Schwa Fronting-1 feeds Velar Fronting-2, which is precisely what one would expect in a dialect like Rheintal with a transparent distribution of velars and palatals. For example, in the word [liːəçt] 'light' (/liːəxt/ from 20c), the feature [coronal] spreads from /iː/ to schwa, at which point the derived front vowel spreads the inherited [coronal] feature to /x/, thereby creating the palatal fricative [ç]. For transparency I transcribe the fronted realization of schwa with a diacritic: /liːəxt/⟶|liːə̹xt|⟶[liːə̹çt]. (Here and below I enclose sounds at an intermediate synchronic stage in vertical lines, e.g. |x|). The feeding relationship described here is a specific instantiation of Dialect B from Figure 2.5.

[15] As stated in (21), Schwa Fronting-1 spreads [coronal] from any front vowel, including [+low] front vowels in words like [frɛəxx] 'impudent' from (20b). The reason the dorsal fricative surfaces as velar in that type of word is that /ɛ/ is [−low]. Alternatively, one could restrict the set of triggers of Schwa Fronting-1 to nonlow front vowels. Since it cannot be determined which of the two options is correct I simply leave this question open.

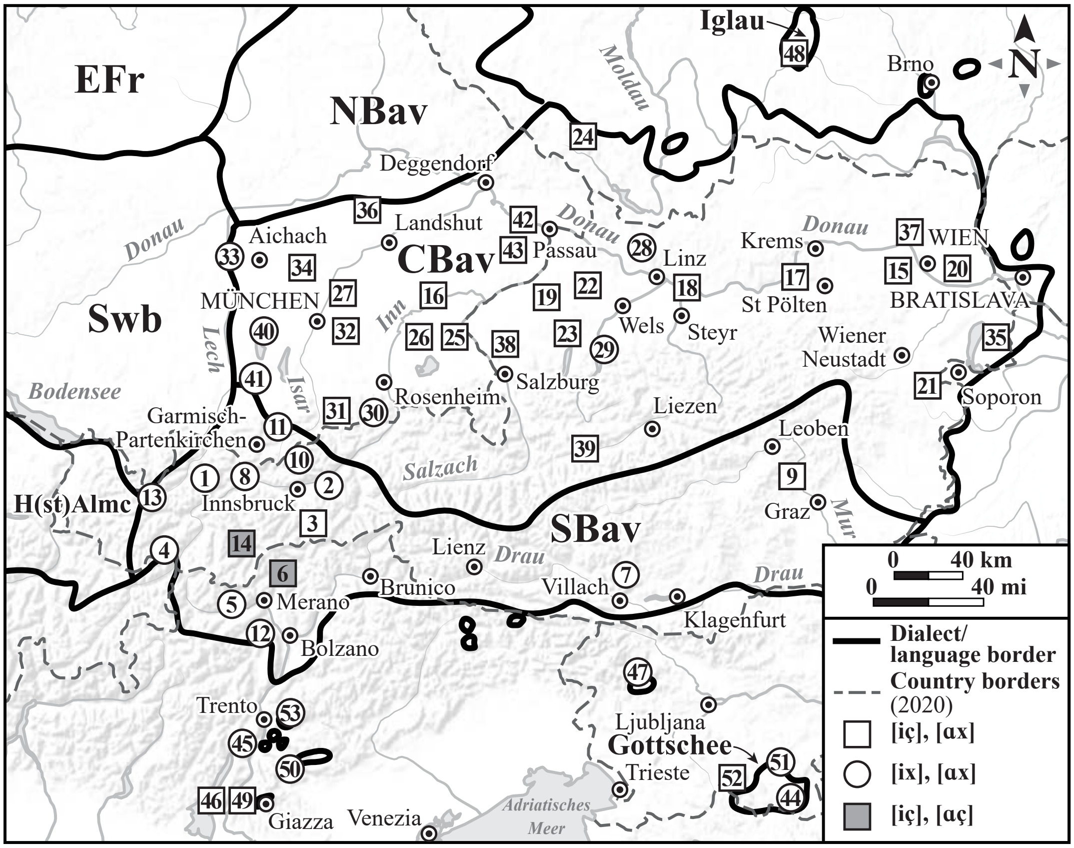
3.5 Central Bavarian (part 1)

The occurrence of [x] and [ç] as positional variants (allophones) after any coronal sonorant is a feature of CBav (as well as the related UG dialects NBav and EFr). By contrast, SBav often preserves [x] even in the context of front vowels. An example of a non-velar fronting (Stage 1) SBav place is Imst (Schatz 1897; Map 3.3). According to Schatz's phonetic description (p. 9), the ach-Laut is articulated on the back part of the soft palate ("am hinteren weichen Gaumen"), regardless of what kind of sound precedes, e.g. [tsøx] 'tick'. Hathaway (1979: 85) investigated the same dialect over seventy years later and did not detect a change.

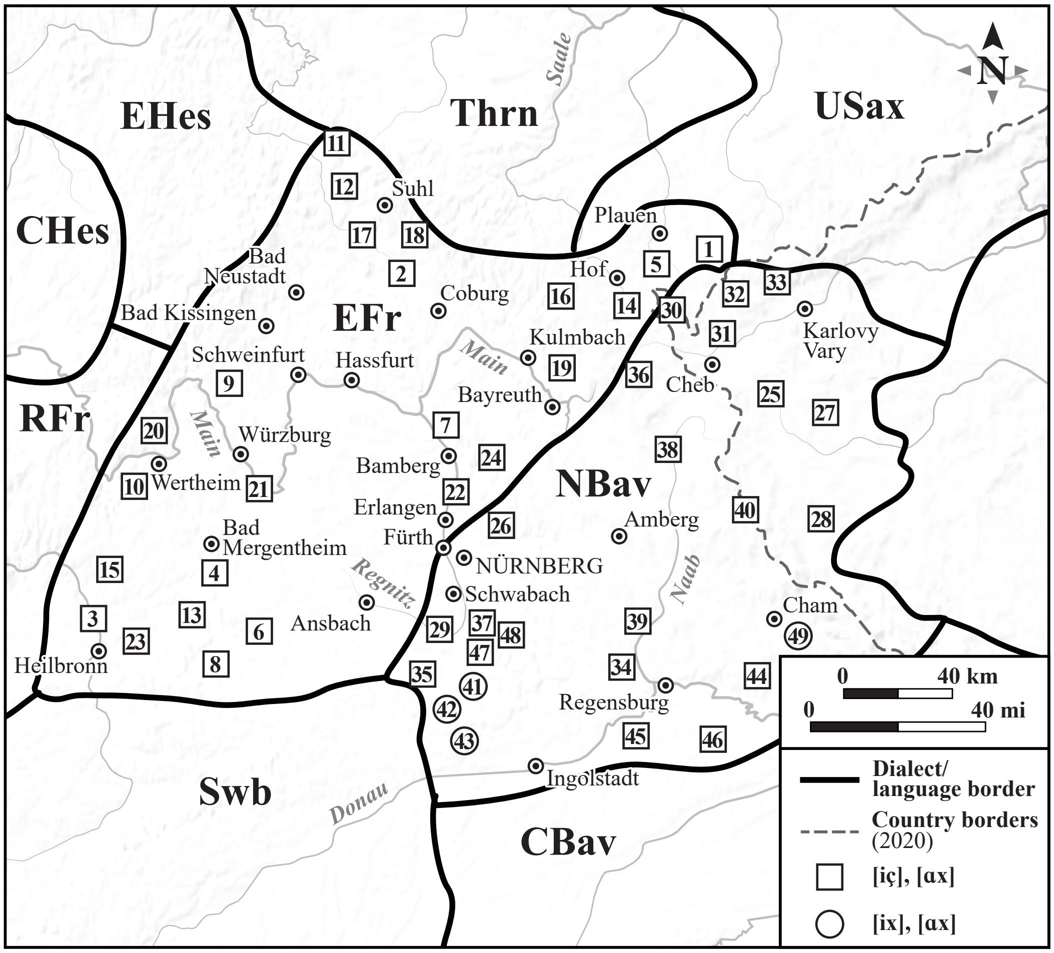
Noelliste (2017) describes the realization of dorsal fricatives for speakers in the Austrian town of Ramsau am Dachstein in the state of Styria (Steiermark; Map 3.3). The dialect is discussed below as a representative example of a velar fronting variety of CBav. Map 3.4 (NBav and EFr) is given here for reference, even though the varieties depicted on the that map are not discussed until later chapters.

The phonemic monophthongs of Ramsau am Dachstein consist of the front vowels /i ɪ e ɛ/ and the back vowels /u ʊ o ɔ ɑː ɑ ə/. The phonemic diphthongs are /ɑi ɔi ɑu/, although I do not discuss /ɔi/ because of its rarity. The dialect also has diphthongs that Noelliste considers to be synchronically derived from monophthongs, e.g. [eə] (from /e/). The only dorsal fricatives are [x] and [ç], which stand in an allophonic relationship in postsonorant position as in (1). Neither sound occurs word-initially.

The following data illustrate that [x] (<WGmc $^{+}$[x k]) surfaces after back vowels (=22a) and [ç] after front vowels (=22b). As noted above, Noelliste (2017) demonstrates that there is an optional rule (Diphthongization) converting tense monophthongs (front or back) to diphthongs ending in a back vowel, e.g. /e/ can be realized as [e] or [eə] and /o/ as [o] or [oʊ]. Example (22c) is important because it shows that [ç] surfaces as expected after [e] but that [x] occurs after the derived diphthong [eə]. The realization of the dorsal fricative as [x] after [eə] is expected because the second component of the diphthong ([ə]) is back (cf. the example [nəx] 'after' from 22a). Examples like [seəxi] indicate that Schwa Fronting-1 (=21) is not active. No examples are present in Noelliste's corpus for dorsal fricatives after [ɔ ɛ], which she considers to be accidental gaps.



Map 3.3: South Bavarian (SBav) and Central Bavarian (CBav). White squares indicate assimilatory postsonorant velar fronting, shaded squares nonassimilatory postsonorant velar fronting and circles the absence of postsonorant velar fronting. 44–53 are German-language islands. 1=Schatz (1897), 2=Schatz (1903), 3=Egger (1909), 4=Gröger (1924), 5=Insam (1936) (Naturns), 6=Insam (1936) (Passeier), 7=Kurath (1965), 8=Hathaway (1979), 9=Moosmüller (1991), 10=Moosmüller (1991), 11=Stein-Meintker (2000), 12=Kollmann (2007), 13=VALTS (Steeg), 14=VALTS (Ötztal), 15=Gartner (1900), 16=Schwäbl (1903), 17=Seemüller (1908a), 18=Seemüller (1909d), 19=Seemüller (1909c), 20=Pfalz (1911), 21=Bíró (1918), 22=Haasbauer (1924), 23=Mindl (1924/1925), 24=Kubitschek (1926), 25=Kufner (1957), 26=Kufner (1960), 27=Kufner (1961), 28=Keller (1961) (Linz), 29=Keller (1961), (Gmünden), 30=Maier (1965) (Kiefersfelden), 31=Maier (1965) (Isarwinkel), 32=Bethge & Bonnin (1969), 33=Ibrom (1971), 34=Gladiator (1971), 35=Manherz (1977), 36=Zehetner (1978), 37=Moosmüller (1987), 38=Moosmüller (1991), 39=Noelliste (2017), 40=SBS (Grafrath), 41= SBS (Weilheim), 42=SNiB (Heining), 43=SNiB (Dorfbach), 44=Tschinkel (1908), 45=Bacher (1905), 46=Schweizer (1939), 47=Lessiak (1959), 48=Stolle (1969), 49=Mayer (1971), 50=Kranzmayer (1981), 51=Wolf (1982), 52=Lipold (1984), 53=Rowley (1986).



Map 3.4: East Franconian (EFr) and North Bavarian (NBav). Squares indicate postsonorant velar fronting and circles the absence of velar fronting. 1=Hedrich (1891), 2=Hertel & Hertel (1902), 3=Braun (1906), 4=Dietzel (1908), 5=Gerbet (1908), 6=Blumenstock (1911), 7=Batz (1911) 8=Knupfer (1912), 9=Schmidt (1912b), 10=Heilig (1912), 11=Dellit (1913), 12=Kaupert (1914), 13=Sander (1916), 14=Meinel (1932), 15=Roedder (1936), 16=Werner (1961), 17=Kober (1962), 18=Bock (1965), 19=Steger (1968), 20=Hirsch (1971), 21=Diegritz (1971), 22=Trukenbrod (1973), 23=Jakob (1985), 24=Schnabel (2000), 25=Gradl (1895), 26=Gebhardt (1907), 27=Eichhorn (1908), 28=Seemüller (1908c), 29=Hain (1936), 30=Gütter (1962a), 31=Gütter (1962b), 32=Gütter (1963b), 33=Gütter (1963a), 34=Dozauer (1967), 35=Schödel (1967), 36=Bethge & Bonnin (1969) (Kreis Wunsiedel), 37=Bethge & Bonnin (1969) (Kreis Schwabach), 38=Denz (1977), 39=Götz (1987), 40=Bachmann (2000), 41=SBS (Raitenbuch), 42=SBS (Dettenheim), 43=SBS (Mörnsheim), 44=SNiB (Zinzenzell), 45=SNiB (Herrnsaal), 46=SNiB (Atting), 47=SMF (Heuberg), 48=SMF (Ebenried), 49=SNOB (Miltach).

(22) Postvocalic [x] and [ç] (from /x/):

a.	[ksuxt]	gesucht	'search-PART'
	[ɔfʊx]	einfach	'simple'
	[voxŋ]	Woche	'week'
	[nəx]	nach	'after'
	[sɑxɛ]	Sache	'thing'
	[ə hɑuxl̩]	ein Hauchl	'a hint'
b.	[siçɐ]	sicher	'certainly'
	[pflɪçt]	Pflicht	'duty'
	[ʀeç]	Reh	'deer'
	[ʀɑiç]	Reich	'empire'
c.	[seçi], [seəxi]	sehe ich	'I see-1SG'

Examples like the ones in (22) are captured by analyzing [x] and [ç] as underlyingly /x/, which surfaces as [ç] after a coronal sonorant by Velar Fronting-1 (=3). I discuss below why the trigger for fronting is the set of coronal sonorants and not the set of front vowels.

Optional forms as in (22c) show that Velar Fronting-1 is fully transparent. The realization [seəxi] illustrates that Diphthongization (Diphth) preempts Velar Fronting-1; see (23a). That this is a bleeding relationship is shown in (23b) where Diphthongization incorrectly counterbleeds Velar Fronting-1 in /sex-i/. The example /ʀɑix/ shows that Diphthongization and Velar Fronting-1 do not interact.

(23)

a.		/sex-i/	/ʀɑix/	b.		/sex-i/	/ʀɑix/
	Diphth	seəxi	-----		Vel Fr-1	seç-i	ʀɑiç
	Vel Fr-1	-----	ʀɑiç		Diphth	seəç-i	------
		[seəxi]	[ʀɑiç]			*[seəçi]	[ʀɑiç]
		'I see-1SG'	'empire'				

The bleeding relationship in (23a) is a specific example of Dialect D from Figure 2.6.

An important difference between Ramsau am Dachstein and Maienfeld/ Rheintal (§3.3, §3.4) is that the one rhotic consonant is coronal ([r]) in Maienfeld/ Rheintal, but uvular ([ʀ]) in Ramsau am Dachstein, as in the final two examples in (22b). I follow Noelliste in analyzing /ʀ/ as phonologically [dorsal]. As in StG (and many other regional varieties discussed below), /ʀ/ has the back vowel allophone [ɐ] – the vocalized-r – in coda position. The data in (24a) illustrate [ʀ]~[ɐ] alternations in which the consonantal sound occurs in the onset and the vocalized sound in the coda. The data in (24b) are significant because the dorsal fricative /x/ surfaces without change as [x] after the vocalized-r. Noelliste demonstrates that the dialect also vocalizes /l/ to the front vowel [ɪ] in coda position. A representative example (from underlying /mɔlx/) is provided in (24c). Note that the sound following the derived front vowel ([ɪ]) is palatal [ç] as expected because the sound to its immediate left is [coronal].

(24)	a.	[meɐ]	Meer	'ocean'
		[me.ʀə]	Meere	'ocean-PL'
		[pə.piɐ]	Papier	'paper'
		[pə.pi.ʀə]	Papiere	'paper-PL'
	b.	[ʃtɔɐx]	Storch	'stork'
		[kiɐxŋ]	Kirche	'church'
	c.	[mɔɪç]	Molch	'salamander'

The significant point is that [x] – and not [ç] – surfaces after [ɐ]. In fact, this is precisely what one would expect given the transparent distribution of [x] and [ç] because both [x] and [ɐ] are back ([dorsal]) sounds. The realization of /x/ as [x] after the vocalized-r is not simply true for Ramsau am Dachstein. Instead, it is a general characteristic of StAG, a point is stressed by Hildenbrandt (2013) and Moosmüller et al. (2015). The data in those sources point to the occurrence of [ç] after front vowels and [x] after all back vowels, including the vocalized-r, e.g. [kiɐxɛ] 'church'. See also Capell (1979: 12), who notes that the occurrence of [x] after [ɐ] is a general pattern for Bav dialects.

The articulation [ɐx] in a word like [ʃtɔɐx] 'stork' can be contrasted with other varieties of German, which have opaque palatal [ç] in that context, e.g. [ʃtɔɐç] 'stork' in StG (§1.2 and §17.3.1).

The realization of /l ʀ/ as [ɪ ɐ] in (24) is accomplished with (25). Following Noelliste, the underlying sonorant consonants consist of [+nasal] sounds (/m n ŋ/) and [−nasal] sounds (/l ʀ/), while place features distinguish the individual members of those two groups, e.g. /l/ is [coronal] and /ʀ/ is [dorsal]. Liquid Vocalization changes the [dorsal] rhotic /ʀ/ into the [−consonantal] sound [ɐ], but [ɐ] retains [dorsal] since the only feature that changes in (25) is [consonantal].[16]

[16]The vocalization of liquids in Bav (and in other German dialects) has been well-documented in the descriptive and theoretical literature. In addition to Noelliste (2017) the reader is referred to Schmeller (1821: 107ff.), Selmer (1933), Kranzmayer (1956: 119ff.), Rein (1974), Haas (1983), Merkle (1984), Glover (2014), and Noelliste (2019), not to mention the linguistic atlases for Bavaria and Upper Austria (§1.6.2). Map 60 in WDU (Volume 4) depicts the vocalization of /l/ to a front vowel throughout most of Austria and Bavaria.

(25) Liquid Vocalization:

$$\begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nas} \end{bmatrix} \rightarrow [-\text{cons}] \;/\; \_\_\_\; C_0\;]_\sigma$$

Liquid Vocalization (Liq Voc) and Velar Fronting-1 do not interact, as illustrated in (26). Thus, [x] surfaces after [ɐ] given either ordering relationship. Observe that /x/ surfaces as [ç] after /l/ in /mɔlx/ because the set of triggers for Velar Fronting-1 consists of all coronal sonorants.

(26)

	a.			b.		
		/ʃtɔʀx/	/mɔlx/		/ʃtɔʀx/	/mɔlx/
	Liq Voc	ʃtɔɐx	mɔɪx	Vel Fr-1	-----	mɔlç
	Vel Fr-1	-----	mɔɪç	Liq Voc	ʃtɔɐx	mɔɪç
		[ʃtɔɐx]	[mɔɪç]		[ʃtɔɐx]	[mɔɪç]
		‘stork’	‘salamander’			

There is a reason why the correct version of velar fronting for Ramsau am Dachstein specifies that the trigger is the set of coronal sonorants ([+sonorant, coronal]) and not the set of front vowels ([−consonantal, coronal]): A few words are attested in which coda /l/ unexpectedly surfaces as [l], but the following /x/ is realized with the palatal allophone, e.g. [valç] ‘goatgrass’. The pronunciation with [ç] in that type of word follows directly if the set of triggers for Velar Fronting-1 is [+sonorant, coronal].

In sum, [x] and [ç] have a transparent distribution on the surface: [ç] occurs only after coronal sonorants and [x] after back vowels. The two sounds never contrast.

Modern-day velar and palatal fricatives in Ramsau am Dachstein surface after back vowels and front vowels respectively regardless of the etymological source of those vowels. A palatal after a historical front vowel is provided in (27a) and a velar after a historical back vowel in (27b). The example in (27c) shows that [x] follows an etymological front vowel which now surfaces as a diphthong ending in schwa ([eə]). That vocalic change (Diphthongization) is a specific example of Vowel Retraction (=7a) because the component of the diphthong adjacent to the dorsal fricative in words like the one in (27c) is back. Example (27d) illustrates the change from the modern-day allophone [ɐ] (/ʀ/) from the earlier [coronal] rhotic [r] (/r/). The change from coronal to dorsal was accomplished by the process I refer to below as r-Retraction in (28). The reconstructions in the second column below are my own.

(27)	a.	[ʀɑiç]	<	+[riːx]	‘empire’	cf. MHG *rīch(e)*	(from 22b)
	b.	[nəx]	<	+[nɑːx]	‘after’	cf. MHG *nāch*	(from 22a)
	c.	[seəxi]	<	+[sexi]	‘I see’	cf. MHG *sehe ich*	(from 22c)
	d.	[ʃtɔɐx]	<	+[ʃtɔrx]	‘stork’	cf. MHG *storch(e)*	(from 24b)

(28) r-Retraction:
/r/ > /ʀ/

From the formal perspective r-Retraction deleted [coronal] and added [dorsal]. That change is assumed to have involved a restructuring of the underlying representation because it was obligatory and did not create alternations.[17]

Before I continue my discussion of velar fronting in Ramsau am Dachstein from the diachronic perspective I provide some background on the phonology of rhotics necessary to better understand the function of r-Retraction, since that sound change plays an important role in a number of case studies investigated below. A number of proposals have been made concerning the nature of the rhotic consonant phoneme in the history of Gmc; a few of those studies penned in the modern era include Runge (1973), Howell (1991), King & Beach (1998), Denton (2003), and Kostakis (2015). Some of that earlier research has proposed that the phonetic variation involving the manner and place of articulation for the rhotic consonant in modern German (Kohler 1977a, Hall 1993) was already present in early Gmc and that the different realizations of the early Gmc rhotic can shed light on sound changes that were triggered by it.

A significant generalization that is sometimes missed in that earlier discussion is that there never was a single variety of Gmc with a rhotic displaying either a manner contrast (trill, approximant, flap) or place contrast (alveolar, velar, uvular). Since the present discussion concerns itself with the place dimension, I state the following generalization which is true for German dialects without exception: There are German dialects with a [coronal] rhotic (/r/) and those with a [dorsal] rhotic (/ʀ/), but no variety of German contrasts the two sounds. In the present framework I therefore posit that the one rhotic phoneme can differ from dialect to dialect in terms of its distinctive features; recall the two structures posited in

[17] The treatment described here is also compatible with one in which r-Retraction is active as a synchronic rule. I leave this possibility open. The change from a coronal (apical) /r/ to the dorsal (uvular) /ʀ/ has been discussed at length in the literature on German dialects. One such study is Wiese (2003: 29), who observes that the change is a very recent one in the speech of post-war actors. Ehlers (2021) is an in-depth study of the abrupt shift from /r/ to /ʀ/ in the mid-twentieth century among LG speakers in Mecklenburg. A similar study for NLGm is Wilcken (2013: 32-33).

(3c, 3d) in §2.2.2. Thus, there are dialects like Erdmannsweiler, Maienfeld, Rheintal, and Upper Austria (see §3.6) where /r/ is phonologically [coronal], as well as ones like Ramsau am Dachstein where /ʀ/ is phonologically [dorsal].

r-Retraction in (28) can be viewed as a sound change that has the function of changing the [coronal] rhotic phoneme into a [dorsal] rhotic phoneme. The example given earlier in (27d) means that Ramsau am Dachstein was once a dialect with /r/ and that r-Retraction restructured it to /ʀ/. Evidence for my claim is that the rhotic phoneme in the broader region (Austria) is primarily [coronal] (/r/) and that areas that once had /r/ now have /ʀ/. See in particular Kranzmayer (1956: 121), who observes that Bav dialects with the [dorsal] rhotic – Zäpfchen-r ("uvular-r") in Kranzmayer's terms – are gradually spreading throughout several regions in Austria where the [coronal] rhotic – Kranzmayer's Zungen-r ("tongue [tip]-r") – was once predominant.[18]

Velar Fronting-1 in modern-day Ramsau am Dachstein (Stage 2) arose out of Stage 1, where /x/ surfaced invariably as [x]. The two stages referred to here are depicted in (29) for three of the items presented above:

(29)	/pflɪxt/	/sɑxɛ/	/stɔrx/	
	[pflɪxt]	[sɑxɛ]	[stɔrx]	Stage 1
	/pflɪxt/	/sɑxɛ/	/ʃtɔʀx/	
	[pflɪçt]	[sɑxɛ]	[ʃtɔɐx]	Stage 2
	Pflicht	*Sache*	*Storch*	StG
	'duty'	'thing'	'stork'	

As noted above, the realization of /x/ as [x] after both back and front vowels at Stage 1 attested in SBav varieties, e.g. Imst (Schatz 1897, Hathaway 1979; Map 3.3). The coronal articulation of the rhotic ([r]) is the realization of /r/ in the Swb and HAlmc varieties discussed above (Map 3.1 and Map 3.2). [r] (/r/) is also the realization among speakers of SBav spoken in the Oberinntal (Upper Inn Valley) to the West of Innsbruck (as observed by Schatz 1897: 6, 11). The same point holds

[18]It is often assumed in the traditional literature that the original language (PGmc) had /r/ and that modern German dialects with /ʀ/ were therefore all innovative. The treatment of Ramsau am Dachstein described above is consistent with that approach. Alternatively, one could argue that even in earlier stages of Gmc (e.g. OHG, MHG) dialects with /r/ and dialects with /ʀ/ coexisted side by side; note that the latter approach is more in line with the findings of Howell (1991) than the former one. In this book I do not discuss cases where a [dorsal] rhotic is preserved from an earlier system with a [dorsal] rhotic, although I do not deny that that type of system could be attested. It is important to stress that the [dorsal] rhotic phoneme in many of the case studies discussed below (Chapter 7) must have been [coronal] at an earlier stage.

for the SBav variety in Samnaun in the far eastern part of Switzerland (Gröger 1924: 126; Map 3.3).

At some point at Stage 1, /x/ was slightly fronted in the context after a front vowel (i.e. it was prevelar), and at Stage 2 that coarticulatory process of velar fronting was phonologized as Velar Fronting-1, which now applies categorically after front vowels and coronal consonants (=[+sonorant, coronal]).

The pattern of velar fronting in Ramsau am Dachstein exemplifies the default case discussed earlier for Erdmannsweiler (§3.2) in the sense that /x/ surfaces as [ç] after any coronal sonorant. That same default pattern is the one attested in other varieties of CBav spoken in both Austria and Germany (Bavaria). One Austrian variety documenting the presence of the default pattern approximately one century ago is the phonetic study of consonants and vowels in Marchfeld (Pfalz 1911; Map 3.3). The material in the latter source reveals that [ç] only surfaces after front vowels and [x] after back vowels. Since liquids are vocalized (as in 24b, 24c), there do not appear to be examples in Pfalz (1911) where dorsal fricatives surface after consonants. As in Ramsau am Dachstein, [x] surfaces after the vocalized-r ([ɐ]).

The same default pattern involving [x] and [ç] has been observed for well over a century in descriptions of CBav dialects spoken in Bavaria. One older source stating that the palatal only occurs after a front vowel and the velar after a back vowel is Schwäbl (1903: 46) for the Rot-Tal region (Map 3.3). Kufner (1957: 178–179, 1960: 12–13) makes the same observation concerning the realization of [x] and [ç] in the same region (Map 3.3). The status of velar fronting in Bav with particular reference to Lower Bavaria is the topic of Chapter 13.

3.6 Central Bavarian (part 2)

Haasbauer (1924) provides a historical description of the consonants and vowels of a broad CBav-speaking region in the Austrian state of Upper Austria (Oberösterreich; Map 3.3).

The phonemic monophthongs and diphthongs differ slightly from community to community. The data presented below have dorsal fricatives in the neighborhood of front vowels (/i ɪ e ɛ/), back vowels (/u o ɔ ɑː ɑ ə/), diphthongs ending in a front vowel (/ɔɪ æɛ/) or diphthongs ending in a back vowel (/uɒ/). The only dorsal fricatives are [x] and [ç], which stand in an allophonic relationship in postsonorant position as in (1). Neither sound occurs word-initially.

[x] surfaces after back vowels (=30a) and [ç] after front vowels (=30b) or the vocalized /l/ (=30c); see Haasbauer (1924: 100) for discussion of the phonetics of

[x] and [ç]. No data were found in the original source in which /r/ occurs before /x/. The diachronic source for [x]/[ç] is WGmc +[k x].

(30) [x] and [ç] (from /x/):

a.	khuxü̜	[kʰuxʏ]	Küche	'kitchen'	92
	woxɒ	[woxɒ]	Woche	'week'	91
	bǫxɒ	[bɔxɒ]	backen	'bake-INF'	107
	suɒxɒ	[suɒxɒ]	suchen	'search-INF'	107
	gɑ̄x	[gɑːx]	jäh	'abruptly'	92
	bɑxd	[bɑxt]	Gebäck	'pastry'	107
b.	siχɒ	[siçɒ]	sicher	'certainly'	107
	seχtɒ	[seçtɒ]	Gefäß	'container'	89
	šlęχd	[ʃlɛçt]	schlecht	'bad'	107
	ǫi̜χŋ	[ɔɪçŋ̍]	Eiche	'oak tree'	97
	fæęχtn	[fæɛçtn̩]	Fichte	'spruce'	95
c.	mui̜χ	[muɪç]	Milch	'milk'	90

The data in (30) are captured by analyzing [x] and [ç] as underlyingly /x/, which surfaces as [ç] after a coronal sonorant by Velar Fronting-1 (=3).

The importance of the patterning of dorsal fricatives in Upper Austria lies in the realization of /r/. In most areas in Upper Austria, that sound is coronal [r] in word-initial position (31a) or in a word-internal onset (31b). Haasbauer describes the sound as an untrilled dental-r ("ungerolltes Zungen-r"), although he also notes that some areas have a dorsal (uvular) articulation ("Zäpfchen-r"; Haasbauer 1924: 100). The most significant examples are the ones in (32), which illustrate the realization of /r/ in coda position after a vowel and before a fortis obstruent. The generalization is that /r/ surfaces as [x] after a back vowel in (32a) or as [ç] after a front vowel in (32b). The data in (32) are typical of the Hausruckviertel, although similar examples obtain elsewhere, e.g. in the region around Ebensee and in the northwest of the Salzkammergut.[19]

[19] A number of studies have documented the realization of the rhotic phoneme as a fortis dorsal fricative before fortis sounds like [t] in varieties of Bav. See, for example, Schönberger (1934: 77–78), Roitinger (1954: 203–207), Kranzmayer (1956: 124–127), and Zehetner (1978: 298–299). In contrast to Haasbauer, the aforementioned authors employ a single symbol representing a fortis dorsal fricative (e.g. ⟦x⟧ or ⟦χ⟧) without saying explicitly whether or not that sound can be realized as a palatal. The linguistic atlas for Upper Austria (SAO) indicates certain parts of Upper Austria (e.g. to the north and west of Wels) where etymological /r/ surfaces as a fricative after a back vowel. For example, it is stated in the commentary for Map I 64 for the word *schwarz* 'black' that the fricative realization for /r/ is velar. /r/ is likewise realized as

(31) Postrhotic [x] and [ç] (from /r/):

a.	ruɒ	[ruɒ]	Ruhe	‘quiet’	105
b.	mǫriŋ	[mɔ.riŋ]	morgen	‘tomorrow’	105

(32) Postrhotic [x] and [ç] (from /r/):

a.	gfiɒxd	[gfiɒxt]	geführt	‘lead-PART’	105
	šwǫxds	[ʃwɔxts]	schwarz	‘black’	105
b.	meχkɒ	[meçkɒ]	merken	‘notice-INF’	105
	gšbeχt	[gʃpeçt]	gesperrt	‘block-PART’	90
	hęχds	[hɛçts]	Herz	‘heart’	105

The dorsal fricatives [x ç] in (32) derived historically from a rhotic (WGmc ⁺[r]). My assumption is that these and similar words retain /r/ in the underlying representation in the synchronic phonology, e.g. /ʃwɔrts/ for [ʃwɔxts] and /hɛrts/ for [hɛçts]. First, speakers with the pronunciation in (32) are certainly aware of the fact that these items surface with [r] in neighboring areas of Upper Austria, e.g. [meːrkɒ] ‘notice-INF’ for [meçkɒ] in (32b). Second, [r] presumably surfaces as an alternant in a word-internal onset for the items listed in (32) in which the fortis consonant following the dorsal fricative is an inflectional suffix, e.g. the /r/ in [gʃpeçt] ‘block-PART’ (from /g-ʃper-t/), cf. StG [ʃpɛʀən] ‘block-INF’ (from /ʃpɛʀ-ən/). Unfortunately, Haasbauer does not provide alternating examples.

The /r/ in (32) undergoes a change to a fortis velar fricative |x|, which in turn feeds Velar Fronting-1. It is possible to account for the change from /r/ to |x| in a single step; I posit two separate changes in (33) on the basis of my treatment of a CG (Rpn) dialect in which two similar rules are synchronically motivated (§5.3.1). Desonorization-1 converts /r/ into a dorsal obstruent (|ʁ|), while Laryngeal Assimilation-1 ensures that obstruents (including derived |ʁ|) shift to a fortis sound (e.g. |x|) before a fortis obstruent. The two changes described here are illustrated representationally in (34). I assume that the feature [−nasal] is not present in |ʁ| or [x], although this point is not crucial. Laryngeal Assimilation-1 is an example of a change that increases the number of target segments for Velar Fronting-1 (=Rule W from Table 2.7).

a fricative after a front vowel in the word *Herz* ‘heart’ on Map I 98, but that map does not distinguish velar from palatal place of articulation. The same drawback holds for Maps 69 (for *Wort* ‘word’) and Map 70 (for *Herzen* ‘heart-DAT.SG’) in the *Kleiner Deutscher Sprachatlas* (KDSA). According to those maps, there is a region in Austria between Innsbruck, Salzburg, and Linz, as well as parts of Bavaria to the south and west of Munich, where the /rt/ and /rts/ sequences in those two words are realized as ⟦cht⟧ and ⟦chz⟧ respectively. There can be little doubt that ⟦ch⟧ on the KSDA maps represents a (fortis) dorsal fricative, but it is not possible – given the broad transcription – to conclude that it is [x] or [ç]

(33) a. Desonorization-1:

$$\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nasal}\\+\textsc{cont}\\\textsc{coronal}\end{bmatrix} \longrightarrow \begin{bmatrix}-\textsc{son}\\\textsc{dorsal}\end{bmatrix} / \underline{\quad} \begin{bmatrix}-\textsc{son}\\+\textsc{fortis}\end{bmatrix}$$

b. Laryngeal Assimilation-1:

$$\begin{bmatrix}-\textsc{son}\end{bmatrix} \longrightarrow \begin{bmatrix}+\textsc{fortis}\end{bmatrix} / \underline{\quad} \begin{bmatrix}-\textsc{son}\\+\textsc{fortis}\end{bmatrix}$$

(34)

$$\begin{array}{ccccc}
/\text{r}/ & \xrightarrow{\text{Deson-1}} & |\text{ʁ}| & \xrightarrow{\text{Lar Assim-1}} & |\text{x}| \\
\begin{bmatrix}+\textsc{cons}\\+\textsc{son}\\-\textsc{nasal}\\+\textsc{cont}\end{bmatrix} & & \begin{bmatrix}+\textsc{cons}\\-\textsc{son}\\+\textsc{cont}\end{bmatrix} & & \begin{bmatrix}+\textsc{cons}\\-\textsc{son}\\+\textsc{cont}\\+\textsc{fortis}\end{bmatrix} \\
| & & | & & | \\
\begin{bmatrix}\textsc{coronal}\end{bmatrix} & & \begin{bmatrix}\textsc{dorsal}\end{bmatrix} & & \begin{bmatrix}\textsc{dorsal}\end{bmatrix}
\end{array}$$

As a representative example, consider the word [hɛçts] (from 32b) in (35a): Desonorization-1 (Deson-1) creates |ʁ|, which undergoes Laryngeal Assimilation-1 (Lar Assim-1), thereby resulting in |x|. That derived fricative surfaces as palatal by Velar Fronting-1. The word [ʃlɛçt] 'bad' (from 30b) in (35a) represents an example with /x/ after a front vowel for comparison. Laryngeal Assimilation-1 cannot counterfeed Velar Fronting-1, as shown in (35b).

(35) a.

	/hɛrts/	/ʃlɛxt/
Deson-1	hɛʁts	-----
Lar Assim-1	hɛxts	-----
Vel Fr-1	hɛçts	ʃlɛçt
	[hɛçts]	[ʃlɛçt]
	'heart'	'bad'

b.

	/hɛrts/	/ʃlɛxt/
Deson-1	hɛʁts	-----
Vel Fr-1	-----	ʃlɛçt
Lar Assim-1	hɛxts	-----
	*[hɛxts]	[ʃlɛçt]

In sum, (35a) demonstrates that the surface distribution of [x] and [ç] is transparent and not opaque. The feeding relationship between Laryngeal Assimilation-1 and Velar Fronting-1 in (35a) is similar to the feeding relationship depicted for Dialect A in Figure 2.5.

The importance of the Upper Austrian data in (32) is made clear in §5.3, where I show that underapplication opacity as in (35b) is correct in other dialects.

3.7 Conclusion

In three of the UG varieties discussed above (Erdmannsweiler, Maienfeld, Ramsau am Dachstein) a default pattern was established, whereby a single velar target segment (/x/) is realized as the corresponding palatal ([ç]) after a set of triggers defined as the class of all coronal sonorants. Elsewhere – that is, after a back vowel – /x/ is realized without change as [x]. However, that default pattern is not what one encounters in the data from Rheintal. First, the set of triggers is narrower than the one for the default pattern in the sense that it only consists of [−low] front vowels or a coronal sonorant consonant. Second, the set of targets is broader than in the default pattern because it includes not only the fricative /x/ but also another velar sound, namely the affricate /kx/. The conclusion is that one cannot know for certain whether or not the default pattern holds for any given velar fronting variety. It is therefore essential for any cross-dialectal study to determine for any given variety both (a) the set of velar sounds that undergo fronting (targets), and (b) the set of sounds that induce fronting (triggers).

Rheintal is also significant because it exemplifies an allophonic distribution of velar and palatal in word-initial position. A cross-dialectal analysis like the present one therefore needs to consider the patterning of velar and palatal sounds in word-initial position (if present) and to determine the set of targets and triggers for that fronting process.

A final point worth emphasizing is that the occurrence of palatals ([ç]) in the neighborhood of front sounds and velars ([x]) in the neighborhood of back sounds holds regardless of the historical source of the sounds that induce fronting. In all of the dialects discussed above, palatals like [ç] occur not only after front segments that were historically front, but also after front sounds that were historically back. The processes fronting sounds like /x/ to [ç] were therefore transparent because they were fed by historical changes of Vowel Fronting, e.g. i-Umlaut. Likewise, velars such as [x] surface after back segments that were historically back (e.g. [u o ɑ]), but also after back segments that were historically front (e.g. [ɐ] /ʁ/ from earlier [r] /r/). Sound changes creating back sounds from front sounds such as r-Retraction and Vowel Retraction therefore bled the fronting processes that created palatals ([ç]) from velars ([x]). Finally, the sounds undergoing velar fronting (targets) include not only underlying velar sounds (e.g.

/x/) but also new velars created by other changes (Desonorization-1, Laryngeal Assimilation-1), e.g. [x] from /r/.

4 Allophony (part 2)

4.1 Introduction

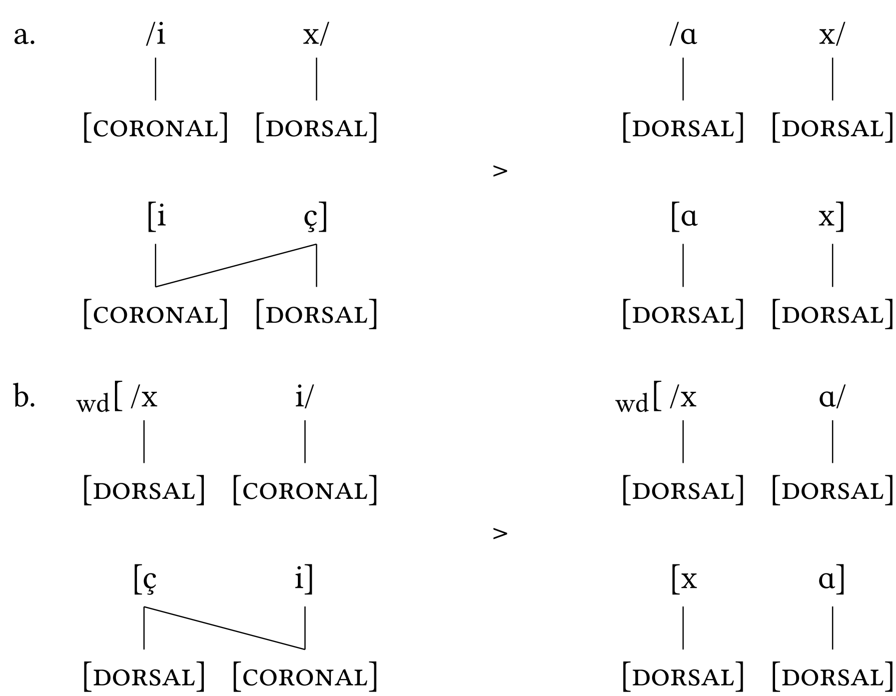
The present chapter investigates the allophonic distribution of velars like [x] and palatals like [ç] in three varieties of WLG. In contrast to the UG dialects discussed in Chapter 3 the WLG varieties considered below possess one or two lenis dorsal fricatives, namely velar [ɣ] and palatal [ʝ], in addition to [x] and [ç]. Three systems are compared (System A-C), which are defined according to the target segments for postsonorant velar fronting. In System A the set of targets comprises /x/ as well as the lenis dorsal fricative (|ɣ|) produced from an underlying /g/ in coda position. That synchronically derived fricative |ɣ| surfaces in coda position as [ç] after a coronal sonorant and as [x] after a back vowel. In System B /x/ surfaces as [ç] after a coronal sonorant, but /ɣ/ is realized as [ɣ] in a word-internal onset (e.g. between vowels) even if the segment preceding /ɣ/ is a front vowel. However, /ɣ/ is realized as [x] or [ç] in coda position after a back or front vowel respectively. In System C [ʝ] and [ɣ] are positional variants (as are [x] and [ç]); hence, the two palatals [ç ʝ] derive synchronically from the corresponding velars (/x ɣ/) by a version of velar fronting. The conclusion is that velar fronting differs according to the target segments: In System B the target is /x/ (but not /ɣ/), in System C the target consists of both /x/ and /ɣ/, and in System A it cannot be determined if the target consists of the fortis velar fricative only (/x/ and |x| from /ɣ/) or /x/ and the derived lenis sound |ɣ| before it hardens to |x|. The triggers for velar fronting consist of coronal sonorants in System A-C, although it is demonstrated below that the rule fronting /x/ in a word-initial onset to [ç] in System B and System C is triggered only by front vowels but not by coronal sonorant consonants.

In all three dialects the lenis palatal fricative [ʝ] (/ʝ/) surfaces in word-initial position before front vowels and back vowels. That sound was referred to in §2.4.3 as the etymological palatal because it derived historically from the homorganic glide (WGmc $^{+}$[j]). Since the [ʝ] in question never derived historically from a velar sound, its occurrence in the context of back vowels does not involve opacity, i.e. the overapplication of velar fronting.

The purely transparent distribution of palatals (in the neighborhood of front sounds) and velars (in the neighborhood of back sounds) holds regardless of the historical source of the triggers for velar fronting. For example, velars like [x] occur not only in the context of back segments that were historically back but also when adjacent to back sounds that were historically front (Vowel Retraction, r-Retraction). Likewise palatals like [ç] surface in the context of front sounds that were etymologically front as well as front sounds that were etymologically back (Vowel Fronting). The sounds undergoing velar fronting included not only underlying velars but also new velars created by independent changes.

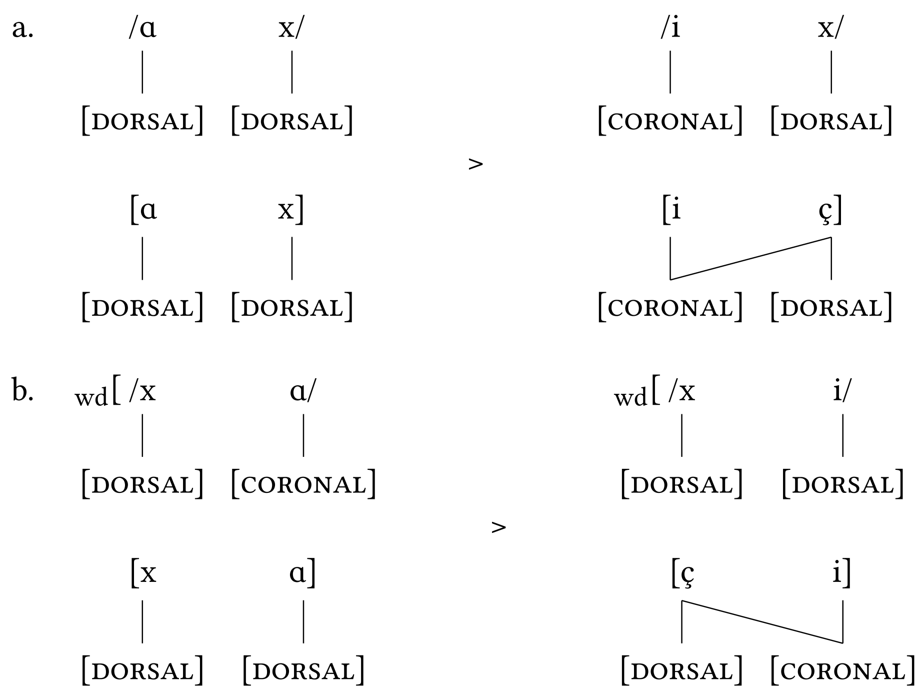
The effect retractions and frontings had on the triggers for the fronting of velars was discussed in Chapter 3. In (1) and (2) I exemplify the formal aspects of those changes. (1) depicts retraction, where the phonetic symbols "i" and "ɑ" represent front and back sounds and "x" and "ç" a velar and a palatal. (1a) depicts postsonorant position and (1b) word-initial position. Retraction (i.e. Vowel Retraction/r-Retraction) is expressed in (1) as /i/ > /ɑ/. The multiple link between the two features [coronal] and [dorsal] to the left of the wedge in the phonetic representation is created by the synchronic rule of velar fronting. Since the front sound in the trigger of fronting is replaced with a back sound (after the wedge) it can be said that the processes of retraction bleeds fronting.

(1)



In (2) I illustrate how the change shifting back sounds to front sounds (Vowel Fronting) affected the fronting of velars in postsonorant position in (2a) and word-initial position in (2b). Velar fronting is not present to the left of the wedge in (2a) or (2b) because the back segment is not a trigger. When that back sound is restructured as front (/ɑ/ > /i/) the velar then fronts to palatal; hence, Vowel Fronting feeds the fronting of velars.

(2)

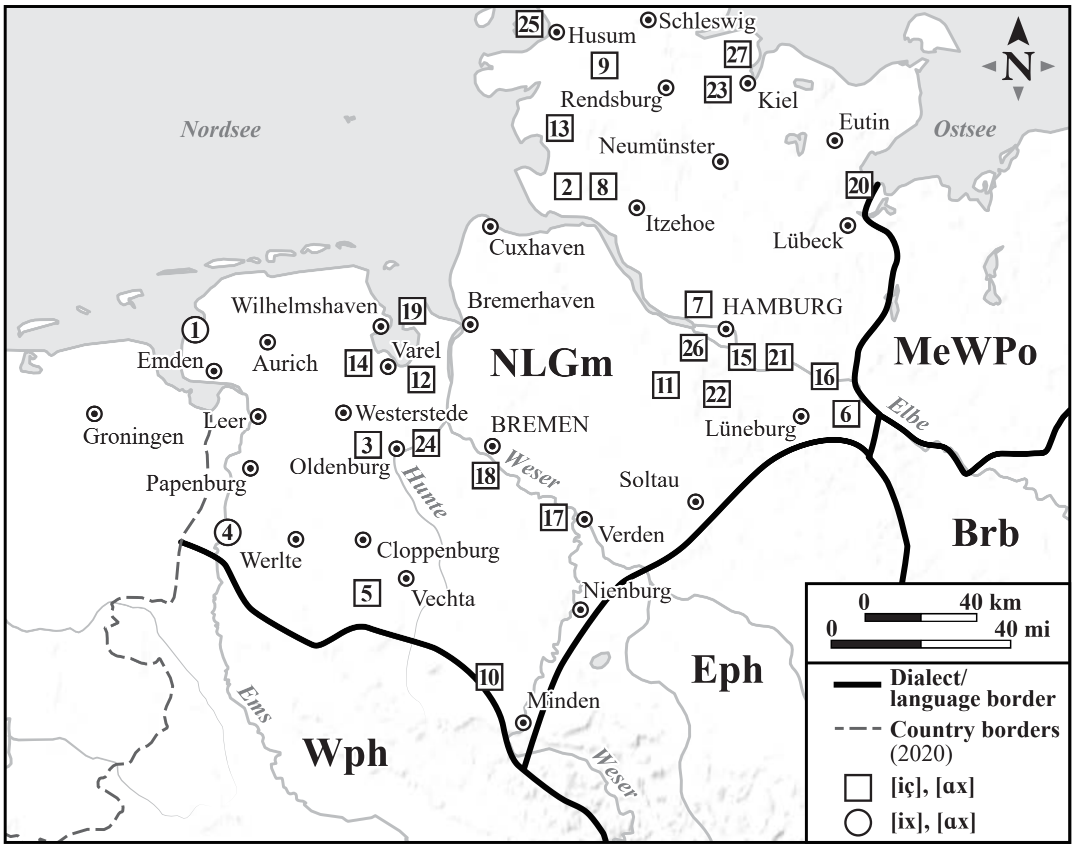


I discuss three WLG varieties (corresponding to System A-C referred to above), namely NLG (§4.2), Wph (§4.3), and Eph (§4.4). In §4.5 I provide some discussion, and in §4.6 I conclude.

4.2 North Low German

In the dialect discussed below (System A) a velar target – either /x/ or the spirantized realization of /g/ – surfaces as palatal after a coronal sonorant and elsewhere (after a back vowel) as velar.

Larsson (1917) describes a NLG dialect spoken in Altengamme (Map 4.1). The dialect has phonemic front vowels (/iː ɪ yː ʏ eː ɛ øː œ/), back vowels (/uː ʊ oː o ɔ ɑ ə/), diphthongs ending in a front vowel (/ɔɪ ɑɪ/), and diphthongs ending in a back vowel (/øʊ ɔʊ ɑʊ/). There are three dorsal fricatives [x ç ʝ]. The lenis velar [ɣ] does not occur on the surface, although that sound (|ɣ|) is created by a rule spirantizing /g/. It is clear from the discussion of the phonetics in the original source (Larsson 1917: 11–12) that [ʝ] is a fricative and not a glide.



Map 4.1: North Low German (NLG). Squares indicate postsonorant velar fronting, and circles indicate the absence of postsonorant velar fronting. 27 is a variety of High German spoken in Kiel. 1=Hobbing (1879), 2=Kohbrok (1901), 3=vor Mohr (1904), 4=Schönhoff (1908), 5=Vehslage (1908), 6=Rabeler (1911), 7=Kloeke (1914), 8=Stammerjohann (1914), 9=Sievers (1914), 10=Larsson (1917), 11=Götze (1922) (Hollenstedt), 12=Götze (1922) (Jade), 13=Jörgensen (1928/1929), 14=Heigener (1937), 15=Schmeding (1937), 16=Feyer (1939), 17=Feyer (1941), 18=Bollmann (1942), 19=Schmidt-Brockhoff (1943), 20=Pühn (1956), 21=von Essen (1958), 22=Keller (1961), 23=Bethge & Bonnin (1969) (Kiel), 24=Mews (1971), 25=Willkommen (1999), 26=Höder (2010), 27=Glover (2011, 2014)

As shown in (3), Altengamme has two underlying dorsal fricatives: /x/ and /ʝ/. The dialect also has a phonemic /g/ which I include in (3) because it participates in morphophonemic alternations with [x] and [ç]. The sounds in (3a) occur word-initially and the ones in (3b) after a sonorant. Appendix H provides a list of the contrastive consonants for LG dialects like Altengamme.

(3) a. /ʝ/ → [ʝ]; /g/ → [g]

b. /x/ → [x], [ç]; /g/ → [g]

The formalism in (3) expresses traditional phonemes and allophones only; hence, it is not intended to capture morphophonemic alternations between two or more underlying segments, e.g. between [g] and [x]/[ç] alluded to above.

The only context in which [ʝ] surfaces is word-initial. That sound is the etymological palatal because it is the modern realization of an earlier palatal glide (WGmc ⁺[j]). It is clear from the appendix in Larsson (1917) that there are no constraints on the type of vowel following [ʝ]. For example, [ʝ] can occur before a back vowel in (4a) or front vowel in (4b). Word-initial [ʝ] contrasts with [g] (<WGmc ⁺[ɣ]), which likewise surfaces before any back vowel in (4c) or front vowel in (4d). Singular-plural pairs like [gɑs]~[gɛs] 'guest~guest-PL' show that [g] does not alternate with [ʝ] before a front vowel (cf. data from Dingelstedt am Huy in §8.4). [ʝ] does not surface in a word-internal onset (e.g. between vowels) because (i) WGmc ⁺[j] in that context either deleted or turned into another sound, and (ii) there were no sound changes that introduced new instances of [ʝ] in a word-internal onset. By contrast, [g] (<WGmc ⁺[ɣ]) surfaces in a word-internal onset after a back vowel in (4e) or front vowel in (4f). [k]~∅ alternations in (4g) are captured synchronically with an underlying /g/ that surfaces as [k] by in coda position by Final Fortition (see below), e.g. /lɑŋg/⟶[lɑŋk] or by a process deleting /g/ before a vowel, e.g. /lɪŋg-r/⟶[lɪŋɐ].

(4) Word-initial [ʝ] (from /ʝ/) and [g] (from /g/):

a.	jamɑ	[ʝɑmɐ]	Jammer	'lament'	11
b.	jȳ	[ʝyː]	ihr	'you-PL'	79
c.	gas	[gɑs]	Gast	'guest'	87
d.	gɪf	[gɪf]	Gift	'poison'	114
e.	mōgɑ	[moː.gɐ]	mager	'lean'	88
f.	zēgl̩	[zeː.gl̩]	Segel	'sail'	88

g.	laŋk	[lɑŋk]	lang	‘long’	120
	lɪŋɑ	[lɪŋɐ]	länger	‘longer’	120

Velar [x] only occurs after a back vowel in (5a) and palatal [ç] after a front vowel in (5b) or sonorant consonant in (5c).[1] From the synchronic perspective, [x ç] in (5) are the realization of the phoneme /x/. Altengamme [x ç] in (5) have several diachronic sources (WGmc ⁺[x ɣ gg f]), all of which restructured to /x/. The original [ɣ] in words like [foːx] in (5a) and [fɛlç] in (5c) is synchronically /x/ and not /g/ because there is no alternant with [g]. Examples like these therefore differ from the alternating examples discussed below.

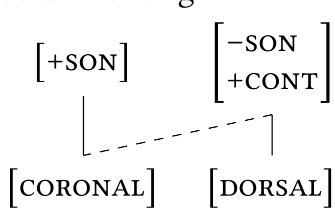
(5) [x] and [ç] (from /x/):

a.	buxt	[bʊxt]	Bucht	‘bay’	109
	fōx	[foːx]	Vogt	‘reeve’	113
	nɔx	[nɔx]	noch	‘still’	123
	axtɑ	[ɑxtɐ]	hinter	‘behind’	84
	høux	[høʊx]	hoch	‘high’	86
b.	bɪχ	[bɪç]	Beichte	‘confession’	108
	bryχ	[brʏç]	Brücke	‘bridge’	109
	fɛχən	[fɛçən]	fechten	‘fence-INF’	86
c.	fɛlχ	[fɛlç]	Felge	‘wheel rim’	112

As in all of the dialects discussed in this book, the front vowel in Umlaut-induced alternations regularly conditions the occurrence of [ç], e.g. [pœç] ‘frog-PL’ (cf. [pɔx] ‘frog’).

Velar /x/ in (5) surfaces as palatal [ç] after a coronal sonorant by Velar Fronting-1 (§3.2), which is repeated in (6). Elsewhere (after back vowels) /x/ is realized as [x].

(6) Velar Fronting-1:



[1] [ç] does not occur after [r] because the latter sound either deletes or merges together with a preceding vowel before a labial or velar (Larsson 1917: 42–48). The two sounds in the [nç] sequence present in other dialects are separated by a vowel, e.g. Altengamme [mɑnɪçmɔʊl] ‘sometimes’; cf. StG [mɑnçmɑːl]. There are a few gaps involving long vowels (e.g. [eː]) in (5a, 5b), which are accidental because they occur in the words with [g] alternations introduced below in (7).

Since Altengamme does not have /ɣ/ there is no reason for the target segment (/x/) to be specified for a laryngeal feature ([+fortis]). However, underlying /ʝ/ in words like the ones in (4a, 4b) is a complex (corono-dorsal) fricative marked [−fortis]. /ʝ/ must bear that feature to make its representation distinct from the corono-dorsal structure for the derived palatal [ç]. This assumption concerning features holds not only for Altengamme but for all other dialects with /x/ and /ʝ/.

A second source for [x] and [ç] can be observed in (7). These items illustrate a regular alternation between [g] and [x] after a back vowel in (7a) or between [g] and [ç] after a front vowel in (7b–7d). The original source suggests that there are no constraints on the type of back vowel in (7a) or front vowel in (7b–7d) that occur before these dorsal sounds. The [g] in (7) is in a word-internal onset, as reflected in the syllable boundaries in the phonetic representations. [g x ç] in (7) derived historically from WGmc $^{+}$[ɣ] (/ɣ/).

(7) [g]~[x]/[ç] alternations (from /g/):

a.	frōgŋ	[froː.gŋ]	fragen	‘ask-INF’	113
	frōx	[froːx]	Frage	‘question’	113
b.	flåıgŋ	[flɔɪ.gŋ]	fliegen	‘fly-INF’	113
	flăıχ	[flɑɪç]	Fliege	‘fly’	113
c.	drēgŋ	[dreː.gŋ]	tragen	‘carry-INF’	40
	drēχ	[dreːç]	trage	‘carry-1SG’	40
	drɪχs	[drɪçs]	trägst	‘carry-2SG’	40
d.	låıgŋ	[lɔɪ.gŋ]	lügen	‘lie-INF’	66
	lyχs	[lʏçs]	lügst	‘lie-2SG’	77
	lø̄χ	[løːç]	Lüge	‘lie’	121

The coda /g/ in (7) undergoes Final Fortition in (8a) and g-Spirantization-1 in (8b).[2] g-Spirantization-1 does not affect [+fortis] /k/, which surfaces in coda position without change, e.g. [lɔk] ‘hole’ (from /lɔk/).

(8) a. Final Fortition:
[−sonorant] → [+fortis] / ___ C_0 $]_\sigma$

[2] I have been unable to find examples in which [g] alternates with [ç] after a consonant ([l]). (5c) appears to be such an example, but as noted above, the dorsal fricative in that item does not have an alternant with [g]. Final Fortition derives independent support from fortis vs. lenis alternations, e.g. [grɑs] ‘grass’ vs. [grɔʊ.zn̩] ‘graze-INF’. The reason that such alternations derive from a lenis sound (/z/) which undergoes fortition in the coda and not from a fortis sound (/s/) which lenites in the onset is that there are items like [lɑɪ.sn̩] ‘afford-INF’ in which [s] (from /s/) surfaces in a word-internal onset.

b. g-Spirantization-1:

$$\begin{bmatrix} -\textsc{son} \\ -\textsc{cont} \\ -\textsc{fortis} \\ \textsc{dorsal} \end{bmatrix} \longrightarrow \begin{bmatrix}+\textsc{cont}\end{bmatrix} \;/\; \begin{bmatrix}-\textsc{cons}\end{bmatrix} \;\_\_\_\; \mathrm{C}_0\;]_\sigma$$

On the basis of the data in Larsson (1917) the set of vocalic ([−consonantal]) triggers for g-Spirantization-1 is the entire natural class of front vowels.

Final Fortition (Fnl For) and Velar Fronting-1 (Vel Fr-1) create transparent outputs, as shown in (9a) for [dreːç] (/dreːg/) from (7c). The /g/ in that type of example is parsed as a coda and therefore shifts to |ɣ| by g-Spirantization-1 (g-Spir-1). That derived |ɣ| hardens to [x] and then surfaces as [ç] by Velar Fronting-1.

(9) a.

	/dreːg/
g-Spir-1	dreːɣ
Fnl Fort	dreːx
Vel Fr-1	dreːç
	[dreːç]
	'carry-1sg'

b.

	/dreːg/
g-Spir-1	dreːɣ
Vel Fr-1	dreːʝ
Fnl Fort	dreːç
	[dreːç]

Alternatively, |ɣ| undergoes Velar Fronting-1 to |ʝ| and then Final Fortition to [ç], as in (9b). (9) illustrates that Final Fortition and Velar Fronting-1 are not ordered.[3]

As noted in (4), word-initial palatal [ʝ] (/ʝ/) derived historically from the corresponding glide (WGmc ⁺[j]), while [g] (/g/) is the reflex of WGmc ⁺[ɣ]. The changes affecting those original sounds are stated in (10):

(10) a. Glide Hardening:
WGmc ⁺/j/ > /ʝ/ $_\sigma[$ ____

b. g-Formation-1:
WGmc ⁺/ɣ/ > /g/

Glide Hardening is a very general change in LG and CG; see Hall (2014b) and Appendix F. As observed in Hall (2014b) that change affected all glides and not simply WGmc ⁺[j]. WGmc ⁺[ɣ] is realized as the corresponding stop ([g]) throughout UG and in many CG and LG varieties (=10b). Altengamme represents dialects where every instance of WGmc ⁺[ɣ] shifted to [g]; other dialects discussed below in Chapter 8 only affect WGmc ⁺[ɣ] in certain contexts but not others (e.g. word-initially).

[3]Final Fortition counterbleeds g-Spirantization-1 in either scenario, otherwise the underlying /g/ in a word like /dreːg/ would shift to |k| in the coda and bleed g-Spirantization-1. However, the counterbleeding ordering described here does not involve opaque overapplication effects (recall §2.2.4).

The distribution of velars and palatals in Altengamme holds regardless of the historical source of the triggers for Velar Fronting-1. Thus, dialect-specific sound changes shifting original back vowels to front vowels (i-Umlaut as an example of Vowel Fronting) fed Velar Fronting-1, e.g. [pœç] 'frog-PL' (cf. [pɔx] 'frog'). The formal change in that type of example is depicted in (2a). The change from an etymological front vowel to a back vowel (Vowel Retraction) appears not to be attested in Altengamme.

The pattern described above differs from what is found in other varieties of NLG, especially those in the vicinity of the Dutch border. For example, in Lathen (Schönhoff 1908; Map 4.1) there is a contrast between the etymological palatal [ʝ] (<WGmc +[j]) and velar [ɣ] (<WGmc +[ɣ]) in word-initial position (§8.2). Since /ɣ/ surfaces consistently as [ɣ] even before front vowels there is no velar fronting in word-initial position. In that same variety velar fronting is also absent in postsonorant position, since [x] (<WGmc +[x]) and [ɣ] (<WGmc +[ɣ]) surface as velars even after front vowels. Thus, Lathen mirrors Dutch, e.g. [zɛx] 'say-1SG'.[4]

In those varieties of NLG with postsonorant fronting that process is characterized by the broad set of triggers, as in Altengamme. Hence, [ç] (from /x/ or /g/) only surfaces after a coronal sonorant and [x] only after a back vowel, e.g. Oldenburg (vor Mohr 1904), Finkenwärder (Kloeke 1914), Kreis Herzogtum Lauenburg (Heigener 1937), Grambkermoor (Bollmann 1942) and Hemmelsdorf (Pühn 1956). All of these places as well as other ones for similar NLG dialects are indicated on Map 4.1.

4.3 Westphalian

Wph represents a branch of LG which exhibits little consistency with respect to the distribution of dorsal fricatives. I discuss below a late nineteenth century description of the dialect once spoken in a single town. However, it will be clear in the ensuing chapters that other Wph communities exhibit a very different pattern. The variation involving dorsal fricatives referred to here can be observed throughout the Wph-speaking region over a time frame of approximately ninety years (1886–1974), after which the dialect has essentially become moribund.

The data discussed below have been drawn from the Wph dialect once spoken in the town of Soest ([zoːst]; Holthausen 1886; Map 4.2).

The phonemic monophthongs consist of the front vowels /ɪ ɛː ɛ ʏ œː œ/ and the back vowels /ʊ ɔː ɔ ɑː ɑ ə/. Holthausen (1886: 7) lists a total of twenty-one

[4]Here and below I transcribe the Dutch fricative in question broadly as [x]. See Gussenhoven (1992), Collins & Mees (2003), and Verhoeven (2005) for discussion of its phonetic realization.

diphthongs. Of those sounds, three have a second element that is front (/ui ɔe ɑe/), while eighteen have a second element that is back. The dorsal fricatives discussed below only occur in the context of six of the diphthongs ending in a back vowel (/iə iːə yə uə iu ɛo/).

Soest has four dorsal fricatives: [x ç] and [ɣ ʝ], whose relationship is expressed in (11a) for word-initial position and in (11b) for the context after a sonorant. In contrast to Altengamme, the dialect has no [g].

(11)

a.	/x/		/ʝ/	b.	/x/		/ɣ/
	[x]	[ç]	[ʝ]		[x]	[ç]	[ɣ]

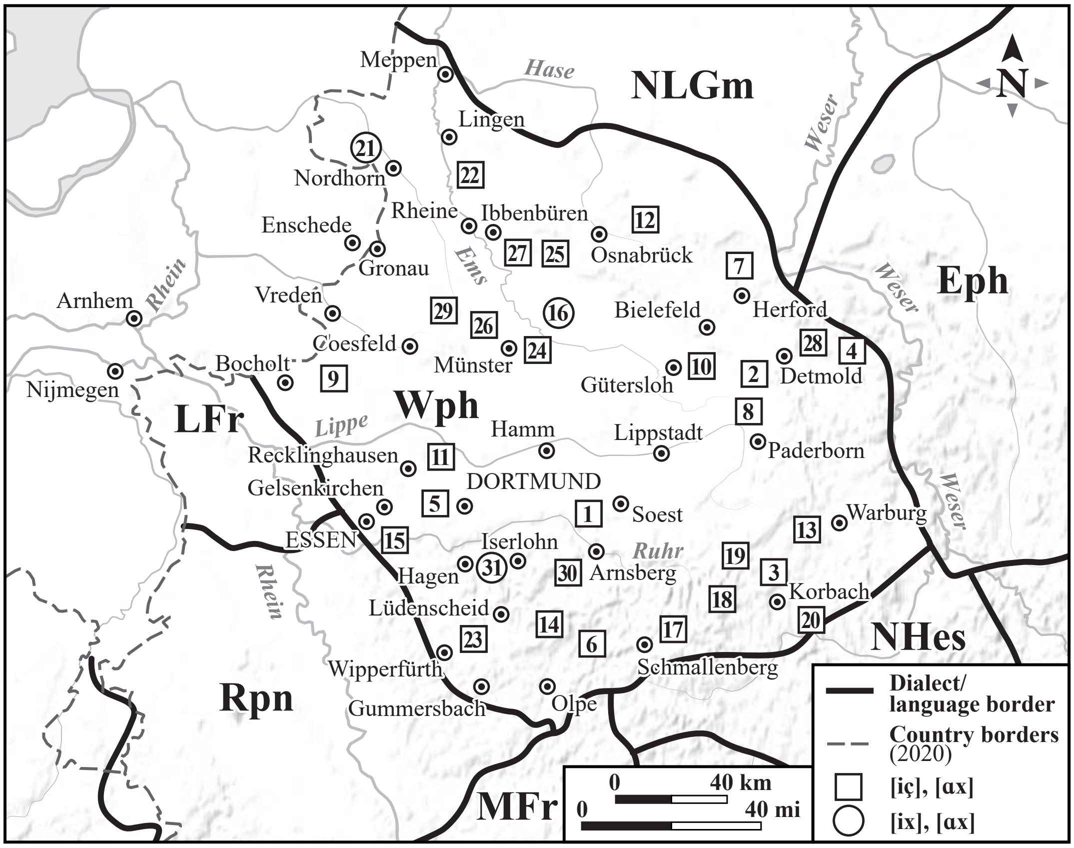
As indicated in (11), [ç] and [x] stand in complementary distribution both word-initially and after a sonorant. [ɣ] and [ʝ] likewise never contrast because the latter only occurs initially and the former only after a sonorant. Soest represents System B referred to in §4.1.

In word-initial position, [x] (=⟦x⟧) surfaces either before a back vowel in (12a) or a sonorant consonant in (12c), while [ç] (=⟦c⟧) occurs before a front vowel in (12b). The sonorant consonant after [x] in (12c) is either a liquid ([l] or [ʀ]) or the nasal [n]. Holthausen (1886: 9) describes the rhotic consonant as a dorsal fricative (‘gutturaler Engelaut’). Word-initial [x] surfaces before a consonant regardless of the quality of the vowel following that consonant; in particular, that vowel can be either front (first example in 12c) or back (second two examples). There are a few gaps in the data set below (e.g. no [x] before [ɔː]), which I consider to be accidental. Word-initial [x] and [ç] in examples like these derived historically from WGmc $^{+}$[ɣ]; see Holthausen (1886: 44).[5]

(12) Distribution of word-initial [x] and [ç] (from /x/):

a.	xuət	[xuət]	gut	‘good’	88
	xòt	[xɔt]	geht	‘go-3SG’	73
	xā	[xɑː]	gar	‘even’	42
	xɑst	[xɑst]	Gast	‘guest’	44
	xədult	[xədʊlt]	Geduld	‘patience’	15
b.	cist*a*n	[çɪstɐn]	gestern	‘yesterday’	44
	cymln	[çʏml̩n]	weinerlich sprechen	‘speak whiningly-INF’	44
	cèst	[çɛst]	Hefe	‘yeast’	43

[5]The StG cognate verb (infinitive) for [xʀuinə] ‘cry-1SG’ in (12c) is *greinen* [gʀɑinən] ‘whine-INF’. The historical precursor for [xnɑːɣn̩] ‘gnaw-INF’ in (12c) is OSax *gnagan*.



Map 4.2: Westphalian (Wph). Squares indicate postsonorant velar fronting and circles the absence of postsonorant velar fronting. 1=Holthausen (1886), 2=Hoffmann (1887), 3=Collitz (1899), 4=Böger (1906), 5=Beisenherz (1907), 6=Arens (1908), 7=Schwagmeyer (1908), 8=Brand (1914), 9=Herdemann (1921 [2006]), 10=Wix (1921), 11=Götze (1922) (Behringhausen), 12=Götze (1922) (Schinkel), 13=Martin (1925), 14=Gregory (1934), 15=Hellberg (1936), 16=Holtmann (1939), 17=Schulte (1941), 18=Martin (1942) (Willingen), 19=Martin (1942) (Sudeck), 20=Martin (1942) (Freienhagen), 21=Rakers (1944), 22=Borchert (1955), 23=Frebel (1957), 24=Keller (1961), 25=Bethge & Bonnin (1969) (Kreis Tecklenburg), 26=Seymour (1970), 27=Bethge (1970), 28=Stellmacher (1972), 29=Niebaum (1974, 1982), 30=Niebaum et al. (1976), 31=Brandes (2011).

	co̤*a*tə	[çœɐtə]	Grütze	‘groat’	44
	cèŏs	[çɛɔs]	Gans	‘goose’	44
	cę̄*a*n	[çɛːɐn]	gern	‘gladly’	44
	ciəntn	[çiəntn̩]	dort	‘there’	43
c.	xlykə	[xlʏkə]	Glück	‘fortune’	84
	xruĭnə	[xʀuinə]	weine	‘cry-1SG’	44
	xnāʒ̨n	[xnɑːɣn̩]	nagen	‘gnaw-INF’	44

The complementary distribution of word-initial [x] and [ç] also holds after a word-initial consonant (always [s]), as in (13): [x] surfaces before a back vowel in (13a) or consonant (always [ʀ]), in (13c) and [ç] before a front vowel in (13b). The [sx sç] in these examples derived etymologically from WGmc ⁺[sk].

(13) Distribution of word-initial [sx] and [sç] (from /sx/):

a.	sxult	[sxʊlt]	Schuld	‘guilt’	15
	sxǭp	[sxɔːp]	Schaf	‘sheep’	43
b.	scylic	[sçʏlɪç]	schuldig	‘guilty’	43
	scèpm	[sçɛpm̩]	schöpfen	‘ladle-INF’	43
c.	sxruĭvə	[sxʀuivə]	schreibe	‘write-1SG’	43
	sxriʒ̨n	[sxʀɪɣn̩]	schreien	‘scream-INF’	62

Holthausen’s discussion of inflectional morphology includes copious examples of regular Umlaut-induced alternations between [x] and [ç] in word-initial position, e.g. [xɑst] ‘guest’ vs. [çɛstə] ‘guest-PL’ in which [x]/[ç] are the reflexes of WGmc ⁺[ɣ] and [sxɑp] ‘cabinet’ vs. [sçɛpə] ‘cabinet-PL’, where [sx sç] are the reflexes of WGmc ⁺[sk].

[x] and [ç] in (12)-(13) are surface realizations of underlying /x/ in word-initial onset position. In that context, /x/ surfaces as [ç] by (14) and elsewhere (before a back vowel or /ʀ/) as [x]. Since there is no /ɣ/ in word-initial position that could potentially undergo (14) there is no reason to specify that its target be marked for a laryngeal feature.

(14) Wd-Initial Velar Fronting-3:

$$
\begin{array}{llcc}
{}_{\mathrm{wd}}[& (\mathrm{C}) & \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} & \begin{bmatrix} -\textsc{cons} \end{bmatrix} \\
 & & | & | \\
 & & \begin{bmatrix} \textsc{dorsal} \end{bmatrix} & \begin{bmatrix} \textsc{coronal} \end{bmatrix}
\end{array}
$$

As indicated above, [coronal] spreads leftward from a front vowel. The feature [−consonantal] in the trigger ensures that /x/ fails to shift to [ç] before coronal consonants like [l] and [n] (cf. 12c).

The data below show that the etymological palatal (<WGmc ⁺[j]) surfaces in word-initial position before a back vowel in (15a) or a front vowel in (15b).[6] As noted earlier, the velar counterpart to [ʝ] (i.e. [ɣ]) never surfaces in word-initial position. [ʝ] in (15) is an underlying palatal (/ʝ/).

(15) Word-initial [ʝ] (from /ʝ/):

a.	ją	[ʝɔː]	ja	'yes'	43
	juŋk	[ʝʊŋk]	jung	'young'	43
b.	jiŭxn	[ʝiuxn̩]	jauchzen	'cheer-INF'	43

The data in (16) illustrate that [x] and [ç] do not contrast in postvocalic position: [x] surfaces after a back vowel in (16a) and [ç] after a front vowel in (16b). Holthausen (1886) also provides many examples exhibiting Umlaut-induced alternations between [x] and [ç], e.g. [dɔxtɐ] 'daughter' vs. [dœçtɐ] 'daughter-PL'. In contrast to some of the dialects discussed above and below, /x/ does not occur after a consonant, although I consider that gap to be accidental. As indicated below, the dorsal fricatives in (16) are underlyingly /x/. The diachronic source for [x]/[ç] in (16a, 16b) is WGmc ⁺[x]. The additional examples in (16c) show that the diachronic source for /x/ can be a sound other than /x/. In particular, the [x ç] in those items derived historically from WGmc ⁺[f] by a change affecting LG (x-Formation); cf. OSax *luft* 'air', MHG *niftel(e)* 'niece'. (x-Formation is an example of a change that increased the number of potential targets; recall Rule W from Table 2.7).

(16) Postvocalic [x] and [ç] (from /x/):

a.	sòxtə	[sɔxtə]	suchte	'search-PRET'	44
	lɑxən	[lɑxən]	lachen	'laugh-INF'	44
b.	dyctic	[dʏçtɪç]	tüchtig	'capable'	44
	kröcn	[kʀœçn̩]	husten	'cough-INF'	44
	trèct*a*	[tʀɛçtɐ]	Trichter	'funnel'	14
	fröctn	[fʀœçtn̩]	fürchten	'fear-INF'	44
c.	luxt	[lʊxt]	Luft	'air'	44
	nicte	[nɪçtə]	Nichte	'niece'	44

[6]Example (15b) is rare because word-initial [ʝ] shifted to [ç] before a front vowel (Holthausen 1886: 43). Apparently the word [ʝiuxn̩] 'cheer-INF' was an exception to that change.

A series of sound changes ensured that [x]/[ç] occur after a short vowel and usually before [t] but not after a long vowel. First, historical ⁺[x] deleted in contexts other than before [t]; second, long front monophthongs shortened (and laxed) to [ɪ ʏ ɛ œ] before ⁺[x]; and third, ⁺[x] deleted in word-internal position before a vowel. As a result of those changes there are now no native words in Soest in which [ç] (or [x]) are situated in word-internal onset position.

As indicated in (17), velar [ɣ] (=⟦ʒ⟧) surfaces after a sonorant and before a syllabic nasal or vowel. In the second column, [ɣ] stands in a word-internal onset preceded by a back vowel (17a), front vowel (17b), or consonant (17c). It is shown below that underlying /ʀ/ can occur before /ɣ/, but that the former sound regularly vocalizes to [ɐ] in that position. The [ɣ] in (17) derives historically from one of several dorsal sounds (WGmc ⁺[ɣ gg j]); see Hall (2014b) for discussion.

(17) Postsonorant [ɣ] (from /ɣ/):

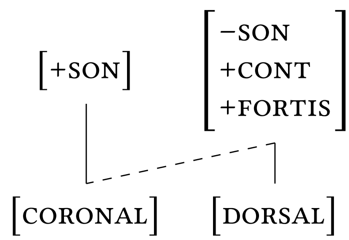
a.	vāʒn	[vɑː.ɣn̩]	Wagen	'car'	45
	ròʒə	[ʀɔ.ɣə]	Roggen	'rye'	44
	rę*a*ʒn	[ʀeɐ.ɣn̩]	Regen	'rain'	44
	tīəʒn	[tiːə.ɣn̩]	gegen	'against'	44
b.	bryʒə	[bʀʏ.ɣə]	Brücke	'bridge'	44
	liʒə	[lɪ.ɣə]	liege	'lie-1SG'	44
	drèʒn	[dʀɛ.ɣn̩]	drehen	'turn-INF'	34
	ruĭʒə	[ʀui.ɣə]	Reihe	'row'	44
c.	bɑlʒə	[bɑl.ɣə]	Balge	'brat-DAT.SG'	44

The items listed in (17b) are significant because they show that the palatal counterpart of [ɣ] (i.e. [ʝ]) does not occur even after a front vowel.[7]

The dorsal fricatives in (16) derive from /x/, which surfaces as [ç] after a front vowel by (18) and as [x] in the elsewhere case (after a back vowel). The examples in (17) show that the target for fronting cannot be the natural class of dorsal fricatives ([−sonorant, +continuant, dorsal]) because /ɣ/ is unaffected. As noted earlier, there are no examples in the original source in which /x/ occurs after a consonant. I assume that the trigger for fronting is [+sonorant], although it would alternatively be possible to posit that the trigger is [−consonantal], as in Wd-Initial Velar Fronting-3 in (14). Since Velar Fronting-4 only affects /x/ but not /ɣ/, surface [ɣ] after front vowels as in (17b) does not exemplify opacity.

[7]Since Soest has no surface [g], [ɣ]~[g] alternations motivating a synchronic rule of g-Spirantization (recall 8b) are absent; see Holthausen (1886: 43). The post-nasal [k] in words like [diŋk] 'thing' arguably derives from an underlying representation /diŋg/, whereby /g/ undergoes Final Fortition to [k]; recall the parallel examples from Altengamme in (4g).

(18) Velar Fronting-4:



It was noted above that [x]/[ç] in (16) only occur after a short vowel. There is no reason to specify that the trigger in (18) be restricted to the context after a short vowel because there are no data in which /x/ is present after a long vowel.

Soest has regular alternations between fortis and lenis fricatives (and fortis and lenis stops). Since fricatives are the focus of the present study, I only concentrate on those alternations here, e.g. [lius] 'louse' vs. [lui.zə] 'louse-PL' for [s]~[z] and [slɑx] 'blow' vs. [sleɐ.ɣə] 'blow-PL', [viːəx] 'weigh-IMP.SG' vs. [veɐ.ɣə] 'weigh-1SG' for [x]~[ɣ]. Those alternations require an underlying lenis sound (e.g. /z ɣ/) that surfaces as fortis in coda position by Final Fortition (in 8a); see Holthausen (1886: 75, 76). Morphemes with nonalternating fortis fricatives preclude analyzing [x]~[ɣ] alternations with a rule leniting underlying fortis sounds, e.g. [kʏ.sn̩] 'kiss-INF', [lɑ.xn̩] 'laugh-INF'.

The examples presented above show that postsonorant [x] has two synchronic sources: /x/ in words like the ones (16) and /ɣ/ in alternating words like [slɑx] 'blow' (cf. [sleɐ.ɣə] 'blow-PL') mentioned in the preceding paragraph. The |x| derived from /ɣ/ regularly shifts to palatal [ç] in coda position after a front vowel, as in (19). Holthausen (1886) lists many strong verbs, nouns and adjectives like these exhibiting alternations along laryngeal and place dimensions (i.e. [ɣ]~[x]~[ç]).

(19) Place and laryngeal alternations (from /ɣ/):

a.	stuĭʒn	[stui.ɣn̩]	steigen	'climb-INF'	61
	sticst	[stɪçst]	steigst	'climb-2SG'	61
	stòĕc	[stɔeç]	stieg	'climb-PRET'	61
b.	flɑĕʒn	[flɑe.ɣn̩]	fliegen	'fly-INF'	63
	flycst	[flʏçst]	fliegst	'fly-2SG'	63
	flèŏx	[flɛox]	flog	'fly-PRET'	63

Final Fortition and Velar Fronting-4 together produce transparent outputs. The /ɣ/ in (19) surfaces as [ɣ] in onset position, e.g. [stui.ɣn̩] 'climb-INF' and [flɑe.ɣn̩] 'fly-INF'. In the coda, /ɣ/ shifts to |x|, which surfaces as [x] after a back vowel (e.g. [flɛɔx] 'fly-PRET') and as [ç] after a front vowel via Velar Fronting-4 (Vel

Fr-4). Final Fortition therefore creates a new |x| which forms the input to Velar Fronting-4, as in (20a) for /stɪɣ-st/ 'climb-2sg' (from 19a). The word /fʀœxt-n̩/ 'fear-inf' (from 16b) is a representative example of /x/ after a front vowel for comparison. The relationship between Final Fortition and Velar Fronting-4 is a feeding one, cf. (20a). The reverse ordering in (20b) shows that Final Fortition cannot counterfeed Velar Fronting-4. See also §5.2, in which I discuss a different Wph variety in which the counterfeeding relationship between the two rules in question is correct.

(20)

a.		/stɪɣ-st/	/fʀœxt-n̩/
	Fnl For	stɪx-st	—
	Vel Fr-4	stɪçst	fʀœçtn̩
		[stɪçst]	[fʀœçtn̩]
		'climb-2sg'	'fear-inf'
b.		/stɪɣ-st/	/fʀœxt-n̩/
	Vel Fr-4	—	fʀœçtn̩
	Fnl For	stɪx-st	—
		*[stɪxst]	[fʀœçtn̩]

The feeding relationship depicted in (20a) is a specific example of the hypothetical Dialect A from Figure 2.5.

As in Ramsau am Dachstein (§3.5), Soest has many alternations involving the consonantal rhotic (dorsal [ʀ]) and the vocalized-r ([ɐ]). A discussion of the realization of [ʀ] in the coda can be found in Holthausen (1886: 42).[8]

(21) [ʀ]~[ɐ] alternations (from /ʀ/):

a.	ę̄rə	[ɛːʀə]	ihre	'her-infl'	25
	ę̄*a*	[ɛːɐ]	ihr	'her'	25
b.	hœ̄rə	[hœːʀə]	höre	'hear-1sg'	28
	hœ̄*a*st	[hœːɐst]	hörst	'hear-2sg'	28
c.	tę̄rə	[tɛːʀə]	zehre	'feed on-1sg'	74
	tę̄*a*st	[tɛːɐst]	zehrst	'feed on-2sg'	74

The data in (22) illustrate that /ɣ/ surfaces as velar ([x]) in coda position after [ɐ]:

[8]Note the similarity between Holthausen's symbol for the vocalized-r (⟦*a*⟧) and his symbol for the short low back vowel (i.e. ⟦ɑ⟧). The discussion of the phonetics of vowels in that source indicates that the two vowels in question are distinct (Holthausen 1886: 7). I transcribe Holthausen's vocalized-r henceforth as [ɐ].

(22) Velar [x] (from /x/) after [ɐ] (from /ʀ/):

bę̄ɑx	[bɛːɐx]	Berg	‘mountain’	44
tvę̄ɑx	[tvɛːɐx]	Zwerg	‘dwarf’	24
bǫɑx	[boːɐx]	Borg	‘barrow’	44

Soest /ʀ/ surfaces as [ɐ] in coda position by r-Vocalization in (23) and elsewhere (in the onset) as [ʀ]. Example (17c) indicates that Soest does not vocalize coda /l/ as Ramsau am Dachstein.

(23) r-Vocalization:

$$\begin{bmatrix} \text{+CONS} \\ \text{+SON} \\ \text{−NASAL} \\ \text{DORSAL} \end{bmatrix} \rightarrow [\text{−cons}] \ / \ \_\_\_ \ C_0 \ ]_\sigma$$

r-Vocalization only alters the feature [±consonantal]; hence, the derived sound [ɐ] – like the input /ʀ/ – is also [dorsal]. Since [ɐ] is phonologically [dorsal] the occurrence of [x] after that sound is precisely what one would expect in a dialect where [x] and [ç] have a transparent distribution.

The significant point concerning the history of dorsal fricatives in Soest is that sound changes converting original front sounds to back sounds (Vowel Retraction) or the reverse (Vowel Fronting) had no effect on the distribution of velar and palatal allophones in the neighborhood of those front/back sounds. I consider first word-initial position and then the context after a sonorant.

In the dialect of Soest as it was described in 1886, word-initial [x]/[ç] developed out of WGmc +[ɣ] and word-initial [sx]/[sç] from WGmc +[sk]. Palatal [ç] occurs before front vowels that were historically front (=24d) and before front vowels that were etymologically back (=24c). The surface velar [x] likewise occurs before etymological back vowels (=24a, 24e) and before vowels that were originally front (=24b). The reconstructed forms to the right of the wedge are my own; the forms in the third column represent Stage 1. It is assumed that WGmc +[ɣ] and WGmc +[sk] had already changed to [x] (/x/) and [sx] (/sx/) respectively. The second column represents the point where velar fronting (=Wd-Initial Velar Fronting-3) was phonologized but before certain front vowels had changed to schwa in (24b).

(24)

a.	[xɑst]	<	+[xɑst]	<	+[xɑst]	‘guest’	cf. OSax *gast*
b.	[xədʊlt]	<	+[çidʊlt]	<	+[xidʊlt]	‘patience’	cf. OSax *githuld*
c.	[çɛɔs]	<	+[çɛɔns]	<	+[xɑs]	‘goose’	cf. MLG *gōs*
d.	[çɪstɐn]	<	+[çɪstɐn]	<	+[xɪstɐn]	‘yesterday’	cf. MLG *gisteren*

e.	[sxʊlt]	< $^+$[sxʊlt]	< $^+$[sxʊlt]	‘guilt’	cf. OSax *skuld*
f.	[sçʏlıç]	< $^+$[sçʏldıç]	< $^+$[sxʊldıx]	‘guilty’	

The two historical changes that introduced /x/ into word-initial onsets are stated in (25a, 25b). Wd-Initial ɣ-Fortition and k-Spirantization were general sound changes affecting many LG varieties. The vocalic modifications in (24) exemplifying Vowel Fronting include i-Umlaut in (24f) and a change specific to LG in (24c), i.e. /ɑ/ > /ɛɔ/. Note that the latter change is classified as Vowel Fronting because the part of the new diphthong that is front (/ɛ/) is the one adjacent to the dorsal fricative. Vowel Fronting in word-initial position is depicted in (2b). The change whereby unstressed full vowels surfaced as schwa in (24b) is presented in (25c); recall §2.4.3. If the original vowel is front (=24b) then Vowel Reduction can be classified as a particular type of Vowel Retraction. Vowel Reduction is a major sound change that affected virtually all LG and HG dialects.

(25) a. Wd-Initial ɣ-Fortition:
/ɣ/ > /x/ $_{\text{wd}}$[____

b. k-Spirantization:
/k/ > /x/ $_{\text{wd}}$[s ____

c. Vowel Reduction:
/{ unstressed vowel }/ > /ə/

In (26) I give historical derivations for three examples from (24). At Stage 1 Velar fronting has not yet been phonologized, but Wd-Initial ɣ-Fortition and k-Spirantization had already introduced new instances of [x] (/x/). Stage 2 represents the dialect as it was described by Ferdinand Holthausen in 1886. The intermediate stage (“Pre-Soest”) corresponds to the second column in (24): This is the point after Wd-Initial Velar Fronting-3 had been phonologized but before Vowel Reduction had restructured unstressed full vowels to schwa.

(26)	/xɑst/	/xidʊlt/	/xɪstɐn/	
	[xɑst]	[xidʊlt]	[xɪstɐn]	Stage 1
	/xɑst/	/xidʊlt/	/xɪstɐn/	
	[xɑst]	[çidʊlt]	[çɪstɐn]	Pre-Soest
	/xɑst/	/xədʊlt/	/xɪstɐn/	
	[xɑst]	[xədʊlt]	[çɪstɐn]	Stage 2
	Gast	*Geduld*	*gestern*	StG
	‘guest’	‘patience’	‘yesterday’	

The word [xədʊlt] requires comment. The initial fricative in that type of example was a surface palatal at the Pre-Soest stage, prior to Vowel Reduction. That stage ([çidʊlt]) is not attested in any modern German dialect, although the material presented in the LG dialects discussed in Chapter 7 and Chapter 8 makes it clear that there must have been that earlier stage (cf. OSax *giduld*). Since the vowel following /x/ in [xədʊlt] is schwa, the fricative /x/ cannot front to palatal and therefore surfaces as [x]. The change from a Pre-Soest sequence like /xi/ to Stage 2 /xə/ involved Vowel Reduction, which deleted the feature [coronal] from the front vowel (/i/). The significance of that development is discussed in Chapters 7 and 8 where it is shown that there are other German dialects in which the initial sound surfaces as palatal [ç] before schwa.

The reflexes of WGmc ⁺[ɣ] in postsonorant position are given for three representative words in (27). The reconstructions are my own.

(27)	a.	[stui.ɣn̩]	<	⁺[stiɣɑn]	'climb-INF'	cf. OSax *stīgan*	(from 19a)
	b.	[stɪçst]	<	⁺[stiɣst]	'climb-2SG'		(from 19a)
	c.	[bɛːɐx]	<	⁺[berɣ]	'mountain'	cf. OSax *berg*	(from 22)

Example (27c) deserves comment. As in Ramsau am Dachstein (§3.5), the [dorsal] rhotic derived historically from the corresponding [coronal] sound /r/. Evidence for that assumption is that the [coronal] sound is retained as [r] (/r/) in many closely related LG dialects discussed throughout this book. My treatment in (27c) is also consistent with the description of the rhotic consonant in the original source, where Holthausen (1886: 43) observes that the original realization ([r]) is retained in the villages surrounding Soest. Given the earlier stage with [r] (/r/), r-Retraction (§3.5) must have restructured the [coronal] rhotic in Soest to the [dorsal] rhotic.

The three examples from (27) are illustrated in (28). Stage 2B is the Soest dialect of 1886. Recall from (20) that both Velar Fronting-4 and Final Fortition are present. It is assumed here that Final Fortition was already active at Stage 1; see §5.5.2 for discussion.

(28)	/stuiɣ-n/	/stɪɣ-st/	/bɛːrɣ/	
	[stui.ɣn̩]	[stɪxst]	[bɛːrx]	Stage 1
	/stuiɣ-n/	/stɪɣ-st/	/bɛːrɣ/	
	[stui.ɣn̩]	[stɪçst]	[bɛːrç]	Stage 2A
	/stuiɣ-n/	/stɪɣ-st/	/bɛːʀɣ/	
	[stui.ɣn̩]	[stɪçst]	[bɛːɐx]	Stage 2B
	steigen	*steigst*	*Berg*	StG
	'climb-INF'	'climb-2SG'	'mountain'	

Stage 2A represents the point where Velar Fronting-4 and Final Fortition were first active together in the synchronic phonology. Crucially, the rhotic in words like [bɛːrç] 'mountain' was still coronal. Since the set of triggers for Velar Fronting-4 includes all coronal sonorants, the dorsal fricative in words like [bɛːrç] surfaced as palatal at Stage 2A. Evidence for Stage 2A comes from dialects spoken roughly at the same time as the one Holthausen (1886) describes in Soest where the [rç] sequence is preserved, cf. [bɑrç] 'mountain' in Dorste in (34a) below.

Stage 2B (=Soest in 1886) represents the point where r-Retraction restructured /r/ to /ʀ/. The change from /r/ to /ʀ/ is a specific example of retraction, which was depicted above for vowels in (1a): In the first column of (28), the feature [coronal] is linked to both sounds (e.g. [r] and [ç]) as a consequence of Velar Fronting-4. When /r/ restructured to /ʀ/ by r-Retraction [coronal] was replaced with [dorsal], as illustrated to the right of the wedge in (1a). The consequence of that change is that the surface palatal [ç] depicted before the wedge reverted back to [x] (after the wedge).

Each variety of Wph needs to be assessed individually because there are few generalizations concerning the patterning of dorsal fricatives that hold for that entire branch of WLG. One might conclude that there is nothing at all unusual about the transparent patterning of dorsal fricatives in Soest, but this impression is not correct when one compares the Soest system with other Wph (and Eph) ones. The conclusion is that the system of velar and palatal fricatives in Soest is more the exception than the rule.

Soest has processes fronting velars in word-initial position and after a sonorant. However, some Wph varieties are attested with no velar fronting in word-initial position; hence, /x/ (<WGmc ⁺[ɣ] or after initial ⁺[s]) surfaces as [x] even before front vowels, e.g. Gütersloh (Wix 1921; Map 4.2). In Wph varieties with either word-initial or postsonorant velar fronting the targets and triggers for those processes are not necessarily the same as the targets and triggers for the same processes in Soest. In word-initial onset position Soest /x/ surfaces as [ç] before a narrow set of sounds (front vowels but not before coronal consonants). That pattern is essentially the same in Laer (Niebaum 1974, 1982; Map 4.2), but in Elspe (Arens 1908; Map 4.2) the set of triggers is broader (all coronal sonorants). For postsonorant position the sole target for fronting in Soest is /x/ (but not /ɣ/). That narrow set of targets is attested in other varieties of Wph, e.g. Adorf (Collitz 1899; Map 4.2) and Laer (Niebaum 1974, 1982; Map 4.2). The same point holds for Eph, e.g. Meinersen (Bierwirth 1890; Map 4.3) and Börßum (Heibey 1891; Map 4.3), as well as several varieties of WCG (§12.3.4). That pattern can be contrasted with other varieties with a broader set of targets (i.e. /x/ and /ɣ/; §4.4).

The patterning of [x]/[ç] from /x/ is allophonic in Soest, but that type of system can be contrasted with ones in which [ç] has been quasi-phonemicized to /ç/, e.g. Elspe (Arens 1908; Map 4.2) and Schieder-Schwalenberg (Böger 1906; Map 4.2). Examples like these are discussed in detail in Chapter 7.

4.4 Eastphalian

The present section investigates the complementary distribution of velar fricatives ([x ɣ]) with the corresponding palatals ([ç ʝ]) in an Eph variety. The significance of this case study is that the target segments for postsonorant fronting consist of both /x/ and /ɣ/ and not just /x/, as in Soest (System C referred to in §4.1).

The data discussed below are drawn from the Eph dialect once spoken in and around the town of Dorste (Dahlberg 1934, 1937; Map 4.3). See also Mackel's (1939) phonetic transcriptions of a speaker from Dorste (Osterode am Harz).

The phonemic monophthongs consist of the front vowels /iː ɪ yː ʏ eː ɛː ɛ œ/ and the back vowels /uː ʊ ɔ ɑː ɑ ə/. I omit Dahlberg's ⟦œ̄⟧ because no example was found in that source with a dorsal fricative in the neighborhood of that vowel. Of the twelve diphthongs listed in the original source I only consider the eight which occur in the context of dorsal fricatives. Those diphthongs end in a front vowel (/ʊɪ ɔɪ ɑɪ/) or back vowel (/iːə uːə eːə ɛʊ ɑʊ/).

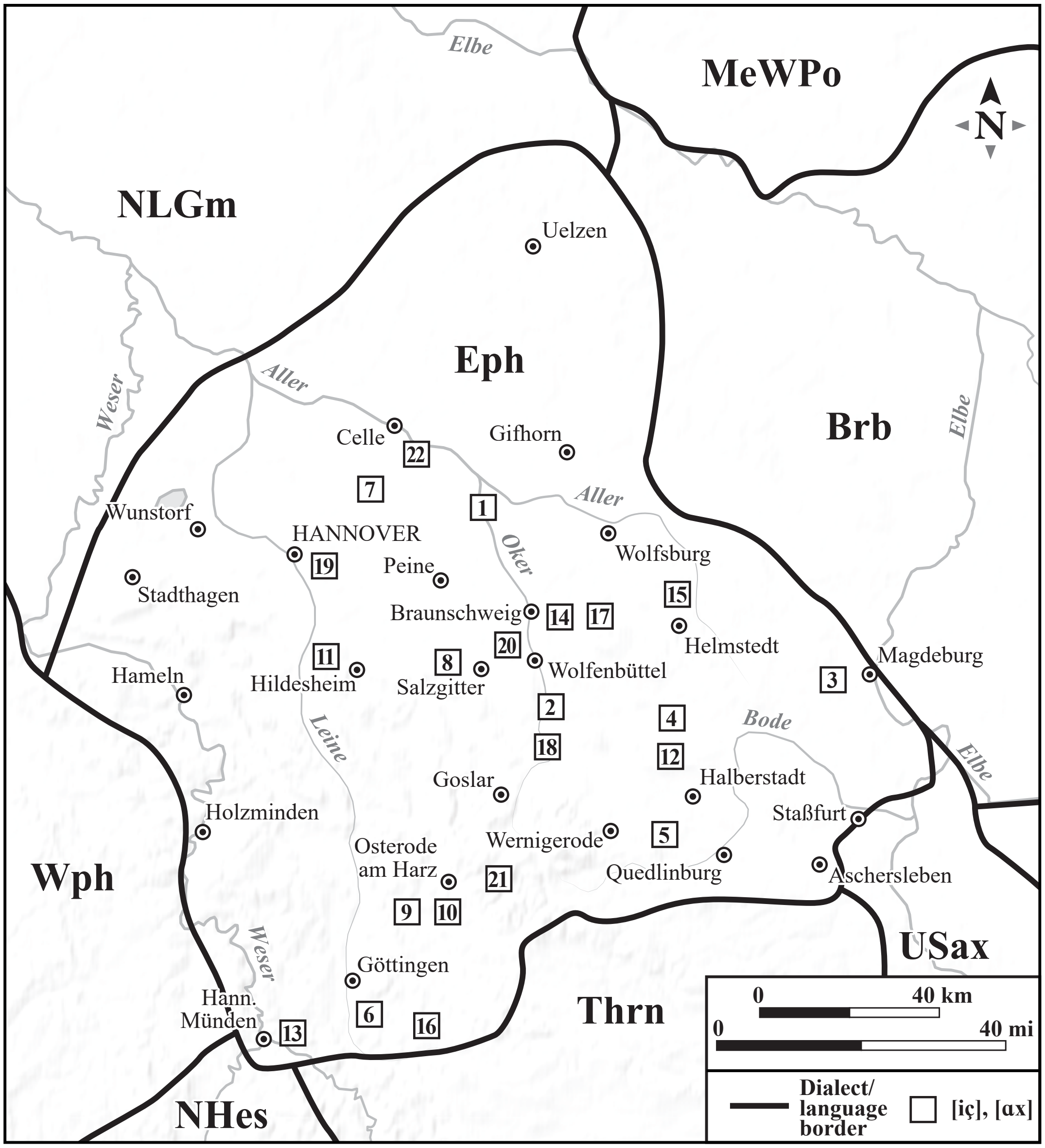
Dorste possesses the four dorsal fricatives [x ç ɣ ʝ], whose relationship is depicted word-initially (29a) and after a sonorant in (29b). There are no contrasts between velar and the corresponding palatal.

(29) a. /x/ → [x] [ç]; /ʝ/ → [ʝ]

b. /x/ → [x] [ç]; /ɣ/ → [ɣ] [ʝ]

The word-initial pattern in (29a) is the same as in Soest. The difference between Soest and Dorste is in postsonorant position, as indicated in (29b), cf. (11b).

Word-initial [x] (=⟦x⟧) surfaces either before a back vowel in (30a) or a sonorant consonant in (30c) and [ç] (=⟦χ⟧) before a front vowel in (30b); see Dahlberg (1937: 15). The coronal sonorant consonant after [x] in (30c) is either a liquid ([l]/[r]) or nasal [n]. [r] is coronal because it is articulated with the tongue tip ("Zungenspitzen-r": Dahlberg 1937: 5). Word-initial [x] surfaces before a consonant regardless of the quality of the vowel following that consonant; in particular, it can be either front (as in the final example in 30c) or back (as in the first



Map 4.3: Eastphalian (Eph). Squares indicate postsonorant velar fronting. 1=Bierwirth (1890), 2=Heibey (1891), 3=Roloff (1902), 4=Block (1910), 5=Damköhler (1919), 6=Jungandreas (1926), Jungandreas (1927), 7=Jarfe (1929). 8= Löfstedt (1933), 9=Dahlberg (1934, 1937), 10=Mackel (1939) (Osterode am Harz), 11=Mackel (1939) (Hildesheim), 12=Hille (1939), 13=Hassel (1942), 14=Pahl (1943), 15=Brugge (1944), 16=Schütze (1953), 17=Bethge & Flechsig (1958), 18=Lange (1963), 19=Bethge & Bonnin (1969), 20=Bethge & Bonnin (1969), 21=Göschel (1973), 22=ACeM.

two examples). Word-initial [x ç] in (30) derived historically from WGmc $^{+}$[ɣ] by Wd-Initial ɣ-Fortition (in 25a).[9]

(30) Distribution of word-initial [x] and [ç] (from /x/):

a.	xūətə	[xuːətə]	Gosse	‘gutter’	73
	xųnst	[xʊnst]	Gunst	‘favor’	73
	xǫt	[xɔt]	Gott	‘God’	15
	xɑ̣̄l	[xɑːl]	geil	‘horny’	73
	xɑst	[xɑst]	Gast	‘guest’	73
	xɑįst	[xɑɪst]	Geist	‘intellect’	72
	xaųt	[xɑʊt]	gut	‘good’	15
b.	χījn̥	[çiːɟn̩]	gegen	‘against’	15
	χįstə(r)n	[çɪstə(r)n]	gestern	‘yesterday’	74
	χų̈stə	[çʏstə]	keine Milch gebend	‘not giving-PART milk’	74
	χę̄və	[çɛːvə]	gäbe	‘give-SUBJ’	74
	χęlt	[çɛlt]	Geld	‘money’	73
	χǫ̈rtl̥	[çœrtl̩]	Gürtel	‘belt’	74
	χēərn	[çeːərn]	gern	‘gladly’	74
	χę̈ųs	[çɛʊs]	Gans	‘goose’	73
	χīən	[çiːən]	jäten	‘weed-INF’	74
c.	xlɑs	[xlɑs]	Glas	‘glass’	15
	xrɑs	[xrɑs]	Gras	‘grass’	15
	xnę̈ųʒn̥	[xnɛʊɣn̩]	nagen	‘gnaw-INF’	73

Dahlberg (1937) gives many morphemes with [x]~[ç] alternations triggered by Umlaut, e.g. [xɑst] ‘guest’ vs. [çɛstə] ‘guest-PL’. The two sounds [x] and [ç] in those alternating examples and in (30) are surface realizations of the phoneme /x/, which surfaces as [ç] in word-initial position if the following segment is a front vowel (by Wd-Initial Velar Fronting-3 from 14).

[9] In contrast to Soest, there are no words containing [x] or [ç] after a word-initial sibilant (recall 13). The corresponding examples in Dorste are realized as [ʃ] (/ʃ/), e.g. [ʃɑːf] ‘sheep’ (cf. Soest [sxɔːp]). Dahlberg’s ⟦ę̄⟧ is described as a vowel corresponding to StG *spät* ‘late’ (Dahlberg 1934: 13) and is therefore transcribed as [ɛː]. His ⟦ɛ⟧ expresses a vowel quality between [eː] (=⟦ē⟧) and [ɛː] (=⟦ę̄⟧). I transcribe ⟦ɛ⟧ below as [ɛː] because my treatment does not hinge on the fine-grained vowel qualities described in the original source. For the same reason, I transcribe Dahlberg’s ⟦ę⟧ and ⟦ę̈⟧ both as [ɛ].

The etymological palatal ([ʝ] < WGmc ⁺[j]) surfaces in word-initial position before a back vowel in (31a) or front vowel in (31b). The velar counterpart to [ʝ] (i.e. [ɣ]) never occurs in word-initial position.[10]

(31) Word-initial [ʝ] (from /ʝ/):

a.	jụŋə	[ʝʊŋə]	Junge	'boy'	76
	jɑmə(r)	[ʝɑmə(r)ə]	Jammer	'lament'	76
b.	jü̧kn̥	[ʝʏkn̩]	jucken	'itch-INF'	76
	jö̧k	[ʝœk]	euch	'you-ACC/DAT.PL'	76

In postsonorant position [x] and [ç] stand in an allophonic relationship: [x] surfaces after a back vowel in (32a) and [ç] after a front vowel in (32b) or a coronal sonorant consonant in (32c). The nonoccurrence of [x ç] after phonemic vowels other than the ones listed below or after /l n/ is accidental. Due to Umlaut-induced vowel changes there are many [x]~[ç] alternations, e.g. [hɛʊx] 'high' vs. [hœçst] 'highest'. [x ç] in alternating examples like these and [x ç] in (32) derive synchronically from /x/ by Velar Fronting-1. Historically the dorsal fricatives in (32a–32c) derive from WGmc ⁺[x]. As in Soest (=16c), /x/ can also derive historically from /f/ by x-Formation (=32d).

(32) Postsonorant [x] and [ç] (from /x/):

a.	dǫx	[dɔx]	doch	'however'	15
	ɑxt	[ɑxt]	acht	'eight'	64
b.	bį̈χtə	[bɪçtə]	Beichte	'confession'	16
	lü̧χtn̥	[lʏçtn̩]	leuchten	'glow-INF'	80
	fụį̈χt	[fʊɪçt]	feucht	'damp'	72
c.	fǫrχt	[fɔrçt]	Furcht	'fear'	71
d.	lụxt	[lʊxt]	Luft	'air'	16
	ęχt	[ɛçt]	echt	'genuine'	16

Recall from the discussion after (16) that there are historical reasons for why the dorsal fricatives in LG items like these only occur after a short vowel (typically followed by [t]).

[10] [ʝ] (/ʝ/) also derived historically from WGmc ⁺[ɣ] in word-initial position before schwa, e.g. [ʝəvɑlt] 'violence' (=⟦jəvɑlt⟧), cf.OSax *giwald*. The [ʝ] (/ʝ/) in that type of example is a palatal quasi-phoneme, which is discussed in other German dialects in detail in Chapter 7. No Eph dialect in the present study is completely free from opacity, although the one opaque palatal in Dorste is extremely limited in its occurrence. Note that the corresponding examples in Soest have a velar ([x]), e.g. [xədʊlt] 'patience' in (12a); cf. OSax *giduld*.

[ɣ] (=⟦ʒ̥⟧) and [ʝ] (=⟦j⟧) have a distribution that parallels the one involving [x] and [ç] (see 29b). As indicated in (33), velar [ɣ] surfaces in a word-internal onset after a back vowel in (33a) and palatal [ʝ] in a word-internal onset after a front vowel in (33b) or coronal sonorant consonant in (33c). In the overwhelming majority of examples like these [ɣ ʝ] are the reflexes of WGmc ⁺[ɣ]. As noted below, [ɣ ʝ] in (33) derive synchronically from velar /ɣ/.[11]

(33) Postsonorant [ɣ] and [ʝ] (from /ɣ/):

a.	būʒ̥n̥	[buː.ɣn̩]	Bogen	'bow'	16
	ę̈ṷʒ̥ə	[ɛʊ.ɣə]	Auge	'eye'	70
b.	hījn̥	[hiː.ʝn̩]	hegen	'foster-INF'	75
	bǖjl̥	[byː.ʝl̩]	Bügel	'clamp'	68
	fɛ̄jn̥	[fɛː.ʝn̩]	fegen	'sweep-INF'	75
	drę̄jn̥	[drɛː.ʝn̩]	drehen	'turn-INF'	69
	mǫi̯jətə	[mɔɪ.ʝətə]	Mägde	'maidservant-PL'	15
	drṷi̯jə	[drʊɪ.ʝə]	trocken	'dry'	69
	flɑi̯jə	[flɑɪ.ʝə]	Fliege	'fly'	71
c.	fęljə	[fɛl.ʝə]	Felge	'wheel rim'	16
	mǫrjə	[mɔr.ʝə]	morgen	'tomorrow'	81

In postsonorant position palatals occur only after coronal sonorants and velars after back vowels; hence, there are no contrastive sequences like [ix] vs. [ɑç] (or [iɣ] vs. [ɑʝ] before a vowel).

The examples in (33) illustrate an important difference between Dorste and Soest: In the latter dialect, [ɣ] – but not [ʝ] – surfaces in word-internal onset position after back vowels, front vowels and liquids (recall 17). By contrast, in Dorste the two fricatives [ɣ] and [ʝ] – like [x] and [ç] – stand in complementary distribution in postsonorant position. Thus, the set of targets for postsonorant fronting consists of /x/ but not /ɣ/ in Soest, but in Dorste it consists of /x/ and /ɣ/. The different targets are captured formally with two different fronting processes: Velar Fronting-4 for Soest and Velar Fronting-1 for Dorste.

The examples in (34) exhibit an alternation involving laryngeal features in (34a, 34b) and both place and laryngeal features in (34c, 34d); see Dahlberg (1937: 34).

[11] The fricative in words like [drɛː.ʝn̩] 'turn-INF' in (33b) is the reflex of WGmc ⁺[j]. That glide shifted to velar /ɣ/ after a front vowel by a regular change that affected LG dialects (Hall 2014b). Recall from (17b) that the /ɣ/ in question is preserved as [ɣ] in Soest (e.g. [dʀɛ.ɣn̩] 'turn-INF').

(34) Place and laryngeal alternations (from /ɣ/):

a.	bɑrχ	[bɑrç]	Berg	‘mountain’	65
	bɑrjə	[bɑrɟə]	Berge	‘mountain-PL’	16
b.	ve̜χ	[vɛç]	Weg	‘path’	34
	ve̜jə	[vɛɟə]	Wege	‘path-PL’	34
c.	slɑx	[slɑx]	Schlag	‘blow’	34
	slë̜u̯ʒəs	[slɛʊɣəs]	Schlages	‘blow-GEN.SG’	34
	slɛjə	[slɛːɟə]	Schläge	‘blow-PL’	34
d.	dǖjn̥	[dyːɟn̩]	taugen	‘be good for sth-INF’	32
	dǖjə	[dyːɟə]	tauge	‘id.-1SG’	32
	dö̜χst	[dœçst]	taugst	‘id.-2SG’	32
	do̜xtə	[dɔxtə]	taugte	‘id.-PRET’	32

The fortis vs. lenis alternations in (34) are accounted for with Final Fortition (8a) and the surface palatals with Velar Fronting-1. As shown below, the outputs are transparent because the two rules in question are unordered (cf. Altengamme in 9). The word [vɛç] ‘path’ (34b) is representative of words ending in a front vowel followed by /ɣ/. The word [ɛçt] ‘genuine’ (32d) illustrates the behavior of /x/ after a front vowel for comparison.

(35)

a.		/vɛɣ/	/ɛxt/	b.		/vɛɣ/	/ɛxt/
	Fnl For	vɛx	––		Vel Fr-1	vɛɟ	ɛçt
	Vel Fr-1	vɛç	ɛçt		Fnl For	vɛç	––
		[vɛç]	[ɛçt]			[vɛç]	[ɛçt]
		‘path’	‘genuine’				

The relationship between Velar Fronting-1 and Final Fortition in (35) can be compared with the ones in (20) for Soest, in which Final Fortition feeds Velar Fronting-4.

As in all of the other German dialects discussed above, velars fronted to palatal in Dorste regardless of the etymological source of the segments serving as triggers. Thus, palatals surface in the neighborhood of front vowels that were etymologically front in (36a, 37a) or back in (36b , 37b) and velars in the neighborhood of back vowels that were etymologically back in (36c, 37c) or front in (36d). (36b) and (37b) illustrate dialect-specific examples of Vowel Fronting and (36d) of Vowel Retraction; no parallel case was found for Vowel Retraction in the post-sonorant context. Note that the change from back monophthong to a diphthong in (36b) and (37b) is classified as Vowel Fronting on the basis of the location of the front vowel component of that diphthong. Hence, [oː] > [ɛʊ] involves Vowel

Fronting because the [ɛ] component is adjacent to the dorsal fricative, but [o] > [ʊɪ] is likewise Vowel Fronting because the front component [ɪ] is adjacent to the dorsal fricative. The changes involving Vowel Retraction and Vowel Fronting in Dorste are depicted in (1) and (2) respectively. The reconstructed examples in the second column below are my own.

(36)	a.	[çɛlt]	<	+[xɛld]	'money'	cf. OSax *geld*	(from 30b)
	b.	[çɛʊs]	<	+[xoːs]	'goose'	cf. MLG *gōs*	(from 30b)
	c.	[xɑst]	<	+[xɑst]	'guest'	cf. OSax *gast*	(from 30a)
	d.	[xɑːl]	<	+[xeːl]	'horny'	cf. OSax *gēl*	(from 30a)
(37)	a.	[fɛːʝn̩]	<	+[fɛːɣn̩]	'sweep-INF'	cf. OSax *fegon*	(from 33b)
	b.	[drʊɪʝə]	<	+[droɣə]	'dry'	cf. MLG *droge*	(from 33b)
	c.	[ɛʊɣə]	<	+[ɛʊɣə]	'eye'	cf. OSax *ōga*	(from 33a)

The broad set of targets for postsonorant fronting (/x ɣ/) and the full range of triggers for that change (coronal sonorants) were exemplified above for Dorste. The same pattern is reflected in other Eph varieties, e.g. Magdeburger Börde (Roloff 1902; Map 4.3), Eilsdorf (Block 1910; Map 4.3), Emmerstedt (Brugge 1944; Map 4.3), and Göddeckenrode/Isingerode (Lange 1963; Map 4.3). However, as noted in §4.2, there are also Eph-speaking communities like Meinersen and Börßum with the narrow set of targets for postsonorant velar fronting (/x/), as in Soest.

The synchronic fronting of word-initial /x/ to [ç] as described above for Dorste is not a general feature of Eph because Wd-Initial ɣ-Fortition in (25a) did not affect that entire dialect region. Instead, WGmc +[ɣ] underwent either g-Formation-1 in (10b) or a more specific change from /ɣ/ to /g/ in word-initial position only. The realization of /x/ as [x] or [ç] after a word-initial [s] as in Soest (=13) is attested neither in Dorste, nor in other varieties of Eph, where the realization is [ʃ], as in StG; see Hall (2021) for extensive discussion.

Velar fricatives are in complementary distribution with the corresponding palatals in Dorste, but other varieties of Eph are attested in which velar vs. palatal contrasts occur in word-initial position. According to one pattern, WGmc +[ɣ] is realized as [ɣ] word-initially before back vowels. Since Glide Hardening in (10a) ensured that word-initial +[j] is realized as [ʝ] (/ʝ/) before any vowel, that type of dialect now has contrasts between velars ([ɣ] /ɣ/) and palatals ([ʝ] /ʝ/) in word-initial position before back vowels (e.g. Block 1910; Map 4.3). Examples like these are discussed in Chapter 8.

4.5 Discussion

The material investigated in this chapter and in Chapter 3 reveals variation involving targets and triggers for velar fronting. In §4.5.1 I summarize the synchronic facts discussed above and consider briefly how they are accommodated in the rule generalization model (§2.4.1). In all of the case studies discussed up to this point palatal [ç] is the derived allophone of /x/ occurring in the context of a front segment, but the word-initial etymological palatal [ɟ] (/ɟ/) occurs before front and back vowels. In §4.5.2 I discuss the phonological motivation for the emergence of those underlying palatals.

4.5.1 Interim assessment of targets, triggers, and rule generalization

The various versions of velar fronting posited above do not have a consistent set of targets and/or triggers. For example, the target for postsonorant fronting consists solely of /x/ in Soest but of /x ɣ/ in Dorste. The triggers for the fronting of /x/ in word-initial position in Soest and Dorste is the set of front vowels, but in another Wph variety alluded to earlier (Elspe; Arens 1908) the fronting of word-initial /x/ is induced by all coronal sonorants. Postsonorant velar fronting in Rheintal (§3.4) occurs in the context of nonlow front vowels or coronal sonorant consonants, but the set of triggers for the same process in a number of other varieties discussed above consists of all coronal sonorants.

In this book I apply rule generalization to velar fronting in German dialects. When that process was first phonologized the change was triggered by a highly restricted set of front segments, and the target segment was likewise restricted to a single velar; recall Figure 2.3 and Figure 2.4. In terms of time, the set of triggers expanded to include more and more front sounds, while the set of targets analogously increased to include a greater number of velars. In terms of space, velar fronting spread outwards from the focal areas; when this occurred, the process had the narrow set of targets and triggers. Recall how rule generalization was depicted abstractly in Figure 2.1.

A preliminary list of changes from specific to general targets/triggers is given in (38). HFV=high front vowels, MFV=mid front vowels, LFV=low front vowels, and CC=coronal sonorant consonants

(38) Changes in targets (in a) and triggers (in b):

a. /x/ > /x ɣ/ > /x ɣ k g ŋ/

b. $\{\text{HFV}\} > \begin{Bmatrix}\text{FHV}\\ \text{MFV}\end{Bmatrix} > \begin{Bmatrix}\text{HFV}\\ \text{MFV}\\ \text{CC}\end{Bmatrix} > \begin{Bmatrix}\text{HFV}\\ \text{MFV}\\ \text{LFV}\\ \text{CC}\end{Bmatrix}$

Synchronic evidence for the historical stages depicted in (38) comes in the form of dialects described in late nineteenth century up to the present representing those stages. For example, postsonorant velar fronting in Soest exemplifies the /x/ stage and Dorste the /x ɣ/ stage. In terms of time, the original set of targets expanded from pre-Dorste (/x/ only) to Dorste (/x/ and /ɣ/). Dialects with the largest set of targets (/x ɣ k g ŋ/) are discussed in Chapter 11.

That /ɣ/ was not an original target follows from the Implicational Universal for Velar Fronting Targets-2 (§2.3.2): "If a lenis sound undergoes velar fronting then the corresponding fortis sound does as well". Given that exceptionless generalization, /ɣ/ cannot be the target segment unless /x/ is.

The set of triggers for velar fronting at the point when the process was first phonologized likewise consisted of a small number of sounds most conducive to fronting and then gradually expanded to include a larger number of sounds; see (38b). The final stage in (38b) represents the default set of triggers (all coronal sonorants), which can be observed in several varieties discussed above. The penultimate stage in (38b) is represented by Rheintal, while the antepenultimate one (HFV, MFV) is perhaps reflected in word-initial velar fronting in Soest and Dorste.[12]

The progression from high front vowels to high and mid front vowels to all front vowels is a consequence of the Implicational Universal for Palatalization Triggers (§2.3.3): "If lower front vowels trigger Palatalization, then so will higher front vowels". No dialect is attested which fails to obey that hierarchy.

Variation in terms of space (regional dialects) directly reflects changes along the temporal dimension. In particular, dialects with a more restricted set of triggers/targets preserve an earlier historical stage than dialects with the full set of triggers/targets, which represent a later stage. Regions where velar fronting had the greatest set of targets/triggers (e.g. /x ɣ/ in Dorste) represent places where velar fronting has been active longer than those places where velar fronting exhibits a narrower set of targets/triggers (e.g. /x/ in Soest). The reason is that velar fronting has been present longer in the focal areas than in outlying areas and that the change has therefore had more time to expand the number of targets and triggers.

[12] The conclusion is inconclusive because neither Soest nor Dorste possess low front vowels (e.g. /æ/); hence, one cannot know for certain whether or not low front vowels in either of those varieties belongs to the set of triggers.

4.5.2 Emergence of the underlying palatal /ʝ/ via Glide Hardening

In all of the studies discussed up to this point the palatal fricative [ç] has a highly restricted distribution in the sense that it only occurs when adjacent to coronal sonorants (or some subset thereof). The limited occurrence of [ç] is captured formally by treating that sound as an allophone of a velar produced by velar fronting. The same generalization holds for the postsonorant palatal [ʝ] in Dorste, which was shown to be a realization of the velar /ɣ/.

One of the challenges in this book is to account for the occurrence of opaque palatals like [ç] occurring in the neighborhood of back sounds. Reference to such dialects was made at various points in previous chapters. One generalization true for the dialects discussed below is that the back vowels adjacent to opaque palatals were etymologically front. Thus, the backing of those front vowels by Vowel Retraction and/or r-Retraction follows if velar fronting was active synchronically at the stage before either retraction process occurred. Thus, retraction resulted in a reassociation of the feature [coronal] from the front vowel trigger to the adjacent dorsal fricative, thereby creating either a palatal quasi-phoneme or a phonemic palatal (/ç/ or /ʝ/).

At issue is the word-initial lenis palatal fricative [ʝ] in all three of the LG varieties discussed in the present chapter. That sound is an underlying palatal (/ʝ/) because it occurs before front vowels and back vowels. Since the /ʝ/ in question was never the product of assimilatory fronting from an earlier velar it does not have an opaque history. The important point is that [ʝ] (/ʝ/) emerged in the back vowel context even in dialects which otherwise ban fortis palatals in that environment. Given this, what is the phonological reason for the emergence of that [ʝ] (/ʝ/), especially in the context of back vowels?

As noted above, the palatal fricative under discussion is the modern reflex of an earlier palatal glide (WGmc $^{+}$[j]) by Glide Hardening (=10a). The motivation for that change is syllable structure, since it only affected glides in onset position, while glides in the nucleus or coda were immune. It has long been known that languages impose sonority-based constraints on onset and coda segments. A version of the Sonority Hierarchy is posited in (39), which is similar to the one proposed by Clements (1990) with the exception that rhotics like /r/ are analyzed in (39) as more sonorous than laterals. See Vennemann (1982), Strauss (1982), Wiese (1988), Eisenberg et al. (1992), Wiese (1996b), Grijzenhout (1998), and Hall (2002) for discussion of sonority in StG. Hall (2011b) examines sonority in a HstAlmc variety spoken in Visperterminen (§6.2), and Noelliste (2019) gives a language-specific sonority hierarchy for Bav. Parker (2011) proposes a very fine-grained version of (39) on the basis of cross-linguistic evidence.

(39) Sonority hierarchy:

Vowels	Glides	Rhotics	Laterals	Nasals	Obstruents
more sonorous					less sonorous

Languages tend to prefer less sonorous sounds in the onset and more sonorous sounds in the coda. Thus, there is general agreement in phonology that glides (as sonorants) make for poor onsets. This cross-linguistic generalization has been captured formally in various ways, e.g., the Head Law of Vennemann (1988) in the Preference Law framework, the Sonority Dispersion Principle (Clements 1990), or the various Margin Hierarchies in Optimality Theory (e.g. Prince & Smolensky 2004, Clements 1997, Smith 2003, and Hall 2011b to name a few). The reason why glides and not other sonorants (i.e. nasals or liquids) are singled out for hardening in (10a) can be found by considering the sonority of these sounds: According to most versions of the Sonority Hierarchy (as in 39), glides are more sonorous than nasals or liquids. For this reason, syllables like [ja] and [wa] are worse than ones like [na], [la] and [ra] because of the relatively shallow rise in sonority from glide to following vowel.

In sum, the preference for fricatives as opposed to glides in an onset was prioritized over the requirement that palatal fricatives be banned in the context of back vowels.

Since there is solid phonological motivation for Glide Hardening it should not come as a surprise that that change – or something very similar – is independently attested both within and outside of Gmc; see the discussion in Hall (2014b). In early Gmc there was a sound change traditionally referred to as Verschärfung (literally 'sharpening') – otherwise known as Holtzmann's Law (Polomé 1949, Kuryłowicz 1967, Suzuki 1990, Davis & Iverson 1996, and Page 1999) –, which was responsible for the shift of PGmc singleton glides $^{+}$[j] and $^{+}$[w] after a short vowel and before a vowel to a geminate obstruent in East Germanic (Go) or NGmc (ON). Two examples discussed in the works cited earlier are PGmc $^{+}$*twa-jē* > Go *twaddjē*, ON *tveggja*, OHG *zweiio* 'two-GEN' and PGmc $^{+}$*trewa-s* > Go *triggws*, ON *tryggr*, OHG *triuwi* 'true'. Following Page (1999), Verschärfung involved the following two stages: $^{+}$[VG_aV] > $^{+}$[VG_aG_aV] > [VO_aO_aV]. Stage 1 converted a singleton glide (G_a) into a geminate glide (G_aG_a) after a short vowel and before a vowel, while the Stage 2 changed that geminate glide into a geminate obstruent (O_aO_a). The relevant part is Stage 2, which involved the exceptionless shift of a geminate glide to a geminate obstruent. That change was similar to my process of Glide Hardening as stated in (10a), but it differed from the latter change because Stage 2 of Verschärfung could not have been motivated as an avoidance of glides in the onset. The reason is that Go [j] did not harden to an obstruent in word-internal onset position. For example, Go *bidjan* 'ask-INF' was syllabified [bid.jɑn], and yet, there is no evidence that the [j] hardened to an obstruent.

These differences aside, it is undeniably the case that Glide Hardening independent of Verschärfung has been attested throughout the history of Gmc. For example, Seebold (1982: 174, 183) discusses the change from Indo-European (IE) $^{+}$[w] to PGmc/WGmc $^{+}$[k] or $^{+}$[g], e.g. IE $^{+}$daiwēr 'brother-in-law' > PGmc $^{+}$taikur (cf. OHG *zeihhur*) and IE $^{+}$juwnti 'youth' > WGmc $^{+}$jugunþi (cf. OHG *jugund*). This change was similar to Glide Hardening in (10a) because the target segment was a glide and the output was an obstruent.

Examples of changes in later stages of German show directly or indirectly that Glide Hardening was involved. For example, in MHG, the glide [w] regularly shifted to [b] after liquids in ENHG, e.g. MHG [narwə] > ENHG [narbə] 'scar', MHG [gelwər] > ENHG [gelbər] 'yellow-INFL'; Schirmunski (1962: 368).

A number of non-Gmc languages are attested with Glide Hardening. For example, Harris & Kaisse (1999) investigate alternations between the palatal glide [j] and the lenis nonanterior coronal fricative [ʒ] – ⟦ž⟧ in the original source – in Argentinian Spanish, e.g. lé[j] 'law' vs. lé.[ž]-es 'laws'. Harris & Kaisse account for data like these with a rule they dub Coronalization (p. 146), which converts the glide /j/ into the lenis nonanterior coronal fricative in syllable-initial position. Like Glide Hardening in (10a), Coronalization creates a fricative from a glide in onset position. Baltazani et al. (2016) discuss Glide Hardening in Greek (and in other languages) at length. They demonstrate that Greek has a rule of Glide Hardening which targets glides in onset position in CjV sequences, turning them into consonants.[13]

4.6 Conclusion

In this chapter I examined the transparent (allophonic) distribution of velars and palatals in three varieties of WLG, which were defined according to the target segments for postsonorant velar fronting.

The occurrence of palatals and velars holds regardless of the historical source of the triggers and targets for velar fronting. Thus, velars like [x] occur not only

[13]Other instances of Glide Hardening probably involve the assimilation (spreading) of a major class feature ([+consonantal]); see Kaisse (1992). For example, Kamprath (1986) discusses Glide Hardening in Bergüner Romansh (Switzerland), which converts the glides /j/ and /w/ into into a velar stop in the context before another consonant. The near mirror-image process is attested in Cypriot Greek (Newton 1972a).

in the context of back segments that were historically back but also when adjacent to back sounds that were historically front. Palatals like [ç] likewise surface in the context of front sounds that were etymologically front as well and in the neighborhood of front sounds that were etymologically back. The sounds undergoing velar fronting include not only underlying (etymological) velars but also new velars created from non-velars by independent changes.

The transparent distribution of velars and palatals in the present chapter – and in Chapter 3 – can be contrasted with the opaque distribution of those sounds discussed in the following five chapters. In Chapters 5–6 I consider velar fronting dialects in which some instances of a velar ([x]) occur in the context of front vowels, indicating that velar fronting underapplies. In Chapters 7–9 I consider velar fronting dialects with some instances of a palatal (e.g. [ç]) occurring in the context of a back sound that was etymologically front. In that type of dialect, the historical process of velar fronting overapplies.

5 Underapplication opacity

5.1 Introduction

In the type of system referred to here, velar fronting is an active synchronic process creating palatal [ç] from velar /x/, but that system also includes many instances of velar |x| deriving synchronically from a different sound (/A/). The rule creating |x| from /A/ (=Rule W in Table 2.7) counterfeeds velar fronting. Hence, on the surface there are front vowel plus palatal sequences like [iç] deriving from /ix/ via velar fronting, as well as front vowel plus velar sequences like [ix], which originate from /iA/ via Rule W. Velar fronting underapplies because the |x| produced by Rule W potentially feeds velar fronting, but in actuality, it does not. Examples like [ix] from /iA/ via Rule W exemplify underapplication opacity.

From the diachronic perspective, it is argued that velar fronting was phonologized at the end of the grammar (recall Chapters 3 and 4), at which point it applied transparently because it was fed by processes already active in the grammar which created derived velars (|x| from Rule W). Underapplication opacity was the result of velar fronting moving up in the derivation so that it was then counterfed by Rule W.

In §5.2 I discuss a Wph system in which the rule counterfeeding velar fronting is Final Fortition. In §5.3 I consider Rpn and SBav varieties in which the opaque velar fricative derives synchronically (and diachronically) from the rhotic phoneme (/ʀ/). In §5.4 I discuss an apparent example of a rule counterbleeding velar fronting in the synchronic grammar. I argue that there is a plausible alternative treatment in which velar fronting is transparent and conclude that the only cases in which velar fronting is opaque in the synchronic grammar involve underapplication in the form of counterfeeding orders. §5.5 provides some discussion of two issues, namely the DOMAIN NARROWING approach to language change endorsed by Bermúdez-Otero (2007, 2015) and Ramsammy (2015) and linguistic/philological evidence for the historical stages presupposed in this chapter and in Chapters 3 and 4. In §5.6 I conclude.

5.2 Westphalian

The data discussed below have been drawn from the Wph dialect of Rhoden, a district of Diemelstadt, in the German state of Hesse (Martin 1925; Map 4.2).

Rhoden has front vowels (/i ɪ y ʏ eː ɛː ɛ øː œ æ/), back vowels (/uː u ʊ oː ɔː ɔ ɑː ɑ ə/), diphthongs ending in a front vowel (/ei ɛi øy ɑi iɛ yœ/), and diphthongs ending in a back vowel (/ou ɑu uɔ/). Martin's symbol ⟦ȧ⟧ is transcribed here and below as [æ] because it is low ("niedrig") and front ("[p]alatal"). The author also notes (p.12) that ⟦ȧ⟧ is pronounced like the vowel in the English word *fat* ("wird gesprochen wie das *a* in englisch *fat*"). Rhoden possesses the four dorsal fricatives [x ç ɣ ʝ]. The relationship between those sounds is depicted in (1) for the environment after a sonorant, which is the context I focus on below.[1] The Rhoden system in (1) is strikingly similar to the one in the related Wph variety of Soest (§4.3), although the crucial difference between the two is that only Rhoden is characterized by counterfeeding opacity.

(1)

/x/		/ʝ/
[x]	[ç]	[ʝ]

The patterning of [ç] in (1) requires that vowels be marked for the distinctive feature [±low]. As indicated in Table 5.1, that feature is assigned to all vowels. Those vowels marked [−low] receive the feature [±high], and if two vowels share that height feature, then they are distinguished with [±tense]. All phonemic vowels are listed here with the exception of schwa, which is placeless. The features for vowels in Table 5.1 also hold for the individual components of the diphthongs. Most significantly, the second part of /ei ɛi øy ɑi iɛ yœ/ is [coronal] and [−low]. Four vowel pairs in Table 5.1 are listed together under the same column (/ɛː ɛ/, /uː u/, /ɔː ɔ/, /ɑː ɑ/). The two vowels in each of those pairs differ in terms of length units, which are not given here.

[1] The word-initial system for Rhoden consists of the etymological palatal [ʝ] (/ʝ/), [g] (/g/), and [x] (/x/) in [ʃx] (/ʃx/) clusters. The [x] in [ʃx] (<WGmc $^+$[sk]) surfaces even before front vowels, e.g. [ʃxip] 'ship'. Since [g] (< WGmc $^+$[ɣ]) only occurs in word-initial position (Martin 1925: 51–53) I treat it as a word-initial allophone of /ɣ/, as in Dingelstedt am Huy (§8.4). Martin (1925: 14) writes that velar stops (his ⟦k⟧ and ⟦g⟧) and the velar nasal (his ⟦ŋ⟧) also have a palatal realization, although he does not describe the context, nor does he transcribe the palatals in question with separate symbols. As I point out in §11.2, the claim that there are fronted variants of [k g ŋ] is not uncommon in descriptive work during the period in which Bernhard Martin penned his grammar of Rhoden.

Table 5.1: Distinctive features for vowels (Rhoden)

	i	ɪ	eː	ɛː ɛ	æ	y	ʏ	øː	œ	uː u	ʊ	oː	ɔː ɔ	ɑː ɑ
[coronal]	✓	✓	✓	✓	✓	✓	✓	✓	✓					
[dorsal]										✓	✓	✓	✓	✓
[labial]						✓	✓	✓	✓	✓	✓	✓	✓	
[low]	−	−	−	−	+	−	−	−	−	−	−	−	−	+
[high]	+	+	−	−		+	+	−	−	+	+	−	−	
[tense]	+	−	+	−		+	−	+	−	+	−	+	−	

The data in (2) and (3) reveal that [x] occurs after a back vowel in (2a–2g) or the [+low] front vowel [æ] in (2h) and that [ç] surfaces after a [−low] front vowel in (3). There are no examples in which /x/ occurs after a consonant. The [x ç] in these examples derive historically from WGmc $^{+}$[x].

(2) Postvocalic [x] from /x/:

a.	jūxən	[ʝuːxən]	jauchzen	‘cheer-INF’	35
b.	jux	[ʝux]	euch	‘you-ACC/DAT PL’	229
c.	bụxt	[bʊxt]	Bucht	‘bay’	201
d.	dọxtər	[dɔxtər]	Tochter	‘daughter’	63
e.	nɑxt	[nɑxt]	Nacht	‘night’	63
f.	hɑux	[hɑux]	hoch	‘high’	223
g.	duọxt	[duɔx]	doch	‘however’	206
h.	šlȧxt	[ʃlæxt]	schlecht	‘bad’	63
	hȧx	[hæx]	Hauch	‘breath’	221

(3) Postvocalic [ç] from /x/:

a.	lįχtə	[lɪçtə]	leicht	‘light’	63
	įnzįχt	[ɪnzɪçt]	Einsicht	‘insight’	228
b.	ly̨χtən	[lʏçtən]	leuchten	‘glow-INF’	63
c.	lęχt	[lɛçt]	Licht	‘light’	63
	tręχtər	[trɛçtər]	Trichter	‘funnel’	20
d.	fərnøχtərən	[fərnœçtərən]	ernüchtern	‘sober-INF’	211

The data in (3) indicate that [ç] surfaces in coda position after any one of the four [−low] short lax vowels [ɪ ʏ ɛ œ], provided that [t] follows; recall from §4.3 that this is a pattern common among Wph dialects.

Since Rhoden lies in the vicinity of the HG dialect continuum (NHes), it is not surprising that the dialect has adopted copious HG loanwords, as in (4). These data illustrate that velar [x] surfaces after any back vowel in (4a) or after the [+low] front vowel [æ] in (4c). By contrast, palatal [ç] occurs after any [−low] front vowel in (4b).

(4) [x]/[ç] (from /x/) after vowels in loanwords:

a.	lǫx	[lɔx]	Loch	'hole'	49
	drɑxə	[drɑxə]	Drache	'dragon'	49
b.	ry˛χən	[rʏçən]	riechen	'smell-INF'	124
	šprḭχələn	[ʃprɪçələn]	hochdeutsch sprechen 'speak-INF High German'		270
	leiχə	[leiçə]	Leiche	'body'	49
	keiχən	[keiçən]	keuchen	'gasp-INF'	231
	zęiχən	[zɛiçən]	seichen	'piss-INF'	260
	šmęiχəln	[ʃmɛiçəln]	schmeicheln	'flatter-INF'	266
	gnøyχələn	[gnøyçələn]	lächeln	'smile-INF'	220
c.	frɑ̇x	[fræx]	frech	'impudent'	49

The items listed in (4b) with diphthongs ([ei ɛi øy]) are important because they show that [ç] occurs after any [−low] front vowel and not simply after the four [−low] short lax vowels [ɪ ʏ ɛ œ] in the native examples in (3).

Velar [ɣ] (=⟦ɣ⟧) surfaces in a word-internal onset after a sonorant; recall Soest (§4.3). The following examples exemplify the occurrence of [ɣ] after a back vowel in (5a), the [+low] front vowel in (5b), a [−low] front vowel in (5c), or a liquid in (5d).

(5) Postsonorant [ɣ] (from /ɣ/):

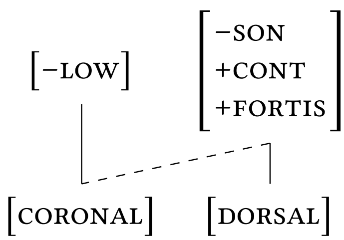
a.	frǭɣən	[frɔː.ɣən]	fragen	'ask-INF'	52
	rǫɣən	[rɔ.ɣən]	Roggen	'rye'	52
	māɣən	[mɑː.ɣən]	Magen	'stomach'	52
	zouɣən	[zou.ɣən]	saugen	'suck-INF'	34
b.	zɑ̇ɣən	[zæ.ɣən]	säen	'sow-INF'	260
c.	iɣəl	[i.ɣəl]	Igel	'hedgehog'	52
	drḭɣərt	[drɪ.ɣərt]	¾ Morgen	'ca. 1 acre'	52
	bry˛ɣə	[brʏ.ɣə]	Brücke	'bridge'	52
	węɣə	[wɛ.ɣə]	Weck	'bread roll'	52
	šnę̄ɣəl	[ʃnɛː.ɣəl]	Schnecke	'snail'	52

	mø̨ɣə	[mœ.ɣə]	Mühe	‘trouble’	54
	zɑiɣən	[zɑi.ɣən]	säugen	‘lactate-INF’	52
d.	fɑ̇lɣə	[fæl.ɣə]	Felge	‘wheel rim’	52
	zuǫrɣə	[zuɔr.ɣə]	Sorge	‘sorrow’	52

The items listed in (5c) show that /ɣ/ is not a target for velar fronting (see below). Martin (1925: 52) is clear on this point when he writes that [ɣ] surfaces in word-internal position even after a front vowel (“auch nach palatalem vocal”).

The data in (3–4) show that [ç] occurs after a [−low] front vowel and velar [x] in the elsewhere case. [x]/[ç] derive from /x/ by (6). Note that Velar Fronting-5 is distinct from Velar Fronting-2 (§3.4) because only the former requires that the target be specified for a laryngeal feature ([+fortis]).

(6) Velar Fronting-5:



The set of triggers for Velar Fronting-5 consists of all [−low, coronal] segments. Since [±low] is distinctive only for vowels and not for consonants there is no need to specify the leftmost segment of that rule (the target) as [−consonantal]. The loanword data in (4) are significant because they show that fronting is triggered by any [−low] front vowel and not simply by the four [−low] short lax vowels present in the native words in (3).

As in Soest, many morphemes in Rhoden exhibit [x]~[ɣ] alternations, where both fricatives derive historically from WGmc ⁺[ɣ]. The word pairs in (7) illustrate that [x] is in the coda and [ɣ] in a word-internal onset. [x] surfaces after a back vowel in (7a–7e) or a liquid in (7f). By contrast, [ɣ] can surface after any type of sound, i.e. front vowel, back vowel or liquid. As indicated below, the sound underlying [x]~[ɣ] alternations as in (7) is /ɣ/.

(7) [x]~[ɣ] alternations (from /ɣ/):

a.	plōx	[plo:x]	Pflug	‘plow’	254
	plø̄ɣən	[plø:.ɣən]	pflügen	‘plow-INF’	254
b.	dɑx	[dɑx]	Tag	‘day’	52
	dɑɣən	[dɑ.ɣən]	Tage	‘day-PL’	202

c.	kynəx	[ky.nəx]	König	‘king’	86
	kynəɣə	[ky.nə.ɣə]	Könige	‘king-PL’	86
d.	truǫx	[truɔx]	Trog	‘trough’	86
	truǫɣə	[truɔ.ɣə]	Tröge	‘trough-PL’	86
e.	flɑux	[flɑux]	flog	‘fly-PRET’	74
	flēɣən	[fleː.ɣən]	fliegen	‘fly-INF’	213
	flyø̧ɣən	[flyœ.ɣən]	flögen	‘fly-SUBJ’	26
f.	bɑlx	[bɑlx]	Balg	‘brat’	86
	bɑ̇lɣə	[bæl.ɣə]	Bälge	‘brat-PL’	86

Similar fortis vs. lenis alternations involve other fricative (and stop) pairs, e.g. [glɑs] ‘glass’ vs. [glɛː.zə.rə] ‘glass-PL’.

Fortis-lenis alternations like the ones in (7) are captured with underlying lenis sound (/ɣ/), which surface as fortis in coda position by Final Fortition (§4.2) in (8). Nonalternating fortis sounds are underlyingly fortis, e.g. /x/ in [lɑ.xən] ‘laugh-INF’.

(8) Final Fortition:

$[-\text{sonorant}] \rightarrow [+\text{fortis}]\ /\ \_\_\ C_0\ ]_\sigma$

The words in (9) are like the ones in (7) in the sense that they exhibit [x]~[ɣ] alternations derived from /ɣ/. In contrast to the items presented in (7), the segment preceding the [x] in (9) is a [−low] front vowel. The significance of the data in (9) is that the |x| created by Final Fortition does not undergo Velar Fronting-5. Hence, the |x| produced by Velar Fronting-5 is opaque and not transparent.

(9) [ɣ]~[x] alternations (from /ɣ/):

a.	zę̄ɣən	[zɛː.ɣən]	sagen	‘say-INF’	82
	zę̄x	[zɛːx]	sag	‘say-IMP.SG’	82
	zięxtə	[ziɛx.tə]	sagte	‘say-PRET’	82
	əzięxt	[əziɛxt]	gesagt	‘say-PART’	82
b.	wę̄x	[βɛːx]	Weg	‘path’	85
	wę̄ɣə	[βɛː.ɣə]	Wege	‘path-PL’	85
c.	ęɣən	[ɛ.ɣən]	eggen	‘harrow-INF’	80
	ięxtə	[iɛx.tə]	eggte	‘harrow-PRET’	80
d.	lę̄ɣən	[lɛː.ɣən]	legen	‘place-INF’	240
	ųngəlięxt	[ʊngəliɛxt]	ungelegt	‘unplaced’	279
e.	kreiɣən	[krei.ɣən]	kriegen	‘wage war-INF’	236
	kreix	[kreix]	Krieg	‘war’	236

f.	dāɣən	[dɑː.ɣən]	tagen	'hold a meeting-INF'	202
	dē̜xlək	[dɛːx.lək]	täglich	'daily'	203
g.	myɣən	[my.ɣən]	mögen	'like-INF'	246
	myxlək	[myx.lək]	möglich	'possible'	246
h.	tøyɣə	[tøy.ɣə]	Zeuge	'witness'	277
	tøyxni̜s	[tøyx.nɪs]	Zeugnis	'testimonial'	277

Martin does not provide examples for [x] (from /ɣ/) after any of the four [−low] short front lax vowels ([ɪ ʏ ɛ œ]) present in the (native) items in (3), but I consider this to be an accident. In particular, Martin's description of the inflectional morphology (pp. 72–95) implies that there should be examples in which [x] (from /ɣ/) also occurs after [ɪ ʏ ɛ œ]. For example, the [ɣ] in a word-internal onset surfaces in coda position as [x] in the imperative singular of weak verbs, e.g. [zɛːx] 'say-IMP.SG' in (9a). Rhoden has several weak verbs with vowels like [ɪ ʏ ɛ œ] followed by /ɣ/, e.g. [ʃpɪɣən] 'spit-INF' (=⟦špi̜ɣən⟧), which presumably surface with [x] after the same stem vowel in the imperative singular, but these examples are not provided in the original source.

It is interesting to consider the passages in Martin (1925) describing the data presented above because he indicates not only that he is aware of the regular patterning of [x] and [ç] but also the aberrant instances of [x]. For example, Martin (1925: 63) states with respect to (3) that WGmc $^{+}$[x] (before [t]) is realized as [ç] after a front vowel ("nach palatalen [Vocalen]"). However, Martin (1925: 14) also notes in the introduction that quite often one hears [x] after a front vowel (" ...hört man sehr oft *x* ... nach palatalen Vocalen"). It is especially significant to observe that Martin (1925: 52) recognizes that the modern reflex of historical $^{+}$[ɣ] in (10) is a voiceless velar fricative in coda position *even if the preceding vowel is front* (my emphasis). He writes: "Im Auslaut wird wg. *g* (=$^{+}$[ɣ]) zum stimmlosen velaren Spiranten (auch bei vorausgehenden palatalen Vocalen)..."

The examples given above show that it is difficult to find examples in which [x] and [ç] occur after precisely the same vowel. As noted earlier, for historical reasons [ç] (from /x/) is only attested after the four [−low] front vowels [ɪ ʏ ɛ œ] and before [t]. By contrast, the bulk of the native examples with [x] (from /ɣ/) show that fricative occurring after vowels other than [ɪ ʏ ɛ œ]. What is more, it is clear from (3) that [ç] (from /x/) surfaces after any [−low] front vowel and that the opaque [x] derives from /ɣ/.

Opaque examples like the ones in (9) are accommodated by ensuring that only an underlying /x/ but not the |x| derived from /ɣ/ by Final Fortition (Fnl For) undergoes Velar Fronting-5 (Vel Fr-5). This is captured in (10a), which illustrates underapplication (counterfeeding) opacity. The two examples are drawn from (9a) and (3c).

(10)

a.		/zeːɣ/	/lɛxt/	b.		/zɛːɣ/	/lɛxt/
	Vel Fr-5	-------	lɛçt		Fnl For	zɛːx	------
	Fnl For	zɛːx	------		Vel Fr-5	zɛːç	lɛçt
		[zɛːx]	[lɛçt]			*[zɛːç]	[lɛçt]
		‘say-IMP.SG’	‘light’				

If the output of Final Fortition were to feed Velar Fronting-5 in (10b), then the derived fortis dorsal fricative |x| in words like /zɛːɣ/ ‘say-IMP.SG’ would incorrectly surface as the palatal [ç]. The distinction between an underlying /x/ and a derived |x| is correctly captured in (10a) if Final Fortition counterfeeds Velar Fronting-5. This means that the underlying /x/ in words like /lɛxt/ ‘light’ shifts to a palatal |ç| before the underlying /ɣ/ in words like /zeːɣ/ ‘say-IMP.SG’ becomes a fortis velar [x] by Final Fortition. The opaque system in (10a) is a specific example of the hypothetical Dialect G from Figure 2.8.

The development of the three typical words from (3c) and (9a) is depicted in (11) for the three historical stages referred to in previous chapters. For each stage the underlying representation and the phonetic representation are provided.

(11)

/zɛːɣ-ən/	/zɛːɣ/	/lɛxt/	
[zɛː.ɣən]	[zɛːx]	[lɛxt]	Stage 1
/zɛːɣ-ən/	/zɛːɣ/	/lɛxt/	
[zɛː.ɣən]	[zɛːç]	[lɛçt]	Stage 2
/zɛːɣ-ən/	/zɛːɣ/	/lɛxt/	
[zɛː.ɣən]	[zɛːx]	[lɛçt]	Stage 3
sagen	*sag*	*Licht*	StG
‘say-INF’	‘say-IMP.SG’	‘light’	

It is assumed above that Final Fortition was already present in the grammar at Stage 1; see §5.5.2 for discussion. Stage 2 depicts the point where Velar Fronting-5 was phonologized at the end of the grammar. Examples like [zɛːç] ‘say-IMP.SG’ and [lɛçt] ‘light’ indicate that the rule was transparent because it was fed by Final Fortition. The dialect of Rhoden as it was described in 1925 by Bernhard Martin is represented by Stage 3. Stage 2 in (11) is attested in Soest (§4.3), which is repeated in (12). Recall that this transparent system is a specific example of the hypothetical Dialect A from Figure 2.5.

(12)

		/stɪɣ-st/	/fʀœxt-n̩/
	Fnl For	stɪx-st	------
	Vel Fr-4	stɪçst	fʀœçtn̩
		[stɪçst]	[fʀœçtn̩]
		‘climb-2SG’	‘fear-INF’

Stage 3 in (11) therefore involved the change from a transparent relationship between Final Fortition and Vel Fr-4 in (12) to the opaque relationship in (10a).

In §2.5 I described the historical model adopted in this book, which sees change from one stage to the next as one involving a speaker pronouncing words which are then misperceived by listeners in acquisition. It is this misparsing of sounds uttered by adults that leads to the acquisition of the rule of velar fronting.

The change from transparent Stage 2 to opaque Stage 3 in (11) does not involve misperception. The interesting example is the shift from Stage 2 [zɛːç] ‘say-IMP.SG’ to Stage 3 [zɛːx]. If a speaker (P_1) utters [zɛːç] (from /zeːɣ/) at Stage 2, then the listener (P_2) correctly hears [zɛːç] and hence the question is why P_2 would opt for the Stage 3 opaque realization ([zɛːx]) rather than the Stage 2 transparent one ([zɛːç]). The answer is that P_2 has adopted a feature specific PARADIGM UNIFORMITY constraint (e.g. Downing et al. 2005): P_2 posits that the place of articulation of consonants in the cells of paradigms (verb conjugations and noun/adjective declensions) must remain the same. Given that requirement, the Stage 2 alternation between velar ([ɣ]) and palatal ([ç]) in examples like [zɛː.ɣən] vs. [zɛːç] is levelled to velar at Stage 3, namely [zɛː.ɣən] vs. [zɛːx]. Since P_2 is already aware of fortis vs. lenis alternations like the one in (7), (s)he has internalized Final Fortition and knows that the fortis vs. lenis alternation in pairs of words like [zɛː.ɣən] vs. [zɛːx] requires /ɣ/ and not /x/. For these reasons, P_2 posits a Stage 3 grammar in which Final Fortition counterfeeds velar fronting.

The description of changes involving dorsal fricatives in Martin’s (1925) grammar can be confirmed in the 97-page appendix of that work, which consists of a list in alphabetical order (in phonetic transcription) of all of the words cited in the grammar. An examination of that list also includes a small number of items within which [x] (from /x/) unexpectedly occurs after a front vowel; see (13).

(13)

	a.	gəšxi̯xtə	[gəʃxɪxtə]	Geschichte	‘history’	188, 218
	b.	fy˛xtə	[fʏxtə]	Feuchte	‘humidity’	36, 216
	c.	nø̨xtərən	[nœxtərən]	nüchtern	‘sober’	34, 248
	d.	lę̨xt, lę̨χt	[lɛxt], [lɛçt]	Licht	‘light’	40, 63, 87, 240
	e.	trę̨xtər, trę̨χtər	[trɛxtər], [trɛçtər]	Trichter	‘funnel’	20, 277

I refer to the words in (13) with [x] as irregularities to the otherwise regular process fronting /x/ after [−low] front vowels (Velar Fronting-5). For reasons that will become clear in §12.8.3 the words in (13) with the pronunciation [x] do not exemplify lexical exceptions as that term is usually employed in the literature.

Consider first the three items in (13a–13c). Martin (1925: 218) transcribes the word *Geschichte* 'history' in (13a) with his symbols for [ɪx] in both the appendix (p. 218) and in his transcription of an informant's recitation of a fairy tale (p. 188). One might argue that the post-[ɪ] dorsal fricative in [gəʃxɪxtə] is [x] and not [ç] because the vowel [ɪ] is preceded by [x]. This cannot be the correct interpretation because there are other words in which [ç] surfaces as expected after [ɪ] even though [x] precedes the vowel, e.g. [ʃxɪçt] 'shift' (Martin 1925: 262). Note too that the second [x] in [gəʃxɪxtə] occurs after the vowel [ɪ] but the words [lɪçtə] 'light' and [ɪnzɪçt] 'insight' from (3) show the regular pattern whereby /x/ surfaces as [ç] after that vowel. The same point holds for [fʏxtə] 'humidity' in (13b) in which the [x] contrasts with the [ç] in [lʏçtən] 'glow-INF' from (3). In [nœxtərən] 'sober' in (13c) the velar [x] similarly surfaces unexpectedly after the nonlow front vowel [œ], but in [fərnœçtərən] 'sober-INF' from (3), [ç] occurs as expected after [œ].

The items in (13d, 13e) differ from the ones in (13a–13c) because they exhibit both the expected pronunciation with [ç] as well as the unexpected pronunciation with [x]. The pronunciation with [x] for (13d) occurs only once (p. 240) and the realization with a palatal three times (p. 40, 63, 87). The pronunciation with [x] for (13e) is attested once (p. 277) and the expected realization with a palatal once (p. 20).

One might argue that Martin's ⟦x⟧ in (13) is merely a transcriptional error, but I consider that interpretation to be dubious. First, as indicated in the page numbers listed in the final column of (13), several of the irregular words are transcribed with ⟦x⟧ at more than one point in Martin's grammar. For example, if the word *Geschichte* were incorrectly transcribed with ⟦x⟧ after the vowel ⟦i̯⟧ on p. 218, what are the chances that Martin would make precisely the same mistake in the same word on p. 188? Note too that two other words are given on p. 218 in which Martin's ⟦χ⟧ (=[ç]) surfaces after ⟦i̯⟧, namely ⟦gəzi̯χtə⟧ 'face' (=[gəzɪçtə]) and ⟦gəri̯χt⟧ 'dish' (=[gərɪçt]). Second, the aberrant items in (13) always involve ⟦x⟧ after a [−low] front vowel, but never ⟦χ⟧ after a [+low] front vowel or back vowel. That generalization correlates with the author's observation commented on earlier that velar [x] is often heard in the front vowel context. If the ⟦x⟧ in (13) were simply a transcriptional error, then one would expect the author to also incorrectly transcribe a palatal ⟦χ⟧ after the vowels [uː u ʊ oː ɔː ɔ ɑː ɑ ə] or [æ], but no such examples are present in Martin (1925). Third, several commentators have observed that [x] can surface in the neighborhood of front vowels in ELG even when velar fronting can be shown to be active (see §12.8.3 for discussion). Hence, the unexpected items in (13) are representative of LG in general.

I claim that there is a connection between the items in (13) and the opaque [x] in (9), although further study is necessary to determine the nature of that connection. According to one scenario (Analysis A), when Velar Fronting-5 was operative at Stage 2 in (11), it was not only transparent (because it was fed by Final Fortition), but also regular because there were no items like the ones in (13). At some point still at Stage 2 irregularities emerged, e.g. the earlier realization [gəʃxɪçtə] 'history' was replaced with the irregular [gəʃxɪçtə] in (13a), and then eventually more aberrant items arose. The presence of those words eventually signalled to the listener that sequences such as [ɪx] are acceptable, which then served as a catalyst for the shift from Velar Fronting-5 as a rule applying at the end of the grammar at Stage 2 to an opaque rule counterfed by Final Fortition at Stage 3. According to a second alternative (Analysis B), it was the other way around: At Stage 2 there were no irregularities at all, and then Velar Fronting-5 moved up so that it was counterfed by Final Fortition. According to Analysis B it was the presence of opaque examples like [zɛːx] say-IMP.SG' (from /zɛːɣ/) that signaled to the listener that [x] is acceptable after a nonlow front vowel, which then served as a catalyst for the emergence of the items in (13).

At this point one cannot know for certain which of the two scenarios is the more likely. On the one hand, there are LG varieties referred to earlier (discussed in §12.8.3) with irregularities like the ones in (13) but no opaque forms, which would argue against Analysis B. However, there are also dialects with opacity but without irregularities (§5.3.1), which would pose a problem for Analysis A.

To summarize, the Rhoden system involving underapplication opacity (recall 10) is unique. Although several other varieties of German are described in §5.3 where a rule creating a fortis dorsal fricative |x| counterfeeds velar fronting, the derived |x| in those dialects derives synchronically (and diachronically) from the rhotic phoneme. By contrast, Rhoden is the only dialect discovered in the present survey where Final Fortition creates |x| from /ɣ/, which in turn counterfeeds velar fronting.[2]

[2]There is scant evidence from a brief description of the variety of LFr of Homberg (Meynen 1911; Map 5.1) suggesting that there is a similar pattern attested elsewhere. Homberg has a version of velar fronting in which the target is /x/ and the trigger is any preceding front vowel. Meynen gives a very small number of words ending in a front vowel plus [x], but in those examples the [x] derives from [ɣ] which was followed historically by schwa, e.g. ⟦zæ¹x⟧ 'saw' (cf. StG *Säge*). That word can be compared to one in which [x] derives from /x/, where there was no following schwa, e.g. ⟦ræ¹χ⟧ 'right' (cf. StG *recht*). Since Meynen (1911) does not provide enough data to draw the correct conclusions I do not discuss this example further.

5.3 Opaque realization of /r/ and velar fronting

German velar fronting dialects are attested in which the rhotic consonant (/ʀ/) is realized as a fortis velar fricative ([x]) in the context after front vowels. The most detailed treatment of that opaque rhotic reported in the literature to my knowledge is a Rpn variety described in §5.3.1. §5.3.2 investigates a strikingly similar pattern for a community of early twentieth century SBav speakers in Silesia. §5.3.3 discusses the areal distribution of counterfeeding opacity in German dialects

5.3.1 Ripuarian

The data given below are drawn from Hall (1993), who describes and analyzes the speech of several informants living in the general vicinity between Düsseldorf and Cologne (Köln); see Map 5.1. Following the original source, I refer to this Rpn variety as Lower Rhine German (LRG).

LRG has the same vocalic sounds as StG (§17.2), namely front vowels /iː ɪ yː ʏ eː ɛː ɛ øː œ/, back vowels /uː u ʊ oː ɔ ɑː ɑ ə/), and diphthongs ending in a front vowel (/ɑi ɔy/) or back vowel (/ɑu/). The relationship between the two surface dorsal fricatives ([x]/[ç]), which only occur in postsonorant position, is depicted in (14).[3]

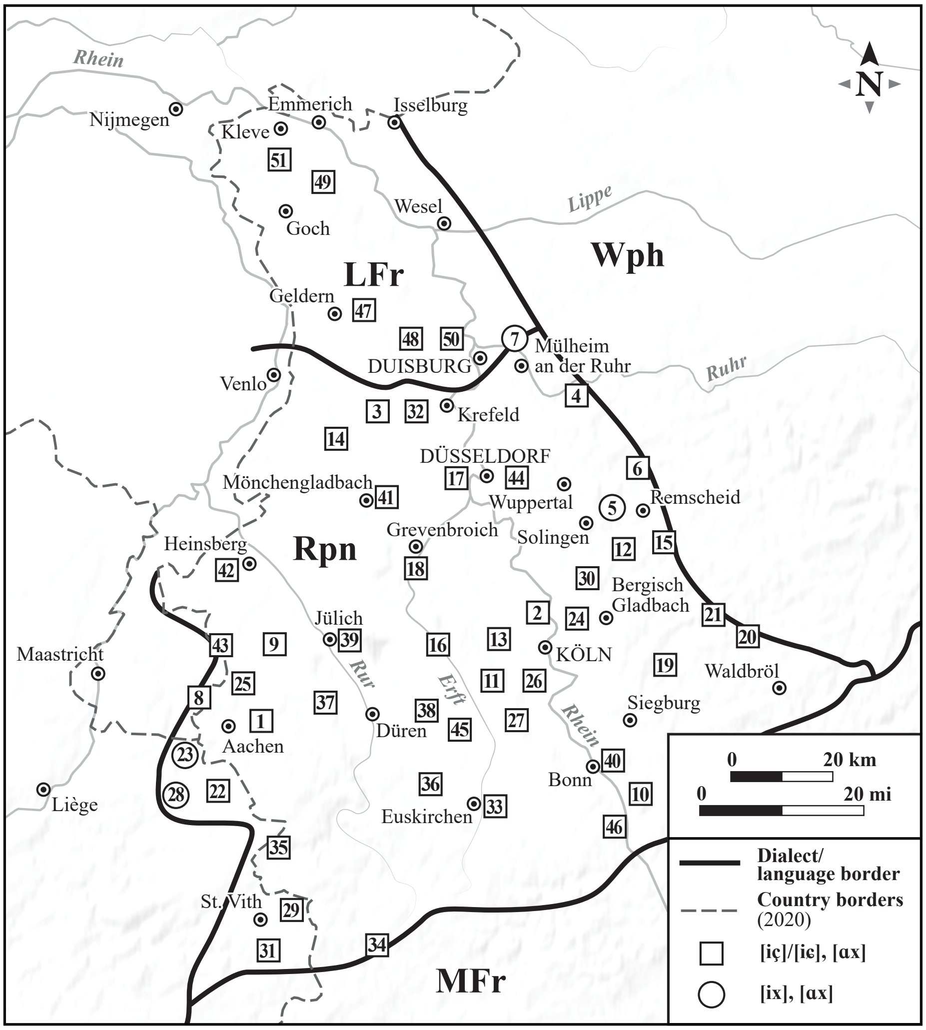
(14) /x/

[x] [ç]

[x] occurs after a back vowel in (15a) and [ç] after a front vowel in (15b) or a sonorant consonant in (15c).[4]

[3]Hall (1993) transcribes [x] narrowly as uvular (⟦χ⟧). The etymological palatal [ʝ] surfaces word-initially before any vowel. LRG has no [ɣ] because g-Formation-1 (§4.2) restructured WGmc $^{+}$[ɣ] (/ɣ/) to [g] (/g/). As in StG, LRG [g] alternates with [ç] after the front vowel [ɪ], e.g. [køːnɪç] 'king' vs. [køːnɪgə] 'king-PL' (§1.2). I ignore data like these because they are peripheral; see §17.2 for discussion.

[4]In contrast to some of the dialects discussed earlier (e.g. Ramsau am Dachstein in §3.5 and Soest in §4.3), palatal [ç] surfaces unexpectedly in LRG after the back vowel [ɐ] (from /ʀ/), e.g. [dʊɐç] 'through'. This is an example of a palatal quasi-phoneme, which is discussed in detail in Chapter 7 for several other regional varieties and in §17.2 for StG.



Map 5.1: Ripuarian (Rpn) and Low Franconian (LFr). Squares indicate postsonorant velar fronting and circles the absence of postsonorant velar fronting. 1=Rovenhagen (1860), 2=Wahlenberg (1877), 3=Röttsches (1877), 4=Koch (1879), 5=Holthausen (1885a), 6=Holthaus (1887), 7=Maurmann (1889), 8=Jardon (1891), 9=Schmitz (1893), 10=Müller (1900), 11=Münch (1904 [1970]), 12=Hasenclever (1905), 13=Müller (1912), 14=Frings (1913), 15=Lobbes (1915), 16=Grass (1920), 17=Zeck (1921), 18=Greferath (1922), 19=Mackenbach (1924), 20=Branscheid (1927) (Eckenhagen), 21=Branscheid (1927) (Berghausen), 22=Welter (1929), 23=Welter (1933), 24=Bubner (1935), 25=Welter (1938), 26=Heike (1964), 27=Heike (1970), 28=Jongen (1972), 29=Hecker (1972), 30=Heinrichs (1978), 31=Cajot & Beckers (1979), 32=Bister-Broosen (1989), 33–42=Cornelissen et al. (1989) (Euskirchen (33), Dahlem (34), Monschau (35), Zülpich (36), Langerwehe (37), Nörvenich (38), Jülich (39), Bonn (40), Mönchengladbach (41), Heinsberg (42)), 43=Hinskens (1992), 44=Hall (1993), 45=Kreymann (1994), 46=Fuss (2001), 47=Ramisch (1908), 48=Meynen (1911), 49=Hanenberg (1915), 50=Bethge & Bonnin (1969), 51=Stiebels (2013).

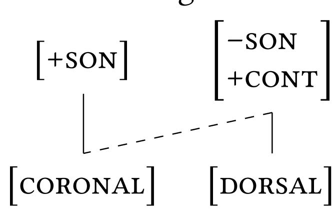
(15) [x] and [ç] (from /x/):

a.	[tuːx]	Tuch	‘towel’
	[bʊxt]	Bucht	‘bay’
	[hoːx]	hoch	‘high’
	[kɔx]	Koch	‘cook’
	[bɑx]	Bach	‘stream’
	[nɑːx]	nach	‘after’
	[bɑux]	Bauch	‘stomach’
b.	[ziːç]	siech	‘ailing’
	[lɪçt]	Licht	‘light’
	[gəʀʏçt]	Gerücht	‘rumor’
	[ʀɛçt]	recht	‘right’
	[ʀɑiç]	Reich	‘empire’
	[ɔyç]	euch	‘you-ACC/DAT.PL’
c.	[mœnç]	Mönch	‘monk’
	[dɔlç]	Dolch	‘dagger’

Umlaut alternations predictably trigger the occurrence of [x] or [ç], e.g. [buːx] ‘book’ vs. [byːçɐ] ‘book-PL’.

The complementary distribution of [x] and [ç] is expressed by analyzing [ç] as a positional variant of /x/. The rule capturing the data in (15) is Velar Fronting-1, which is reproduced in (16).

(16) Velar Fronting-1:



Since the opaque [x] discussed below derives from /ʀ/ it is essential that the phonological patterning and phonetic realization of that liquid be addressed.

As is StG, the one underlying rhotic (/ʀ/) patterns in LRG as a [+sonorant] sound, although it can optionally surface as an obstruent ([ʁ]). The disconnect between the phonological patterning and the phonetic realization is discussed at length in Hall (1993). The claim defended in that work – also adopted here – is that the realization of /ʀ/ as an obstruent is expressed as an optional synchronic process that has become phonologized in LRG.

/ʀ/ is phonologically a sonorant because it patterns together with other sonorants in terms of syllabification. German syllables obey the Sonority Sequencing Generalization (e.g. Clements 1990, Parker 2011) in the sense that syllable-initial clusters exhibit a sonority rise (from left-to-right) and syllable-final clusters a sonority fall (from left-to-right). The Sonority Hierarchy for German (§4.5.2) makes crucial reference to /ʀ/.

The distinction between /ʀ/, /l/ and the nasals derives motivation from the fact that word-final /ʀ/+/l/, /l/ + nasal and /ʀ/ + nasal are all parsed as coda clusters in (17a), while /l/ + /ʀ/, nasal + /l/, and nasal + /ʀ/ in the same context are heterosyllabified in (17b).

(17)	a.	[kɛʀl]	Kerl	'fellow'
		[fɪlm]	Film	'film'
		[ɑʀm]	Arm	'arm'
		[tsɔʀn]	Zorn	'anger'
	b.	[kɛlɐ]	Keller	'cellar'
		[tʊnl̩]	Tunnel	'tunnel'
		[hɪml̩]	Himmel	'sky'

The Sonority Hierarchy supports the analysis of /ʀ/ as a [+sonorant] sound. Were /ʀ/ analyzed as [−sonorant], then the generalization would be lost that the entire natural class of [+sonorant] sounds is more sonorous than the class of [−sonorant] sounds.

A number of studies have shown that one of the realizations of German /ʀ/ is a lenis uvular fricative ([ʁ]), e.g. Ulbrich (1972), Kohler (1977a: 169). In particular, the amount of constriction in the vocal tract for the consonantal rhotic can increase to the point where friction occurs. According to Ulbrich (1972), the most common realization of the consonantal (nonvocalized) rhotic is the fricative [ʁ], although a non-fricative sound ([ʀ]) is also common.[5] Data displaying the variation between the sonorant [ʀ] and the obstruent [ʁ] are presented for word-initial position in (18a), between vowels in (18b), the second member of an onset cluster in (18c), and coda position after a short vowel in (18d).

(18)	a.	[ʀɑːzən], [ʁɑːzən]	Rasen	'lawn'
	b.	[mʏʀɪʃ], [mʏʁɪʃ]	mürrisch	'sullen'
	c.	[dʀɑŋ], [dʁɑŋ]	Drang	'impulse'
	d.	[hɛʀ], [hɛʁ]	Herr	'gentleman'

[5] The non-fricative articulation referred to here is either a trill or an approximant. The distinction between those two realizations is not important in the following discussion because both trills and approximants are [+sonorant] from the point of view of phonology.

The data discussed above require the operation in (19), which converts the sonorant /ʀ/ into the corresponding obstruent. Desonorization-2 differs minimally from Desonorization-1 (§3.6), which is not context-free. Desonorization-2 is optional in order to account for both realizations in (18).

(19) Desonorization-2:

$$\begin{bmatrix} +\text{CONS} \\ +\text{SON} \\ -\text{NASAL} \\ \text{DORSAL} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{SON} \\ +\text{CONT} \end{bmatrix}$$

One might assume that the variation in (18) is purely phonetic and not phonological. This might be the case in some German dialects, but it will be argued below that Desonorization-2 was phonologized in LRG because the derived sound it creates (|ʁ|) forms the input to the rule creating the opaque [x], which itself is nondistinct from underlying /x/. Since the assimilatory operation posited below creating opaque [x] is a phonological rule, the implication is that Desonorization-2 cannot be a rule of phonetic implementation; recall the relationship between Phonology and Phonetics in Figure 2.1.

/ʀ/ vocalizes to [ɐ] in coda position. Alternations between [ɐ] and [ʀ]/[ʁ] are presented in (20). The change from /ʀ/ to [ɐ] by r-Vocalization (§4.3) in (21) is obligatory after a long vowel in (20a) and optional after a short vowel in (20c). I offer no explanation for the condition on optionality.[6]

(20)

a.	[tiːɐ]	Tier	‘animal’
b.	[tiː.ʀə], [tiː.ʁə]	Tiere	‘animal-PL’
c.	[hɛɐ], [hɛʀ], [hɛʁ]	Herr	‘gentleman’
d.	[hɛ.ʀən]	Herren	‘gentleman-PL’

(21) r-Vocalization:

$$\begin{bmatrix} +\text{CONS} \\ +\text{SON} \\ -\text{NASAL} \\ \text{DORSAL} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{CONS} \end{bmatrix} \; / \; \_\_\_\_ \; C_0 \;]_\sigma$$

Condition: Optional after a short vowel

[6]The vocalized-r is transcribed in Hall (1993) as ⟦ʌ⟧, which I render for the sake of consistency with other varieties of German as [ɐ].

The data in (15) suggest that the distribution of [x] and [ç] is fully transparent. That this is not the case, is illustrated in the additional data below. Those examples (Hall 1993: 92–93) reveal that there are two optional realizations of an underlying /ʀ/ in the context after a short vowel and before a fortis coronal obstruent. In (22) the coronal referred to here is word-final, and in (23) it is in the onset. The first column in both data sets shows that underlying /ʀ/ – indicated in the orthography as *r* – is realized either as the vowel [ɐ] or as the dorsal fricative [x]. The [x] in the examples listed below can occur after any short vowel, regardless of whether or not it is back in (22a, 23a) or front in (22b, 23b). Surface [x] in words like the ones in (22) and (23) must derive synchronically from /ʀ/ because that is the only source for the [ɐ] allophone present in the other optional variant.[7]

(22) [x] (from /ʀ/):

a.	[kʊɐs], [kʊxs]	Kurs	'course'
	[vɔɐt], [vɔxt]	Wort	'word'
	[mɑɐs], [mɑxs]	Mars	'Mars'
b.	[hɪɐʃ], [hɪxʃ]	Hirsch	'deer'
	[vɪɐt], [vɪxt]	Wirt	'host'
	[gəvʏɐts], [gəvʏxts]	Gewürz	'spice'
	[fɛɐs], [fɛxs]	Vers	'verse'

(23) [x] (from /ʀ/):

a.	[ʊɐ.tail], [ʊx.tail]	Urteil	'judgement'
	[vʊɐ.tsəl], [vʊx.tsəl]	Wurzel	'root'
	[fɔɐ.ʃən], [fɔx.ʃən]	forschen	'research-INF'
	[vɑɐ.tən], [vɑx.tən]	warten	'wait-INF'
b.	[fɛɐ.tɪç], [fɛx.tɪç]	fertig	'ready'
	[hɪɐ.ʃə], [hɪx.ʃə]	Hirsche	'deer-PL'
	[kʏɐ.tsɐ], [kʏx.tsɐ]	kürzer	'shorter'

The most significant examples presented above are the ones in (22b) and (23b), which show that velar [x] can occur after a front vowel. Regardless of how one analyzes the data, it is undeniably the case that LRG is a dialect in which [x] and [ç] contrast on the surface after front vowels (represented by [ɪ ʏ ɛ] below). This

[7] In the context after a short vowel and before anything other than a coronal obstruent, /ʀ/ in the coda surfaces either as [ɐ] or as the lenis dorsal (uvular) fricative [ʁ], but not as [x], e.g. [mɑɐkt], [mɑʁkt] 'market' (*[mɑxkt]). An /ʀ/ in coda position after a long vowel surfaces obligatorily as [ɐ], e.g. [leːɐt] (*[leːxt], *[leːʁt]) 'teach-3SG' (from /leːʀ-st/; cf. [leːʀən] 'teach-INF').

contrast is illustrated with several of the examples given earlier, which I repeat in (24): In (24a) velar [x] (from /ʀ/) surfaces after [ɪ ɛ ʏ] and before a fortis coronal obstruent, and in (24b) palatal [ç] (from /x/) surfaces in the same context. See also Wiesemann (1970: 67), who discusses a nearly identical set of data in a variety of German she calls "Northern Standard German". Wiesemann correctly observes that [x] (from /x/) and [ç] (from /ʀ/) contrast in the contrast after a front vowel.

(24) Surface contrasts between [x] and [ç] after /ɪ ɛ ʏ/:

a.	[vɪxt]	Wirt	'host'
	[gəvʏxts]	Gewürz	'spice'
	[fɛxs]	Vers	'verse'
b.	[lɪçt]	Licht	'light'
	[gəʀʏçt]	Gerücht	'rumor'
	[ʀɛçt]	recht	'right'

On the basis of the surface contrasts in (24) one might be inclined to analyze both the [ç] in words like [lɪçt] 'light' and the [x] in words like [vɪxt] 'host' as phonemic, i.e. /lɪçt/ vs. /vɪxt/, and to deny that [ç] is an allophone of /x/. I reject that treatment because it fails to recognize that the fully transparent [ç] in [lɪçt] has a different synchronic source than the opaque [x] in [vɪxt]. In particular, the [ç] in the former type of example is the surface realization of underlying /x/ produced by Velar Fronting-1, whereas the opaque [x] in words like [vɪxt] is a sound that derives from the rhotic phoneme /ʀ/. Seen in this light, the examples in (22) and (23) show that Velar Fronting-1 is active but that it is opaque in examples like the ones in (22b) and (23b).

LRG involves an interaction between Desonorization-2 in (19) and the process of laryngeal assimilation accounting for fortis vs. lenis alternations in examples like [leːst] 'read-2pl' with fortis [s] before fortis [t] vs. [leːzən] 'read-inf' with lenis [z] between vowels. The assimilation rule referred to above is stated linearly in (25), which differs only minimally from the eponymous assimilatory process posited in §3.6 for Upper Austria because the trigger for (25) is specified as a fortis coronal obstruent. It is argued in the original source to be required in addition to Final Fortition, which ensures that an obstruent is [+fortis] at the right edge of a syllable.

(25) Laryngeal Assimilation-2 (Lar Assim-2):

$$\begin{bmatrix}-\textsc{son}\end{bmatrix} \rightarrow \begin{bmatrix}+\textsc{fortis}\end{bmatrix} \;/\; \underline{\quad\quad} \begin{bmatrix}-\textsc{son}\\ +\textsc{fortis}\\ \textsc{coronal}\end{bmatrix}$$

In (26) I show how Desonorization-2 (Deson-2) feeds Laryngeal Assimilation-2 (Lar-Assim-2): The former creates |ʁ| and the latter |x|. Given the approach presupposed here, derived |x| in (26) has the same features as underlying /x/. As in Upper Austria (§3.6), the assumption is that [−nasal] is not present in |ʁ| or |x|.

(26)

$$
\begin{array}{ccccc}
/\text{ʀ}/ & \xrightarrow{\text{Deson-2}} & |\text{ʁ}| & \xrightarrow{\text{Lar Assim-2}} & |\text{x}| \\
\begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \\ -\textsc{nasal} \end{bmatrix} & & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \end{bmatrix} & & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \\ +\textsc{fortis} \end{bmatrix} \\
| & & | & & | \\
[\textsc{dorsal}] & & [\textsc{dorsal}] & & [\textsc{dorsal}]
\end{array}
$$

The opaque LRG examples presented above can be modelled in a rule-based approach consistent with the one proposed in Hall (1993). That treatment is illustrated in (27a): Desonorization-2 (Deson-2) feeds Laryngeal Assimilation-2 (Lar Assim-2), which itself counterfeeds Velar Fronting-1 (Vel Fr-1). This can be seen in the word [vɪxt] 'host' in (27a), which is intended to be representative of the data in (22b) and (23b). Significantly, Velar Fronting-1 applies at a point where the rhotic in that word has not yet been converted to [x] by Laryngeal Assimilation-2. If the latter were to feed Velar Fronting-1, then the [x] in words like [vɪxt] would incorrectly shift to the palatal [ç] after a front vowel, as in (27b). Note that the opaque system in (27a) is a specific example of the hypothetical Dialect G from Figure 2.8.

(27)

a.		/vɪʀt/	/lɪxt/	b.	/vɪʀt/	/lɪxt/
	Vel Fr-1	—	lɪçt	Deson-2	vɪʁt	—
	Deson-2	vɪʁt	—	Lar Assim-2	vɪxt	—
	Lar Assim-2	vɪxt	—	Vel Fr-1	vɪçt	lɪçt
		[vɪxt]	[lɪçt]		*[vɪçt]	[lɪçt]
		'host'	'light'			

Recall from §3.6 that the transparent relationship between the assimilation of laryngeal features (Laryngeal Assimilation-1) and Velar Fronting-1 as depicted above in (27b) is correct for Upper Austria, which corresponds to the hypothetical Dialect A from Figure 2.5.

Given the historical model introduced in §2.5, the modern-day system for LRG in (27a) represents opacity at Stage 3, while the transparent realization in (27b) exemplifies Stage 2. Stage 1 (not depicted above) is a system with Desonorization-2 and Laryngeal Assimilation-2, but without Velar Fronting-1. That type of dialect is therefore one where /ʀ/ surfaces as [x] before a fortis coronal obstruent (e.g. /vɪʀt/⟶[vɪxt]) but where /x/ is realized as [x] even after a front vowel (e.g. /lɪxt/⟶[lɪxt]). Although none of the sources cited in the present survey of German dialects explicitly describe such a dialect, the research referred to in §3.6 and §5.3.3 suggests that there are such systems among desonorizing SBav localities (e.g. Roitinger 1954: 203–207, Kranzmayer 1956: 124–127).

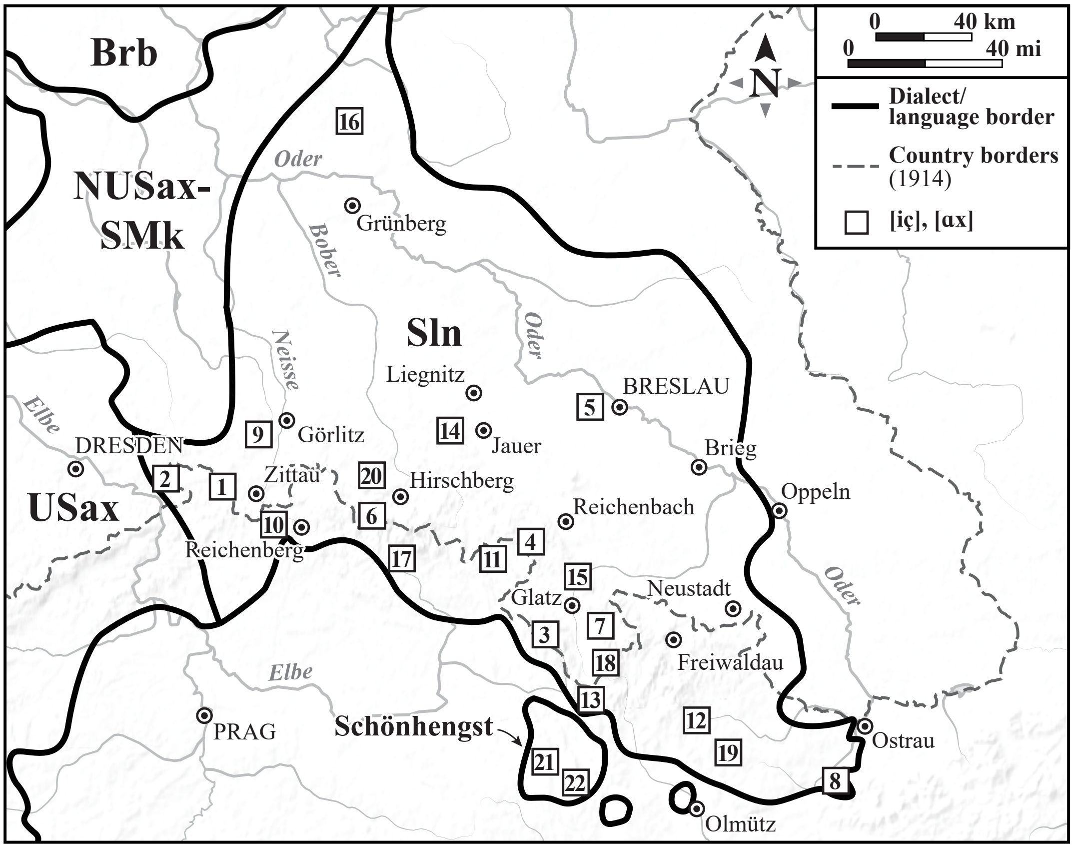
5.3.2 South Bavarian

The dialect described below is a variety of SBav originally spoken in the Ziller Valley (Zillertal), ca. 40 km to the east of Innsbruck in the Austria state of Tyrol (Map 3.3 and Map 15.9). In the year 1837 a number of those speakers – known as the Zillertaler Protestants ("Zillertaler Inklinanten") – emigrated to Prussia for religious reasons. Those emigrants settled in and around what was then known as Erdmannsdorf about 20km to the northwest of Hirschberg in the former province of Silesia (Siebs 1906; Map 5.2).

The source for the Erdmannsdorf dialect is Siebs (1906), who is known as the primary author of one of the most influential pronouncing dictionary of StG (Siebs 1898, de Boor et al. 1969). In contrast to other sources consulted in this book, Siebs (1906) is quite short (24 pages), and therefore the datasets discussed below exhibit several gaps. Nevertheless, the most significant generalizations (regarding /ʀ/ and velar fronting) are quite clear from the discussion in the original source.

Erdmannsdorf has front vowels (/iː ɪ yː ʏ eː ɛ øː œ/) and back vowels (/ʊ oː ɔ ɑː ɑ ə/) as well as a number of diphthongs, although the data with dorsal fricatives appear primarily after monophthongs. The two dorsal fricatives [x ç] (<WGmc $^{+}$[k] or $^{+}$[x]) stand in an allophonic relationship in postsonorant position, as in (28).[8]

[8] Siebs (1906: 110) is clear that his ⟦x⟧ and ⟦χ⟧ correspond to [x] and [ç] respectively, although he notes that ⟦χ⟧ is articulated in a slightly more retracted position ("weiter hinten") than [ç] in the standard language ("[B]ühnendeutsch"). The fine-grained difference between ⟦χ⟧ and [ç] is a matter of phonetics and is therefore ignored below. Erdmannsdorf also possesses a dorsal affricate (⟦kx⟧), although Siebs (1906: 125) does not discuss whether or not that sound has a palatal allophone in the neighborhood of front vowels, as in Rheintal (§3.4). The etymological palatal [j] is restricted in its distribution to word-initial position, and there is no [ʝ].



Map 5.2: Silesian (Sln). 20 is a variety of South Bavarian; 21 and 22 are German-language islands. Squares indicate postsonorant velar fronting. 1=Michel (1891), 2=Meiche (1898), 3=Pautsch (1901), 4=Hoffmann (1906), 5=von Unwert (1908), 6=Graebisch (1912a) (Kreis Hirschberg), 7=Graebisch (1912b) (Alt-Waltersdorf), 8=Wenzel (1919), 9=Giernoth (1917), 10=Kämpf (1920), 11=Festa (1925), 12=Rieger (1935), 13=Weiser (1937), 14=Halbsguth (1938), 15=Blaschke (1966), 16=Messow (1965), 17=SchlSA (Hohenelbe), 18=SchlSA (Grulich), 19=SchlSA (Bärn), 20=Siebs (1906), 21=Janiczek (1911), 22=Benesch (1979).

(28) [x] and [ç] (from /x/):

a.	moxn̥	[mɔxn̩]	machen	‘do-INF’	125
	āx	[ɑːx]	auch	‘also’	125
	hôax	[hoːɑx]	hoch	‘high’	114
b.	îχ	[iːç]	ich	‘I’	125
	küχn̥	[kʏçn̩]	Kuchen	‘cake’	115
	töχtr̥	[tœçtʀ̩]	Töchter	‘daughter-PL’	122
	kȫχ	[køːç]	Brei	‘porridge’	125
	kšleχt	[kʃlɛçt]	schlecht	‘bad’	125
c.	milχ	[mɪlç]	Milch	‘milk’	125

As indicated above, [x] occurs after a back vowel in (28a) and [ç] after a coronal sonorant in (28b, 28c).[9] There are various gaps (e.g. no dorsal fricatives after [ɪ yː ʊ]), which I interpret as accidental in light of the brevity of the source.

Words with velar [x] surfacing after a front vowel are common. The generalization is that the [x] in those examples has a different synchronic (and diachronic) source than the transparent [x ç] in (28), namely /ʀ/.

At several points in his article, Siebs (1906) discusses the realization of /ʀ/ in coda position (“Auslaut”). In general, /ʀ/ either deletes or is vocalized in that context (Siebs 1906: 119; 123). However, the author adds that the realization of the rhotic is [x] word-internally before a consonant or in final position. (“Neuhochd. r … im Inlaute vor Konsonanten und im Auslaute erscheint … als x (ch) …”). In the context before a consonant, /ʀ/ is pronounced as [x] before [s] or [st]. (“rs erscheint als x, rst als xt”). Recall from §3.6 that the historical change from the rhotic phoneme to a fortis dorsal fricative before sounds like [t] is well-documented in a number of varieties of Bav.

The data presented in (29) illustrate the realizations of /ʀ/ in coda position, as described in the preceding paragraph. The sound in question is reflected as *r* in the StG orthography in the third column. An item showing the vocalization of /ʀ/ (=⟦a⟧) is presented in (29a). Examples in which /ʀ/ surfaces as [x] after a back vowel and before a fortis coronal obstruent ([t] or [ts]) can be seen in (29b). Erdmannsdorf /ʀ/ also surfaces as [x] in coda position even if a consonant does not follow, as in (29c). The most significant examples are ones in which /ʀ/ surfaces as velar [x] after a front vowel, as in (29d). The post-front vowel [x] in some examples has an alternate with [ʀ], as in (29e).[10]

[9] As in Maienfeld (§3.3), there are also [x]~[ç]~[h] alternations (from /h/) in which [x] and [ç] have a transparent distribution. I ignore these data below. Erdmannsdorf has a palatal quasi-phoneme after a rhotic (cf. LRG).

[10] A peripheral point concerns the realization of w as in several items listed in (29). Siebs (1906: 109) observes that the sound in question is articulated with hardly any noticeable frication and

(29) Realizations of coda /ʀ/:

a.	vôa	[foːɐ]	vor	'before'	119
b.	wuxt	[bʊxt]	wurde	'become-PRET'	120
	wôxt	[boːxt]	Wort	'word'	114
	šwôxts	[ʃboːxt]	schwarz	'black'	120
	hêaxt	[heːɑxt]	hört	'hear-3SG'	114
	hêaxts	[heːɑxts]	Herz	'heart'	123
	êaxt	[eːɑxt]	erst	'only'	123
	bîəxtə	[biːəxtə]	Bürste	'brush'	123
c.	fôəx	[foːəx]	vor's	'before it'	123
	iəx	[iəx]	ihr	'you-PL'	120
	wû̂əx	[byːəx]	Wurst	'sausage'	115
d.	fextîχ	[fɛxtiːç]	fertig	'ready'	117
	fêxt	[feːxt]	fährt	'go-3SG'	112
e.	fîr	[fiːʀ]	vier	'four'	113
	fîxtə	[fiːxtə]	vierte	'fourth'	113

The critical reader may call into question that the [x] in (29) derives from /ʀ/. Recall from §5.3.1 that the /ʀ/ in similar data from LRG is justified on the basis of the optional pronunciation with [ɐ], whose only synchronic source is /ʀ/. Siebs does not say explicitly that the same kind of free variation is possible for his speakers, but he does provide examples like the ones in (29e) that justify /ʀ/.

The most important examples are the ones in (29), which reveal the occurrence of velar [x] after a front vowel. Erdmannsdorf [x] and [ç] contrast on the surface after front vowels. That contrast is illustrated with several of the examples presented above, which I repeat in (30): In (30a) velar [x] (from /ʀ/) surfaces in the coda after [iː ɛ], and in (30b) palatal [ç] (from /x/) surfaces in the same context.

(30) Contrasts between [x] and [ç] after /iː/ and /ɛ/:

a.	fîxtə	[fiːxtə]	vierte	'fourth'
	fextîχ	[fɛxtiːç]	fertig	'ready'
b.	îχ	[iːç]	ich	'I'
	kšleχt	[kʃlɛçt]	schlecht	'bad'

appears to be pronounced in onset position as [b]. (29d) demonstrates that *-ig* surfaces as [iːç] and not as the expected [iːk], which is the reflex of that suffix in UG. Siebs (1906: 124) notes that his informants pronounced the *g* in *-ig* as [k] or as [ç]. Given the examples in (29c), it is not clear why the rhotic in [fiːʀ] in (29e) fails to surface as [x].

Opaque examples in which [x] surfaces after a front vowel can be accounted for if Final Fortition counterfeeds Velar Fronting-1, cf. Rhoden (§5.2). Counterfeeding opacity is evident in the word [fiːxtə] 'fourth' in (31a), which is intended to be representative of all of opaque examples. Significantly, Velar Fronting-1 (Vel Fr-1) applies at a point where the rhotic in that word has not yet been converted to [x] by Final Fortition (Fnl For). If the latter were to feed Velar Fronting-1, then the [x] in words like [fiːxtə] would incorrectly shift to the palatal [ç] after a front vowel, as illustrated in (31b). Note that the correct output in (31a) is obtained if /ʀ/ undergoes Desonorization-1 (Deson-1), thereby feeding Final Fortition.

(31) a.

	/fiːʀ-tə/	/iːx/
Vel Fr-1	—	iːç
Deson-1	fiːʁtə	—
Fnl For	fiːxtə	—
	[fiːxtə]	[iːç]
	'fourth'	'I'

b.

	/fiːʀ-tə/	/iːx/
Deson-1	fiːʁtə	—
Fnl For	fiːxtə	—
Vel Fr-1	fiːçtə	iːç
	*[fiːçtə]	[iːç]

(31a) exhibits the underapplication of Velar Fronting-1: The fortis velar fricative in the phonetic representation potentially forms the input to Velar Fronting-1 because it stands after a front vowel. The opaque system in (31a) exemplifies the hypothetical Dialect G from Figure 2.8.

The historical progression from transparency to opacity is essentially the same as the one proposed earlier for LRG. Thus, the opaque Erdmannsdorf system in (31a) represents Stage 3, while the transparent system in (31b) illustrates Upper Austria (§3.6). Not depicted above is Stage 1, where Velar Fronting-1 was absent.

The opaque system in (31a) for Erdmannsdorf could not have arisen under the influence of Sln dialects spoken in the general vicinity. An examination of the sources for Sln reveals that there is no evidence for contact-induced change. This point is clear from the maps in the linguistic atlas for Silesia (SchlSA) for words with /r/ in the coda (e.g. Map 6 for *Kirche* 'church' and Map 38 for *Tür* 'door'). The rhotic in those words is most commonly realized on those maps as the coronal consonant [r], or it the vocalized-r; however, no variant with [x] (or [ç]) is attested. The same conclusion is drawn by all of the sources consulted for Sln. The following three examples are significant because they all reveal that [x] and [ç] have a transparent distribution.

Halbsguth (1938) describes the Sln dialect once spoken in Bremberg (Map 5.2). He writes that the rhotic surfaces as an untrilled tongue-tip-r ("ein ungerolltes Zungenspitzen-r") in word- and syllable-initial position (Halbsguth 1938: 29–30). In the coda, the sound is vocalized after a long vowel, but it is retained as [r] after a short vowel in coda position before velars and labials. In coda position after a short vowel, [r] tends to delete if the following consonant is a coronal. No mention is made of the realization of data like the ones in (29b–29e). In Bremberg, the palatals [ç ʝ] and velars [x ɣ] are the realization of the corresponding velars /x ɣ/ after a front vowel and back vowel respectively, but there does not appear to be an opaque [x] or an opaque [ɣ].

Pautsch (1901) provides a historical grammar of the Sln variety once spoken in Kieslingswalde (Map 5.2). On the basis of his description of the phonetics of consonants (p. 12), the one rhotic is a coronal tongue-tip sound ("Zungenspitzen-r") which vocalizes in coda position. The dialect has the four dorsal fricatives [x ɣ ç ʝ], but those sounds have a transparent distribution (i.e. palatals after coronal sonorants and velars after back vowels). There do not appear to be cases involving an opaque [x] or [ɣ].

Von Unwert (1908) is a descriptive grammar of the Sln dialect as it was spoken throughout the Prussian province of Silesia (Map 5.2) and the neighboring areas of the Austro-Hungarian Empire (modern-day Czech Republic). According to that source (pp. 33–34), [r] is a coronal sound articulated on the tongue-tip ("Zungenspitze") in onset position. In coda position that sound tends to either delete or vocalize before coronal consonants, but no mention is made of a [x] realization, as in (29b–29e). The dialect described by von Unwert has the velar fricative [x] and the two palatal fricatives [ç] and [ʝ], but those sounds all have a transparent distribution (von Unwert 1908: 52–54): [ç] and [ʝ] surface after a front vowel or coronal consonant ([l] or [r]) and [x] after a back vowel. There is no evidence for an opaque [x].

5.3.3 Areal distribution of opacity resulting from desonorization

The two case studies discussed above have in common that /ʀ/ surfaces as the velar fricative [x] even in the context after front vowels. It is interesting to observe that the same set of facts obtain in two places (in and around Düsseldorf and Erdmannsdorf) separated by several hundred kilometers.

The realization of the consonantal rhotic ([r]/[ʀ]) as the velar fricative [x] has been discussed at length in the literature on German dialectology and phonetics. A recent assessment of the state of that research can be found in NOSA: 309–321. According to that source the change [r]/[ʀ] > [x] is most prevalent in the Rpn and MFr dialect areas, but it is also attested throughout various places in North Germany. NOSA also concludes that the change typically occurs in the context after a short vowel and before fortis (voiceless) coronal obstruents, or some subset thereof (e.g. [t]). The data from North Germany discussed in NOSA reveal that the change is most common in the context after short back vowels, although the percentages listed (p. 319) make it clear that [x] can also occur in the context after a short front vowel. Since the areas in North Germany discussed in NOSA have velar fronting, sequences like [ɪx] (from /ɪʀ/) are therefore opaque.

In Table 5.2 I cite some of the sources known to me (other than LRG and Erdmannsdorf) which have documented the change [r]/[ʀ] > [x] in German dialects. These sources have in common that they either state explicitly that the change occurs in the context after a short vowel and before a coronal obstruent (or some subset thereof), or that context is implied by the examples they give. Since velar fronting is prevalent in all of the areas listed below any realization of [r]/[ʀ] as [x] after a front vowel implies an opaque system like the ones discussed in §5.3.1 and §5.3.2. Some of the sources give such opaque examples, while others only cite data in the context after a short back vowel.[11]

Table 5.2: Desonorization ([r]/[ʀ] >[x])in German dialects

Source	Area
Runschke (1938: 102)	Berlin
Meyer-Eppler (1959: 248)	Rpn/West Germany
Niekerken (1963: 171–173)	Area south of Hannover
Wiesemann (1970: 67)	North Germany
Kohler (1977a: 170)	Rhineland
Wängler (1983: 157–158)	North Germany
Macha (1991: 145–149)	Siegburg (Rpn)
Kreymann (1994: 73–77)	Erp (Erftstadt) (Rpn)
Lauf (1996: 213)	Eph dialect area
Cornelissen (2002: 298–300)	Rheinland (Rpn)
Elmentaler (2012: 108ff.)	Hannover
Möller (2013: 98; 172f.)	Bonn (Rpn)

The occurrence of desonorization throughout the Rhineland (Rpn/MFr) is also documented spatially in several maps. One example already cited in Table 5.2 can be found in Cornelissen (2002). Two linguistic atlases with similar maps are AAS (for *Garten* ‘garden’ in Volume 2 : 197) and ADA (for *Karte* ‘map’ and *Sport* ‘sports’).

[11]One of the works listed in Table 5.2 (Niekerken 1963: 171) observes that the change from rhotic to [x] occurs after the vowels [ɑ] and [o] and before [t], e.g. ⟦gɑxtn̩⟧ ‘garden’. By contrast, in the context after front vowels or [u], an epenthetic (back) vowel is inserted before the [x], e.g. ⟦vɪ̯ᵒxt⟧ ‘host’ (cf. StG [vɪʀt], LRG [vɪxt]). Epenthesis appears to be a strategy speakers adopt to avoid an opaque output. To the best of my knowledge no other German dialect is attested which involves a repair to avoid opacity.

Recall from §5.3.2 that the context for desonorization in Erdmannsdorf is not the same as the one attested in the places listed above. In particular, desonorization also occurs in the context (A) after a long vowel and before a fortis coronal obstruent or (B) in word-final position. The following three studies document either (A) or (B) in German dialects. Since velar fronting is active in all of these places the occurrence of derived [x] after a front vowel implies opacity.

In his study of the CG varieties spoken in Manderfeld and Wallerode (to the north(east) of St. Vith on Map 5.1), Hecker (1972: 67–68) writes:

> Im Auslaut kann /r/ als [x] realisiert werden, zum Beispiel /taːrt/ [taːxt] ‘Butterbrot’ … Ein auf /r/ zurückgehendes [x] kann auch nach palatalem Silbenkern vorkommen.
>
> “In the coda /r/ can be realized as [x], for example /taːrt/ [taːxt] ‘bread and butter’ … A [x] deriving from /r/ can also occur after a front vowel”.

The example shows that desonorization occurs in context (A). No examples are provided for the opaque sequences alluded to in this quote.

A more explicit statement concerning opacity can be found in Freund (1910: 97), who makes the following observation concerning the realization of /ʀ/ as a dorsal fricative in the variety of CHes spoken in Marburg (Map 7.1). The examples discussed under cases (2) and (3) in this quote differ from the data in other case studies in this section because they show that the contrast between /ʀ/ and /ɣ/ (=⟦ɣ⟧) is neutralized to [ɣ] in onset position and to [x] in the coda.

> “There is no difference in the pronunciation of (1) *Wacht* and *ward* [ʋaxt], *mocht* and *Mord* [moxt], *Wucht* and *wurd’* [ʋuxt] (fortis x); (2) *behagt* and *behaart* [bəhaːxt (lenis x); and (3) *Wagen* and *waren* [vaːɣn], *behagen* and *beharren* [bəhaːɣn], *saugen* and *sauren* [saoɣn] …”.

The important point regarding Freund’s treatment of Marburg /ʀ/ is that his data show the same kind of underapplication opacity as in LRG and Erdmannsdorf. Examples from Freund (1910: 97) with a derived [x] after a front vowel include [hexʃn] ‘rule-INF’ (cf. StG [hɛʀʃən]), [fexs] ‘verse’ (cf. StG [fɛʀs]), and [kixçə] ‘church’ (cf. StG [kɪʀçə]).

The final example is Müller (1958b), which contains a brief description of the consonants and vowels in Kassel (NHes), including a phonetically transcribed text from a native speaker (Map 7.1). It is clear from the transcriptions that the data are essentially the same as the ones described above for Marburg. Thus, /ʀ/ is realized as [x] after both back and front vowels, e.g. *erst* ‘only’ [ɛxst] (cf. StG [ɛʀst]) and *mehr* ‘more’ [meːx] (cf. StG [meːɐ] from /meːʀ/). The second example illustrates context (B). Significantly, the two examples cited here demonstrate opacity.

5.4 An apparent case of overapplication opacity

The dialects discussed in this chapter have in common that they involve underapplication. In particular, they all possess a velar fricative derived from some other sound (by Rule W from Table 2.7), but that derived velar fricative (|x|) fails to serve as a target segment for velar fronting. Rule W therefore counterfeeds velar fronting synchronically.

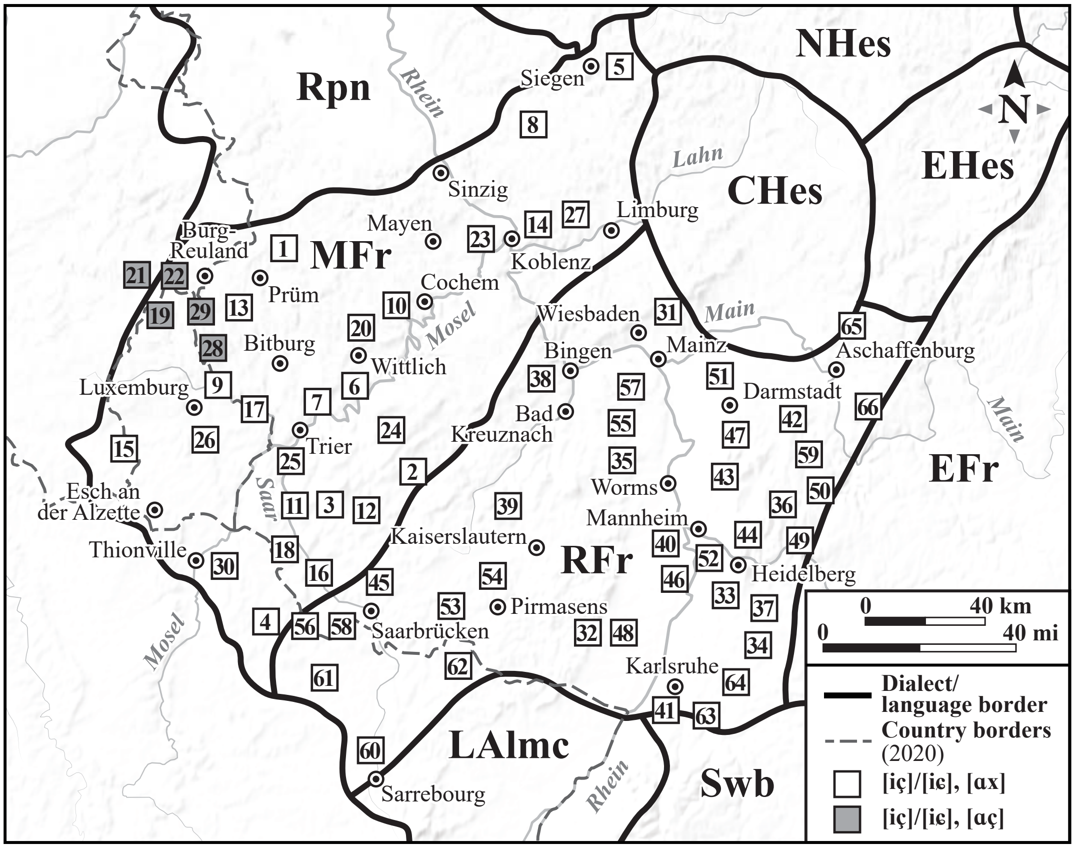
Although the underapplication of velar fronting in the synchronic phonology is well-attested, the overapplication of that same process is not. There is one potential example known to me of a synchronic process counterbleeding velar fronting thereby resulting in overapplication opacity. Although that type of example is very well-attested in German dialects, I demonstrate that there is a plausible alternative which does not require velar fronting to be counterbled by another process in the synchronic grammar.

Hommer (1910) describes a MFr dialect spoken in the northern part of Westerwald in the German state of Rhineland-Palatinate (Rheinland-Pfalz). Hommer's grammar focuses on the community of Sörth (Map 5.3).

It is clear from the material in Hommer (1910) that Sörth possesses the two underlying velar fricatives /x ɣ/, which have palatal allophones [ç ʝ] after any front vowel in (32c, 32d) or (coronal) liquid in (32e). After any full back vowel /x ɣ/ surface as velars in (32a, 32b).

(32) Postsonorant [x ɣ] and [ç ʝ] (from /x ɣ/):

a.	šdrux	[ʃtrux]	Strauch	'shrub'	22
	kōxən	[koːxən]	Kuchen	'cake'	22
	kǫxən	[kɔxən]	kochen	'cook-INF'	22
	māxən	[mɑːxən]	machen	'do-INF'	22
b.	fuɣəl	[fuɣəl]	Vogel	'bird'	25
	ōɣən	[oːɣən]	Augen	'eye-PL'	25
	frǭɣən	[frɔːɣən]	fragen	'ask-INF'	25
	grāɣən	[grɑːɣən]	Kragen	'collar'	25
c.	sīχ	[siːç]	siech	'ailing'	22
	liχ	[lɪç]	Leiche	'body'	22
	kyχ	[kyç]	Küche	'kitchen'	13
	šlēχt	[ʃleːç]	schlecht	'bad'	10
	eχ	[eç]	ich	'I'	22
	blęχ	[blɛç]	Blech	'tin'	22
	sø̄χən	[søːçən]	suchen	'search-INF'	10



Map 5.3: Moselle Franconian (MFr) and Rhenish Franconian (RFr). White squares indicate assimilatory postsonorant velar fronting, and the shaded squares represent nonassimilatory postsonorant velar fronting. 1=Büsch (1888), 2=Baldes (1896), 3=Fuchs (1903), 4=Tarral (1903), 5=Reuter (1903), 6=Ludwig (1906), 7=Thomé (1908), 8=Hommer (1910), 9=Engelmann (1910), 10=Wimmert (1910), 11=Thies (1912), 12=Scholl (1912), 13=Meyers (1913a,b), 14=Bach (1921), 15=Bertrang (1921), 16=Lehnert (1926), 17=Palgen (1931), 18=Pallier (1934), 19=Bruch (1952), 20= Bethge & Bonnin (1969), 21=Hecker (1972), 22=Cajot & Beckers (1979), 23=Mattheier (1987), 24=Reuter (1989), 25=Peetz (1989), 26=Gilles (1999), 27=Féry (2017), 28=MRhSA (Dahnen), 29=MRhSA (Lützkampen), 30=ALLG (Elzange), 31=Reis (1892), 32=Heeger (1896), 33= Lenz (1900), 34= Wanner (1907, 1908), 35=Haster (1908), 36=Wenz (1911), 37=Reichert (1914), 38=Martin (1922), 39=Christmann (1927), 40= Krell (1927), 41=Lauinger (1929), 42=Freiling (1929), 43=Seibt (1930), 44=Treiber (1931), 45=Kuntze (1932), 46=Waibel (1932), 47=Grund (1935), 48=Bertram (1937), 49=Kilian (1951), 50=Bauer (1957), 51=Keller (1961) (Darmstadt), 52=Liébray (1969), 53=Castleman (1975), 54=Karch (1980), 55=Karch (1981), 56=Steitz (1981), 57=Post (1987), 58=Pützer (1988), 59=Durrell & Davies (1989), 60=ALLG (Langatte), 61=ALLG (Laning) 62=ALLG (Schorbach), 63=SNBW (Remschingen), 64=SNBW (Bretten), 65=SUF (Schneppenbach), 66=SUF (Wintersbach).

d.	ijəl	[ɪɟəl]	Igel	'hedgehog'	24
	flyjəl	[flyɟəl]	Flügel	'wing'	24
	fējən	[feːɟən]	fegen	'sweep-INF'	24
e.	foljən	[fɔlɟən]	folgen	'follow-INF'	24
	bɑrjən	[bɑrɟən]	borgen	'borrow-INF'	24

The distribution of postsonorant dorsal fricatives in (32) is captured with Velar Fronting-1.

The crucial set of examples involves the occurrence of palatal [ç] after schwa ([ə]) in word-final (coda) position, as in (33). The corresponding velar ([x]) is not attested after that vowel. The consonant preceding [ə] is a coronal liquid, namely [r] in (33a) or [l] in (33b), but there are no words ending in [əç] preceded by anything other than [l] or [r]. The sound underlying [ç] is either /x/ (e.g. in the first word in 33a) or /ɣ/ in the remaining words, e.g. [bɑləç] in (33b), in which [ç] alternates with [ɟ] in [bɑlɟən] 'scrap-INF' (Hommer 1910: 5). Alternations involving [ɟ] and [ç] are captured with Final Fortition in (8).

(33)	a.	kęrəχ	[kɛrəç]	Kirche	'church'	22
		sɑrəχ	[sɑrəç]	Sorge	'sorrow'	11
		węrəχ	[vɛrəç]	Werg	'oakum'	22
	b.	bɑləχ	[bɑləç]	Balg	'brat'	24

The sequence [əç] appears to involve overapplication because palatal [ç] derives from velar /x/ after a vowel (schwa) that is not front.

The schwa in (33) is a synchronically epenthetic vowel. Hommer himself sees schwa in examples like the ones in (33) as the product of epenthesis (Svarabhakkti). The data in the original source indicate that schwa is epenthesized after a coronal liquid and before a coda labial or velar. Two examples with an epenthetic schwa after a liquid and before a coda labial are presented in (34a). Many words given in the original source are transcribed with and without schwa, as in (34b), indicating that the epenthesis process is optional. The examples in (34c) and (34d) show that the schwa after a liquid and before the dorsal fricative [ç] behaves precisely like the epenthetic schwa in (33a, 33b).[12]

(34)	a.	hɑləf	[hɑləf]	halb	'half'	26
		kɑrəf	[kɑrəf]	Korb	'basket'	26

[12] Although Hommer does not say so explicitly, the pattern of epenthesis described above only holds between a liquid and a noncoronal; hence, a word like *alt* 'old' (Hommer 1910: 23) is pronounced [ɑlt] and not [ɑlət]. Hommer provides some examples in which a schwa appears between a nasal and a noncoronal (e.g. [hɑnəf] 'hemp') and between a liquid and a coronal nasal (e.g. [gɑrən] 'yarn'). These complications do not bear on the present analysis.

b.	hɑlm, hɑləm	[hɑlm], [hɑləm]	Halm	'blade'	5
	kɑlk, kɑlək	[kɑlk], [kɑlək]	Kalk	'lime'	5
	šɑrf, šɑrəf	[ʃɑrf], [ʃɑrəf]	scharf	'sharp'	5
c.	bȩrχ, bȩrəχ	[bɛrç], [bɛrəç]	Berg	'mountain'	8, 24
	bȩrjən	[bɛrʝən]	in der Grube arbeiten 'work-INF in the pit'		8
d.	bɑlχ, bɑləχ	[bɑlç], [bɑləç]	Balg	'brat'	5, 24
	bɑljən	[bɑlʝən]	balgen	'scrap-INF'	5

Examples like the ones in (34c, 34d) indicate that there is no contrast between word-final sequences like [ləç] and word-final [lç]. This suggests that the words in question have no schwa in the underlying representation and that it is inserted by an optional rule. The way in which Schwa Epenthesis is analyzed is not important for present purposes; I simply state the process in its prose form in (35) for transparency:

(35) Schwa Epenthesis: Insert [ə] between a liquid and a labial or dorsal coda consonant.

The epenthesis of schwa between a liquid and a labial or dorsal consonant is not restricted to Sörth, nor is it a defining property of MFr in general. As noted by Schirmunski (1962: 401), Schwa Epenthesis between a liquid and labial/velar can be observed to a certain degree in all HG dialects. ("Die Erscheinung hat alle Hochdeutschen Dialekte erfasst …") I do not attempt to provide a survey of specific varieties of German dialects with (35); however, I provide a selection of ten WCG and UG varieties in Table 5.3 in which the sources state explicitly that epenthesis (Svarabhakkti) is present in examples like the ones in (33) and (34). For a discussion of the presence of (35) in German dialects the reader is referred to Auer (1997).[13]

The pattern of epenthesis in Sörth and in the dialects in Table 5.3 is also essentially the same as in Dutch (Trommelen 1984: 77–79, Booij 1995: 127–128, Grijzenhout 1998: 39–42, van Oostendorp 2000). Dutch words showing the (optional) epenthesis of schwa between a liquid and a final noncoronal (from Booij 1995)

[13] Auer argues that the sound transcribed as schwa ([ə]) in (34) is not the product of epenthesis. One of his reasons for questioning a traditional phonological rule of insertion is that schwa in data like the ones in (34) can be seen as a consequence of the mistiming of articulatory gestures; see Browman & Goldstein's (1992) framework of Articulatory Phonology. The purpose of this section is not to defend a traditional rule of epenthesis, but instead to discuss the extent to which the data in (34) illustrate the opacity of velar fronting. Seen in this light, the treatment for Sörth I suggest below can be modelled in a number of frameworks, including the ones Auer endorses.

Table 5.3: Selection of UG and WCG varieties attested with Schwa Epenthesis (=35)

Place/Region	Dialect	Source
Wachbach	EFr	Dietzel (1908)
Suhl	EFr	Kober (1962)
Oberschopfheim	LAlmc	Schwend (1900)
Rheinbischofsheim	LAlmc	Weik (1913)
Sehlem	MFr	Ludwig (1906)
Arel	MFr	Bertrang (1921)
Zaisenhausen	RFr	Wanner (1907, 1908)
Saarbrücken	RFr	Kuntze (1932)
Erftgebiet	Rpn	Münch (1904 [1970])
Schelsen	Rpn	Greferath (1922)

include *arm* 'arm' and *elf* 'eleven', which can surface as [ɑrəm] and [ɛləf] respectively. By contrast, there is no schwa between a liquid and a coronal obstruent, e.g. *halt* [hɑlt] 'stop-IMP SG'.

One approach to the data in (33) – which I reject – requires Schwa Epenthesis to counterbleed Velar Fronting-1 (Vel Fr-1), as in (36a). This is a counterbleeding relationship because the reverse ordering in (36b) requires Schwa Epenthesis to bleed Velar Fronting-1.

(36) Counterbleeding order in Moselle Franconian (rejected):

a.		/kɛrx/	b.		/kɛrx/
	Vel Fr-1	kɛrç		Schwa Epenthesis	kɛrəx
	Schwa Epenthesis	kɛrəç		Vel Fr-1	—
		[kɛrəç]			*[kɛrəx]
		'church'			

(36a) implies that a phonetic representation like [kɛrəç] is opaque on the surface because it involves the overapplication of Velar Fronting-1. The aforementioned process overapplies in (36a) because it can only create a palatal after a front ([coronal]) vowel; since schwa is not a [coronal] vowel, a surface form like [kɛrəç] shows that Velar Fronting-1 also appears to apply in a context not specified in the structural description of the rule.

There is a plausible alternative analysis for Sörth that eschews opacity. I argue that the epenthetic schwa is a surface front vowel because it occurs after a front consonant. That derived front vowel is created by Schwa Fronting-2 in (37), which spreads the feature [coronal] rightward from a liquid to schwa. Recall from §3.4 that an eponymous process was posited for Rheintal to account for the realization of dorsal fricatives and affricates as palatal in the context after diphthongs ending in schwa if that schwa is preceded by a front vowel. The difference between Schwa Fronting-1 and Schwa Fronting-2 is the set of triggers: For the former it is front vowels and for the latter it is liquids. For some discussion of both processes of schwa fronting the reader is referred to §12.8.1.

(37) Schwa Fronting-2:

$$\begin{array}{ll} \begin{bmatrix} +\textsc{son} \\ -\textsc{nas} \end{bmatrix} & \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \end{bmatrix} \\ \big| & \\ \big[\textsc{coronal}\big] & \end{array}$$

The target for Schwa Fronting-2 is a placeless front vowel (=/ə/; recall §2.2.3). When that assimilation applies a derived front vowel is created which bears the three features [−consonantal, +sonorant, coronal] but no others. That synchronically derived feature complex is distinct from the features characterizing all underlying front vowels, which bear specification for either height features, the tenseness feature, or both.[14]

Schwa Epenthesis feeds Schwa Fronting-2, thereby creating the derived front vowel, which in turn feeds Velar Fronting-1 (Vel Fr-1). The transparent system depicted in (38) is a specific example of the hypothetical Dialect B from Figure 2.5.

(38)		
		/kɛrx/
	Schwa Epenthesis	kɛrəx
	Schwa Fronting-2	kɛrə̟x
	Vel Fr-1	kɛrə̟ç
		[kɛrə̟ç]
		‘church’

The advantage of the present treatment is that it is fully transparent and therefore does not rely on an otherwise unattested type of (synchronic) opacity, namely the overapplication of velar fronting.

[14]The target must be a placeless vowel. If a full back vowel occurs after a liquid and before /x/, then Schwa Fronting-2 fails to apply; cf. [ʃtrʊx] ‘shrub’ from (32a), which surfaces with [x] and not [ç]. The [coronal] feature cannot progressively assimilate from /r/ to /ʊ/ in that type of example because /ʊ/ is a full back vowel, which by definition bears a place feature (e.g. [dorsal]).

One conceivable objection to the transparent treatment in (38) is that the schwa is not transcribed in Hommer (1910) as a fronted vowel. However, an examination of the other sources for dialects with Schwa Epenthesis in Table 5.3 reveals that the epenthetic schwa in the context between a liquid and a palatal fricative is typically transcribed with a distinct front vowel symbol from the schwa in other contexts. As a representative example, consider the EFr dialect spoken in Suhl (Kober 1962; Map 3.4). In that dialect the only (synchronic) target for velar fronting is /x/, which surfaces as [ç] after any front vowel and [x] after any back vowel. As in a number of case studies cited earlier, Kober's symbols for the fortis palatal and velar fricatives are ⟦χ⟧ and ⟦x⟧ respectively, as in (39a, 39b). It is clear from the material presented in the original source that there is an epenthetic schwa between a liquid and /x/, as in (39c). The additional data in (39d) illustrate that – in contrast to Sörth – epenthesis is not triggered by a labial or velar. The important point is that the epenthetic schwa is transcribed in Kober (1962) as ⟦ɩ̣⟧, which itself is not a phonemic vowel, but it differs minimally from the author's (phonemic) high front unrounded lax vowel ⟦ɩ⟧, e.g. ⟦dɩχd⟧ 'tight'. The item listed in (39a) is significant because it indicates Kober has the symbol for schwa (⟦ə⟧), which is present if not inserted between a liquid and velar. The IPA transcriptions in (39) are the ones I assume to be correct. Kober's ⟦ɩ̣⟧ is my [ə̹].

(39)	a.	wīχə	[viːçə]	Wiege	'cradle'	84
	b.	bōx	[boːx]	Bogen	'bow'	84
	c.	sǫrɩ̣χ	[sɔrə̹ç]	Sorge	'sorrow'	70
		folɩ̣χ	[folə̹ç]	folgen	'follow-INF'	84
	d.	bɑlg	[bɑlg]	Balken	'beam'	87
		wɑrm	[vɑrm]	warm	'warm'	70

Although Hommer (1910) fails to provide a separate phonetic symbol for a fronted schwa, I contend that his transcription was broad and was therefore not intended to capture a fine-grained distinction between two types of schwa. All of the sources listed in Table 5.3 with the exception of Münch (1904 [1970]) and Greferath (1922) transcribe the epenthetic schwa differently than the underlying schwa.[15]

[15]On the basis of some of the works cited in Table 5.3 it appears that the fronted schwa occurs between a liquid and a palatal (e.g. [ç]) or velar (e.g. [k]). This suggests that the target segment in Schwa Fronting-2 must be followed by a [dorsal] consonant. Since my treatment is not affected by this modification I do not discuss this matter further.

Since velar fronting (regardless of dialect) is a phonological process and not a phonetic one the implication in (38) is that Schwa Fronting-2 is also phonological and not phonetic. If this is correct, then one would expect there to be dialects with some version of velar fronting and some version of schwa epenthesis but without Schwa Fronting-2. In that type of dialect palatals would surface after a front vowel (e.g. [siːç] 'ailing' in 32c), velars after a full back vowel (e.g. [ʃtrux] 'shrub' in 32a) and after the epenthetic schwa (e.g. [kɛrəx] 'church'). Thus, Schwa Epenthesis would bleed velar fronting, as in (36b). That type of dialect is extremely rare; in fact, the present survey has only uncovered one, namely the town of Langenlutsch in the former German-language island of Schönhengst in the Czech Republic (Janiczek 1911; Map 5.2). That dialect is discussed in §15.3.

The reason dialects like the one described by Janiczek (1911) are so rare can be attributed to the geographic spread of velar fronting. My survey reveals that – with only a small number of exceptions – some version of postsonorant velar fronting is active in virtually all present-day German dialects (see Chapter 12). Given the extent to which velar fronting predominates geographically it is difficult – although not impossible – to find a non-velar fronting variety like the one documented by Janiczek (1911).

5.5 Discussion

5.5.1 Rule reordering and domain narrowing

The diachronic treatment of underapplication opacity proposed in this chapter is viewed below in the context of domain narrowing (e.g. Bermúdez-Otero 2007, 2015, 2007, Ramsammy 2015). According to that theory, rules are phonologized at the end of the grammar and then gradually work their way up into smaller domains. As described in §2.2.1, many phonologists argue that the phonological component is subdivided into domains of various sizes to which rules are assigned. For example, in Stratal Optimality Theory a distinction is drawn between phrase level, word level, and stem level rules. Examples from American English for those three domains were discussed in that earlier section, i.e. Trisyllabic Laxing (stem level), n-Deletion (word level), and Flapping (phrase level).

Domain narrowing postulates that rules work their way up (diachronically) from the lowest level (i.e. the largest domain) to higher levels (i.e. narrow domains). In particular, it is argued in the literature cited above that phonetic rules become categorical (i.e. phonological), at which point they are phrase level rules, and then they gradually become word level rules and finally stem level rules. A striking example (Bermúdez-Otero 2015) supporting domain narrowing is the progression of postnasal g-Deletion from phrase final position to word-final position and finally to stem-final position at various stages in the history of English (see Table 5.4). The way in which the /ng/ sequence in bold (fifth column) is realized at the various stages is illustrated here. For recent discussion on the realization of /ng/ the reader is referred to Bailey (2021).

Table 5.4: Domain narrowing in the history of English g-Deletion (adapted from Bermúdez-Otero 2015: 384)

Stage 0	Stage 1	Stage 2	Stage 3	/ng/	
[ŋg]	[ŋg]	[ŋg]	[ŋg]	elo**ng**ate	-----
[ŋg]	[ŋg]	[ŋg]	[ŋ]	prolo**ng**-er	STEM LEVEL
[ŋg]	[ŋg]	[ŋ]	[ŋ]	prolo**ng** it	WORD LEVEL
[ŋg]	[ŋ]	[ŋ]	[ŋ]	prolo**ng** ⟧	PHRASE LEVEL

Each of the four stages depicted in Table 5.4 is shown in Bermúdez-Otero (2015) to be attested. g-Deletion was absent at Stage 0. At Stage 1 it applied at the end of a phrase (⟧), at Stage 2 at the end of a word, and at Stage 3 at the end of a stem.

I consider and reject casting my treatment of Rhoden from §5.2 in the domain narrowing approach. The same conclusions holds for the other case studies discussed in this chapter (in §5.3).

Recall that my treatment presupposes Final Fortition was present in the grammar before Velar Fronting-5, which was then added at the end of the grammar to produce the transparent Stage 2 Soest system. At Stage 3, those two rules are reordered, thereby producing the opaque Rhoden system. That treatment is given in a simplified form in Table 5.5. I omit the numerical suffix on velar fronting for greater transparency.

Table 5.5: Monostratal approach

Stage 1	Stage 2	Stage 3
Final Fortition	Final Fortition Velar Fronting	Velar Fronting Final Fortition

The monostratal treatment in Table 5.5 does not refer to the distinction between phrase level, word level, and stem level, as in Table 5.4. One way of applying that approach to Table 5.5 would be to modify it by taking the three levels into consideration (Table 5.6):

Table 5.6: Domain narrowing

Stage 1	Stage 2i	Stage 2ii	Stage 3	
			Velar Fronting	Stem level
Final Fortition	Final Fortition	Final Fortition Velar Fronting	Final Fortition	Word level
	Velar Fronting			Phrase level

At Stage 1, Final Fortition is present (and is assumed to be at the word level), but velar fronting is absent. The latter process is added at the end of the grammar at Stage 2i at the phrase level and then works its way up to the word level at Stage 2ii. At Stage 3 (Rhoden) the domain of velar fronting narrows even further to the stem level. Stages 2i and 2ii correspond to two stages of Soest (not distinguished above).

In §12.8.2 it is shown that velar fronting is a word level rule in all dialects for which data are available. There is therefore no evidence that there is some variety of German in which velar fronting is (or ever was) a phrase level rule. Given that conclusion I reject Stage 2i in Table 5.6. It is possible in theory to adopt an approach with a word level and a stem level as in Table 5.6, but it is also possible to collapse the two into a single level (word level), as in Table 5.5. Occam's Razor points to Table 5.5 as the simpler of the two treatments, and it is therefore the one I adopt. An additional argument pointing to the monostratal approach in Table 5.5 is that, to the best of my knowledge, there is no evidence from German dialects for a distinction between stem level affixes and word level affixes, as proposed for English (§2.2.1).

5.5.2 Linguistic and philological evidence for historical stages

From the synchronic perspective velar fronting has been shown in Chapters 3–4 to be either fed or bled by another rule. The synchronic relationships ("Rules W/X feed velar fronting" or "Rules Y,Z bleed velar fronting") are assumed to directly reflect history in the sense that Rules W-Z preceded velar fronting temporally. The same point holds for the relationship between the epenthesis of schwa and velar fronting discussed in §5.4. In §5.2 and §5.3 I considered dialects where velar fronting is counterfed by another process (Rule W) and postulated that the synchronic ordering was originally the reverse, i.e. "Rule W feeds velar fronting" > "velar fronting is counterfed by Rule W".

One question not discussed above is whether or not the historical relationships between velar fronting and the specific changes referred to as Rule W-Z can actually be confirmed with linguistic and/or philological evidence. Unfortunately that evidence is often (but not always) lacking. I discuss briefly the case studies referred to above.

Linguistic argumentation discussed in later chapters can be adduced that velar fronting must have been phonologized very early, namely in OHG (500–1050) for HG and OSax (800–1150) for LG, although it is also possible that phonologization occurred in some places at a later time. This topic is discussed in Chapter 16. The important point is that if Rules W-Z were present in the grammar before velar fronting, then the former changes must have been very early ones.

My claim that the epenthesis of schwa precedes velar fronting diachronically (§5.4) derives strong independent support. Braune (2004: 71–73) discusses orthographic evidence for Schwa Epenthesis ("Sprossvokale") at length, concluding that vowels were often epenthesized between a liquid and *h* in OHG, e.g. OHG *duruh* (< WGmc $^{+}$[θurx]) 'through'. That type of epenthesis was especially prevalent in Franconian varieties of OHG, which was the immediate precursor of MFr varieties like Sörth discussed above.

Two of the case studies discussed earlier involved SwG varieties. In Maienfeld (§3.3) velar fronting is bled by a rule of Debuccalization, and in Rheintal (§3.4) it is fed by a rule fronting schwa (Schwa Fronting-1). However, there is no evidence available for those two places concerning the chronology of velar fronting or the processes debuccalizing /x/ or fronting schwa. There is no reason to assume that velar fronting must have been active in OHG in either of those two dialects because they each phonologized that process independently from one another and independently from all other German dialects.

A greater challenge is to confirm the relationship between Final Fortition and velar fronting presupposed for LG in (11) and (12). Orthographic evidence suggests that some version of Final Fortition was probably already present in OSax. Holthausen (1900: 78) observes that the lenis labial fricative in that language (traditionally transcribed as [ƀ]) was realized as fortis [f] in word-final position and before fortis obstruents. Holthausen (1900: 81) also assumes that [ɣ] was realized as fortis [x] in final position, although the orthographic evidence he cites is only sporadic. The philological evidence is admittedly thin; however, it is conceivable that a specific version of Final Fortition with fricatives as targets was present before velar fronting was phonologized for the Wph dialects in question (Soest, Rhoden). See Foerste (1957: 1759) and Woods (1975: 23–27) for some discussion of the status of Final Fortition in OSax.

A difficult claim to confirm is that the rules creating [x] from /ʀ/ were already active and applied transparently before the opaque stage arose (recall 27 and 31). To the best of my knowledge, no linguistic or philological evidence is available which might (dis)confirm that treatment. It was assumed above that the |ʁ| created from /ʀ/ surfaced as [x] in coda position by either Final Fortition or Laryngeal Assimilation-2. According to Paul (2007: 131–133), orthographic evidence from OHG and MHG suggests that there was considerable variation concerning when and where lenis fricatives were realized as fortis. For more extensive discussion on dating Final Fortition the reader is referred to Mihm (2004). In any case, no orthographic evidence from OHG or MHG suggests that *r* in those earlier stages had a [x] realization in coda position.

5.6 Conclusion

The opaque examples discussed in this chapter can all be captured procedurally in terms of the interaction of one rule creating palatal [ç] from velar /x/ (velar fronting) and another one deriving |x| from an independent segment (Rule W). Since the velar derived by Rule W does not feed velar fronting, the former counterfeeds the latter; hence, opaque sequences like [ix] involve underapplication opacity in the synchronic grammar.

In the following chapter I discuss two dialects in which velar fronting creates palatals like [ç] from the corresponding velars (/x/), but those dialects also possess regular instances of [x] in the context of front vowels that also derive from /x/. The dialects in question therefore have sequences like [iç] (from /ix/) and ones like [ix] (from /ix/). The unexpected (opaque) velar referred to here is therefore not the consequence of a counterfeeding order in the synchronic phonology. Instead, I demonstrate that the opaque velar [x] in sequences like [ix] are the consequence of a unique representation for the preceding front vowels.

6 Neutral vowels

6.1 Introduction

In the SwG dialects discussed below velar fronting is an active synchronic process creating a palatal (e.g. [ç]) from the corresponding velar (e.g. /x/), but there are also many regular instances of underlying velars (e.g. /x/) surfacing unexpectedly without change (e.g. [x]) in the front vowel context. For example, in one dialect, the /i/ component of the diphthong /ei/ triggers the fronting of a following /x/ to [ç], but /x/ underapplies after the /i/ component of the diphthong /øi/, i.e. [eiç] vs. [øix]. The aberrant vocoid – that is, the [i] in [øi] – is a neutral vowel (§2.4.2), defined as a phonetically front vowel lacking the place feature [coronal], as in (1b). By contrast, nonneutral vowels like the /i/ in /ei/ are phonetically front and phonologically [coronal], as in (1a).[1]

(1) Representations for front vowels:

a. Front nonneutral vowels:

$$\begin{array}{c}\begin{bmatrix}-\textsc{cons}\\ \alpha\mathrm{F}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{coronal}\end{bmatrix}\end{array}$$

b. Neutral vowels:

$$\begin{bmatrix}-\textsc{cons}\\ \alpha\mathrm{F}\end{bmatrix}$$

The representation in (1b) is intended to indicate the absence of [coronal]. Front rounded neutral vowels (/y/ or /ʏ/), present in both dialects discussed below, must bear a feature capturing roundedness to make them distinct from their unrounded counterparts.

The neutral vowel in (1b) derived historically from a back vowel, e.g. /øi/ < /ou/; Recall Figure 2.9. The vocalic change that created (1b) therefore exemplifies Vowel Fronting, which in this case involved the deletion of the backness feature

[1] In (1), [αF] is an abbreviation for all other distinctive properties (e.g. the major class feature [+sonorant], height features [±high] and [±low], the tenseness feature [±tense], or manner features like [±nasal] if there is a contrast between oral and nasalized vowels). The presence of [αF] in representation (1b) makes neutral vowels distinct from schwa, which bears only [+sonorant] and [−consonantal], but no additional features.

for back vowels without the addition of the [coronal]. In that type of example, the historical process of velar fronting underapplied after historically back sounds like /øi/; hence, velar sounds like [x] in the context of neutral vowels like [øi] are opaque.

In the remainder of this chapter I present two case studies from HstAlmc illustrating neutral vowels (§6.2, §6.3). In §6.4 I consider how neutral vowels emerged historically, and in §6.5 I provide some discussion. The chapter concludes in §6.6.

6.2 Highest Alemannic (part 1)

The present section investigates the patterning of dorsal fricatives and affricates in the HstAlmc variety described in detail by Wipf (1910), spoken in the town of Visperterminen in the Swiss canton of Valais (Wallis; Map 3.2). Visperterminen is part of a large velar fronting island comprising Upper Valais because it is surrounded by non-velar fronting regions; see §15.8 for discussion.

The patterning of dorsal fricatives and affricates in Visperterminen can only be understood by considering first the phonetics and especially the phonology of vowels (§6.2.1). The intricate distribution of velar and palatal stops and affricates is discussed in §6.2.2.

6.2.1 Phonetics and phonology of vowels

Visperterminen has phonemic oral and nasalized vowels. The monophthongs consist of front vowels (oral /iː i yː eː e ɛː ɛ æː æ/ and nasalized /ĩː ĩ ỹː ẽː ɛ̃ː ɛ̃/) and back vowels (oral /(uː) u oː o ɑː ɑ/ and nasalized /ũ õː õ ɑ̃ː ɑ̃/). /uː/ is parenthesized because it occurs in only a very small number of words (Wipf 1910: 11). The only front rounded monophthongs are /yː/ and /ỹː/.[2] There are six phonemic diphthongs, namely oral /øi ei yo iæ/ and nasalized /ɑ̃i ẽi/. Note that two front rounded vowels occur in diphthongs which are absent in the system of monophthongs, i.e. /ø/ in /øi/ and /y/ in /yo/.

Visperterminen is extremely conservative in the sense that it preserves a number of features from OHG. One such feature is the retention of full vowels in unstressed syllables, which were ultimately reduced to schwa in MHG, e.g. [hilffu] ‘help-1sg’ (cf. StG [hɛlfə]); Wipf (1910: 146). Since Vowel Reduction (Chapter 4)

[2] [yː] derives historically from OHG [uː], which underwent a context-free fronting, e.g. OHG [fuːl] > [fyːl] ‘lazy’. Nasalized vowels arose historically through the assimilation of nasality from a nasal consonant to a preceding vowel followed by the deletion of that nasal consonant before a fricative. The details of that change (Wipf 1910: 44–45) exceed the goals of the present analysis.

never occurred in Visperterminen, [ə] is not a phonemic vowel. Wipf transcribes the second element of the diphthong [iæ] as schwa (⟦ə⟧). However, she notes that the pronunciation with [ə] as the second component only holds for fast speech ("das rasche zusammenhängende Sprechen"; Wipf 1910: 12). In the same passage she observes that the pronunciation of the second part of the diphthong in question with the low front vowel [æ] is typical for slower speech. The example she gives is the word *Fieber* 'fever', which can be pronounced [fiəber] or [fiæber]. In the related dialect discussed below in §6.3 (Brun 1918), that author makes a similar observation, but he consistently transcribes the second component of the diphthong in question as ⟦æ⟧; (Brun 1918: 18–19). I transcribe the diphthong [iæ] henceforth with [æ]; more significantly, there is evidence discussed throughout this chapter that [i] and [æ] in [iæ] are phonologically front ([coronal]) vowels. I see the pronunciation [iə] as a consequence of a rule of phonetic implementation that is not relevant for the phonology.

The two components of the six diphthongs can be made distinct by referring to features referring to height, roundedness, backness, and nasality. Consider first /øi/ and /ei/. What those two diphthongs have in common is that the first part is mid and front and the second part high (i.e. /i/). The difference between /ø/ and /e/ in the first component of /øi/ and /ei/ involves only rounding. For the two oral diphthongs /yo/ and /iæ/ the first component is high (/y/ or /i/) and the second component nonhigh (/o/ or /æ/). Note that the two vowels /o/ and /æ/ differ in terms of backness. What the two nasalized diphthongs /ɑ̃i/ and /ẽi/ have in common is that the first component is nonhigh (/ɑ̃/ or /ẽ/), and the second component is high (/i/). The difference between /ɑ̃/ or /ẽ/ is one of backness. Phonological representations for the diphthongs are provided below.

The four oral diphthongs /øi ei yo iæ/ are phonemic because they contrast with one another and with monophthongs. Although actual minimal pairs were not found in the original source, it is not difficult to find examples of words in which those diphthongs appear in very similar environments. In (2) I present monosyllabic words in which the four oral diphthongs surface between two consonants.[3]

(2)	a.	teiff	[teiff]	tief	'deep'	37
	b.	briəf	[briæf]	Brief	'letter'	38
	c.	böim	[bøim]	Baum	'tree'	38
	d.	büob	[byob]	Bube	'single young man'	40

[3] All of the oral monophthongs can also surface as the V in CVC words, although I present no examples here. I conclude that there is no evidence that the diphthongs in (2) derive from monophthongs as is sometimes proposed for other languages (§2.2.3).

From the point of view of phonology, the four diphthongs in (2) are not derived. Thus, they are present in the underlying representations as /ei/, /iæ/, /øi/, and /yo/ and surface without change as [ei], [iæ], [øi], and [yo]. However, I show below that there are also regular Umlaut-based alternations involving /ei/~/øi/ and /iæ/~/yo/.

The status of the two nasalized diphthongs /ɑ̃i/ and /ẽi/ in the synchronic phonology (in particular [ɑ̃i]) is not as clear-cut as the status of the four oral diphthongs. Since /ɑ̃i/ and /ẽi/ derived historically from an oral vowel plus nasal consonant sequence before a fricative (recall Footnote 2), they occur primarily in the context before the fricative, e.g. [xɑ̃iʃt] 'can-2sg' (cf. StG *kannst*), [gʃpẽiʃt] 'ghost' (cf. StG *Gespenst*). Word-finally, /ẽi/ surfaces in words like [klẽi] 'small' (cf. StG *klein*). In that context it contrasts with the oral diphthongs, e.g. [hiə] 'here', [fryo] 'early'. Wipf (1910: 45) notes that native speakers often pronounce [ɑ̃i] as [ɑŋ], which suggests that the former is synchronically derived from the latter. I analyze [ẽi] and [ɑ̃i] in words like the ones given above as phonemic (i.e. /ẽi/ and /ɑ̃i/), although it will be clear below that an analysis in which [ɑi] is synchronically derived from /ɑŋ/ is compatible with my treatment.[4] It will be seen below that there are Umlaut alternations involving [ẽi]~[ɑ̃i].

The correct features for vocalic segments can be established by considering the way in which they behave phonologically. It is shown on the basis of vocalic alternations that certain front vowels in diphthongs require neutral representations as in (1b) and others the nonneutral representation in (1a).

As indicated in (3), vocalic alternations (Umlaut) fall into one of three categories. First, back monophthongs alternate with the corresponding front unrounded monophthongs in (3a).[5] Second, front rounded monophthongs are the umlauted counterparts of the corresponding front unrounded monophthongs, as in (3b). Third, diphthongs show the pattern of alternation illustrated in (3c). Note that the first component of the diphthongs in the two alternating pairs [øi]~[ei] and [yo]~[iæ] exhibits the same pattern as in (3b). By contrast, the second part of [øi] remains unchanged in [ei], while the second component of [yo] corresponds to [æ] in the Umlaut context.

[4] The mirror-image change (nasalized vowel is realized as the corresponding oral vowel plus [ŋ]) has a parallel in the realization of French loanwords in StG, e.g. [pɑʀfœ̃ː]>[pɑʀfœŋ] 'perfume'; Mangold (2005: 65).

[5] [uː]~[iː] alternations are apparently unattested because [uː] is a rare sound. No examples could be found in the original source in which the nasalized vowels [õ] or [õː] occur in the context for Umlaut. I omit from the present discussion the short low back vowel [ɑ], which surfaces in the Umlaut context in some morphemes as [e] and in others as [æ]. That type variation exemplifies a complication that exceeds the goals of the present work.

(3) a. [u]~[i]
[ũ]~[ĩ]
[o]~[e]
[oː]~[eː]
[ɑː]~[æː]

b. [yː]~[iː]
[ỹː]~[ĩː]

c. [øi]~[ei]
[yo]~[iæ]
[ɑ̃i]~[ẽi]

The three patterns in (3) are displayed in (4–6). The morphological contexts for Umlaut in these examples are the plural of nouns and diminutives.

(4)	a.	hund	[hund]	Hund	‘dog’	122
		hind	[hind]	Hunde	‘dog-PL’	136
	b.	su͔	[sũ]	Sohn	‘son’	122
		si͔	[sĩ]	Söhne	‘son-PL’	122
	c.	xopf	[xopf]	Kopf	‘head’	93
		xepf	[xepf]	Köpfe	‘head-PL’	93
	d.	flō	[floː]	Floh	‘flea’	122
		flē	[fleː]	Flöhe	‘flea-PL’	35
	e.	fɑ̄lt	[fɑːlt]	Falte	‘wrinkle’	122
		fǣlt	[fæːlt]	Falten	‘wrinkle-PL’	122
(5)	a.	krǖt	[kryːt]	Kraut	‘herb’	93
		krītter	[kriːter]	Kräuter	‘herb-PL’	93
	b.	tsü͔	[tsỹː]	Zaun	‘fence’	122
		tsī͔	[tsĩː]	Zäune	‘fence-PL’	122
(6)	a.	bøim	[bøim]	Baum	‘tree’	38
		beim	[beim]	Bäume	‘tree-PL’	39
	b.	brüoder	[bryoder]	Bruder	‘brother’	40
		briədri	[briædri]	Bruder, dim	‘brother-DIM’	40
	c.	He͔iši	[hẽiʃi]	Hans, dim	‘Hans-DIM’	168
		Hɑ͔isi	[hɑ̃isi]	Hans, dim	‘Hans-DIM’	168

If a front unrounded vowel occurs in the Umlaut context, then that vowel does not exhibit an alternation, e.g. [rind] ‘cow’ vs. [rinner] ‘cow-PL’.

I propose that monophthongs have the representations in (7). In those structures, front unrounded segments are nonneutral and hence [coronal]; see (7a). In contrast to all of the dialects considered in previous chapters, the back monophthongs of Visperterminen are [peripheral]; see (7c). That structure follows Rice (2002), who proposes that [peripheral] expresses backness and/or roundedness in vowels. Neither [dorsal] nor [labial] are necessary in the representation of back monophthongs given the structure in (7c). The representation for front rounded sounds is presented in (7b). In contrast to (7a) and (7c), the one in (7b) is a complex structure with [coronal] and [peripheral]. The advantages of analyzing the monophthongs in (7b, 7c) as [peripheral] and not as [dorsal] and/or [labial] are discussed below.

(7) a. Front unrounded:

$$\begin{array}{c}\begin{bmatrix}-\textsc{cons}\\ \alpha\mathrm{F}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{coronal}\end{bmatrix}\end{array}$$

b. Front rounded:

$$\begin{array}{ccc} & \begin{bmatrix}-\textsc{cons}\\ \alpha\mathrm{F}\end{bmatrix} & \\ / & & \backslash \\ \begin{bmatrix}\textsc{coronal}\end{bmatrix} & & \begin{bmatrix}\textsc{peripheral}\end{bmatrix}\end{array}$$

c. Back:

$$\begin{array}{c}\begin{bmatrix}-\textsc{cons}\\ \alpha\mathrm{F}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{peripheral}\end{bmatrix}\end{array}$$

The contrast between the simplex representations in (7a)/(7c) and the complex structure in (7b) derives support from markedness. Regardless of how that term is defined, it is uncontroversially the case that front rounded vowels like [yː] are more marked than both their back ([uː]) and front ([iː]) counterparts (e.g. de Lacy 2006, Rice 2007).

Individual monophthongs are assigned distinctive features, as indicated in Table 6.1 for the oral vowels. Note that [peripheral] is assigned twice, depending on whether or not it corresponds to the backness or the roundedness dimension. The distinction between short and long vowels is ignored here.

Table 6.1: Distinctive features for vowels (Visperterminen)

	iː i	yː	eː e	ɛː ɛ	æː æ	uː u	oː o	ɑ ɑː
[coronal]	✓	✓	✓	✓	✓			
[peripheral]						✓	✓	✓
[high]	+	+	−	−	−	+	−	−
[low]			−	−	+		−	+
[tense]			+	−				
[peripheral]		✓						

I classify the six diphthongs in terms of the values of the feature [±nasal] and a height feature ([±high] or [±low]) for each component, as in (8). Note that four of these diphthongs consist of [−high] followed by [+high] in (8a–8d) and two are [+high] followed by [+low] in (8e, 8f). I consider additional features for diphthongs below.

(8) a. /øi/:
$$\begin{bmatrix}-\text{NASAL}\\-\text{HIGH}\end{bmatrix}\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}$$

b. /ei/:
$$\begin{bmatrix}-\text{NASAL}\\-\text{HIGH}\end{bmatrix}\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}$$

c. /ɑ̃i/:
$$\begin{bmatrix}+\text{NASAL}\\-\text{HIGH}\end{bmatrix}\begin{bmatrix}+\text{NASAL}\\+\text{HIGH}\end{bmatrix}$$

d. /ẽi/:
$$\begin{bmatrix}+\text{NASAL}\\-\text{HIGH}\end{bmatrix}\begin{bmatrix}+\text{NASAL}\\+\text{HIGH}\end{bmatrix}$$

e. /yo/:
$$\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}\begin{bmatrix}-\text{NASAL}\\+\text{LOW}\end{bmatrix}$$

f. /iæ/:
$$\begin{bmatrix}-\text{NASAL}\\+\text{HIGH}\end{bmatrix}\begin{bmatrix}-\text{NASAL}\\+\text{LOW}\end{bmatrix}$$

The feature [+low] can be justified in (8f) because /æ/ is phonetically low, but the same cannot be said about (8e) because /o/ is phonetically mid and not low. It needs to be stressed that the features adopted here are intended to capture phonological patterns and not the phonetics of the sounds in question. Recall the discussion of vowels in §2.2.3 and the analysis of Rheintal /ɛː ɛ œː œ/ as phonologically [+low] in §3.4. The /o/ component of the /yo/ diphthong in (8e) and the /æ/ component of /iæ/ in (8f) do not bear the same features as the respective monophthongs /o/ and /æ/ in Table 6.1, although my analysis does not crucially depend on this.

The complete featural representations for the four [−high]-[+high] diphthongs are presented in (9). In the following discussion I concentrate on the place features.

(9) a. /øi/:

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix}\quad\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}$$
$$\big[\textsc{peripheral}\big]$$

b. /ei/:

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix}\quad\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}$$
$$\big[\textsc{coronal}\big]$$

c. /ɑ̃i/:

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix}\quad\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix}$$
$$\big[\textsc{peripheral}\big]$$

d. /ẽi/:

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix}\quad\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix}$$
$$\big[\textsc{coronal}\big]$$

The diphthongs in (9b) and (9d) consist of a sequence of two front vowels which share the feature [coronal] by the OCP (recall §2.2.3). Both parts of /ei/ and /ẽi/ are therefore nonneutral, as in (1a).

The diphthongs in (9b, 9d) can now be compared with the ones in (9a, 9c): The second part of /øi/ and /ɑ̃i/ is specified for a height feature but not for [coronal] or [peripheral]; hence, the /i/ in /øi/ and /ɑ̃i/ – but not the /i/ in /ei/ or /ẽi/ – is a neutral vowel, as in (1b). The first part of /øi/ bears the place feature [peripheral]; [coronal] is redundant for /ø/ in /øi/ because there are no diphthongs in Visperterminen consisting of the corresponding back vowel plus /i/, i.e. /oi/. Some evidence that the feature [coronal] is absent in the representation for /ø/ comes from phonetics. Wipf (1910: 11–12) notes that her informants pronounced that vowel as [ø] but that other informants appeared to be pronouncing [o]. The fact that the front rounded vowel in /øi/ vacillates between a front vowel and a back vowel supports a structure like the one in (9a) in which the frontness feature ([coronal]) is absent.[6]

The vowel /ɑ̃/ in /ɑ̃i/ in (9c) is phonetically back and phonologically [peripheral]. Note that there is no contrast between /ɑ̃i/ and a nasalized diphthong whose first member is low and front (/æ̃i/); hence, the feature [peripheral] can be interpreted in the phonetics as a back vowel and not as a front vowel.[7]

[6]Wipf also notes that the second part of /øi/ can be rounded, i.e. /øi/ can be realized as [øy]. This type of variation is also consistent with the representation in (9a) because a feature for rounding is absent.

[7]It was noted above that [ɑ̃i] may be derived synchronically from /ɑŋ/. That type of analysis would require that [+nasal] spreads from /ŋ/ onto the preceding vowel and that /ŋ/ changes

In (10) I give the representations for the two [+high]-[+low] diphthongs in (8e, 8f):

(10) a. /yo/:

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}\quad\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{low}\end{bmatrix}$$

$$[\textsc{peripheral}]$$

b. /iæ/:

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}\quad\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{low}\end{bmatrix}$$

$$[\textsc{coronal}]$$

Both parts of the diphthong /iæ/ in (10b) are front and therefore marked [coronal] in the phonological representation. The representation in (10b) is therefore akin to the structures in (9b, 9d) for the other two front diphthongs.

The diphthong /yo/ in (10a) consists of a single [peripheral] component. As was the case with /øi/, it is not necessary to include the feature [coronal] for the /y/ component of /yo/ because there is no diphthong in Visperterminen consisting of the corresponding back vowel plus /o/, i.e. /uo/. The front rounded vowel in (10a) does not bear the feature [coronal] and is therefore neutral vowel, as in (1b).

The representations for monophthongs and diphthongs presented above hold regardless of whether or not the sound in question participates in Umlaut alternations. For example, the diphthongs /ei/ and /iæ/ from (2) do not alternate with other vowels. However, the /ei/ and /iæ/ alternate with /øi/ and /yo/ in (6a, 6b).

Given the structures for vowels posited above, Umlaut alternations in Visperterminen are expressed as in (11a) for diphthongs and as in (11b) for monophthongs. The abbreviation 'mcat' is the set of morphological categories (e.g. singular~plural in nouns).

(11) a.

$$(/\ \ldots\ [-\textsc{cons}]\ \ldots\ [-\textsc{cons}]\ \ldots\ /)_{\text{mcat}}\ \sim$$

$$[\textsc{peripheral}]$$

$$(/\ \ldots\ [-\textsc{cons}]\ \ldots\ [-\textsc{cons}]\ \ldots\ /)_{\text{mcat}}$$

$$[\textsc{coronal}]$$

into a nasalized vowel (i.e. /ĩ/). If that were the correct analysis then the change from [ŋ] to the nasalized vowel would require [+consonantal] to change to [−consonantal] and [peripheral] to be deleted.

b. $(/ \ldots \begin{bmatrix}-\textsc{cons}\end{bmatrix} \ldots /)_{\text{mcat}} \sim (/ \ldots \begin{bmatrix}-\textsc{cons}\end{bmatrix} \ldots /)_{\text{mcat}}$

$\begin{bmatrix}\textsc{peripheral}\end{bmatrix}$ $\begin{bmatrix}\textsc{coronal}\end{bmatrix}$

The advantage of analyzing back monophthongs as [peripheral] and not as [dorsal] (and/or [labial]) is that the umlauted vowels also include front rounded monophthongs. Recall from (3b) that /yː/ and /ỹː/ alternate with /iː/ and /ĩː/. In an alternative featural system in which front rounded monophthongs are [coronal] and [labial], it is not clear how (3a) and (3b) can be unified.

In (12) I illustrate the alternations involving the diphthongs in (3c):

(12) a. /øi/ ~ /ei/

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix} \sim \begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$\begin{bmatrix}\textsc{peripheral}\end{bmatrix}$ $\begin{bmatrix}\textsc{coronal}\end{bmatrix}$

b. /ɑ̃i/ ~ /ẽi/

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix} \sim \begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\-\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\+\textsc{nas}\\+\textsc{high}\end{bmatrix}$$

$\begin{bmatrix}\textsc{peripheral}\end{bmatrix}$ $\begin{bmatrix}\textsc{coronal}\end{bmatrix}$

c. /yo/ ~ /iæ/

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{low}\end{bmatrix} \sim \begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{high}\end{bmatrix}\begin{bmatrix}-\textsc{cons}\\-\textsc{nas}\\+\textsc{low}\end{bmatrix}$$

$\begin{bmatrix}\textsc{peripheral}\end{bmatrix}$ $\begin{bmatrix}\textsc{coronal}\end{bmatrix}$

The representations for vowels were posited on the basis of Umlaut alternations. The structures defended above include nonneutral vowels as well as neutral vowels. The following predictions can be made regarding the vowels of Visperterminen:

(13) a. /i/ in /øi/ and /ãi/ does not behave phonologically like a coronal;
  b. /y/ in /yo/ does not behave phonologically like a coronal;
  c. /iæ/ behaves phonologically like a coronal;
  d. /ø/ in /øi/ does not behave phonologically like a coronal;
  e. /o/ in /yo/ does not behave phonologically like a dorsal

In §6.2.2 I demonstrate that the predictions in (13a–13c) are correct on the basis of the patterning of dorsal fricative and dorsal affricate allophones. By contrast, predictions (13d, 13e) are shown to be untestable.

6.2.2 Dorsal fricatives and affricates

Vispertermінen possesses two singleton dorsal fricatives, namely velar [x] (=⟦x⟧) and palatal [ç] (=⟦χ⟧); Wipf (1910: 14). [x] and [ç] also have geminate counterparts, namely [xx] (=⟦xx⟧) and [çç] (=⟦χχ⟧). It is clear from the original source (Wipf 1910: 16) that the geminate articulation is the surface realization of a dorsal fricative after a short vowel. ("Der Spirant *x* resp. *χ* kommt nur nach kurzem Vokal als Geminata vor"). By contrast, the singleton counterparts [x] and [ç] occur in the elsewhere case, i.e. after a long vowel or consonant or word-initially. I assume that singletons and geminates are allophones, although I do not provide a formal treatment.

As in Rheintal (§3.4), Visperterminen also possesses the two dorsal affricates, namely velar [kx] (=⟦kx⟧) and palatal [kç] (=⟦kχ⟧). Affricates are phonemic because they contrast with stops and fricatives at the same place of articulation, e.g. after [u] in [luk] 'loose' vs. [bruxx] 'fracture' vs. [ʃtukx] 'piece'. The distribution of [kx] and [kç] is shown below to mirror the distribution of the corresponding fricatives. The relationship between velar and palatal fricatives and affricates (ignoring the geminate realizations) is depicted in (14) for word-initial and post-sonorant position.

(14) /x/ /kx/

[x] [ç] [kx] [kç]

The intricate facts involving the distribution of the sounds in (14) are summarized in (15) and (16). These statements mirror very closely the historical observations in the original source (Wipf 1910: 92, 93, 96).

(15) [x]/[kx] and [ç]/[kç] in word-initial onsets:

a. [ç] occurs word-initially only before high front vowels but not before [yo];

b. [x] occurs word-initially before nonhigh front vowels, back vowels, or coronal sonorant consonants;

c. [x] occurs word-initially before [yo];

d. [kç] and [kx] have the same distribution as word-initial [x]/[ç].

(16) [x]/[kx] and [ç]/[kç] after a sonorant:

a. [ç] occurs after high front vowels with the exception of [øi] and [ɑ̃i];

b. [ç] occurs after [iæ];

c. [x] occurs after nonhigh front vowels or back vowels (not including [iæ]);

d. [x] occurs after [øi] and [ɑ̃i];

e. [ç] occurs after high front vowels followed by a liquid;

f. [x] occurs after any other vowel followed by a liquid;

g. [kç] and [kx] have the same distribution as [x]/[ç].

The generalizations in (15) and (16) together indicate that palatal and velar fricatives and palatal and velar affricates do not contrast.

Distributional statement (15a) is revealed in (17): Word-initial [ç] occurs before a high front vowel, namely [iː] in (17a), [i] in (17b), [iæ] in (17c), or [ỹː] in (17d). The historical source for velar and palatal fricatives and affricates in (17) and in all subsequent datasets is WGmc $^{+}$[k] or $^{+}$[x], although a few assimilated loanwords are included as well. In a number of examples presented below there are front stem vowels that were originally back; thus, Vowel Fronting fed velar fronting. I comment on those examples below.

(17) Word-initial [ç] (from /x/):

a.	χībe	[çiːbe]	zürnen	‘be angry-INF’	35
b.	χind	[çind]	Kind	‘child’	124
c.	χiəl	[çiæl]	kühl	‘cool’	92
d.	χü͔χ lɑ	[çỹːçlɑ]	Kunkel	‘explosive pellet’	94

The absence of words beginning with a dorsal fricative followed by the oral vowel [yː] is accidental. Evidence that [yː] behaves as a front vowel – like its nasal counterpart [ỹː] – comes from the occurrence of the word-initial palatal affricate before that vowel (see below). It is also shown that /x/ is realized as palatal in the context after [yː].

The data presented below reveal that [x] surfaces in word-initial position in the elsewhere case (=15b, 15c). In (18), word-initial [x] is followed by a back vowel in (18a), a non-high front vowel in (18b), or [yo] in (18c). Note that sequences like [xyo] reveal underapplication opacity. No examples were found in the original source in which a word-initial dorsal fricative is followed by the back vowel [ɑː] or before the nonhigh front vowel [æː]. I hold these gaps to be accidental.

(18) Word-initial [x] (from /x/):

a.	xuxxi	[xuxxi]	Küche	'kitchen'	93
	xopf	[xopf]	Kopf	'head'	93
	xōru	[xoːru]	Korn	'grain'	93
	xɑtsɑ	[xɑtsɑ]	Katze	'cat'	92
b.	xebjɑ	[xebjɑ]	Käfig	'cage'	93
	xertsɑ	[xertsɑ]	Kerze	'candle'	93
	xɛnnu	[xɛnnu]	können	'be able-INF'	93
	xællɑ	[xællɑ]	Kelle	'trowel'	93
	xeišto	[xeiʃto]	Keim	'germ'	93
	xøiffu	[xøiffu]	kaufen	'buy-INF'	71
c.	xüo	[xyo]	Kuh	'cow'	127
	xüoffɑ	[xyoffɑ]	Kufe	'vat'	40

The examples in (19) show that velar [x] – but not palatal [ç] – occurs in word-initial position before a coronal sonorant consonant, namely [n] in (19a), [l] in (19b), or [r] in (19c); recall (15b). There are no restrictions governing the type of vowel that can follow the sonorant consonant in question. In particular, that vowel can be high and front, but that high front vowel exerts no influence on the initial dorsal fricative, which consistently surfaces as [x].

(19) Word-initial [x] (from /x/):

a.	xnɑll	[xnɑll]	Knall	'bang'	93
	xnæxt	[xnæxt]	Knecht	'vassal'	121
b.	xlɑgu	[xlɑgu]	klagen	'complain-INF'	93
	xliwwe	[xliwwe]	Kleie	'bran-PL'	93
c.	xrīts	[xriːts]	Kreuz	'cross'	93
	xrɑnts	[xrɑnts]	Kranz	'wreath'	93

Wipf includes in her grammar [x]~[ç] alternations like the ones in (20), which suggest that the complementary distribution between word-initial [x] and [ç] described above is a rule-governed process. In the first example in (20a) the stem vowel is [u], which alternates with [i], as in the second example. The pair of words in (20b) is similar to the word pair in (20a), although the stem vowel in [çiːrli] shows the effects of an apparently idiosyncratic process of raising (together with Umlaut). Significantly, the [x] in [xoːru] 'grain' is replaced by [ç] in [çiːrli] 'grain-DIM' because the vowel [iː] follows [x]. The examples in (20c) demonstrate that the stem vowel [o] alternates with [e] but that [x] does not change to [ç] after the latter vowel because [e] is not high and front. The most significant examples are the ones in (20d) because they indicate that opaque [x] is only present before the one diphthong [yo]. When that diphthong is replaced with [iæ] in the plural, opaque [x] surfaces as [ç] as expected.

(20) Dorsal fricatives (from /x/) before alternating vowels:

a.	xurts	[xurts]	kurz	'short'	93
	χirtzer	[çirtser]	kürzer	'shorter'	93
b.	xōru	[xoːru]	Korn	'grain'	93
	χīrli	[çiːrli]	Korn, dim.	'grain-DIM'	93
c.	xopf	[xopf]	Kopf	'grain'	122
	xepf	[xepf]	Köpfe	'head-PL'	122
d.	xüo	[xyo]	Kuh	'cow'	127
	χiə	[çiæ]	Kühe	'cow-PL'	127

The data presented up to this point show that [x] and [ç] stand in complementary distribution in word-initial position, although the [yo] context is characterized by opacity.

The examples in (21) demonstrate that the distribution of the velar affricate [kx] and its palatal counterpart [kç] parallels the distribution of the corresponding fricatives (=15d). Thus, [kç] occurs in word-initial position before a high front vowel in (21a) and [kx] in the elsewhere case in (21b). The second example in (21a) is important because it illustrates the occurrence of the palatal affricate before [yː]; recall the discussion above on the absence of word-initial dorsal fricatives before that vowel.[8]

[8] The affricates in [kçitsjot] and [kxeːrt] are synchronically derived from the past participle prefix /k/, which coalesces with the stem-initial fricative (/x/), i.e. /k-xitsjot/ and /k-xeːrt/. The remaining examples in (21) show that there is also a phonemic affricate /kx/.

(21) Word-initial dorsal affricates (from /kx/):

a.	kχitsjot	[kçitsjot]	gekitzelt	'tickle-PART'	69
	kχǖr	[kçyːr]	Kur	'health resort'	95
b.	kxɑffḗ	[kxɑffeː]	Kaffee	'coffee'	95
	kxumpíəru	[kxumpiæru]	kopieren	'copy-INF'	95
	kxērt	[kxeːrt]	gekehrt	'sweep-PART'	69

No examples in the original source were found in which a word-initial dorsal affricate surfaces before any of the diphthongs. I interpret this gap as accidental.

The examples in (22) show that [k] does not have a palatal realization. In word-initial position, [k] surfaces before any vowel. Example (22a) has [k] before a high front vowel and the ones in (22b) have [k] before other vowels.

(22) Word-initial [k] (from /k/):

a.	kinte	[kinte]	Launen	'mood-PL'	96
b.	keittu	[keittu]	schwanken	'fluctuate-INF'	96
	kætter	[kætter]	Gitter	'grate'	97
	koffrɑ	[koffrɑ]	Koffer	'suitcase'	95
	kunto	[kunto]	Konto	'account'	95

The conclusion is that the velars [x]/[kx] and the corresponding palatals [ç]/[kç] do not contrast in word-initial position. The distribution of those sounds follows if the underlying velars (/x/ and /kx/) and the surface palatals ([ç] and [kç]) have the representations in (23). Given those structures, the rule fronting word-initial /x/ and /kx/ is given in (24). Recall from §2.2.2 that stops are [−sonorant, −continuant], affricates are [−sonorant, −continuant, +continuant], and fricatives are [−sonorant, +continuant]. The target of Wd-Initial Velar Fronting-4 is expressed as the natural class of [−sonorant, +continuant, peripheral] sounds, i.e. /x/ and /kx/ in (23a). The stop /k/ is not a target since that sound is [−continuant]. No spreading occurs from /r l n/ because none of those sounds is [+high].

(23) Representations for dorsal fricatives/affricates:

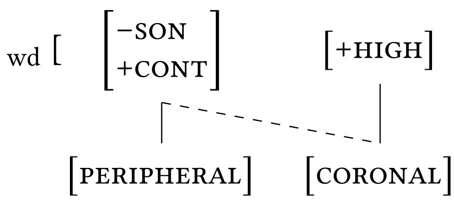
a. /x/, /kx/:

$$\begin{array}{c}\begin{bmatrix}-\text{SON}\\+\text{CONT}\end{bmatrix}\\ | \\ \begin{bmatrix}\text{PERIPHERAL}\end{bmatrix}\end{array}$$

b. [ç], [kç]:

$$\begin{array}{ccc} & \begin{bmatrix}-\text{SON}\\+\text{CONT}\end{bmatrix} & \\ / & & \backslash \\ \begin{bmatrix}\text{CORONAL}\end{bmatrix} & & \begin{bmatrix}\text{PERIPHERAL}\end{bmatrix}\end{array}$$

(24) Wd-Initial Velar Fronting-4:



The structures in (23) differ only minimally from the ones presupposed for velar and palatal fricatives in earlier chapters: Velars in Visperterminen are [peripheral] (and not [dorsal]), while palatals are [coronal] and [peripheral] (and not [coronal] and [dorsal]). Wd-Initial Velar Fronting-4 in (24) differs from the corresponding rule posited in the dialects discussed in earlier case studies because the trigger for (24) is restricted to [+high] sounds.

Wd-Initial Velar Fronting-4 spreads [coronal] from a high front segment (e.g. /i/). Recall from (7a, 7b) that all front nonneutral vowels are [coronal]. The natural class of high [coronal] vowels also includes the /i/ in the diphthong /iæ/, as in (10b). By contrast, word-initial /x/ surfaces as opaque [x] before /yo/ because the /y/ in that diphthong – as a neutral vowel – lacks [coronal], as in (10a); recall (15c).

Distributional generalization (16a) is exhibited in (25a–25g): Palatal fricatives ([ç] or [çç]) surface only after a high front vowel. The categories within (25) illustrate the individual high front vowels, i.e. the oral vowels [i iː yː ei] and the nasalized vowels [ỹː ĩː ẽi]. Note that the palatal fricatives can surface either in word-final position after a vowel or between vowels. Generalization (16b) is exemplified with example (25h).

(25) Postvocalic palatal fricatives (from /x/):

a.	līχt	[liːçt]	leicht	‘easy’	35
b.	štiχχ	[ʃtiçç]	Stich	‘sting’	93
c.	bǖχ	[byːç]	Bauch	‘stomach’	35
d.	weiχ	[weiç]	weich	‘soft’	94
e.	χü͔χlɑ	[çỹːçlɑ]	Kunkel	‘explosive pellet’	94
f.	wī͔χill	[wĩːçill]	Winkel	‘angle’	94
g.	de͔iχu	[dẽiçu]	denken	‘think-INF’	94
h.	liəχt	[liæçt]	Licht	‘light’	38

The examples in (26a–26h) illustrate the occurrence of velar fricatives ([x] or [xx]) after back vowels or nonhigh front vowels (=16c). Those eight categories represent the individual vowels, i.e. [u o ɑ ɑː yo e ɛː æ]. The nonoccurrence of words with a velar fricative after the other vowels (e.g. [ɛ eː æː oː] and the nasalized monophthongs) is accidental. The items listed in (26i, 26j) exemplify (16d): The opaque velar fricative underapplies after the two diphthongs [øi ɑ̃i].

(26) Postvocalic velar fricatives (from /x/):

a.	bruxx	[bruxx]	Bruch	'fracture'	93
b.	loxx	[loxx]	Loch	'hole'	93
c.	bɑxx	[bɑxx]	Bach	'stream'	94
d.	nɑ̄x	[nɑːx]	nahe	'near'	34
e.	süoxu	[syoxu]	suchen	'search-INF'	156
f.	dexxi	[dexxi]	Decke	'blanket'	93
g.	nɛ̄xšt	[nɛːxʃt]	nächst	'next'	34
h.	blæx	[blæx]	Blech	'tin'	94
i.	øix	[øix]	auch	'also'	95
	røix	[røix]	Rauch	'smoke'	94
j.	ɑ̜ixo	[ɑ̃ixo]	Butter	'butter'	94
	dɑ̜ixu	[dɑ̃ixu]	danken	'thank-INF'	94

[x]~[ç] alternations in postsonorant position are presented in (27a–27e). The two stems in (27a) are lexically listed because the vowels are not related by a regular synchronic process, i.e. /ræxt/, /rixt-ig/. Umlaut alternations in (27b–27e) reflect the final two patterns in (3c). The pair in (27f) exhibits [o]~[e] Umlaut alternations (=3a), but velar [xx] stays velar [xx] after [e] because that vowel is not [+high].

(27) Dorsal fricatives (from /x/) after front vowels:

a.	ræxt	[ræxt]	recht	'right'	29
	riχtig	[riçtig]	richtig	'correct'	29
b.	büox	[byox]	Buch	'book'	40
	biəχer	[biæçer]	Bücher	'book-PL'	40
c.	tüox	[tyox]	Tuch	'towel'	171
	tiəχji	[tiæçji]	Tüchlein	'towel-DIM'	171
d.	brüox	[bryox]	Pferdegeschirr	'horse harness'	94
	briəχ	[briæç]	Pferdgeschirr, pl.	'horse harness-PL'	94

e.	bɑ͔ix	[bɑ̃ix]	Bank	‘bench’	94
	be͔iχ	[blẽiç]	Bänke	‘bench-PL’	94
	xlɑ͔ix	[xlɑ̃ix]	(Glocken-)klang	‘sound of bell’	94
	xle͔iχ	[xlẽiç]	(Glocken-)klang, pl.	‘sound-PL of bell’	94
f.	loxx	[loxx]	Loch	‘hole’	124
	lexxer	[lexxer]	Löcher	‘hole-PL’	33

The most significant examples above involve the occurrence of the opaque velar fricative after the [i] component of [ɑ̃i] and the transparent palatal after the [i] component of [ẽi] in (27e); recall (9c, 9d).

The examples in (28) demonstrate that palatal [kç] surfaces after a high front vowel, while the data in (29) show that the velar [kx] occurs after all other sounds (=16g). The separate categories in (28–29) indicate the individual vowels. No examples were found in the original source with dorsal affricates after neutral vowels.

(28) Postvocalic palatal [kç] (from /kx/):

a.	dikχ	[dikç]	dick	‘fat’	96
b.	bleikχu	[bleikçu]	bleichen	‘bleach-INF’	96

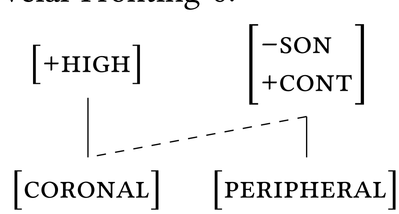
(29) Postvocalic velar [kx] (from /kx/):

a.	štukx	[ʃtukx]	Stück	‘piece’	96
b.	bokx	[bokx]	Bock	‘buck’	96
c.	sɑkx	[sɑkx]	Sack	‘sack’	96
d.	dekxu	[dekxu]	decken	‘cover-INF’	96
e.	rε̄kx	[rεːkx]	bitter	‘bitter’	96
f.	bækxu	[bækxu]	picken	‘peck-INF’	96

Visperterminen also has words containing [k] after a high front vowel, which show that [k] has no palatal realization, e.g. [rik] ‘back’ (Wipf 1910: 98).

The examples in (25–29) reveal that velars and the corresponding palatals do not contrast after a vowel. The palatals are derived from velars by (30):

(30) Velar Fronting-6:



Velar Fronting-6 does not apply after /øi/ and /ɑ̃i/ (=26i, 26j) because the /i/ component of both diphthongs is a neutral sound and therefore lacks [coronal]; recall (9a, 9c). By contrast, spreading occurs after /ei/ (=25d) and /ẽi/ (=25g) because the /i/ in those diphthongs are [coronal]; recall (9b, 9d).

Example (25h) illustrates that Velar Fronting-6 creates palatals after /iæ/. This is possible because that diphthong is [coronal]; recall (10b). The spreading of [coronal] in /iæ/ occurs as expected: /liæxt/→[liæçt].

The data in this section support predictions (13a–13c). (13a) is correct because velars and not palatals occur after /ɑ̃i/ and /øi/, and (13c) is substantiated because palatals and not velars surface after /iæ/. The data from word-initial position support (13b) because velars and not palatals occur in that position before [yo]. Since Velar Fronting-6 and Wd-Initial Velar Fronting-4 are both triggered by high front vowels, neither (13d) nor (13e) can be (dis)confirmed.

I conclude this section by considering the distribution of the dorsal fricatives and affricates after a consonant. Unlike all of the dialects discussed in the preceding chapters, velars ([x]/[kx]) and palatals ([ç]/[kç]) both occur after a (liquid) consonant; there are no dorsal fricatives or affricates before [n] because nasals deleted in that context by a historical process (Wipf 1910: 44–45). The relevant generalization is that the place of articulation of the dorsal sound is determined by the vowel immediately preceding the liquid (=16e, 16f). In (31) I show that [ç] occurs after a liquid if the immediately preceding vowel is high and front. The palatal fricative can be either word-final or word-internal before a vowel. In (31a) the liquid in question is [l] and in (31b) it is [r]. In all of the examples presented in (31) the high front vowel preceding the liquid is [i]. The absence of examples with [yː] in that context can be attributed to the lack of OHG words with the cognate vowel [uː] followed by a liquid plus dorsal fricative (Footnote 2). I speculate that there are similar historical reasons accounting for the lack of words with [iː] or any of the high front nasalized vowels followed by a sequence of liquid plus dorsal fricative.

(31) Postconsonantal [ç] (from /x/):

a.	χilχɑ	[çilçɑ]	Kirche	‘church’	94
	milχ	[milç]	Milch	‘milk’	94
b.	firχtu	[firçtu]	fürchten	‘fear-INF’	42
	birχɑ	[birçɑ]	Birke	‘birch’	42

The examples in (32) indicate that velar [x] surfaces after a liquid if the preceding vowel is either back or nonhigh and front. The liquid is [l] in (32a) and [r] in (32b).

(32) Postconsonantal [x] (from /x/):

a.	wulxɑ	[wulxɑ]	Wolke	‘cloud’	94
	xɑlx	[xɑlx]	Kalk	‘lime’	94
	mælxu	[mælxu]	melken	‘milk-INF’	94
b.	sɑ̄rx	[sɑːrx]	Sarg	‘coffin’	94
	lerx	[lerx]	Lärche	‘larch’	94
	wǣrx	[wæːrx]	Werk	‘work’	94

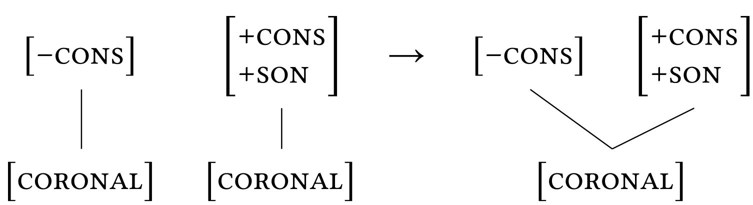
Dorsal affricates have an identical distribution to the corresponding fricatives. Two representative examples given in (33).

(33) Postconsonantal dorsal affricates (from /kx/):

a.	wirkχu	[wirkçu]	wirken	‘seem-INF’	96
b.	merkxu	[merkxu]	merken	‘notice-INF’	96

I argue that front vowel plus liquid sequences undergo the OCP-motivated change in (34), which merges the two [coronal] features into one. I assume that the first vowel in (34) is not restricted to [+high] sounds; there are no examples suggesting that the change does or does not occur after a nonhigh vowel. Since there are no nasal consonants that can potentially undergo Coalescence-1, I omit [−nasal] from the second segment in (34). Coalescence-1 has a function similar to the two schwa fronting changes posited in §3.4 (for Rheintal) and in §5.4 (for a number of HG varieties). See also §12.8.1 for further discussion.

(34) Coalescence-1:



In examples like [milç] ‘milk’ in (31a), Coalescence-1 feeds Velar Fronting-6: /milx/⟶[milç]. By contrast, Coalescence-1 does not affect the /ul/ sequence in examples like [wulxɑ] ‘cloud’ in (32a); hence, Velar Fronting-6 does not apply: /wulxɑ/⟶[wulxɑ].

6.3 Highest Alemannic (part 2)

Brun (1918) describes a HstAlmc dialect spoken in the community (Gemeinde) of Obersaxen (now known as Obersaxen Mundaun) in the Swiss canton of Grisons (Graubünden); see Map 3.2.

Obersaxen is an area in Switzerland settled by people originally from the canton of Valais during the Walser migrations (Walserwanderungen); see Bohnenberger (1913) and Wiesinger (1983a: 904). Hence, the dialect described by Brun (1918) is one variety of Walser German (Walderdeutsch). Obersaxen is a unique dialect because it is a German-language island (Wiesinger 1983a) completely surrounded by areas in which a Romance language is the dominant tongue (Romansh). See §15.6 for further discussion.

In his discussion of the sounds of Walser German, Bohnenberger (1913: 173) observes that /kx/ and /x/ are realized as palatal depending on the nature of the preceding vowel. It is tempting to interpret Bohnenberger's observation as evidence that Walser German as a whole is characterized by velar fronting. The problem with this interpretation is twofold. First, not all varieties of Walser German have velar fronting (e.g. Schanfigg; Kessler 1931; Map 3.2). Second, varieties of Walser German with velar fronting do not have the same rule (see Chapter 15 for discussion).

Although Obersaxen is shown below to possess a neutral vowel and is hence structurally similar to Visperterminen (Wipf 1910; §6.2), it needs to be stressed that the two SwG varieties are spoken in different cantons and that they are therefore separated by conservative non-velar fronting varieties. Neutral vowels in Visperterminen and Obersaxen therefore developed independently.

I consider first the phonetics/phonology of the vowels (§6.3.1) and then the patterning of dorsal fricatives and affricates (§6.3.2).

6.3.1 Phonetics and phonology of vowels

Obersaxen possesses front vowels (/i y yː e eː æ æː/), back vowels (/u o oː ɑ ɑː ə/), and six diphthongs (/æʊ ʊæ ʏu æɪ ɪæ ɪi/).[9] The diphthongs are placed into two categories based on how they behave with respect to Umlaut: /æʊ ʊæ ʏu/ bear [peripheral] and /æɪ ɪæ ɪi/ [coronal]; see below for representations. The most important diphthong for present purposes /ʏu/, whose phonetically front component /ʏ/ is shown below to be a neutral vowel, cf. the equivalent diphthong in Visperterminen /yo/.

Vocalic alternations involving Umlaut are essentially the same as in Visperterminen: Back monophthongs alternate with the corresponding front unrounded monophthongs in (35a); front rounded monophthongs surface in the context of

[9] Three surface monophthongs are ignored, namely [ɪ ø ɛ]. [ø ɛ] only occur rarely (Brun 1918: 45, 67) and apparently never in the context of a dorsal fricative or affricate. [ɪ] is a stressless allophone of /i/. Two diphthongs are not considered below ([ɪə ʊə]) because they do not occur in the neighborhood of dorsal fricatives or affricates.

Umlaut as the corresponding front unrounded monophthongs in (35b). Diphthongs exhibit the pattern of alternation in (35c).

(35) a. [u]~[i]
[o]~[e]
[oː]~[eː]
[ɑ]~[æ]
[ɑː]~[æː]

b. [yː]~[iː]
[y]~[i]

c. [ʊæ]~[ɪæ]
[æʊ]~[æɪ]
[ʏu]~[ɪi]

The three patterns in (35) are illustrated in (36a–36c). The morphological contexts for Umlaut in these examples are the comparative or superlative of adjectives, the plural of nouns and the derivational suffixes [-ər] and [-lɪçç]. Synchronic alternations involving the pair [ʏu]~[ɪi] in (35c) are difficult to come by; a crucial example involving that pair of diphthongs as it interacts with the distribution of dorsal fricatives is discussed in §6.3.2.

(36)	a.	ksunt	[ksunt]	gesund	‘healthy’	61
		ksintər	[ksindər]	gesünder	‘healthier’	61
		grop	[grop]	grob	‘rough’	61
		grebər	[grebər]	gröber	‘rougher’	61
		grōss	[groːss]	groß	‘large’	160
		grēšt	[greːʃt]	größt-	‘largest’	160
		štɑrxx	[ʃtɑrxx]	stark	‘strong’	160
		štærxšt	[ʃtærxʃt]	stärkst-	‘strongest’	160
		nɑ̄t	[nɑːt]	Naht	‘seam’	57
		nǣtlι	[næːtlɪ]	Naht, dim	‘seam-DIM’	57
	b.	fǖšt	[fyːʃt]	Faust	‘fist’	155
		fīšt	[fiːʃt]	Fäuste	‘fist-PL’	155
		hüt	[hyt]	Haut	‘skin’	75
		hittæ	[hittæ]	häuten	‘skin-INF’	75
	c.	šuæl	[ʃʊæl]	Schule	‘school’	55
		šiælər	[ʃɪælər]	Schüler	‘student’	66
		glæubæ	[glæʊbæ]	glauben	‘believe-INF’	81
		uŋklæιplιχχ	[uŋklæɪplɪçç]	unglaublich	‘unbelievable’	63

Front unrounded monophthongs are nonneutral and hence [coronal]; see (7a), while back monophthongs are [peripheral]; see (7c). The correct representation for front rounded monophthongs is (7b). Individual monophthongs are assigned distinctive features, as indicated in Table 6.2. In contrast to Visperterminen (= Table 6.1), [low] must be assigned before [high] so that high and mid front vowels all bear the feature [−low]. [peripheral] is assigned twice, depending on whether or not it corresponds to the backness or the roundedness dimension.

Table 6.2: Distinctive features for vowels (Obersaxen)

	i	yː y	eː e	æː æ	u	oː o	ɑː ɑ
[coronal]	✓	✓	✓	✓			
[peripheral]					✓	✓	✓
[low]	−	−	−	+	−	−	+
[high]	+	+	−	−	+	−	−
[peripheral]		✓					

The featural representations for the six diphthongs are presented in (37). Note that both components of those diphthongs bear either a positive or negative specification of the feature [high]. The feature [high], together with the place features [coronal] and [peripheral], suffices to make all six diphthongs distinct. For that reason, the feature [±low] is redundant, as is [±tense]. The fact that certain components of the diphthongs are phonetically lax and others are phonetically tense is captured in the phonetics and not in the phonology.

(37) a. /æʊ/

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix}$$

$$\begin{bmatrix}\textsc{peripheral}\end{bmatrix}$$

b. /æɪ/

$$\begin{bmatrix}-\textsc{cons}\\-\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix}$$

$$\begin{bmatrix}\textsc{coronal}\end{bmatrix}$$

c. /ʊæ/

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\-\textsc{high}\end{bmatrix}$$

$$\begin{bmatrix}\textsc{peripheral}\end{bmatrix}$$

d. /ɪæ/

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\-\textsc{high}\end{bmatrix}$$

$$\begin{bmatrix}\textsc{coronal}\end{bmatrix}$$

e. /ʏu/

$\begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix}$ $\begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix}$

$\big[\textsc{peripheral}\big]$

f. /ɪi/

$\begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix}$ $\begin{bmatrix}-\textsc{cons}\\+\textsc{high}\end{bmatrix}$

$\big[\textsc{coronal}\big]$

Given the structures for monophthongs in (7) and diphthongs in (37), Umlaut is expressed as in (11).

6.3.2 Dorsal fricatives and affricates

Obersaxen has two singleton dorsal fricatives, namely [x] (=⟦x⟧) and [ç] (=⟦χ⟧), which also have geminate counterparts [xx] (=⟦xx⟧) and [çç] (=⟦χχ⟧). In contrast to Visperterminen, geminates can occur in Obersaxen after a long vowel. The basic facts involving the distribution of dorsal fricatives and affricates in Obersaxen are very similar – but not identical – to the facts for Visperterminen. The reader is referred to the detailed discussion in the original source (Brun 1918: 113–118; 121–122). The relationship between the velars and corresponding palatals is depicted in (14) for word-initial and postsonorant position.

The distribution of the velar and palatal sounds in question is summarized in (38) and (39):

(38) [x]/[kx] and [ç]/[kç] in word-initial onsets:
  a. [ç] occurs word-initially only before nonlow front vowels but not before [ʏu];
  b. [x] occurs word-initially in the elsewhere case (also before [ʏu]);
  c. [kç] and [kx] have the same distribution as word-initial [x]/[ç].

(39) [x]/[kx] and [ç]/[kç] after a sonorant:
  a. [ç] occurs after a nonlow front vowel;
  b. [x] occurs after other vowels (including [ɪæ]);
  c. [ç] occurs after a nonlow front vowel followed by a liquid;
  d. [x] occurs after any other vowel followed by a liquid;
  e. [kç] and [kx] have the same distribution as [x]/[ç].

There are two crucial differences between Obersaxen and Visperterminen: First, in Visperterminen palatals occur in the neighborhood of a [+high] coronal, but in Obersaxen palatals surface when adjacent to a [−low] sound. Second, in

Obersaxen, [x] surfaces after the diphthong [ɪæ], but in Visperterminen, palatal [ç] surfaces after the equivalent diphthong ([iæ]).

In word-initial position, [ç] occurs before a nonlow front vowel (=38a). The vowel referred to here can be [i] in (40a), [yː] in (40b), [e] in (40c), [eː] in (40d), or [ɪæ] in (40e). No examples with a word-initial dorsal fricative were found in Brun (1918) in which the vowel following that fricative is [y] or [ɪi] – gaps I interpret as accidental. The dorsal fricatives and affricates in (40) and subsequent datasets derive historically from WGmc $^{+}$[k] or $^{+}$[x].

(40) Word-initial [ç] (from /x/):

a.	χint	[çint]	Kind	'child'	113
b.	χǖχχlæ	[çyːççlæ]	Kunkel	'explosive pellet'	113
c.	χegəl	[çegəl]	Kegel	'pin'	113
d.	χēl	[çeːl]	Kohl	'cabbage'	47
e.	χɩæholts	[çɪæholts]	Kienholz	'resinous wood'	54

As shown in (41), before any other segment, the word-initial dorsal fricative surfaces as [x] (=38b). Thus, word-initial [x] occurs before a back vowel in (41a), a nonhigh front vowel in the diphthongs [æu] and [æi] in (41b), or the diphthong [ʏu] in (41c). The latter example is crucial because [ʏ] is a high front vowel and, as such, would be expected to pattern like the examples in (40). Thus, a surface sequence of velar followed by [ʏu] exemplifies the underapplication of velar fronting.

(41) Word-initial [x] (from /x/):

a.	xunšt	[xunʃt]	Kunst	'art'	113
	xopf	[xopf]	Kopf	'head'	113
	xālt	[xɑːlt]	kalt	'cold'	61
b.	xæuwæ	[xæʊwæ]	kauen	'chew-INF'	113
	xæisər	[xæɪsər]	Kaiser	'emperor'	113
c.	xüuwæ	[xʏuwæ]	Kuh	'cow'	113

In Brun's (1918: 113) description of the distribution of word-initial [x] and [ç], he writes that the former sound occurs before the vowels [ɑ o u æ æɪ æʊ ʏu] and the palatal before [i y e ɪæ]. ("Velare Spirans x……vor den Vokalen *a o u æ æi æu* und *üu*; Palatale χ……vor den Palatalvokalen *i u ɩæ e ǖ*"). Note in particular that Brun classifies the front part of the diphthong [ʏu] with the back vowels and the nonlow front vowels.

The examples in (42) indicate that [x] – but not [ç] – occurs in word-initial position before a coronal sonorant consonant, which can be [n] in (42a), [l] in (42b), or [r] in (42c). The second example in (42a) illustrates that the realization of the word-initial dorsal is not determined by the vowel following /r/.

(42) Word-initial [x] (from /x/):

a.	xnæu	[xnæu]	Knie	'knee'	113
	xnæxt	[xnæxt]	Knecht	'vassal'	34
b.	xrɑnts	[xrɑnts]	Kranz	'wreath'	113
	xrits	[xrits]	Kreuz	'cross'	113
c.	xlā̄r	[xlɑːr]	klar	'clear'	113
	xlæppæræ	[xlæppæræ]	klappern	'rattle-INF'	113

The Umlaut alternations in (43a) trigger a change from velar [x] to palatal [ç] before a nonlow front vowel. The same vocalic change occurs in the pair in (43b). Note that the diphthong in the singular noun is the neutral vowel [ʏu], which is preceded by a surface velar [x]. The fronted counterpart of that neutral vowel is [ɪi] in the plural noun, which is preceded by a surface palatal [ç] because [ɪi] is a nonneutral vowel.

(43) Dorsal fricatives (from /x/) before Umlaut alternations:

a.	xālt	[xɑːlt]	kalt	'cold'	61
	χeltər	[çeltər]	kälter	'colder'	61
b.	xüuwæ	[xʏuwæ]	Kuh	'cow'	155
	χɩijæ	[çɪijæ]	Kühe	'cow-PL'	155

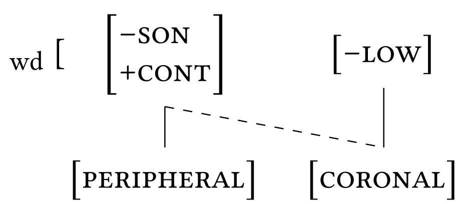
Word-initial velar and palatal affricates showing the same distribution as the corresponding fricatives are presented in (44); recall (38c). Brun (1918: 113) is clear in that the distribution of word-initial dorsal affricates is the same as the distribution of the corresponding fricatives.

(44) Word-initial affricates (from /kx/):

a.	kχits	[kçits]	Werg	'oakum'	114
b.	kxuntæ	[kxuntæ]	Rechnung	'bill'	38
	kxæuffæ	[kxæʊffæ]	kaufen	'buy-INF'	38

In word-initial position velars and palatals do not contrast. As indicated above, I analyze the underlying sound as a velar (/x/ or /kx/), which shifts to the corresponding palatal before a [−low] vowel by (45). No native words begin with [k], although a small number of apparently integrated loanwords have [k] in that context, e.g. [kiŋklæ] 'rabbit'. Since word-initial [k] is not realized as palatal before nonlow front vowels, the set of targets for (45) consists of fricatives and affricates only (=23a).

(45) Wd-Initial Velar Fronting-5:



Wd-Initial Velar Fronting-5 fails to spread [coronal] from a consonant (/r l n/) to a preceding /x/ because [±low] is not distinctive for consonants. Hence, word-initial /x/ in (42) surfaces without change as [x].

The distribution of velar and palatal fricatives after a vowel (=39a–d) is shown in (46): Palatals surface after a nonlow front vowel in (46a), while velars occur after a low front vowel in (46b) or a back vowel in (46c). The examples in (46d) exhibit the occurrence of velar fricatives after the diphthong [ɪæ].[10]

(46) Postvocalic dorsal fricatives (from /x/):

a.	rīχχ	[riːçç]	reich	'rich'	46
	ksiχt	[ksiçt]	Gesicht	'face'	121
	rǣtɪχ	[ræːtɪç]	Rettig	(unclear gloss)	44
	χeχχ	[çeçç]	Köche	'cook-PL'	116
	sēχtæ	[seːçtæ]	Wäsche in die Lauge legen 'put-INF wash in lye'		45
b.	fæxtæ	[fæxtæ]	fechten	'fence-INF'	121
c.	bruxx	[bruxx]	Bruch	'fracture'	39
	loxx	[loxx]	Loch	'hole'	37
	bɑxx	[bɑxx]	Bach	'stream'	116
	dɑ̄x	[dɑːx]	Docht	'wick'	43
	ræuxx	[ræuxx]	Rauch	'smoke'	116

[10] The discussion in Brun (1918: 114) is clear that palatals only surface after the vowels I analyze as nonlow. In the context of that discussion the author notes a complication: If a dorsal fricative occurs between a low front vowel and /ɪ/, then the fricative in question is fronted, e.g. the /xx/ in the word /ʃtæxxɪk/ 'malicious'. I do not take that type of example into consideration below because I see the fronted articulation of /xx/ as the product of a coarticulatory fronting and not of a discreet phonological process. Brun himself notes that the fronted dorsal fricative in words like /ʃtæxxɪk/ is articulatorily between velar and palatal.

d.	sιæxx	[sɪæxx]	krank	'sick'	54
	ərnιæxtæræ	[ərnɪæxtæræ]	Schnapps	'kind of Schnapps'	55

Note in particular the data in (46d): [ɪæ] is followed by a velar fricative in contrast to the data from (25h) indicating that a palatal fricative follows [iæ] in Visperterminen.

The Umlaut alternations in (47) indicate that [x] surfaces after a back vowel in the singular but that [ç] occurs after the fronted (nonlow) vowel in the plural.

(47) Dorsal fricatives (from /x/) after fronted vowels:

a.	fruxt	[fruxt]	Frucht	'fruit'	155
b.	friχt	[friçt]	Früchte	'fruit-PL'	155

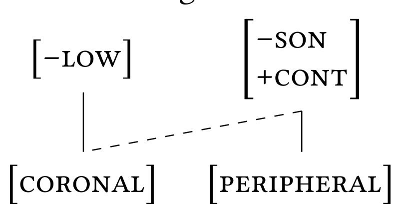
The examples in (48) show that velar and palatal affricates have a parallel distribution to the corresponding fricatives (=39e). Thus, palatal [kç] surfaces after a [−low] front vowel in (48a) and velar [kx] after any other vowel in (48b).

(48) Postvocalic dorsal affricates (from /kx/):

a.	glikχ	[glikç]	Glück	'fortune'	116
b.	štukx	[ʃtukx]	Stück	'piece'	42
	špækx	[ʃtækx]	Speck	'bacon'	116

Postvocalic velars and palatals are derived from /x/ or /kx/ after a [−low] front vowel by (49). As in word-initial position, the target for postsonorant fronting in (49) does not include /k/, e.g. [ek] 'corner'.

(49) Velar Fronting-7:



The examples in (46d) indicate that the dorsal fricative surfaces as velar after the diphthong /ɪæ/, e.g. /sɪæxx/⟶[sɪæxx] 'sick'. The reason [coronal] cannot spread from the diphthong /ɪæ/ to /x/ is that the trigger for fronting (Velar Fronting-7) is [−low]. Recall from (37) that the two components of the six diphthongs are distinguished from one another with the positive or negative value of the feature [high] alone (together with [coronal] and or [peripheral]), but that [low] is not a distinctive feature for diphthongs.

I consider now the distribution of the dorsal fricatives after a consonant (=39c, 39d). In (50) I show that the palatal [ç] occurs after a liquid if the immediately preceding vowel is nonlow and front. In (50a) the liquid in question is [l], and in (50b) it is [r].

(50) Postliquid dorsal fricatives (from /x/):

a.	milχχ	[milçç]	Milch	‘milk’	37
	χelχχ	[çelçç]	Kelch	‘chalice’	32
b.	mælxx	[mælxx]	leicht zu melken	‘easy to milk-INF’	116
c.	xɑlxx	[xɑlxx]	Kalk	‘lime’	37

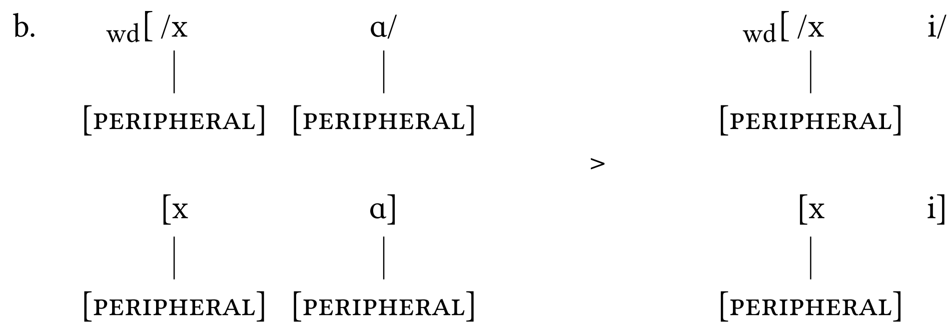
Front vowel plus liquid sequences undergo Coalescence-1 (=34). In (50a) Velar Fronting-7 applies because the front vowel is [−low], e.g. /milxx/⟶[milçç] ‘milk’. Since the vowel preceding the liquid is not front in (50c) Coalescence-1 does not apply, and the dorsal fricative surfaces as velar, e.g. /xɑlxx/⟶[xɑlxx] ‘lime’. In (50b) the front vowel plus liquid sequence undergoes Coalescence-1, but the dorsal fricative after the liquid fails to undergo Velar Fronting-7 because the front vowel does not bear the feature [−low], e.g. /mælxx/⟶[mælxx] ‘easy to milk-PL’.

6.4 Emergence of neutral vowels

As noted above, neutral vowels were historically back. The change from an original back sound to the neutral structure in (1b) exemplifies Vowel Fronting, which requires the deletion of the feature characterizing back sounds ([peripheral]) but crucially not the addition of the front vowel feature ([coronal]). That type of change is depicted in (51a) in the context before a velar and in (51b) in the context after a word-initial velar. Vowel Fronting – depicted here as /ɑ/ > /i/ – deleted the [peripheral] feature from the back sound. The significant point is that the frontness feature ([coronal]) was not added to the new front vowel /i/, which is the neutral vowel represented in (1b). (51) depicts both underlying and surface representations, which are the same.

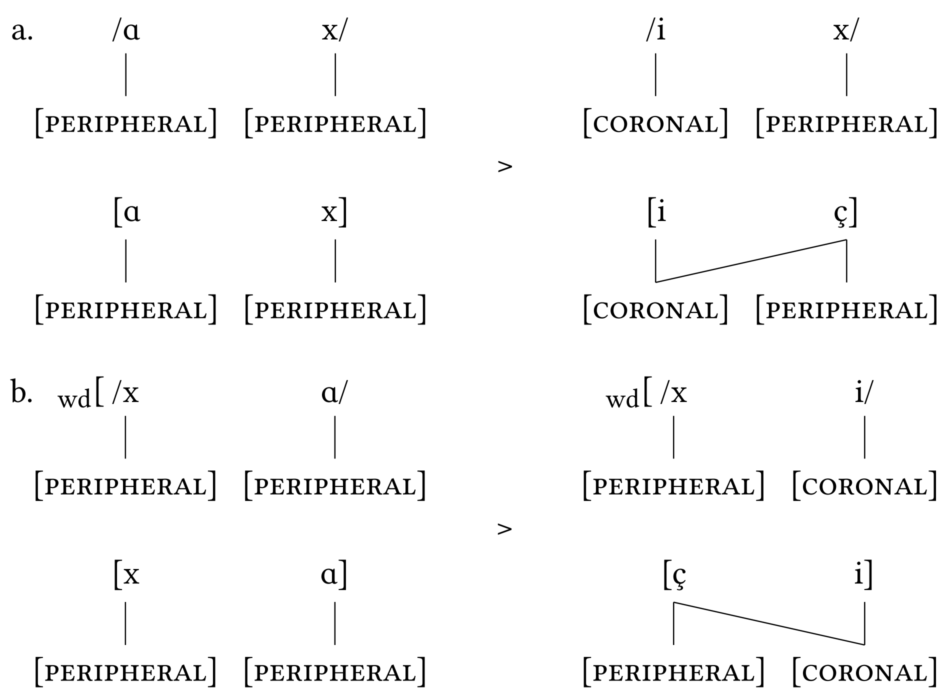
(51) a.

/ɑ	x/		/i	x/
|	|			|
[PERIPHERAL]	[PERIPHERAL]			[PERIPHERAL]
		>		
[ɑ	x]		[i	x]
|	|			|
[PERIPHERAL]	[PERIPHERAL]			[PERIPHERAL]



In some of the examples from Visperterminen and Obersaxen presented earlier, Vowel Fronting involves not simply the deletion of [peripheral] from the original back vowel, but also the addition of [coronal] to those new front vowels, thereby creating the nonneutral representation in (1a). That type of vocalic change is depicted in (52a) for the context before a velar (/x/) and in (52b) for the context after a word-initial velar (/x/). Note that Vowel Fronting – represented here as /ɑ/ > /i/ – feeds velar fronting because the new front vowel created by the former (/i/) serves as a trigger for the latter.

(52)



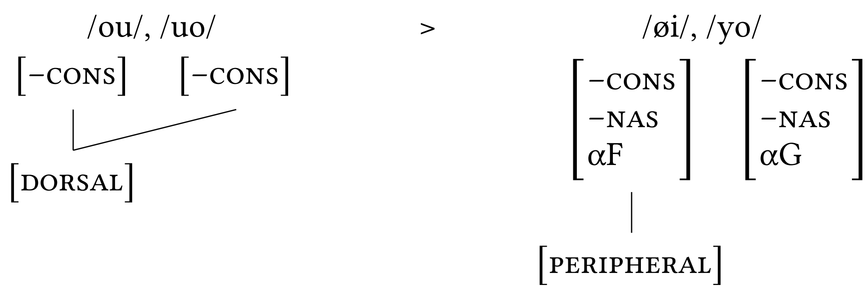
I consider now three representative words in (53) from Visperterminen for the two types of Vowel Fronting. Examples (53a, 53b) exhibit the emergence of neutral vowels (=51) and the one in (53c) of nonneutral vowels (=52). The reconstructed forms in the second column are my own.

(53)	a.	[xyo]	<	+[xuo]	‘cow’	cf. OHG *kuo*	(from 18c)
	b.	[røix]	<	+[rouh]	‘smoke’	cf. OHG *rouh*	(from 26i)
	c.	[byːç]	<	+[buːx]	‘stomach’	cf. OHG *būh*	(from 25c)

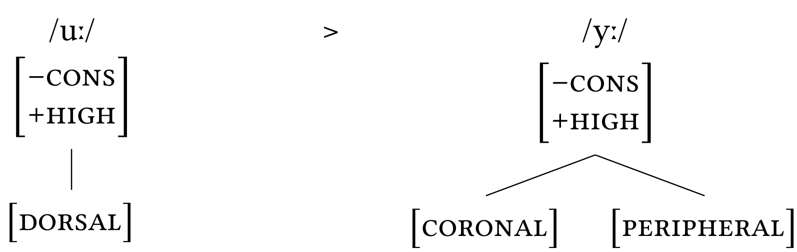
Since Vowel Fronting is simply a cover term for any change from any etymological back vowel to any type of vowel that loses the backness feature, there is no reason to assume that the vocalic changes in (53) were necessarily coterminous. In fact, I show that the changes creating neutral vowels in (53a, 53b) probably came about later than the ones creating nonneutral structures, as in (53c).

The vocalic changes in (53a, 53b) are expressed formally in (54). The featural structure to the left of the wedge in (54) captures the two original diphthongs, which consisted of back vowels (/ou, uo/). According to Neutral Vowel Formation the feature [dorsal] is replaced with [peripheral] and additional features are added to the two components, namely [−nasal] and the height features [±high] and [±low], which are represented in (54) with the two variables [αF] and [αG]. The crucial aspect of the change is that the second component of the diphthongs to the right of the wedge does not acquire the feature [coronal]. Neutral Vowel Formation in (54) can be compared with Coronalization in (55), which is required for example (53c); recall Footnote 2. Coronalization also involves a replacement of [dorsal] with [peripheral], but crucially the structure to the right of the wedge acquires the feature [coronal].

(54) Neutral Vowel Formation:



(55) Coronalization:



In (56) I provide the three examples from (53) as well as the word [weiç] ‘soft’ from (25d). The first and third items represent the neutral vowels [yo] and [øi], the second example shows a high front nonneutral vowel deriving from a historical back vowel, and the fourth example illustrates an inherited high front nonneutral vowel ([i] in [ei]). At Stage 1 velars surfaced without change as velars. Stage 2 reflects the point where velar fronting was phonologized as an allophonic (transparent) process, and Stage 3 represents the dialect as it was described by Elisa Wipf in 1910. The subscripts indicate whether or not the segment in question is peripheral ("p"), dorsal ("d") or coronal ("c"). I assume that all instantiations of [dorsal] at Stage 2 changed to [peripheral] at Stage 3.

(56)	/x$_d$u$_d$o$_d$/	/bu:$_d$x$_d$/	/ro$_d$u$_d$x$_d$/	/we$_c$i$_c$x$_d$/	
	[x$_d$u$_d$o$_d$]	[bu:$_d$x$_d$]	[ro$_d$u$_d$x$_d$]	[we$_c$i$_c$x$_d$]	Stage 1
	/x$_d$u$_d$o$_d$/	/by:$_c$x$_d$/	/ro$_d$u$_d$x$_d$/	/we$_c$i$_c$x$_d$/	
	[x$_d$u$_d$o$_d$]	[by:$_c$ç$_{cd}$]	[ro$_d$u$_d$x$_d$]	[we$_c$i$_c$ç$_{cd}$]	Stage 2
	/x$_p$y$_p$o$_p$/	/by:$_{cp}$x$_p$/	/rø$_p$ix$_p$/	/we$_c$i$_c$x$_p$/	
	[x$_p$y$_p$o$_p$]	[by:$_{cp}$ç$_{cp}$]	[rø$_p$ix$_p$]	[we$_c$i$_c$ç$_{cp}$]	Stage 3
	Kuh	*Bauch*	*Rauch*	*weich*	StG
	'cow'	'stomach'	'smoke'	'soft'	

Coronalization created a front (nonneutral) vowel from a historical back vowel in [by:ç]. When that restructuring occurred (=Stage 2), the new front vowel fed velar fronting, which created a palatal that was fully transparent. By contrast, the examples [xyo] and [røix] exemplify the historical underapplication of velar fronting. In particular, at Stage 3 Neutral Vowel Formation converted the historical back vowels in those examples to diphthongs containing neutral vowels.

In §2.5 I posited a historical model which involves the interaction between speakers and listeners in acquisition. Consider how that approach accounts for the emergence of neutral vowels in (56). At Stage 2 the speaker (P_1) utters words like [weiç] (from /weix/) and [roux] (from /roux/). At Stage 3 the listener (P_2) correctly hears [weiç] and – on the basis of similar examples with [ç] and [x] – deduces that the underlying representation is /weix/ with a rule of velar fronting. By contrast, the diphthong in [roux] is misperceived as a diphthong consisting of a front component ([ø]) followed by a high vowel that is no longer back but also not as front as the second component of [ei]. The second part of the new diphthong is therefore misperceived as something other than [i]. I speculate that when the change from /ou/ to /øi/ was phonologized the new diphthong was probably pronounced as [øi̠], where [i̠] represents a slightly retracted [i]. But the change from Stage 2 to Stage 3 did not simply involve P_2's misperception and pronunciation of that new vowel. It also crucially entailed the interpretation of that vowel in phonological units as one which is neither front nor back, but instead neutral, as in (54). In 1910 when Elisa Wipf published her book on the sounds of Visperterminen the second component of [ei] and [øi] had fallen together; hence, at that point there was no longer a phonetic difference between the [i] in [ei] and the [i̠] in [øi̠], but the unique phonological representation in (54) was retained.[11]

6.5 Discussion

6.5.1 Alternative analyses

Recall from §2.4.2 that there is precedence in the cross-linguistic literature for neutral vowels. The example discussed in that section (Dresher 2009) involved Barrow Inupiaq, which has both a nonneutral, Palatalization-triggering /i/, as well as a neutral, Palatalization-inhibiting /i/. In present terms, the former /i/ is marked phonologically for the feature that spreads in Palatalization ([coronal]), while the neutral /i/ does not have that feature. Significantly, neutral /i/ derived historically from a back vowel.

The material from Barrow Inupiaq lends strong support to the analysis of the two SwG varieties discussed in this chapter because it establishes a precedence for the two representations in (1). In spite of that independent evidence one might claim that coronalless structures like the one in (1b) can be eschewed by adopting an alternative analysis. I discuss and reject three such alternatives below.

The weakest alternative to (1b) (Analysis A) is to assert that velars like [x] and palatals like [ç] are phonemes and to deny that there are any processes fronting the former to the latter. If /x/ and /ç/ – as well as the corresponding affricates – are phonemic, then one might assume that representations like (1b) are superfluous. Analysis A is untenable because velars and palatals never contrast in either of the HstAlmc varieties discussed above. For example, in Visperterminen postvocalic [ç] occurs only after any high front vowel with the exception of the [i] in [øi], but [x] surfaces only after back vowels and the [i] in [øi]. [x] and [øi] are therefore allophones according to any definition. That point aside, the reader should recall that (1b) derives independent support from Umlaut alternations.

[11]If the second component of [ei] and [øi] is now truly the same then it needs to be clarified how generations of Visperterminen listeners since 1910 have correctly acquired phonological representations with neutral vowels. I hypothesize that there remains a very subtle difference between the [i] in [ei] and the [i] in [øi] to the present day which serves as a cue to language learners that only the first but not the second serves as a trigger for velar fronting. Future work on Visperterminen can (dis)confirm my hypothesis.

A second alternative to (1b) (Analysis B) is to derive palatals from the corresponding velars with versions of velar fronting which simply list the segmental triggers. For example, Analysis B would state Wd-Initial Velar Fronting-4 and Velar Fronting-6 as in (57). An analysis along these lines is endorsed by Anderson (1981: 509–511), who assumes a synchronic rule of Velar Palatalization in Icelandic that is triggered by a list of segments and not a set of features.

(57) Alternative rules (rejected):
   a. /x kx/ ⟶ [ç kç] / $_{\text{wd}}$ [__ /i iː iæ ỹː/
   b. /x kx/ ⟶ [ç kç] / /i iː yː ei iæ ĩː ỹː ẽi/ __

The crucial difference between (57) and the rules of fronting posited above is that the rules in (57) are not expressed in terms of features. For example, (57a) is triggered by the four vowels /i iː iæ ỹː/ but not by the high front vowel /y/ in the diphthong /yu/ because /yu/ is not included in the list of triggers. Likewise (57b) applies after the vowels /i iː yː ei iæ ĩː ỹː ẽi/ but not after the /i/ in the diphthongs /øi/. Given that palatals are derived when adjacent to an arbitrary list of vowels – and not to a natural class expressed in terms of features – there is no need to analyze neutral vowels as placeless. Thus, the /y/ in /yo/ and then /i/ in /øi/ and /ɑi/ can be analyzed as [coronal].

A number of criticisms can be directed towards Analysis B. Observe that the treatment's rejection of neutral vowels comes at the expense of relying on rules that do not apply to a natural class. That contrasts with velar fronting in all of the other German dialects investigated in this book. A more serious drawback is that it is not clear how Analysis B accounts for the vocalic alternations described in §6.2.2 and §6.3.2.

A third alternative to (1b) (Analysis C) is to treat the aberrant words as lexical exceptions. On that analysis, the reason [x] surfaces in a word in Visperterminen like [øix] 'also' is not because the /i/ has a coronalless representation, but instead because of the specific morpheme in which the sounds in question occur.

Analysis C can therefore be thought of as a morpheme-based analysis, which contrasts with the present treatment (a vowel-based analysis). There are two arguments against the former approach.

First, Analysis C cannot explain why the exceptional velars only surface in the neighborhood of the same vowels. For example, word-initial [x] surfaces not only in the morpheme [xyo] 'cow', but also in all other morphemes containing [yo]. But [x] fails to surface in word-initial position before other high front vowels. The same points hold for the [x] in Visperterminen examples like [røix] 'smoke'. The fact that opaque velars occur only in the context of certain high front vowels but not in the context of others is captured directly by the vowel-based approach, but the facts are coincidental in the morpheme-based treatment.

Second, if morphemes were marked as exceptional then there would be no explanation for Umlaut alternations. For example, the morpheme ‘cow’ surfaces in Visperterminen as [xyo] in the singular, but the plural is [çiæ]. The morpheme [bɑ̃ix] ‘bank’ likewise surfaces with the palatal [ç] in the plural (i.e. [bẽiç]). The change from [x] to [ç] in these examples makes sense given my treatment (which is vowel-based) because the [y] in [yo] and the [i] in [ɑ̃i] but not the [i] in [iæ] or [ẽi] are neutral vowels. But if morphemes and not vowels were marked as exceptions as per Analysis C, there would be no explanation for the fact that the same morpheme sometimes obeys the rule and other times does not.

6.5.2 Directionality

Reference was made to a directionality parameter in the typological literature on Velar Palatalization (§2.3.5). Thus, the works cited in that section demonstrate that Velar Palatalization can apply either regressively (right-to-left) or progressively (left-to-right). A hypothetical example illustrating regressive Palatalization is /ɑki/⟶[ɑci] and progressive Palatalization is /ikɑ/⟶[icɑ]. Both choices are attested in the languages of the world, although there is a clear preference for regressive spreading.

The directionality parameter has not been discussed in the context of velar fronting in German dialects because postsonorant velar fronting always applies from left-to-right, cf. StG [kuːxən] ‘cake’ vs. [kʏçə] ‘kitchen’. In these items it can be seen that the trigger for velar fronting (e.g. /ʏ/) is to the immediate left of the target (/x/). The reason the trigger cannot be the vowel to the right of the target is that that vowel is always schwa (/ə/) in native words. Schwa cannot trigger the spreading of the frontness feature because it is not a front vowel. Recall that schwa in examples like [kuːxən] ‘cake’ vs. [kʏçə] ‘kitchen’ was etymologically a full vowel (cf. OHG *kuohho* ‘cake’, OHG *kuhhina* ‘kitchen’) which underwent Vowel Reduction. StG also has many nonnative words (including names), in which the velar fronting target (/x/) is between two full vowels (Appendix G), e.g. [ɛço] ‘echo’, *Achim* [ɑxɪm] ‘(name)’. The reason StG tolerates words like these with full vowels in unstressed syllables is that Vowel Reduction is no longer active synchronically. More to the point, examples like [ɛço] and [ɑxɪm] confirm that velar fronting spreads the frontness feature progressively and not regressively. Nonnative words like these are not considered in this book because they are usually not discussed in the original sources.

The topic of directionality is relevant in this chapter because Vowel Reduction never occurred in Visperterminen (recall §6.2.1) and only applied to a limited extent in Obersaxen. Hence – in contrast to all other dialects of German – potential triggers for velar fronting can be present in both of those SwG varieties after the targets even in native words. Four representative examples from Visperterminen with velar fronting targets (/x/ and /kx/) situated between two full vowels are repeated in (58). Words like these confirm that spreading is progressive. Thus, in (58a) the (high front) vowel to the left of the target is a trigger, while the (back) vowel to the right of that target is not a trigger. However, the vowel to the right of the target (/xx/) in (58b) is high and front, while the vowel to the left of the trigger in those words is not high and front. Since the target /xx/ surfaces without change as velar in (58b) it can be concluded that velar fronting cannot spread the frontness feature from right-to-left. (Recall from Footnote 10 that the regressive spreading attested in Obersaxen is the result of coarticulatory fronting and not discreet phonological fronting).

(58)	a.	dḙiχu	[dẽiçu]	'think-INF'	(from 25g)
		bleikχu	[bleikçu]	'bleach-INF'	(from 28b)
	b.	xuxxi	[xuxxi]	'kitchen'	(from 18a)
		dexxi	[dexxi]	'blanket'	(from 26f)

The reason data like the ones in (58b) are significant is that they show velar fronting could potentially apply regressively in native words. Since outputs like *[xuççi] and *[deççi] are incorrect, velar fronting was phonologized in pre-Visperterminen as a rule applying progressively even though the opposite direction was available to native speakers. Interestingly, speakers of pre-Visperterminen did not opt for the preferred regressive direction. I return to the topic of directionality in the context of when velar fronting was phonologized in §16.5.

6.6 Conclusion

What the two case studies discussed above have in common is that they possess neutral vowels, which by definition are phonetically front but which lack the phonological feature [coronal]. From the historical perspective, neutral vowels were once back ([dorsal]) sounds that were restructured to neutral vowels when historical processes eliminated the backness feature (Vowel Fronting) failed to add the frontness feature [coronal]. The occurrence of velars like [x] in the neighborhood of those historical back vowels therefore exemplifies the historical underapplication of velar fronting.

This chapter and the preceding one both consider cases involving the synchronic and/or diachronic underapplication of velar fronting. The reason underapplication occurs is that there were changes eliminating the original backness feature ([dorsal]), but those changes (e.g. Vowel Fronting in the present chapter) failed to feed velar fronting. In the following three chapters I consider the consequences of changes eliminating the feature for historically front sounds ([coronal]) in the context of velars undergoing fronting. It is demonstrated in those chapters that the type of change referred to here (e.g. Vowel Retraction) led to a historical overapplication of velar fronting and opaque palatals in the neighborhood of front vowels.

7 Quasi-phonemicization of palatals

7.1 Introduction

In many German dialects palatal sounds (e.g. [ç]) occur in the context of front vowels and certain back sounds ([Bk]) and velars (e.g. [x]) in the context of all back sounds with the exception of [Bk]. Palatal ([ç]) and velar ([x]) do not contrast because they stand in complementary distribution. All instances of palatals ([ç]) in the context of front vowels derive – both synchronically and diachronically – from the corresponding velar, but opaque palatals in the context of [Bk] are quasi-phonemes (/ç/). Significantly, palatal quasi-phonemes were once palatal allophones deriving from velars in the neighborhood of a front vowel (e.g. [ç] from /x/). When that original front vowel was eliminated, the palatal allophone was quasi-phonemicized to /ç/. This chapter investigates German dialects with palatal quasi-phonemes.

The way in which quasi-phonemes (opaque palatals) arise historically is illustrated in (1): Stage 1 (far left) depicts a system without velar fronting, and Stage 2 (middle) represents a system in which velar fronting is phonologized as a rule creating a palatal allophone ([Pa]). Stage 3 (far right) is one in which a quasi-phoneme is present (/Pa/). In Chapter 16 I discuss the time frame for the developments depicted in (1) and show how those changes fit into the early stages of German (Appendix E).

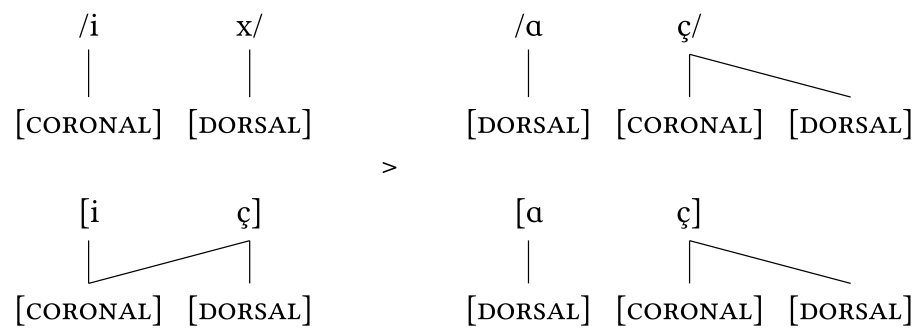
(1)	/Ve/	>	/Ve/		>	/Ve/	/Pa/
	[Ve]		[Ve]	[Pa]		[Ve]	[Pa]

This chapter focuses on two types of palatal [Pa] at Stage 3, although that distinction is not expressed in (1): (a) The synchronically derived palatal [Pa], which is the surface manifestation of underlying /Ve/, and (b) the underlying palatal quasi-phoneme [Pa] (/Pa/), which by definition cannot be synchronically derived from a velar. Derived palatals are situated in the context for velar fronting (e.g. after front vowels), while velars like [Ve] surface in the elsewhere case.

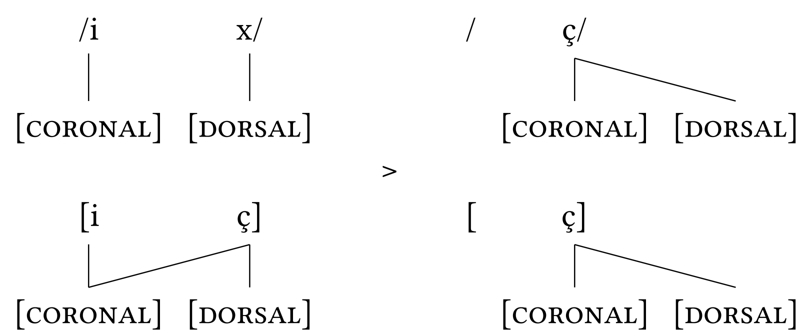
Palatal quasi-phonemes like [Pa] (/Pa/) are found neither in the front vowel context, nor in the elsewhere context for velars. Thus, velars and palatals in the dialects described below do not contrast.

As indicated below, the palatal allophone at Stage 2 – depicted in (2) and (3) with the symbol [ç] – is quasi-phonemicized (/ç/) at Stage 3 when one of the triggers for velar fronting (e.g. /i/) is eliminated. Those opaque palatals therefore exemplify a historical overapplication of velar fronting. (2) illustrates quasi-phonemicization in the context after a sonorant (a front coronal) and (3) word-initially (before a front coronal). In (2) and (3) I indicate both the underlying representation and the phonetic representation.

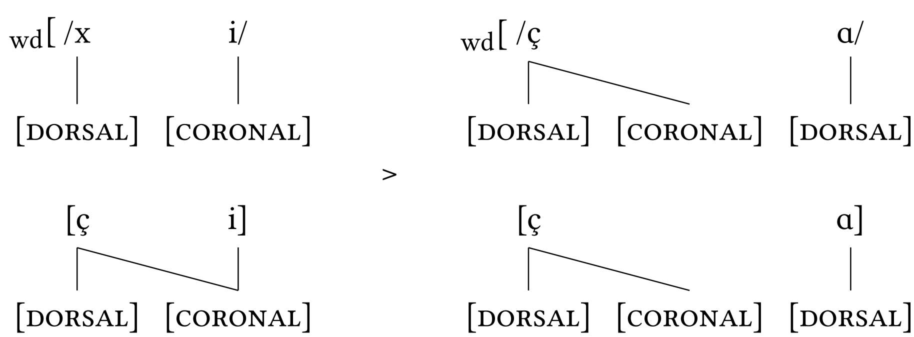
(2) a.



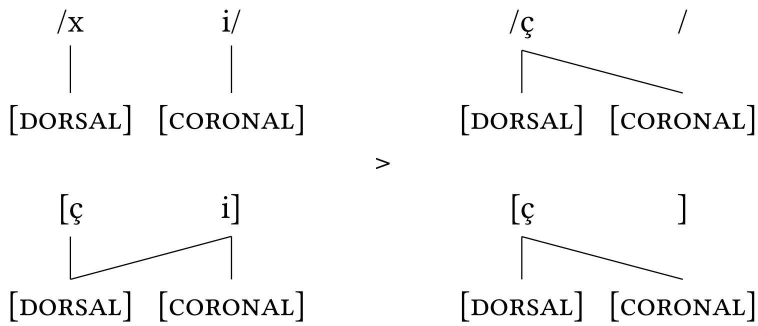
b.



(3) a.



b.



The structure to the left of the wedge in (2) and (3) illustrates the stage in which velar fronting is present as an allophonic rule (=Stage 2). At that point, velar fronting spreads [coronal] from the front segment (/i/) to an adjacent velar (/x/), thereby creating a palatal, i.e. a structure with both [coronal] and [dorsal]. The quasi-phoneme /ç/ is present to the right of the wedge (=Stage 3) in (2) and (3): In (2a) and (3a) the velar fronting trigger (/i/) is restructured to a back vowel (/ɑ/), a change requiring that the trigger lose [coronal] and acquire [dorsal]. Crucially, the [coronal] feature in question is not deleted entirely, but instead it remains linked to the palatal. Since that palatal can no longer be derived synchronically from an adjacent front sound, it is present in the underlying representation. In (2b) and (3b) the palatal is quasi-phonemicized when the velar fronting trigger (/i/) deletes.

As depicted in (2) and (3), palatal quasi-phonemes emerge when a sound that serves as trigger for velar fronting is no longer present. From the formal perspective, the change involves the deletion of the feature that is propagated in velar fronting, which in the present treatment is [coronal]. The quasi-phonemes in the case studies described below can arise from any of the four changes listed in (4), all of which restructure underlying representations. The first three sound changes were introduced in preceding chapters; Syncope is discussed below. The changes in (4) all have in common that they decrease the number of potential triggers for velar fronting (=Rule Z in Table 2.7).

(4) Sound changes which can delete [coronal]:

a. Vowel Retraction:

$/ \left\{\begin{matrix}\text{front} \\ \text{vowel}\end{matrix}\right\} / > / \left\{\begin{matrix}\text{back} \\ \text{vowel}\end{matrix}\right\} /$

b. r-Retraction:

/r/ > /ʀ/

c. Vowel Reduction:

$/ \left\{\begin{matrix}\text{unstressed} \\ \text{vowel}\end{matrix}\right\} / > /\text{ə}/$

d. Syncope:

$/ \left\{\begin{matrix}\text{unstressed} \\ \text{vowel}\end{matrix}\right\} / > \emptyset$

Vowel Retraction (§3.2) in (4a) is a cover term for the change from a front vowel to a back vowel. A formally similar change to (4a) is r-Retraction (§3.5) in (4b), which is responsible for the change from coronal /r/ to dorsal (uvular) /ʀ/. Vowel Reduction (§4.3) in (4c) is the change from any unstressed full vowel to schwa. Recall that full vowels bear place features, while schwa does not; hence, the change in (4c) involves the deletion of place features, including crucially [coronal] if the vowels in question are front. Although Vowel Reduction affected the vowel in both prefixes and in suffixes, the examples discussed below involve primarily the former, in particular the deletion of historical [i] in the *ge-* ([gə]) prefix of StG (cf. OHG *gi-*, OSax *gi-*).[1] Syncope in (4d) entails the deletion of any vowel in an unstressed syllable. Significantly, if the vowel elided by (4d) is front (e.g. /i/), then [coronal] is lost. In the examples discussed below, Syncope affected a front vowel in the weak member of a trochaic foot (e.g. the second syllable in StG [ˈhɑːbɪçt] 'hawk') or a front vowel in certain suffixes, e.g. the denominal adjective-forming *-ig* ([ɪç]) (cf. OHG *-ig*).

In the remainder of this chapter I present a series of brief case studies from German dialects possessing quasi-phonemes, i.e. either /ç/, /ʝ/ or both sounds. Those dialects can have the underlying and surface fricatives depicted in (5a) and/or (5b).

(5) a. /x/ /ç/ b. /ɣ/ /ʝ/
| | | |
[x] [ç] [ɣ] [ʝ]

In some systems the palatal quasi-phonemes depicted in (5) can be found word-initially, in other systems they are attested in postsonorant position, and yet in others they occur in both contexts. The historical triggers for quasi-phonemes can be a coronal sonorant in any one of the changes listed in (4).

Data are presented in §7.2 and §7.3 from WLG and CG varieties with palatal quasi-phonemes. In §7.4 I discuss and reject various alternative treatments. §7.5 provides some discussion of the areal distribution of palatal quasi-phonemes. The chapter concludes in §7.6.

[1] That prefix is also attested in early OHG as *ga-*. Since the vowel [i] (but not the vowel [ɑ]) serves as a trigger for velar fronting, I conclude that the realization with [ɑ] could not have been the one from which [ə] derives in the dialects I discuss below; see §16.2 for discussion.

7.2 West Low German

Arens (1908) describes the Wph dialect of Elspe (Map 4.2). In that variety, [x] and [ç] do not contrast in word-initial position. In the context before a full back vowel, [x] occurs in (6a), while [ç] surfaces before a front vowel in (6b) or a coronal sonorant consonant in (6c). As suggested by the StG orthography in the third column, [x] and [ç] in (6a–6c) derived historically from WGmc +[ɣ]. The same complementary distribution of [x] and [ç] holds for [sx sç] clusters (<WGmc +[sk]) in (6d–6f). Most significantly, the items listed in (6g) illustrate that palatal [ç] (<WGmc +[ɣ]) occurs before schwa.

(6) [x] and [ç] in a word-initial onset in Elspe:

a.	xolt	[xɔlt]	Gold	'gold'	66
	xɑrvə	[xɑrvə]	Garbe	'sheaf'	24
	xɑ̄an	[xɑːɐn]	Garten	'garden'	25
b.	χīəẓn	[çiːəʝn̩]	gegen	'against'	43
	χistan	[çɪstan]	gestern	'yesterday'	62
	χyt	[çʏt]	gießt	'water-3SG'	97
	χēəštə	[çɛːəʃstə]	Gerste	'barley'	38
	χelt	[çɛlt]	Geld	'money'	31
	χɒftə	[çæftə]	gäbe	'give-SUBJ'	60
c.	χreŏt	[çrɛɔt]	groß	'large'	89
	χloftə	[çlɔftə]	glaubte	'believe-PRET'	89
d.	šxugn	[ʃxʊɣn̩]	scheuen	'dread-INF'	96
	šxɑ̄p	[ʃxɑːp]	Schrank	'cabinet'	23
e.	šχyt	[ʃçʏt]	schießt	'shoot-3SG'	97
	šχelə	[ʃçɛlə]	Schale	'bowl'	33
f.	šχrɑpn	[ʃçrɑpn̩]	schaben	'scrape-INF'	27
g.	χəvɑ̄a	[çəvɑːɐ]	gewahr	'aware'	25
	χəzelšop	[çəzɛlʃop]	Gesellschaft	'society'	68
	χəfø̄alək	[çəføːɐlək]	gefährlich	'dangerous'	57

/x/ in a word-initial onset surfaces as [ç] before a coronal sonorant in (6b, 6c, 6e, 6f) by (7), otherwise /x/ is realized as [x] in (6a, 6d).

(7) Wd-Initial Velar Fronting-6:

$$
{}_{\mathrm{wd}}[\ (\mathrm{C}) \quad \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} \qquad [+\textsc{son}]
$$
$$
\begin{array}{cc} | & | \\ [\textsc{dorsal}] & [\textsc{coronal}] \end{array}
$$

Word-initial [ç] in (6g) is a quasi-phoneme /ç/ because it does not contrast with the corresponding velar in the context before schwa and because it derived historically from the palatal allophone [ç] of the velar /x/. The change from the original /i/ to /ə/ in the initial syllable was due to Vowel Reduction (=4c), e.g. [çəvɑːɐ] 'aware' < $^{+}$[xivɑːɐ]; cf. OSax *giwar*. The latter change led to the overapplication of the historical precursor of (7).

Since Wd-Initial Velar Fronting-6 produces a sound ([ç]) that is present in underlying representations as a quasi-phoneme, that process is neither an allophonic rule, nor is it a neutralization. Instead, Wd-Initial Velar Fronting-6 is a quasi-neutralization in dialects like Elspe.

In the Eph dialect of Reinhausen (Jungandreas 1926, 1927; Map 4.3), [x ç] (<WGmc $^{+}$[ɣ]) stand in complementary distribution in word-initial position. In his discussion of word-initial [x ç] Jungandreas observes that the velar [x] surfaces before back vowels ("vor velaren Vokalen") and the palatal [ç] before front vowels ("vor palatalen Vokalen"); see (8a, 8b). The author also notes that the palatal occurs before the two liquids, as in (8c, 8d). Significantly, the symbol ⟦r⟧ in the original source represents a uvular (=dorsal) sound ("Wgerm. *r* ist als Zäpfchen-r erhalten"; Jungandreas 1926: 288). Jungandreas was aware of the anomalous nature of the palatal in (8d) in noting that its occurrence before [ʀ] is an indication that the rhotic was once pronounced as coronal (" ... ein Zeichen übrigens, dass *r* früher mit der Vorderzunge artikuliert wurde").

(8) Word-initial dorsal fricatives in Reinhausen:

a.	xūl	[xuːl]	Gaul	'horse'	291
	xǫt	[xɔt]	Gott	'God'	291
b.	χę̄lt	[çɛlt]	Geld	'money'	291
	χēm	[çeːm]	geben	'give-INF'	291
c.	χlīk	[çliːk]	gleich	'same'	291
d.	χrunt	[çʀunt]	Grund	'reason'	291

Palatal [ç] derives from /x/ in (8b) by Wd-Initial Velar Fronting-6, but the opaque [ç] in (8d) is a quasi-phoneme (/ç/) because it does not contrast with

[x] in the context before [ʀ] and because it derived historically from the allophone [ç] of /x/. Note that the quasi-phonemicization of /ç/ was a consequence of the change from the coronal rhotic /r/ to /ʀ/ by r-Retraction in (4b). The palatal quasi-phoneme /ç/ before the dorsal rhotic [ʀ] (/ʀ/) in [çʀunt] 'reason' in (8d) can be compared with the synchronically derived palatal [ç] (from /x/) before the coronal rhotic [r] (/r/) in (6c) [çrɛɔt] 'large' from Elspe.

Böger (1906) describes the Wph variety of the region in and around the town of Schieder-Schwalenberg (Map 4.2). In word-initial position [x] (=⟦ɧ⟧) occurs before a back vowel in (9a) or the dorsal (uvular) consonant [ʀ] in (9b) and [ç] (=⟦χ⟧) before a front vowel in (9c), coronal sonorant consonant in (9d), or schwa in (9e). The diachronic source for [x] and [ç] in the aforementioned examples is WGmc ⁺[ɣ]. In postsonorant position, velar [x] surfaces after a back vowel in (10a) and palatal [ç] after a front vowel in (10b). Both [x] and [ç] in (10a, 10b) derive from WGmc ⁺[x]. Velar [ɣ] (=⟦g⟧) surfaces in a word-internal onset after any vowel or sonorant consonant in (10c), or as [ç] in coda position after a coronal sonorant consonant in (10d). [ç] also surfaces in coda position after dorsal [ʀ] =⟦r⟧ in (10e).

(9) Word-initial dorsal fricatives in Schieder-Schwalenberg:

a.	ɧafəl	[xɑfəl]	Gabel	'fork'	151
	ɧōən	[xoːən]	gehen	'go-INF'	151
b.	ɧraf	[xʀɑf]	Grab	'grave'	151
	ɧröte	[xʀøtə]	Gröβe	'size'	152
c.	χistərn	[çistəʀn]	gestern	'yesterday'	151
	χelt	[çelt]	Geld	'money'	150
d.	χlas	[çlɑs]	Glas	'glass'	151
	χnaidiχ	[çnɑidiç]	gnädig	'merciful'	151
e.	χədult	[çədult]	Geduld	'patience'	150
	χəfōr	[çəfoːʀ]	Gefahr	'danger'	150

(10) Postsonorant dorsal fricatives in Schieder-Schwalenberg:

a.	luɧt	[luxt]	Licht	'light'	157
	naɧt	[nɑxt]	Nacht	'night'	158
b.	liχt	[liçt]	leicht	'light'	156
	lüχtən	[lyçtən]	leuchten	'glow-INF'	157
c.	jiugənt	[ɟiuɣənt]	Jugend	'youth'	153
	mögən	[møɣən]	mögen	'like-INF'	158
	ärgərn	[ɛʀɣərn]	ärgern	'annoy-INF'	145

d.	talχ	[tɑlç]	Talg	‘tallow’	165
e.	ɑrχ	[ɑʀç]	arg	‘bad’	144
	ōərχ	[oːəʀç]	artig	‘well-behaved’	159

Word-initial /x/ surfaces as [ç] before a coronal sonorant by Wd-Initial Velar Fronting-6 in (9c, 9d), otherwise /x/ is realized as [x], in (9a, 9b). As in Elspe (6g), word-initial opaque [ç] before schwa in (9e) is a quasi-phoneme (/ç/) which arose when the original front vowel /i/ was restructured to /ə/ by Vowel Reduction (=4c). After a coronal sonorant in (10b, 10d), palatals derive from the corresponding velars (/x ɣ/) by Velar Fronting-4 in (11), otherwise those velars surface without change as velar in (10a–10c).

(11) Velar Fronting-4:

$$\begin{array}{cc} [+\text{SON}] & \begin{bmatrix}-\text{SON}\\ +\text{CONT}\\ +\text{FORTIS}\end{bmatrix} \\ | & | \\ [\text{CORONAL}] & [\text{DORSAL}] \end{array}$$

The palatal quasi-phoneme /ʝ/ occurs after /ʀ/, surfacing as [ç] in coda position in (10e). That quasi-phoneme arose historically when coronal /r/ was realized as uvular /ʀ/ by r-Retraction (=4b).

In Table 7.1 I provide historical derivations for representative examples for word-initial [x ç] from Reinhausen in Table 7.1a and Schieder-Schwalenberg in Table 7.1b. To save space I do not include examples in which the original velar occurred before a back vowel.

Consider first Table 7.1a. At Stage 2 the two fricatives [x] and [ç] stood in an allophonic relationship, but when /r/ was restructured to /ʀ/ at Stage 3 by r-Retraction, the word-initial opaque fricative [ç] in examples like [çʀunt] ‘reason’ was quasi-phonemicized to /ç/. Examples like [çɛlt] ‘money’ and [çliːk] ‘same’ demonstrate that Wd-Initial Velar Fronting-6 remains active synchronically at Stage 3. In Table 7.1b [x ç] were allophones at Stage 2. In words like [xʀɑf] ‘grave’ r-Retraction restructured /r/ to /ʀ/ at Stage 3, but the original /x/ was not quasi-phonemicized (in contrast to the /x/ in Reinhausen [çʀunt] ‘reason’ in Table 7.1a). Instead, underlying /x/ in [xʀɑf] was retained as /x/ at Stage 3. The final example in Table 7.1b illustrates the quasi-phonemicization of /ç/ when Vowel Reduction restructured /i/ to /ə/ at Stage 3.

The Wph variety of Kreis Lippe (Hoffmann 1887; Map 4.2) has the four dorsal fricatives [x ɣ ç ʝ], whose postsonorant distribution is exemplified below. See

Table 7.1: Historical derivations for word-initial [x ç] from Reinhausen and Schieder-Schwalenberg

	(a) Reinhausen (=8)			(b) Schieder-Schwalenberg (=9)			
/xɛlt/	/xliːk/	/xrunt/		/xelt/	/xlɑs/	/xrɑf/	/xidult/
[xɛlt]	[xliːk]	[xrunt]	Stage 1	[xelt]	[xlɑs]	[xrɑf]	[xidult]
/xɛlt/	/xliːk/	/xrunt/		/xelt/	/xlɑs/	/xrɑf/	/xidult/
[çɛlt]	[çliːk]	[çrunt]	Stage 2	[çelt]	[çlɑs]	[çrɑf]	[çidult]
/xɛlt/	/xliːk/	/çʀunt/		/xelt/	/xlɑs/	/xʀɑf/	/çədult/
[çɛlt]	[çliːk]	[çʀunt]	Stage 3	[çelt]	[çlɑs]	[xʀɑf]	[çədult]
Geld	*gleich*	*Grund*	StG	*Geld*	*Glas*	*Grab*	*Geduld*
‘money’	‘same’	‘reason’		‘money’	‘glass’	‘grave’	‘patience’

§14.2.2 for discussion of word-initial position, where only palatals but not velars surface. In postsonorant position [x] (<WGmc $^{+}$[x] or $^{+}$[f]) surfaces after a back vowel in (12a) and [ç] (<WGmc $^{+}$[x]) after a front vowel in (12b). Velar [ɣ] surfaces in a word-internal onset after a back vowel in (12c), and palatal [ʝ] occur in a word-internal onset after a front vowel in (12d) or coronal sonorant consonant in (12e). [ɣ ʝ] in those examples derive historically from WGmc $^{+}$[ɣ] or $^{+}$[gg]. Regular alternations involving the four dorsal fricatives permeate the inflectional system in (12f). The example [dreːux] ‘carry-PRET’ in (12f) shows that the second part of the diphthong and not the first determines the place of the following dorsal fricative. Opaque palatals (quasi-phonemes) surface after dorsal [ʀ] in (12g) and the diphthong [æu] in (12h).[2] No example was found in the original source for [ç] after [æu], a gap I consider to be accidental.

(12) Postsonorant dorsal fricatives in Kreis Lippe:

a.	luxt	[lʊxt]	Luft	‘air’	19
	dɑxt	[dɑxt]	Docht	‘wick’	44
b.	liχt	[lɪçt]	leicht	‘light’	44
	füχtə	[fʏçtə]	Fichte	‘spruce’	46
	reχt	[ʀɛçt]	Recht	‘justice’	15
c.	bọ̄ʒə	[boːɣən]	Bogen	‘bow’	19

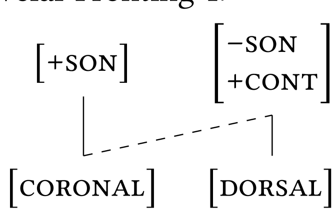
[2]It is clear from Hoffmann (1887: 5) that the one rhotic surfaces as a uvular consonant (/ʀ/) even in coda position; hence, r-Vocalization (§4.3) is not active in the dialect. As the phonetic symbol ⟦æu⟧ in the original source suggests, the first element in that diphthong is front, and the second one is back (in Hoffmann’s terms “Guttural”; see Hoffmann 1887: 11–13).

	wāʒən	[vɑːɣən]	Wagen	‘car’	50
	auʒə	[ɑuɣə]	Auge	‘eye’	26
d.	χījən	[çiːɟən]	gegen	‘against’	15
	brüjə	[brʏɟə]	Brücke	‘bridge’	4
e.	χɑljən	[çɑlɟən]	Galgen	‘gallows’	14
f.	drẹ̄ux	[dreːux]	trug	‘carry-PRET’	24
	drẹ̄jən	[dreːɟən]	tragen	‘carry-INF’	4
	ʿɑux	[hɑux]	hoch	‘high’	25
	ʿoijər	[hoiɟər]	höher	‘higher’	26
g.	forχt	[fɔʀçt]	Furcht	‘fear’	18
	sorjə	[sɔʀɟə]	Sorge	‘sorrow’	18
h.	æujən	[æuɟən]	eigen	‘own’	23
	læujən	[læuɟən]	lägen	‘lie-SUBJ’	32
	læujən	[læuɟən]	lügen	‘lie-INF’	28

Hoffmann lists no examples in which a velar fricative surfaces after [æu]. It will become clear below that there is a historical reason for that gap. Significantly, [æu] has a relatively free distribution and is therefore phonemic (/æu/) in the dialect as it was described in 1886. For example, there are no restrictions concerning the place or manner of articulation of any consonants to the left or right of [æu], e.g. [bʀæuf] ‘letter’, [væuk] ‘soft’, [æutə] ‘eat-SUBJ’. What is more, [æu] contrasts with other diphthongs and monophthongs, e.g. in the context before [p] in [dæup] ‘deep’ vs. [knɑup] ‘button’.

The velars /x ɣ/ surface as palatals [ç ɟ] after a coronal sonorant in (12b, 12d–12f) by Velar Fronting-1 in (13), otherwise those underlying velars are realized as [x ɣ] in (12a, 12c, 12f).

(13) Velar Fronting-1:



[ç ɟ] are quasi-phonemes (/ç ɟ/) in (12g, 12h), e.g. /fɔʀçt/ ‘fear’, /æuɟən/ ‘own’. Those underlying (opaque) palatals arose historically from front ([coronal]) sounds to their immediate left. The historical /r/ in (12g) restructured to the [dorsal] rhotic (/ʀ/) via r-Retraction (=4b). The diphthong [æu] in (12h) was a front vowel at an earlier stage which shifted to [æu] (/æu/) by Vowel Retraction (=4a).

In particular, [æu] is the reflex of earlier [eː] (/eː/), which itself derived form one of three vowels: [eː], [ɑː], [io] (all present in OSax), e.g. [æuɟən] 'own' (cf. OSax *ēgan*), [læuɟə] 'lie-SUBJ' (cf. OSax *lāgīn*), and [læuɟən] 'lie-INF' (cf. OSax *liogan*). The three original vowels [eː ɑː io] merged to the front vowel [eː] (/eː/), which later shifted to [æu]; Hoffmann (1887: 62–63). That all instances of modern [æu] were once a front monophthong ([eː] /eː/) derives additional support from the survey of LG dialects presented in Sarauw (1921), who provides a list of the modern reflexes of the OSax vowels in question in eighteen LG communities (p. 145). According to that chart, the modern reflexes are either front monophthongs (typically [eː]) or diphthongs whose second member is a front vowel (e.g. [ɑi], [ei]) in every LG variety with the exception of the one described by Hoffmann (1887). What this suggests is that [æu] was at one point a front vowel and that the change to [æu] was a very recent shift because it only occurred in the Kreis Lippe variety and nowhere else.

7.3 Central German

Hasenclever (1905) describes the Rpn dialect of Wermelskirchen (Map 5.1). See §14.2.2 for discussion of word-initial position, where only palatals but not velars surface. In postsonorant position [x ɣ] (=⟦χ g⟧) surface after a back vowel in (14a, 14c) and [ç ʝ] after a front vowel or coronal sonorant consonant in (14b, 14d, 14e). Opaque palatals (quasi-phonemes) surface after the dorsal (uvular) rhotic in (14f) or schwa in (14g). Hasenclever (1905: 10) states that the sound he transcribes as ⟦r⟧ is uvular (=dorsal) and not coronal. The dorsal fricatives in (14) derived historically from velars (WGmc $^{+}$[ɣ x k]).

(14) Dorsal fricatives in Wermelskirchen:

a.	lɑχən	[lɑxən]	lachen	'laugh-INF'	51
b.	diçtə	[diçtə]	dicht	'dense'	51
	ʃprɛçən	[ʃprɛçən]	sprechen	'speak-INF'	51
c.	fūgəl	[fuːɣəl]	Vogel	'bird'	47
	zɑgən	[zɑɣən]	sagen	'say-INF'	47
d.	fɛ̄jən	[fɛːʝən]	fegen	'sweep-INF'	47
e.	foljən	[fɔlʝən]	folgen	'follow-INF'	47
f.	ɛrjər	[ɛʀʝər]	Ärger	'anger'	47
g.	īːvəç	[iːvəç]	ewig	'eternal'	83

Wermelskirchen /x ɣ/ shift to the corresponding palatals after a coronal sonorant by Velar Fronting-1. The two contexts in which quasi-phonemes occur are: (i) after /ʀ/ in (14f), and (ii) after /ə/ in (14g). The original palatal allophones were quasi-phonemicized in (i) when /r/ was restructured to /ʀ/ by r-Retraction in (4b), and in (ii) when front vowels shifted to schwa (/ə/) by Vowel Reduction in (4c). The vowel in the *-ig* ([əç]) suffix in (14g) derived historically from [i] (cf. OHG *-ig*).

In the MFr variety of Echternach (Palgen 1931; Map 5.3) velar [x] surfaces after back vowels in (15a) and palatal [ç] after front vowels in (15b). In intervocalic position historical [ɣ ʝ] (<WGmc ⁺[ɣ]) elided, although a few rare words preserve [ɣ] if the preceding vowel is back in (15c). Palatal [ʝ] is regularly retained after a coronal sonorant consonant (i.e. [l] in 15d). Significantly, the two palatals [ç ʝ] also surface after the vocalized-r in (15e, 15f). Palgen (1931: 6) observes that the one rhotic (/ʀ/) is articulated on the uvula ("Zäpfchen-r") in initial position and that it is vocalized in coda position. That sound is transcribed in the original source as ⟦ɒ⟧, which I render as [ɐ], as in all other German dialects with that sound (recall Chapter 2 and Chapter 3).

(15) Dorsal fricatives in Echternach:

a.	vox	[vox]	Woche	'week'	45
	hǫux	[hɔux]	Hauch	'breath'	27
b.	rīχtən	[ʀiːçtən]	richten	'judge-INF'	18
	brēχən	[bʀeːçən]	brechen	'break-INF'	45
	šläχt	[ʃlæçt]	schlecht	'bad'	21
c.	mōɣən	[moːɣən]	Magen	'stomach'	49
d.	gɑljən	[gɑlʝən]	Galgen	'gallows'	49
e.	kīɒχ	[kiːɐç]	Kirche	'church'	18
f.	z·ō.ɒχ	[zoːɐç]	Sorge	'sorrow'	49
	zōɒjən	[zoːɐʝən]	sorgen	'care for-INF'	49

Palatals ([ç ʝ]) in (15b, 15d) derive from velars (/x ɣ/) by Velar Fronting-1, otherwise they surface as [x ɣ] in (15a, 15c). The palatals [ç] and [ʝ] in (15e, 15f) are quasi-phonemes (/ç ʝ/), which arose via r-Retraction in (4b). Thus, the original rhotic was coronal [r] (/r/), which was restructured to [ʀ] (/ʀ/). From the synchronic perspective, /ʀ/ in the dialect as it was described in 1931 surfaces as [ɐ] in coda position by r-Vocalization:

(16) r-Vocalization:

$$\begin{bmatrix} +\text{CONS} \\ +\text{SON} \\ -\text{NASAL} \\ \text{DORSAL} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{CONS} \end{bmatrix} \;/\; \underline{\quad\quad} \; \text{C}_0 \;]_{\sigma}$$

Recall from §3.5 and §4.3 that Liquid Vocalization (and the more specific process of r-Vocalization) produce the back vowel [ɐ] in other dialects, e.g. Soest (Wph), Ramsau am Dachstein (CBav). A significant difference between those earlier case studies and Echternach is that dorsal fricatives to the right of the vocalized-r are realized in Echternach as palatals and not as velars, cf. [ʃtɔɐx] 'sorrow' (from /ʃtɔʀx/) in Ramsau am Dachstein and [bɛːɐx] 'mountain' (from /bɛːʀx/) in Soest. The occurrence of palatal fricatives after the vocalized-r in Echternach has a parallel in StG, which is discussed in greater detail in §17.3.1.

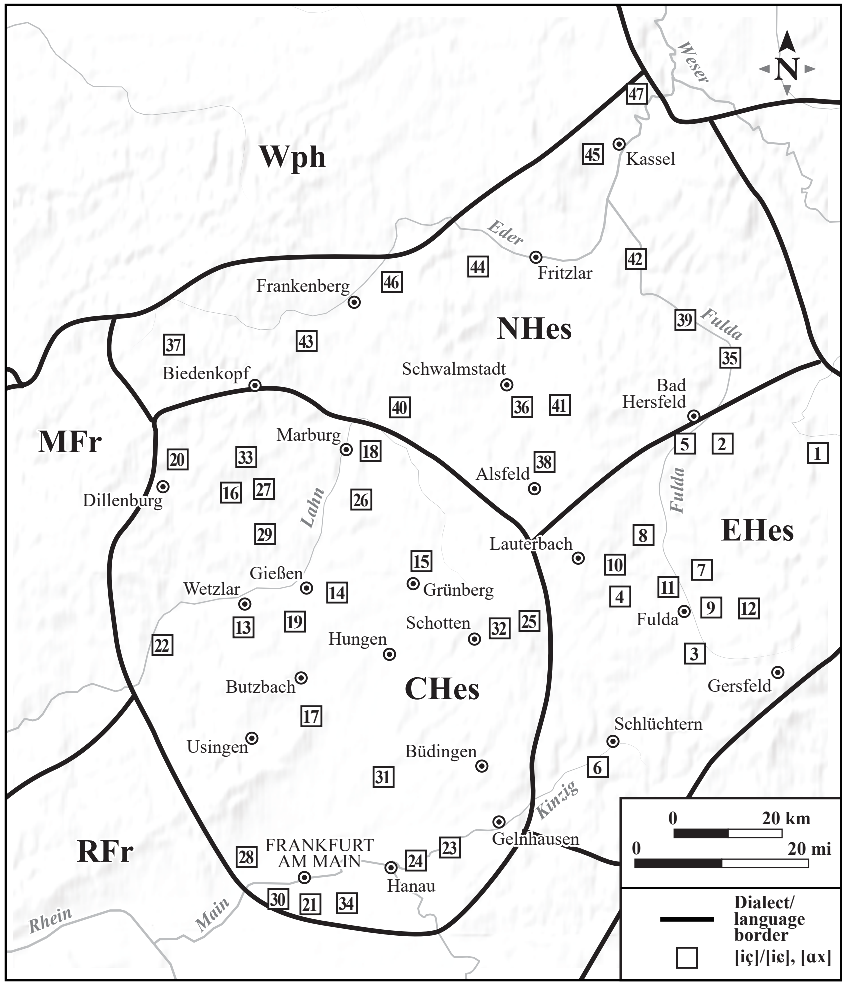
The distribution of [x ç] (< WGmc $^+$[k x]) in the NHes variety attested in Loshausen (Corell 1936; Map 7.1) is illustrated in (17). The velar surfaces after a back vowel in (17a) and the palatal after a front vowel in (17b) or a coronal sonorant consonant in (17c). The item listed in (17d) shows that the opaque palatal [ç] surfaces after a noncoronal consonant. Loshausen also possesses the palatal fricative [ʝ], whose distribution is not discussed here.

(17) Dorsal fricatives in Loshausen:

a.	ọ̄xt	[oːxt]	acht	'eight'	141
	lɑxə	[lɑxə]	lachen	'laugh-INF'	141
b.	ẹ̄χəl	[eːçəl]	Eichel	'acorn'	134
	rę̄χt	[rɛːçt]	recht	'right'	134
c.	mẹlχ	[melç]	Milch	'milk'	134
	lęrχ	[lɛrç]	Lerche	'lark'	134
d.	họbχ	[hɔpç]	Habicht	'hawk'	134

Palatal [ç] in (17b, 17c) is derived from /x/ by Velar Fronting-1, and the opaque [ç] in (17d) is a quasi-phoneme (/ç/), which arose when the original front vowel before [ç] was eliminated via Syncope (=4d).

Hofmann (1926) is a historical grammar and dictionary documenting the NHes community of Oberellenbach (Map 7.1). The examples in (18a–18e) show the basic pattern whereby the palatals [ç ʝ] surface after a coronal sonorant and the velars [x ɣ] after a back vowel. In these examples, [x ç] are the reflexes of WGmc $^+$[k x] and [ɣ ʝ] of WGmc $^+$[ɣ]. The examples in (18f, 18g) exemplify the occurrence of the quasi-phoneme /ç/, which occurs after a noncoronal consonant in (18f) and word-initially before schwa in (18g).



Map 7.1: East Hessian (EHes), Central Hessian (CHes), and North Hessian (NHes). Squares indicate postsonorant velar fronting. 1=Hertel (1888), 2=Salzmann (1888), 3=Glöckner (1913), 4=Noack (1938), 5=Martin (1957), 6=Müller (1958a), 7=Weber (1959), 8=Krafft (1969), 9=Wegera (1977), 10=Post (1985), 11=Schwarz (1992), 12=Dingeldein (1995), 13=Leidolf (1891), 14=Wagner & Horn (1900), 15=Knauss (1906), 16=Schaefer (1907), 17=Reuß (1907), 18=Freund (1910), 19=Faber (1912), 20=Kroh (1915), 21=Rauh (1921), 22=Schwing (1921), 23=Siemon (1922), 24=Urff (1926), 25=Schudt (1927), 26=Bender (1938), 27=Friebertshäuser (1961), 28=Schnellbacher (1963), 29=Spenter (1964), 30=Bethge & Bonnin (1969), 31=Schudt (1970), 32=Hasselbach (1971), 33=Hasselberg (1979), 34=Féry (2017), 35=Dittmar (1891), 36=Schoof (1913a,b,c), 37=Hackler (1914), 38=Heidt (1922), 39=Hofmann (1926), 40=Bromm (1936), 41=Corell (1936), 42=Hofmann (1940), 43=Martin (1942) (Battenberg), 44=Martin (1942) (Bad Wildungen), 45=Müller (1958b), 46=Möhn (1962), 47=Arend (1991).

(18) Dorsal fricatives in Oberellenbach:

a.	būx	[bu:x]	Buch	‘book’	73
	kǫx	[kɔx]	Koch	‘cook’	145
	lɑxən	[lɑxən]	lachen	‘laugh-INF’	153
b.	eχ	[eç]	ich	‘I’	129
	lø̄χ	[lø:ç]	Lauch	‘leek’	19
	blα̨χ	[blæç]	Blech	‘tin’	68
c.	wōʒə	[βo:ɣə]	Waage	‘scale’	27
d.	ijəl	[iʝəl]	Igel	‘hedgehog’	27
	bējən	[be:ʝən]	biegen	‘bend-INF’	27
	sᾱ̨jn̩	[sæ:ʝn̩]	sagen	‘say-INF’	27
e.	mę̄lχ	[mɛlç]	Milch	‘milk’	168
	α̨rjər	[ærʝər]	Ärger	‘anger’	54
f.	hǫbχ	[hɔpç]	Habicht	‘hawk’	24
g.	jəsønt	[ʝəsønt]	gesund	‘healthy’	106

The opaque palatal in (18f) originally stood before a front vowel and was quasi-phonemicized when that segment underwent Syncope (=4d). The schwa in (18g) likewise derived historically from the front vowel [i] (/i/); the palatal that stood before that sound was quasi-phonemicized when the original /i/ underwent Vowel Reduction to [ə] (/ə/) (=4c). Note that word-initial WGmc +[ɣ] shifted to [ʝ] only before [i], which was later realized as schwa; before any other sound, WGmc +[ɣ] surfaces as [g], e.g. [ge:ʝən] ‘around’ (=⟦gējən⟧). The palatals in (18b, 18d, 18e) are derived from the corresponding velars by Velar Fronting-1, while the opaque sounds in (18f, 18g) are palatal quasi-phonemes (/ç ʝ/).

The NHes variety attested in and around Rauschenberg (Bromm 1936; Map 7.1) possesses the four dorsal fricatives [x ç ɣ ʝ]. The postsonorant distribution of the velar and palatal articulations is exemplified in (19): [x] surfaces after back vowels with the exception of the long low vowel [ɑ:] in (19a) and [ç] after front vowels in (19b). Historical [ɑ:] (/ɑ:/) was regularly replaced with [ɔ] (/ɔ/), e.g. [ʃtɔxə] ‘sting-PRET’ (cf. MHG [stɑ:x]). Velar [ɣ] likewise occurs after any phonemic vowel with the exception of [ɑ:] in (19c), while its palatal counterpart surfaces in a word-internal onset after a front vowel in (19d) or coronal sonorant consonant in (19e). The items listed in (19f) show that an opaque palatal [ç] surfaces after [ɑ:] (/ɑ:/). As indicated in the StG orthography in the third column, the [ɑ:] (/ɑ:/) in the latter examples derived historically from the front vowel [e] (/e/). Parallel examples with opaque [ʝ] were not found in the original source.

(19) Dorsal fricatives in Rauschenberg:

a.	bux	[bux]	Buch	'book'	23
	hōx	[hoːx]	hoch	'high'	20
	nǭxd	[nɔːxt]	Nacht	'night'	9
	lǫx	[lɔx]	Loch	'hole'	23
	mɑxə	[mɑxə]	machen	'do-INF'	23
b.	liχd	[liçt]	Licht	'light'	20
	gəseχd	[gəseçt]	Gesicht	'face'	30
	dsẹ̄χə	[tsɛːçə]	Zeichen	'sign'	18
	brẹχə	[brɛçə]	brechen	'break-INF'	23
	rẹiχ	[rɛiç]	reich	'rich'	23
c.	foɣəl	[foɣəl]	Vogel	'bird'	25
	ǭɣə	[ɔːɣə]	Auge	'eye'	19
d.	flijə	[flijə]	fliegen	'fly-INF'	21
	wējə	[veːjə]	Wege	'path-PL'	25
	fẹ̄jə	[fɛːjə]	fegen	'sweep-INF'	25
e.	foljə	[foljə]	folgen	'follow-INF'	25
f.	rɑ̄χd	[rɑːçt]	recht	'right'	11
	šlɑ̄χd	[ʃlɑːçt]	schlecht	'bad'	11
	gnɑ̄χd	[knɑːçt]	Knecht	'vassal'	11

/x ɣ/ surface as the corresponding palatals after a front vowel in (19b, 19d) or coronal sonorant consonant in (19e) by Velar Fronting-1, otherwise (i.e. after a back vowel), they are realized as [x ɣ] in (19a, 19c). The palatal fricative [ç] is a quasi-phoneme (/ç/) after the one back vowel [ɑː] (/ɑː/) in (19f). As noted above, that opaque palatal (quasi-phoneme) arose when the etymological front vowel preceding it ([e] /e/) restructured to [ɑː] (/ɑː/) by Vowel Retraction (=4a).

In the EHes variety documented in the communities of the Rhön Valley (Rhöntal; Glöckner 1913; Map 7.1) the two dorsal fricatives [x ç] exhibit a pattern of distribution represented by the data in (20): [x] surfaces after a back vowel in (20a) and [ç] after a front vowel in (20b) or coronal sonorant consonant in (20c). It is clear from the original source that ⟦a⟧ and ⟦aa⟧ represent low front vowels (=[æ æː]) and that ⟦ɑ⟧ and ⟦ɑɑ⟧ are low back vowels (=[ɑ ɑː]). The most significant examples are the ones in (20d, 20e), which reveal that palatal [ç] surfaces after the long low back vowel [ɑː]. [x] or [ç] surface optionally after [ɑː] derived historically from [e] in (20d), but only [ç] occurs after the [ɑː] deriving from earlier [ei] in (20e). The optionality in (20d) is speaker-dependent.[3]

[3]Glöckner gathered his data from speakers in a variety of communities living in a broad region;

(20) Dorsal fricatives in the Rhöntal:

a.	gərūx	[gəruːx]	Geruch	'smell'	31
	brux	[brux]	brauchen	'need-INF'	43
	fōxl̥	[foːxl̩]	Vogel	'bird'	28
	bǭx	[bɔːx]	Buch	'book'	92
	kǫx	[kɔx]	kochen	'cook-INF'	29
	sɑx	[sɑx]	Sache	'thing'	91
	boux	[boux]	Bauch	'stomach'	44
b.	iχ	[iç]	ich	'I'	92
	wīχ	[βiːç]	Wiege	'cradle'	24
	füχd	[fyçt]	Feuchte	'humidity'	46
	rẹ̄χl̥	[reːçl̩]	Regel	'rule'	21
	lẹχd	[leçt]	Licht	'light'	51
	swöχ	[sβøç]	Schwäche	'weakness'	18
	fraχ	[fræç]	frech	'impudent'	92
	šlaaχd	[ʃlæːçt]	schlecht	'bad'	21
c.	gwaarχ	[kβæːrç]	quer	'across'	21
d.	blɑɑχ, blɑɑx	[blɑːç], [blɑːx]	Blech	'tin'	22
	bɑɑχ, bɑɑx	[bɑːç], [bɑːx]	Pech	'misfortune'	22
e.	wɑɑχ	[βɑːç]	weich	'soft'	58

I account for the optionality in (20d) as follows: I postulate two groups of speakers (Variety A and Variety B). For speakers of Variety A [x] occurs after all back vowels with the exception of [ɑː] (=20a), and [ç] surfaces after coronal sonorant consonants (=20b, 20c) or after [ɑː] (=20e and the [ç] realization in 20d). Speakers of Variety B have [x] after all back vowels, including [ɑː] (=20a and the [x] realization in 20d) and [ç] after coronal sonorant consonants (=20b, 20c) or [ɑː] (=20e). For Variety B the two fricatives [ç] and [x] contrast after [ɑː]. I do not discuss that type of example because similar case studies are dealt with at length in Chapter 8 (for word-initial position) and in Chapter 9 (for postsonorant position).

For Variety A the two fricatives [x] and [ç] do not contrast. As in Rauschenberg (recall 19f) there is a historical reason for the nonoccurrence of [ç] after [ɑː]: First,

hence, the speaker-dependent variation referred to here is probably a factor of geography. [ɣ] does not occur in the dialect as it was described in 1913; historical +[ɣ] (/ɣ/) restructured to /x/, which regularly underwent fronting in words like [rɛːçl̩] 'rule' and otherwise surfaces as [x] in items like [foːxl̩] 'bird'. A small number of items in the original source contain palatal [ʝ] in a word-internal onset after a front vowel, but I do not take these examples into consideration below.

etymological [ɑː] (/ɑː/) was replaced by [ɔː] (/ɔː/); e.g. [nɔːx] 'after' (cf. MHG *nāch*), or [ɔ] (/ɔ/); [dɔxt] 'wick' (cf. MHG *tāht*). Second, the vowel [ɑː] (/ɑː/) in the dialect as it was described in 1913 derived historically from a front vowel, namely [e] (/e/) in (20d) and [ei] (/ei/) in (20e).

Palatal [ç] after a front vowel in (20b) or coronal sonorant consonant in (20c) derives synchronically from /x/ by Velar Fronting-1 and otherwise surfaces as [x] in (20a). The opaque palatal fricative [ç] is a quasi-phoneme (/ç/) for those Variety A speakers who have that sound after the back vowel [ɑː] in (20d) and for the examples with [ç] in (20e). As noted above, the quasi-phoneme /ç/ arose when the etymological front vowel preceding it (/e/ or /ei/) restructured to [ɑː] (/ɑː/) by Vowel Retraction (=4a).[4]

In the Thrn dialect of Sondershausen (Schirmer 1932; Map 7.2) the two dorsal fricatives [x] and [ç] never contrast. As illustrated in (21a, 21b), the velar occurs after a back vowel and the palatal after a front vowel. [ɣ ʝ] do not occur in post-sonorant position because the historical source for those sounds (WGmc ⁺[ɣ]) was restructured to /x/, which is realized as [x] after a back vowel, e.g. [duːxənt] 'virtue' (=⟦dūxənt⟧), and as [ç] after a coronal sonorant, e.g. [iːçəl] 'hedgehog' (=⟦īχəl⟧). Two contexts for quasi-phonemes are (i) after a noncoronal consonant in (21c) or (ii) in word-initial position before schwa in (21d).

(21) Dorsal fricatives in Sondershausen:

a.	būx	[buːx]	Buch	'book'	65
	lox	[lox]	Loch	'hole'	65
	dåx	[dɑx]	Dach	'roof'	65
b.	rīχ	[ʀiːç]	reich	'rich'	65
	bręχə	[bʀɛçə]	brechen	'break-INF'	65
	blæχ	[blæç]	Blech	'tin'	65
c.	gǣfχ	[kæːfç]	Käfig	'cage'	14
d.	χəsiχtə	[çəsiçtə]	Gesicht	'face'	18

[4]Glöckner (1913) also includes a number of examples in which palatal [ç] (=⟦χ⟧) surfaces after the diphthong [ɔə] (=⟦ǫə⟧, e.g. ⟦ǫəχd⟧ 'eight'). Since the diphthong in question consists of two back vowels there is an apparent conundrum because the etymological vowel ([ɑ]) was back, e.g. ⟦ǫəχd⟧ (cf. MHG *aht*). I hold that the original vowel [ɑ] (/ɑ/) underwent a restructuring to a diphthong ending in a front vowel (e.g. [ɔi]/[ɔɪ]), at which point the /x/ following that vowel surfaced as a palatal allophone by Velar Fronting-1. When the front vowel in that diphthong was restructured to one ending in schwa ([ɔə] /ɔə/), the following palatal was quasi-phonemicized. Evidence for the intermediate stage whereby [ɑ] (/ɑ/) changed to a diphthong ending in a front vowel is attested in the CHes variety spoken in Weidenhausen (Friebertshäuser 1961; Map 7.1) discussed in §9.2.

The item in (21c) exemplifies the deletion of an etymological front vowel (Syncope), while the one in (21d) shows the effects of Vowel Reduction. The historical source for word-initial [ç] in (21d) is WGmc $^+$[ɣ]. In word-initial position before any sound other than schwa, that etymological fricative is realized as [g], e.g. [gift] 'poison'.

7.4 Discussion

I consider and reject three alternative treatments for the case studies given in this chapter, all of which have in common that they eschew quasi-phonemes and treat the rules relating velars and palatals as allophonic operations and not as quasi-neutralizations (§7.4.1–§7.4.3). Those alternative treatments qualify as straw man analyses, although it needs to be stressed that formally similar treatments have been applied to independent sets of examples in German as well as other languages. I conclude this section (§7.4.4) by considering and rejecting Kiparsky's (2015) claim that quasi-phonemes arise before the original conditioning factor was eliminated.

In all of the case studies discussed in this chapter the palatal quasi-phoneme is adjacent to a noncoronal segment, namely before or after the dorsal rhotic (/ʀ/), after a full back vowel (e.g. /æu/, /ɑ/), or before or after schwa (/ə/). I refer below to the noncoronal segments adjacent to quasi-phonemes as NCSs.

7.4.1 Analysis A: Counterbleeding opacity

According to this alternative treatment NCSs are phonologically [coronal]. That [coronal] feature then spreads from a NCS to the adjacent velar fricative (/x/ or /ɣ/) by some version of velar fronting, and a later operation deletes [coronal] from the NCS. The treatment described here can potentially be applied to any of the NCSs referred to above. As a representative example, I consider the diphthong /æu/ of Kreis Lippe from (12h). In the treatment depicted in (22a), [æu] is analyzed as a diphthong ending in a [coronal] sound in the underlying representation (/æi/), which shifts to [æu] by a rule I refer to as /i/-Retraction (/æi/→[æu]). Kreis Lippe does not possess the surface diphthong [æi].

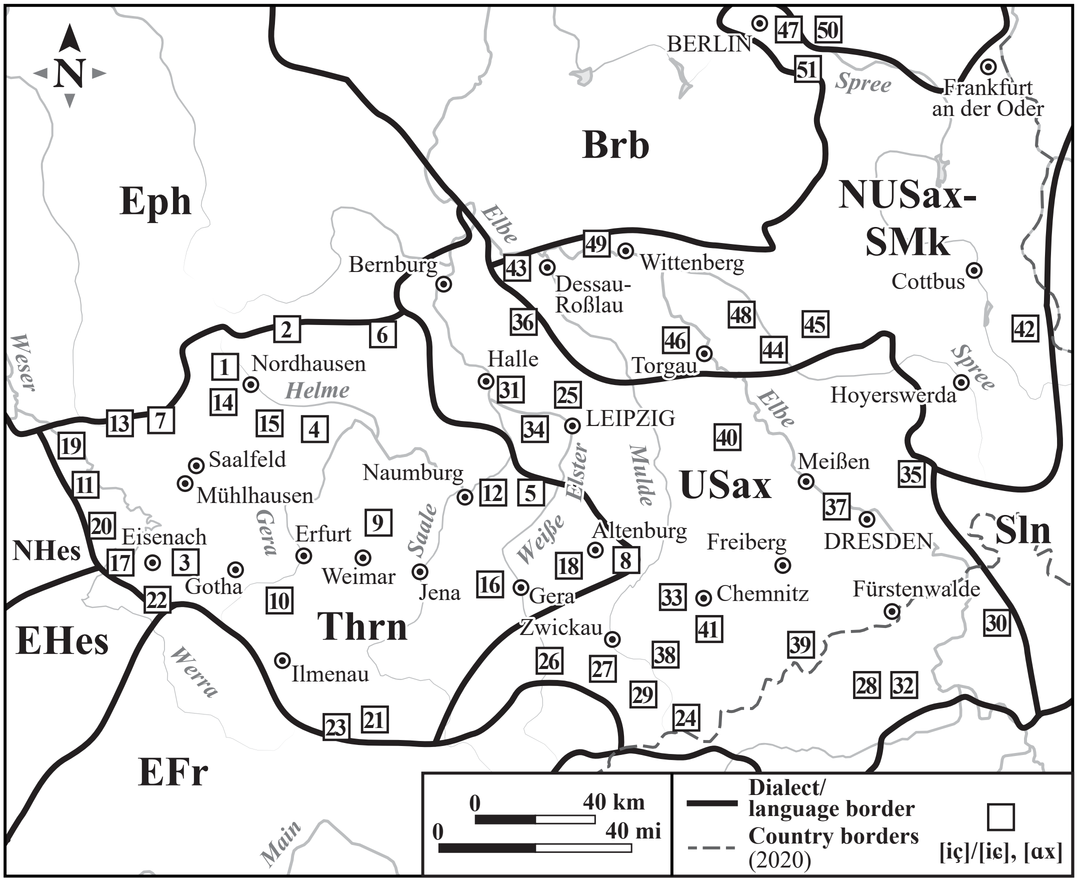
(22) Alternative treatment for Kreis Lippe (rejected):

a.

	/æiɣən/
Vel Fr-1	æiʝən
/i/-Retraction	æuʝən
	[æuʝən]
	'own'

b.

	/æiɣən/
/i/-Retraction	/æuɣən/
Vel Fr-1	—
	*[æuɣən]



Map 7.2: Thuringian (Thrn), Upper Saxon (USax), and North Upper Saxon-South Markish (NUSax-SMk). Squares indicate post-sonorant velar fronting. 1=Schultze (1874), 2=Liesenberg (1890), 3=Flex (1893), 4=Frank (1898), 5=Trebs (1899), 6=Hennemann (1901), 7=Hentrich (1905), 8=Daube (1906), 9=Kürsten & Bremer (1910), 10=Kürsten (1910, 1911), 11=Rasch (1912), 12=Hankel (1913), 13=Hentrich (1920), 14=Rudolph (1924/1925), 15=Schirmer (1932), 16=Dietrich (1957), 17=Spangenberg (1962), 18=Spangenberg (1974, 1989), 19=Guentherodt (1982) (Dudenrode), 20=Guentherodt (1982) (Netra), 21=Harnisch (1987), 22=Weldner (1991), 23=Spangenberg (1998), 24=Goepfert (1878), 25=Albrecht (1983), 26=Hertel (1887), 27=Philipp (1897), 28=Hausenblas (1898), 29=Lang (1906), 30=Pompé (1907), 31=Bremer (1909), 32=Hausenblas (1914), 33=Große (1955), 34=Große (1957), 35=Protze (1957), 36=Schönfeld (1958), 37=Fleischer (1961), 38=Bergmann (1965), 39=Becker (1969), 40=Bethge & Bonnin (1969), 41=Kahn & Weise (2013), 42=Goessgen (1902), 43=Bischoff (1935), 44=Kieser (1963), 45=Seibicke (1967), 46=Krug (1969), 47=Bethge & Bonnin (1969), 48=Stellmacher (1973), 49=Langner (1977), 50=Schönfeld (1986), 51=Schönfeld (2001).

Observe that the correct output in (22a) can only be obtained if /i/-Retraction counterbleeds Velar Fronting-1 (Vel Fr-1) in the synchronic phonology. The relationship is counterbleeding because the reverse ordering in (22b) requires /i/-Retraction to bleed Velar Fronting-1. Note too that the counterbleeding ordering involves an overapplication of Velar Fronting-1 because the front vowel trigger for [ç] in the phonetic representation is not present on the surface.

Although no study to my knowledge has proposed the specific treatment in (22a) to the Kreis Lippe data, many phonologists endorse similar analyses for phenomena in other languages. Examples in early generative phonology are easy to come by, e.g. Chomsky & Halle (1968) and many other authors writing during the 1970s. More recently, Calabrese (2005) proposes a derivational model with counterbleeding orderings involving overapplication. For example, in his treatment of Icelandic, Calabrese (2005: 38–41) follows Anderson (1981) in deriving palatal stops from underlying velars in the context before front vowels (Velar Palatalization). For example, /k/ surfaces as [c] in [cɪftɑ] 'marry-INF' (from /kɪftɑ/) but as [k] in [kou:myr] 'palate' (from /kou:myr/). In order to account for the occurrence of palatal stops before the diphthong [ɑi:], Calabrese analyzes that diphthong as a low front monophthong. Given that treatment, [c] is derived from /k/ before that low front monophthong because Velar Palatalization is ordered before the change from a low front monophthong to [ɑi:] Low Vowel Diphthongization). For example, the /ɑ/ in /kɑl-i/ 'freeze-SUBJ.1SG' shifts to the low front vowel |æ| by Umlaut, which feeds Velar Palatalization, at which point Low Vowel Diphthongization applies, i.e. /kɑl-i/⟶|kæl-i|⟶|cæl-i|⟶|cɑil-i|, which is ultimately realized as [cʰɑi:li]. The important point is that Low Vowel Diphthongization counterbleeds Velar Palatalization.

Recall from §5.4 that there is no evidence in the present survey on German dialects that any version of velar fronting is counterbled synchronically by another rule. A significant finding of Chapter 5 is that opacity involving the fronting of velars in German dialects involves synchronic counterfeeding orders but not synchronic counterbleeding orders. That point aside, I also question the wisdom behind rules like /i/-Retraction in (22a), which exemplify an ABSOLUTE NEUTRALIZATION (see Kaisse & Shaw 1985 and other authors in the Lexical Phonology and Morphology framework). What the treatment in (22a) amounts to is Velar Fronting-1 overapplying because it is counterbled by a rule of absolute neutralization whose sole purpose is to undo a representation that never surfaces. The advantage of the present treatment is that it does not require counterbleeding opacity involving rules eliminating fictional segments, as in (22a).

7.4.2 Analysis B: NCCs are permanently [coronal]

The objections to counterbleeding opacity could potentially be mitigated by adopting a treatment in which the NCS in question is underlyingly [coronal] and remains [coronal] throughout the phonological component. I apply Analysis B to the NCS /ʀ/ because that type of treatment has been made in the published literature discussed below. The arguments I level against analyzing /ʀ/ in that way can be extended to a treatment of other NCSs as well.

Two representations for /ʀ/ according to Analysis B are presented in (23). Both of those structures have in common that the surface dorsal sound [ʀ] is analyzed as phonologically [coronal] in the underlying representation. (23a) is a singleton coronal segment, while (23b) is a complex corono-dorsal sound.

(23) Alternative representations for /ʀ/ (rejected):

a. Singleton coronal:

$$\begin{array}{c}\begin{bmatrix}+\textsc{cons}\\ +\textsc{son}\\ -\textsc{nasal}\end{bmatrix}\\ |\\ \begin{bmatrix}\textsc{coronal}\end{bmatrix}\end{array}$$

b. Complex corono-dorsal:

$$\begin{array}{ccc} & \begin{bmatrix}+\textsc{cons}\\ +\textsc{son}\\ -\textsc{nasal}\end{bmatrix} & \\ \swarrow & & \searrow \\ \begin{bmatrix}\textsc{coronal}\end{bmatrix} & & \begin{bmatrix}\textsc{dorsal}\end{bmatrix}\end{array}$$

Given either representation in (23) the surface palatal [ç] in the context of /ʀ/ can be analyzed as velar /x/ and not as the quasi-phoneme /ç/. For example, the word [çʀunt] 'reason' from Reinhausen in (8d), which I analyze as underlyingly /çʀunt/, can be reanalyzed according to Analysis B as /xʀunt/. The /x/ in that type of example surfaces as [ç] by Wd-Initial Velar Fronting-6 because the liquid is [coronal], as in (23).

Representations similar to the ones in (23) have been posited for surface dorsal liquids in both the cross-linguistic literature and in the literature on German phonology. For example, Blevins (1994) examines the phonological patterning of the velar (dorsal) lateral /ʟ/ in several Trans-New Guinean languages spoken in Papua New Guinea. She shows that [ʟ] alternates with simplex (alveolar) coronals such as [t] and [l] in languages such as Yagaria, Kuman, and Kanite. Within Gmc, Hall (2009a) presents material from the SBav variety spoken in Imst (Schatz 1897; Map 3.3), in which the dorsal rhotic [ʀ] patterns phonologically with the alveolar coronal stop [d]. Both Blevins and Hall argue that the phonetically dorsal liquids in question are phonologically [coronal], as in (23a).

The structure in (23b) is akin to the universal representation for liquids proposed by Walsh Dickey (1997). Glover (2014) argues that StG /ʀ/ is underlyingly underspecified for place features and that default rules create the complex corono-dorsal structure in (23b).

Although it might seem appealing to adopt a treatment whereby palatals are created from /x/ in the context of /ʀ/, the disadvantages both representations in (23) have is that they do not derive independent support. The argument for the treatment of /ʀ/ as [coronal] in StG is based solely on the occurrence of the surface palatal fricative [ç] after that sound. Significantly, there is no evidence that Reinhausen /ʀ/ is coronal if /ʀ/ is situated in any context other than word-initial position after [ç]. Citing the analysis of Hall (1995), Glover (2014) argues that phonotactic evidence from StG corroborates an analysis of /ʀ/ as [coronal]. However, the phonotactic evidence referred to here only holds for postvocalic consonant clusters where /ʀ/ occupies the first slot. No phonotactic evidence supports (23) for /ʀ/ in a context other than the first slot in a sequence of two postvocalic consonants, e.g. word-initial /ʀ/, /ʀ/ between vowels etc. A more serious drawback with that type of argumentation is that same phonotactics involving postvocalic consonant clusters hold in dialects like Schieder-Schwalenberg, where /ʀ/ demonstratively patterns as a noncomplex (singleton) [dorsal] fricative (recall 9b).

An advocate of either (23a) or (23b) might claim that the quasi-phonemes in my analysis do not have independent support either, but this contention is not correct. Quasi-phonemes are surface palatals that must be analyzed as underlying palatals because they do not appear in a context where they can be derived by any version of velar fronting. The highly specific contexts for quasi-phonemes (e.g. word-initial position before /ʀ/ in Reinhausen in 8d) derive diachronic support: The reason quasi-phonemes appear synchronically only when adjacent to certain NCSs like /ʀ/ is that those NCSs were once phonologically [coronal] at an earlier historical stage. That feature was then transferred to the dorsal fricative and created the new quasi-phoneme when the original [coronal] trigger lost the feature [coronal] by sound change (=4). But the same point cannot be made for the representations in (23) because the feature [coronal] in those two structures is present regardless of whether or not those representations are adjacent to a dorsal fricative.

7.4.3 Analysis C: Underlying palatals but no underlying velars

A final alternative to palatal quasi-phonemes is to maintain that all instances of surface velars and surface palatals derive from underlying palatals. Analysis C is illustrated in (24) with six representative words from Elspe from (6) and the alternative rule in (25).

(24) Alternative analysis for Elspe (rejected):

a.	/çɔlt/	→	[xɔlt]	‘gold’
b.	/çɪstan/	→	[çɪstan]	‘yesterday’
c.	/çrɛɔt /	→	[çrɛɔt]	‘large’
d.	/ʃçɑːp/	→	[ʃxɑːp]	‘cabinet’
e.	/ʃçɛlə/	→	[ʃçɛlə]	‘bowl’
f.	/çəvɑːɐ/	→	[çəvɑːɐ]	‘aware’

(25) Wd-Initial Palatal Retraction (rejected):
/ç/ → [x] / $_{\text{wd}}$[(C) ____ back vowel

Since the sound triggering Wd-Initial Palatal Retraction is phonologically back (i.e. [dorsal]), the underlying palatal /ç/ in (24a, 24d) undergoes it and correctly surfaces as [x]. /ç/ in the neighborhood of schwa in (24f) fails to undergo Wd-Initial Palatal Retraction given the representation of schwa that is placeless and therefore correctly surfaces as [ç]. Finally, /ç/ before front sounds in (24b, 24c, 24e) surfaces without change as [ç].

Although the alternative treatment for Elspe in (24) and (25) works technically, I reject it because it cannot be extended successfully to other German dialects with quasi-phonemes. As a representative example, consider the reanalysis in (26) and (27) of the realization of [ɣ ʝ] in Kreis Lippe from (12). Note that there is an underlying palatal /ʝ/, but no /ɣ/.

(26) Alternative analysis for Kreis Lippe (rejected):

a.	/ɑuʝə/	→	[ɑuɣə]	‘eye’
b.	/spɪʝən/	→	[spɪʝən]	‘spout-INF’
c.	/sɔʀʝə/	→	[sɔʀʝə]	‘sorrow’
d.	/æuʝən/	→	[æuʝən]	‘own’

(27) Palatal Retraction (rejected):
/ʝ/ → [ɣ] / back vowel ____

Palatal Retraction in (27) correctly produces [ɣ] in example (26a), but that same process cannot account for the palatal after [ʝ] in (26d).

[ç] and [ʝ] in the examples discussed in the present chapter – regardless of variety – are uncontroversially the product of historical rules that fronted etymological velars. Seen in this light, the proposed diachronic treatment whereby underlying palatals (quasi-phonemes) emerge in the neighborhood of back sounds that were once front is not controversial. Analysis C is an attempt to eschew opacity (=palatal quasi-phonemes) by analyzing all instances of dorsal fricatives as underlying palatal in a synchronic treatment. Since velar fronting (and not Palatal Retraction) was uncontroversially the correct historical process for all German dialects, Analysis C presupposes that rule inversion (Vennemann 1972, McCarthy 1991, Blevins 2004, Hall 2009b) has taken place in every variety of German with quasi-phonemes. Although a rule of Palatal Retraction for word-initial position akin to the one in (25) is posited for an Eph variety in §8.5, it is the only one of its nature discovered in the present survey of velar fronting in German dialects.

Analysis C is directly related to one of the controversial research questions discussed in the literature on the distribution of dorsal fricatives in StG (§1.2): Do the two sounds [x] and [ç] derive synchronically from /x/ or /ç/? Since that question can only be addressed after all case studies of German dialects have been presented, I delay discussion until §17.3.3. In that section I demonstrate that the evidence is overwhelming that palatals derive from velars and not the other way around. That conclusion cannot be reconciled with Analysis C.

7.4.4 Kiparsky's (2015) treatment of quasi-phonemes

Kiparsky (2015) offers an analysis of i-Umlaut in the history of German that relies crucially on the notion of vocalic quasi-phonemes. It is instructive to consider his analysis because his quasi-phonemes are argued to possess a property that cannot be extended to the palatal quasi-phonemes endorsed in this chapter.

Kiparsky's concern is how and why phonemes originate (phonemicization) and why they are sometimes lost (merger). In his treatment of the phonemicization of front rounded vowels in the history of German summarized below, Kiparsky makes crucial use of the notion of quasi-phoneme. In Kiparsky's system, quasi-phonemes are defined in terms of two binary parameters, which he dubs "contrastiveness" and "distinctiveness". Contrastiveness relates to whether or not the distribution of the sounds in question is contextually predictable; distinctiveness is a perceptual notion which refers to whether or not native speakers regard the sounds in question as phonetically different. The traditional definition of phonemes requires that the sounds in question to be both contrastive (contextually unpredictable) and distinctive (perceived as different), while traditional allophones are neither contrastive (because they are in complementary distribution) nor distinctive (because native speakers are typically unaware of the difference between allophones of a given phoneme).

The two properties referred to above predict the existence of two types of sounds that are unexpected in traditional phonemic theory. First, there may be sounds that are distinctive without being contrastive (quasi-phonemes) and second, there could be sounds that are contrastive without being distinctive (near contrasts). The four logical possibilities are summarized in Table 7.2.

According to Kiparsky, the change from allophones to phonemes depicted in (1) involves an intermediate stage, namely quasi-phonemes. His claim is illustrated in the following example from the history of German.

The historical rule of i-Umlaut (Chapters 3–4) fronted back vowels before [i] or [j] in the following syllable. At a later stage the two triggers were eliminated: [j] was lost, while [i] – like all other unstressed vowels – was restructured to schwa ([ə] /ə/) by Vowel Reduction. The examples in (28b, 28c) – adapted from Kiparsky (2015) – illustrate the effects of both i-Umlaut and Vowel Reduction. Example (28a) shows that the original back vowel (/uo/ [uo]) is retained without change when there is no suffix present.

(28)

	OHG			MHG		
a.	[huot]	(/huo/)	>	[huot]	(/huo/)	'hat'
b.	[huote]	(/huot-e/)	>	[huotə]	(/huot-ə/)	'hat-DAT.SG'
c.	[hyeti]	(/huot-i/)	>	[hyetə]	(/hyet-ə/)	'hat-PL'

The most important example is (28c): That item illustrates that the trigger for i-Umlaut (/i/) was restructured to /ə/, at which point the conditioning environment for i-Umlaut was no longer present. In the traditional literature (e.g. Twaddell 1938) it is assumed that the loss of the conditioning environment for the earlier allophonic rule of i-Umlaut triggered the phonemicization of originally allophonic front vowels like [ye] (from /uo/) to phonemic front vowels (/ye/) in MHG. That change is depicted in (29). Note that [ye] and [uo] contrasted in the context before schwa in MHG.

(29)

/huot-i/	/huot-e/	
[huoti]	[huote]	pre-OHG
/huot-i/	/huot-e/	
[hyeti]	[huote]	OHG
/hyet-ə/	/huot-ə/	
[hyetə]	[huotə]	MHG
'hat-PL'	'hat-DAT.SG'	

The question Kiparsky (2015) ponders (see also Liberman 1991) is why the underlying representation for OHG [ye] (/uo/) was not retained as /uo/ after the conditioning environment was eliminated, in which case the (nominative) plural

Table 7.2: Distinctiveness and contrastivity (Kiparsky 2015)

	contrastive	noncontrastive
distinctive	phoneme	quasi-phoneme
nondistinctive	near contrast	allophone

MHG /huot-ə/ would have surfaced as *[huotə]. Since that type of change did not occur, Kiparsky proposes that the future front vowel phonemes (e.g. [ye]) were quasi-phonemicized – they became perceptually distinctive, as depicted in Table 7.2 – prior to the loss of the conditioning environment (Vowel Reduction); see also the discussion in Janda (2005: 409ff.). The approach envisioned by Kiparsky would therefore reanalyze the historical progression in (29) as in (30):

(30)

/huot-i/	/huot-e/	
[huoti]	[huote]	pre-OHG
/huot-i/	/huot-e/	
[hyeti]	[huote]	([ye] and [uo] are allophones)
/hyet-i/	/huot-e/	
[hyeti]	[huote]	([ye] /ye/ is a quasi-phoneme)
/hyet-ə/	/huot-ə/	
[hyetə]	[huotə]	([ye] /ye/ and [uo] /uo/ are phonemes)
‘hat-PL’	‘hat-DAT.SG’	

Note that three of the categories from Table 7.2, namely allophones, quasi-phonemes, and phonemes, are related historically in the sense that allophones become quasi-phonemes, which in turn become phonemes.

There are several differences between Kiparsky’s quasi-phonemes and my own. Recall from §2.4.3 that I defined palatal quasi-phonemes as phonemic palatals which posses two properties: (a) they do not contrast with the corresponding velar, and (b) they have an opaque (counterbleeding) history. For example, in the data from Elspe in (6), word-initial [ç] in the context before schwa ([ə]) is an underlying palatal (/ç/) that does not contrast with [x] and which has an opaque history schematized in (3a). Although property (a) is the same in my treatment and in the one proposed by Kiparsky, property (b) is not because Kiparsky’s quasi-phonemes have a transparent history, as illustrated in (30). That same historical derivation illustrates that Kiparsky’s quasi-phonemes occupy an intermediate stage between allophones and phonemes. However, as I point out below in §9.4.2, it is not always the case that phonemic palatals without palatal quasi-phonemes.[5]

The most significant difference between Kiparsky's quasi-phonemes and my own is that palatal quasi-phonemes in my analysis must emerge *after* the conditioning environment for velar fronting is lost and not before. The reason Kiparsky's treatment cannot be extended to my palatal quasi-phonemes that those palatals can indeed revert back to their original velars in other dialects. More than one example illustrating reversion were given earlier. For example, as shown in Table 7.1, the loss of the conditioning environment for velar fronting caused the original velar /x/ to become quasi-phonemicized to /ç/ before /ʁ/ (< /r/) in Reinhausen, but the palatal allophone [ç] (/x/) in Schieder-Schwalenberg reverted back to [x] /x/ in the same context. The same point can be illustrated by comparing the distribution of word-initial [x] and [ç] in two Wph dialects discussed earlier, namely Soest (§4.3) and Elspe (§7.1). Three representative words from those two dialects are given for Soest in (31) and Elspe in (32). The three categories represent the three contexts "before a full back vowel", "before schwa", and "before a front vowel".

(31)	a.	[xuət]	/xuət/	gut	'good'
	b.	[xədʊlt]	/xədʊlt/	Geduld	'patience'
	c.	[çɪstɐn]	/xɪstɐn/	gestern	'yesterday'
(32)	a.	[xɔlt]	/xɔlt/	Gold	'gold'
	b.	[çəvɑːɐ]	/çəvɑːɐ/	gewahr	'aware'
	c.	[çɪstan]	/xɪstan/	gestern	'yesterday'

The difference between the two dialects is the context before schwa, which was originally a front vowel (/i/). Compare now three historical stages for Soest in (33a) and Elspe in (33b):

(33)	a.	/xɪstɐn/	/xidʊlt/	b.	/xɪstan/	/xivɑːɐ/	
		[xɪstɐn]	[xidʊlt]		[xɪstan]	[xivɑːɐ]	Stage 1
		/xɪstɐn/	/xidʊlt/		/xɪstan/	/xivɑːɐ/	
		[çɪstɐn]	[çidʊlt]		[çɪstan]	[çivɑːɐ]	Stage 2
		/xɪstɐn/	/xədʊlt/		/xɪstan/	/çəvɑːɐ/	
		[çɪstɐn]	[xədʊlt]		[çɪstan]	[çəvɑːɐ]	Stage 3
		'yesterday'	'patience'		'yesterday'	'aware'	

[5]The distinctness property as defined above (recall Table 7.2) does not play a role in the present treatment of quasi-phonemes; in fact, I do not discuss this issue in any chapter of this book because it is not addressed in the original sources I cite.

At Stage 2 Vowel Reduction had not yet reduced full vowels to schwa. Velar fronting was phonologized and therefore created the palatal [ç] before any front vowel. At Stage 3 Vowel Reduction restructured unstressed vowels like /i/ to schwa (/ə/). Significantly, the elimination of the conditioning environment – the creation of /ə/ – led to the emergence of the palatal quasi-phoneme /ç/ in Elspe, but not in Soest, where the original underlying sound (/x/) is retained.[6]

An issue relating to (33) is how those historical changes can be interpreted given a historical model whereby change is intergenerational and listener-driven (§2.5).

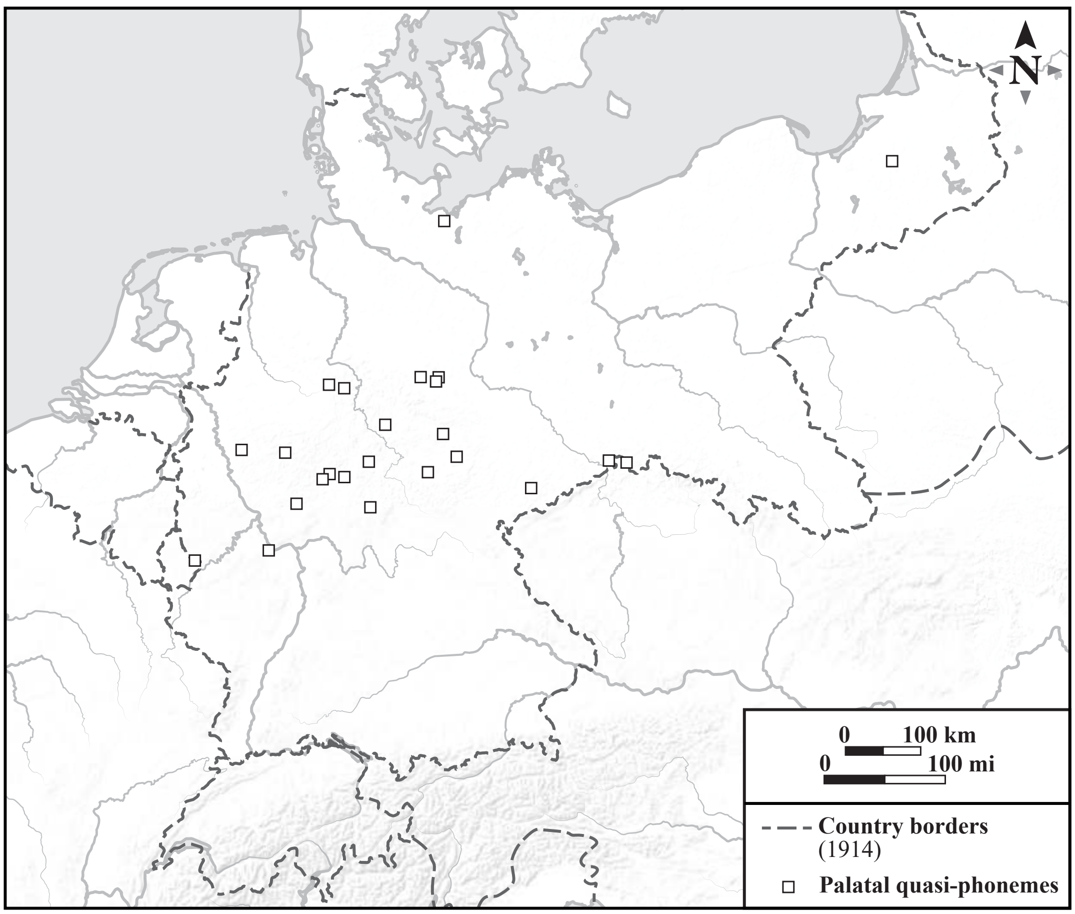
Consider first (33a), where transparent Stage 2 remains transparent at Stage 3: The speaker (P_1) utters [çidʊlt] (from /xidʊlt/), but the listener (P_2) misperceives the first vowel as schwa ([ə]). (S)he therefore alters the pronunciation by replacing [i] with [ə]. P_2 correctly perceives the first segment in [çidʊlt] as a palatal, but (s)he also knows that [ç] does not occur before full back vowels. None of the words P_2 has acquired begin with a palatal fricative before schwa. (S)he assumes that there is an exceptionless ban on words beginning with [ç] followed by any back vowel – full back vowels and schwa – and therefore substitutes the palatal fricative with the other dorsal fricative allophone [x]. Hence, the earlier pronunciation ([çidʊlt]) undergoes two modifications ([xədʊlt]), but only one of those modifications is the result of misperception. Equally important is that P_2 alters the underlying representation to one retaining the earlier /x/, while adopting the new vowel schwa, i.e. /xədʊlt/.

Consider now (33b), where transparent Stage 2 becomes opaque Stage 3: The speaker (P_1) utters [çivɑːɐ] 'aware' (from /xivɑːɐ/), but the listener (P_2) misperceives the first vowel as schwa and therefore alters the pronunciation by replacing [i] with [ə]. P_2 also correctly perceives the palatal fricative as palatal; hence, [ç] is retained. On the basis of other words P_2 has acquired (s)he knows that [ç] does not occur word-initially before full back vowels, but the word-initial back vowels in all of the words acquired do not include schwa. P_2 therefore concludes that the fricative [ç] in word-initial position before schwa is phonotactically legal because [çə] does not contrast with [xə]. The word is therefore pronounced as [çəvɑːɐ], but more significantly, P_2 posits a new underlying representation, namely /çəvɑːɐ/.

[6]Kiparsky's quasi-phonemes have been viewed critically in some of the recent literature (Renwick & Ladd 2016). Those authors correctly point out that the notion of contrast is much more nuanced than what Kiparsky's four-way classification in Table 7.2 suggests. In particular, they demonstrate that the mid vowels of Italian illustrate marginal contrasts that cannot be easily categorized in Kiparsky's terms. I do not discuss Renwick & Ladd (2016) because it is not clear that their criticisms of Kiparsky's system in Table 7.2 can be extended to the quasi-phonemes in my own analysis.

7.5 Areal distribution of palatal quasi-phonemes

The survey of German dialects in this chapter reveals that underlying palatals (quasi-phonemes) are well-attested in LG and CG. The case studies presented in Chapters 8–10 indicate that palatal quasi-phonemes also occur in varieties of German not mentioned in the present chapter, e.g. EPo and LPr (both ELG) as well as USax and HPr (both ECG). Table 7.3 lists the varieties of German with palatal quasi-phonemes discussed in §7.2 and §7.3 as well as a few additional ones I have found in the sources provided. The places listed below that have not been discussed are depicted on Map 5.2, Map 5.3, and Map 11.2. All of the places in the first column of Table 7.3 are plotted on Map 7.3.



Map 7.3: Areal distribution of palatal quasi-phonemes. High German and Low German varieties with palatal quasi-phonemes (< WGmc $^+$[k x ɣ]) in word-initial or post-sonorant position are indicated with white squares.

Table 7.3: Varieties of LG (upper box) and CG (lower box) with palatal quasi-phonemes (< WGmc $^{+}$[k x ɣ]) in word-initial and/or postsonorant position.

Place	Dialect	Source
Kreis Lippe	Wph	Hoffmann (1887)
Schieder-Schwalenberg	Wph	Böger (1906)
Elspe	Wph	Arens (1908)
Eilsdorf	Eph	Block (1910)
Reinhausen	Eph	Jungandreas (1926, 1927)
Dorste	Eph	Dahlberg (1934, 1937)
Dingelstedt am Huy	Eph	Hille (1939)
West Mecklenburg	MeWPo	Kolz (1914)
Wermelskirchen	Rpn	Hasenclever (1905)
Warmsroth	MFr	Martin (1922)
Echternach	MFr	Palgen (1931)
Rhöntal	EHes	Glöckner (1913)
Selters bei Weilburg	CHes	Schwing (1921)
Marburg	CHes	Spenter (1964)
Oberellenbach	NHes	Hofmann (1926)
Loshausen	NHes	Corell (1936)
Rauschenberg	NHes	Bromm (1936)
Seifhennersdorf	Sln	Michel (1891)
Sebnitz	Sln	Meiche (1898)
Bad Frankenhausen	Thrn	Frank (1898)
Buttelstedt	Thrn	Kürsten & Bremer (1910)
Southeast Thuringia	Thrn	Kürsten (1910, 1911)
Vorerzgebirge	USax	Bergmann (1965)
Reimerswalde	HPr	Kuck & Wiesinger (1965)

I make no claim that the list of places in Table 7.3 is anywhere near being complete. Thus, a closer scrutiny of the sources listed in Appendix B should reveal many additional varieties that could be added to Table 7.3 and included on a future revision of Map 7.3.[7]

It is not difficult to find examples of underlying palatals (quasi-phonemes) like the ones discussed above in linguistic atlases. I conclude this section by considering the occurrence of underlying palatals due to Syncope in (4d) and due to changes eliminating the frontness feature of an original /r/. I focus on two specific linguistic atlases illustrating the occurrence of sounds such as /ç/ in those two contexts.

According to ThürDA, there is an area in Thuringia possessing coda clusters with [ç], which arose via Syncope in (4d); recall the word [kæːfç] 'cage' (cf. StG [kɛːfɪç]) in Sondershausen (Thrn) from (21c), as well as the similar items from CHes in (17d) and (18f). According to Map 26 in ThürDA (for the word *Friedhof* 'cemetery') there are parts of central and west Thuringia where that word is realized as *kirfich* or *kerwich*, but to the south the word undergoes two modifications: First, the second vowel is syncopated, and second, the final two consonants metathesize, i.e. *kirfich* > *kirfch* > *kirchf*. The commentary for Map 26 (Volume 2: 136) makes it clear that the consonant cluster is [ʀfç] after Syncope and [ʀçf] after Metathesis. The same commentary notes the similarity between those clusters and clusters of obstruent plus [ç] in words, such as *teigig* 'doughy' (⟦dēgχ⟧=[deːgç]) and *Teppich* 'carpet' (⟦dębχ⟧=[dɛbç]). The important point is that the palatal fricative [ç] in all of the examples mentioned must be an underlying palatal (/ç/) because it is not preceded by a coronal sonorant.

Underlying palatals in the context of an original /r/ are documented in MRhSA for the MFr/RFr dialect area. Since /r/ is one of the segments serving as a trigger for velar fronting any change that eliminates its frontness feature can induce the restructuring of an adjacent velar (/x/) to palatal (/ç/). Underlying palatals are documented on Map 224 in Volume 3 of MRhSA for *durch* 'through'. In (34) I list four places on that map with the respective phonetic representations. The reason I have chosen those particular places is that these are the ones listed in that source with [ç] after a back vowel.

[7]One way of finding additional examples is to conduct an in-depth investigation of the regions affected by the sound changes listed in (4). However, it needs to be stressed that the set of German dialects with palatal quasi-phonemes is not identical to the set of German dialects with the sound changes deleting the frontness feature discussed in this chapter. The reason is that those changes do not automatically result in the emergence of an underlying palatal because they can revert back to the original velar, as demonstrated in Table 7.1, (31), and (32).

(34) Palatal ([ç]) after an etymological /r/:

a.	Barweiler	[d̥uç]
b.	Wendelsheim	[d̥ɔəç]
c.	Kuhardt	[d̥ɔəç]
d.	Ilbesheim	[d̥oəç]

The data listed above indicate that /x/ has been restructured to /ç/ because the original /r/ was either deleted in (34a) or converted into a diphthong consisting of back vowels in (34b–34d). It is not possible to say whether or not the /ç/ in (34) is a quasi-phoneme or a phonemic palatal (Chapter 9), but either way it is an underlying palatal and not a palatal synchronically derived from /x/.[8]

The data from ThürDA and MRhSA should give the reader a feeling for the pervasiveness of palatal quasi-phonemes. Syncope is a change that is well-attested throughout CG, and changes eliminating the frontness feature of an earlier /r/ are well-documented in HG and LG. For these reasons it should not be difficult to find additional attestations of underlying palatals like the ones discussed in this chapter.

7.6 Conclusion

What the case studies discussed in this chapter have in common is that they possess opaque palatals (quasi-phonemes), which by definition are underlying palatals that cannot be derived synchronically from other sounds. From the historical perspective, palatal quasi-phonemes were once palatal allophones of underlying velars that were restructured to underlying segments when historical processes eliminated the front vowels that originally served as triggers for velar fronting. Palatals in the neighborhood of back sounds that were originally front exemplify the underapplication of the historical process of velar fronting.

In the following two chapters I consider German dialects with underlying palatals that differ from quasi-phonemes because they contrast with the corresponding velars. Those contrastive (i.e. phonemic) palatals can arise historically in more than one way, although it is demonstrated below that the four changes listed in (4) are instrumental in their development.

[8] A skeptic might attempt to argue that the schwa in (34b–34d) is phonetically (and phonologically) front, in which case [ç] as opposed to [x] would be the expected outcome of velar fronting. I reject any treatment along those lines because there is no independent evidence in any German dialect for a phonemic front ([coronal]) schwa. It is possible that the schwa in (34b–34d) is phonetically not as retracted as the schwa before other sounds, but this is a consequence of coarticulation (phonetics). See §17.3.1 for my rejection of an analysis of the vocalized-r in StG as a front sound.

8 Phonemicization of palatals (part 1)

8.1 Introduction

This chapter investigates dialects in which velars and the corresponding palatals contrast in word-initial position. Those contrasting dorsal sounds are captured directly in the underlying representation with phonemic velars (e.g. /x/) and phonemic palatals (e.g. /ç/). As described below, there is more than one way in which palatals were phonemicized (recall §2.4.3, §2.5).

The following case studies are organized into three distinct types, defined both synchronically and diachronically. In certain varieties (Contrast Type A) the sounds in question contrast before back vowels and front vowels, but in others (Contrast Type B) that velar vs. palatal contrast occurs before back vowels but not before front vowels, where only the palatal surfaces. In yet another system (Contrast Type C) the velar and the palatal contrast before front vowels, but before back vowels only the velar surfaces. It is argued below that velars and palatals are all phonemic in Contrast Type A-C (either /ɣ ʝ/ or /x ç/). The distribution of word-initial velars and palatals for the three systems are depicted in (1), where [i] and [ɑ] are cover symbols for front vowels and back vowels respectively.

(1) a. Contrast Type A:

$_{\text{wd}}$[[ʝi…]	$_{\text{wd}}$[[ʝɑ…]
$_{\text{wd}}$[[ɣi…]	$_{\text{wd}}$[[ɣɑ…]

b. Contrast Type B:

$_{\text{wd}}$[[ʝi…]	$_{\text{wd}}$[[ʝɑ…]
	$_{\text{wd}}$[[ɣɑ…]

c. Contrast Type C:

$_{\text{wd}}$[[çi…]	
$_{\text{wd}}$[[xi…]	$_{\text{wd}}$[[xɑ…]

The three systems in (1) are not equally common among German dialects. There is no question that (1b) represents the default case, which is represented by many descriptions of LG varieties spoken throughout North Germany (including the pre-1945 regions in the east; see Chapter 11). (1a) is not nearly as well-attested as (1b), although it can be found in more than one variety in the neighborhood of the Dutch border. By contrast, (1c) is restricted to a single Eph village. As such, it deserves special attention because it shows how a unique system can develop as the result of a dialect-specific change introducing potentially new front vowel triggers.

Word-initial palatal vs. velar contrasts as in (1) came about in more than one way, the first of which is exemplified in (2). In WGmc there was a contrast between the lenis velar fricative $^+$[ɣ] (/ɣ/) and the palatal glide $^+$[j] (/j/). That WGmc system is depicted to the left of the wedge in (2). At that stage $^+$[ɣ] occurred before front vowels, back vowels, or consonants and $^+$[j] before front vowels or back vowels but not before consonants (Appendix F). The original fricative vs. glide contrast was altered to a contrast between the lenis velar fricative [ɣ] (/ɣ/) and the lenis palatal fricative [ʝ] (/ʝ/) by Glide Hardening (§4.2, restated in 3). When that restructuring occurred, a contrast arose in word-initial position between a velar fricative /ɣ/ and the corresponding palatal fricative /ʝ/ (=1a).

(2) Phonemicization of /ʝ/ in word-initial position (Glide Hardening):

/ɣ/ /j/ > /ɣ/ /ʝ/
| | | |
[ɣ] [j] [ɣ] [ʝ]

(3) Glide Hardening:
/j/ > /ʝ/ $_{\sigma}$[__

In the system depicted to the right of the wedge in (2), [ɣ] and [ʝ] contrast before a back vowel or front vowel (=1a). Word-initial velar fronting is absent in that system; what is more, there never was a stage in which that process was active in its history. The occurrence of the palatal [ʝ] before a back vowel and the velar [ɣ] before a front vowel does not imply opacity because velar fronting was never active in word-initial position.

The way in which the velar vs. palatal contrast in (2) emerged is very different from the developments that led to Contrast Type B and Contrast Type C. As indicated in (4) those two systems arose by a phonemic split:

(4) /Ve/ > /Ve/ > /Ve/ /Pa/
| | | |
[Ve] [Ve] [Pa] [Ve] [Pa]

Consider first Contrast Type B, depicted in (5a) and (5b). As indicated in the heading below, the change in both (5a) and (5b) involved the phonemic split of the two allophones [ɣ] and [ʝ], as in (4).

(5) Phonemic splits in word-initial position triggered by merger (Glide Hardening):

a.

/ɣ/	/j/	>	/ɣ/		/j/	>	/ɣ/	/ʝ/
[ɣ]	[j]		[ɣ]	[ʝ]	[j]		[ɣ]	[ʝ]

b.

/ɣ/	/j/	>	/ɣ/		/j/	>	/ɣ/	/ʝ/	>	/ɣ/	/ʝ/
[ɣ]	[j]		[ɣ]	[ʝ]	[j]		[ɣ]	[ʝ]		[g]	[ʝ]

In (5a), WGmc +[ɣ] (/ɣ/) shifted to the corresponding palatal [ʝ] in the context before a coronal sonorant (or some subset thereof) via velar fronting (after the first wedge). Since that change occurred before WGmc +[j] underwent Glide Hardening, velar fronting was still an allophonic rule relating the positional variants [ɣ] and [ʝ]; see Chapter 16 for discussion on the time frame for the changes in (5a). When Glide Hardening merged [j] (/j/) with the [ʝ] allophone of /ɣ/ (after the second wedge) a contrast between /ɣ/ and /ʝ/ emerged before a back vowel (as in 1b). That new palatal does not exemplify overapplication opacity because it was not the product of velar fronting.

It is shown below that velar fronting was not lost after the phonemicization of the palatal in (5a). Instead, velar fronting remained in that system as a rule of neutralization creating [ʝ] from /ɣ/ before a front vowel. The palatal in that type of example exemplifies the synchronically derived palatal discussed in §2.4.3.

A variant of (5a) is depicted in (5b). As in (5a), word-initial velar fronting was active as an allophonic rule at the stage before Glide Hardening transpired (after the first wedge). After Glide Hardening merged the new /ʝ/ with the earlier allophone [ʝ], [ɣ] (/ɣ/) was realized as [g] (after the third wedge). As in (5a), word-initial velar fronting remains active in (5b) as a rule of neutralization, thereby creating a derived palatal before a front vowel.

Changes other than a merger can trigger the phonemic split in (4). Consider (6), which shows Contrast Type C:

(6) Phonemic split in word-initial position (r-Deletion):

/ɣ/	>	/x/	>	/x/		>	/x/	/ç/
[ɣ]		[x]		[x]	[ç]		[x]	[ç]

WGmc +[ɣ] (/ɣ/) underwent Wd-Initial ɣ-Fortition (§4.3) to [x] (/x/), at which point the new [x] developed a palatal allophone before a front vowel by velar fronting (after the second wedge). In word-initial position before a consonant, WGmc +[ɣ] was likewise realized as [x], but that fricative did not shift to palatal [ç] because the set of triggers for word-initial velar fronting consisted solely of front vowels. The crucial examples involve WGmc +[ɣ] before [r], e.g. sequences like +[ɣri] (where [i] represents any front vowel) and [ɣrɑ] (where [ɑ] represents any back vowel). In word-initial [xr] clusters, the rhotic was elided by (7) regardless of the nature of the following vowel.

(7) r-Deletion:
/r/ > ∅ / $_{\text{wd}}[$ C ___

As a consequence of (7), sequences like [xri] (/xri/) and [xrɑ] (/xrɑ/) were restructured to [xi] (/xi/) and [xɑ] (/xɑ/) respectively. The result was that [x] and [ç] contrast in word-initial position before a front vowel, but before a back vowel only [x] surfaces, as in (1c). Note that the pre-front vowel [x] exemplifies the historical underapplication of velar fronting. As discussed at length below, r-Deletion led directly to rule inversion. This means that the historical rule fronting a word-initial /x/ to [ç] was reanalyzed as a synchronic rule converting a palatal (/ç/) to the corresponding velar ([x]) before a back vowel.

A phonemic split between a word-initial velar and palatal as in (4) can also occur when the front vowel triggering the original palatal allophone undergoes a qualitative change to a back vowel by Vowel Retraction (§7.1). That development (attested in 1b dialects) is depicted schematically in (8). The number of words exemplifying the type of change here it is very small (§8.6.2). By contrast, the mirror-image phonemic split of velar and palatal in postvocalic position is well-attested in copious examples (Chapter 9). Recall that Vowel Retraction is also responsible for the emergence of quasi-phonemes (Chapter 7).

(8) Phonemic splits in word-initial position (Vowel Retraction):

a.	/ɣ/	/j/	>	/ɣ/		>	/ɣ/	/ʝ/
	[ɣ]	[j]		[ɣ]	[ʝ]		[ɣ]	[ʝ]

b. /ɣ/ /j/ > /x/ > /x/ /ç/

[ɣ] [j] [x] [ç] [x] [ç]

The original WGmc system in (8) led to one in which velar and palatal fricatives were allophones (after the second wedge). When one or more front vowel triggering the palatal allophones shifted to a back vowel by Vowel Retraction, the earlier palatal remained palatal before the new back vowel, thereby creating a contrast between velar and palatal, as in (1b). Note that the opaque pre-back vowel palatal exemplifies the historical overapplication of velar fronting.

§8.2 focuses on a case study (from LFr) with a word-initial [ɣ] vs. [ʝ] contrast before back vowels and front vowels (Contrast Type A). In §8.3 and §8.4 I examine Eph varieties (Contrast Type B), in which the word-initial velar vs. palatal contrast is attested before a back vowel. §8.5 investigates an Eph variety (Contrast Type C) in which [x] and [ç] contrast in word-initial position before a front vowel. §8.6 provides some discussion and §8.7 an assessment of the areal distribution of word-initial phonemic palatals. Concluding remarks can be found in §8.8.

8.2 Low Franconian

Two very similar varieties of LFr are described by Meynen (1911) for Homberg and Hanenberg (1915) for Kalkar. Both places are indicated on Map 5.1. I restrict my discussion below to the Kalkar variety, although the one for Homberg is essentially the same.

The phonemic front and back vowels for Kalkar are /i e ɛ ɛː æ y ø œ/ and /u o ɔ ɑ ə/ respectively, most of which can occur as either short or long. I interpret Hanenberg's ⟦ɛ⟧ as the low vowel [æ] because it occupies a place in his vowel chart lower than his ⟦ę⟧ (=my [ɛ]). Kalkar possesses the four dorsal fricatives [x ç ɣ ʝ], of which only [ɣ ʝ] occur initially. The distribution of those sounds is expressed in (9):

(9) /ɣ/ /ʝ/

[ɣ] [ʝ]

The significance of Kalkar is that the velar and corresponding palatal in (9) contrast in word-initial position before any kind of vowel (=1a).

The data in (10) exemplify the distribution of word-initial [ɣ] and [ʝ], both of which derived from WGmc $^{+}$[ɣ]. Hanenberg's symbol ⟦g⟧ represents a lenis (voiced) velar fricative ("stimmhafter, gutturaler Reibelaut"), and his ⟦j⟧ depicts a lenis (voiced) palatal fricative ("stimmhafter, palataler Reibelaut"). [ɣ] occurs word-initially before back vowels in (10a), front vowels in (10b), or consonants in (10c). The [ɣ] in all of these examples is inherited without change from WGmc $^{+}$[ɣ]. The etymological palatal ([ʝ]) surfaces before back vowels in (10d) or front vowels in (10e). As in many other dialects, the etymological palatal is rare before a front vowel.

(10) Word-initial dorsal fricatives in Kalkar:

a.	gūt	[ɣuːt]	gut	'good'	216
	gǫlt	[ɣɔlt]	Gold	'gold'	216
	gədei̯ə	[ɣədeiə]	gedeihen	'thrive-INF'	217
b.	gø̨n	[ɣœn]	gehe	'go-1SG'	211
	gę̄rn	[ɣɛːrn]	gern	'gladly'	192
	gɛlt	[ɣælt]	Geld	'money'	192
c.	glik	[ɣlik]	gleich	'soon'	198
	grōnd	[ɣʀoːnt]	Grund	'reason'	195
d.	jǫmər	[ʝɔmər]	Jammer	'lament'	209
	jɑxt	[ʝɑxt]	Jagd	'hunt'	209
e.	jø̨kə	[ʝœkə]	jucken	'itch-INF'	209

Kalkar contrasts [ɣ] and [ʝ] before front and back vowels alike. In fact, it is not difficult to find examples in which the two fricatives occur before the same vowel, e.g. [ɣɔlt] 'gold' vs. [ʝɔmər] 'lament'. From the synchronic perspective, both velar and palatal are phonemic, as depicted in (9).

As illustrated in (2), word-initial contrasts like the ones in (10) arose historically from an earlier stage in which the fricative [ɣ] (<WGmc $^{+}$[ɣ]) contrasted with the palatal glide [j] (<WGmc $^{+}$[j]). When the latter sound underwent Glide Hardening, the contrast between /ɣ/ and /ʝ/ emerged.

Phonemicization as in (2) is also attested in other varieties of German spoken in the same general region, two examples of which are presented in (11) and (12). The first three categories in both of those datasets exemplify the contexts for [ɣ] before back vowels, front vowels, and coronal consonants respectively. (11d) and (12d) are items with the etymological palatal ([ʝ]). Both sources cited below are clear that the respective word-initial sounds in (11) and (12) represent lenis velar and palatal fricatives. Like Kalkar, the two varieties below can be classified as Contrast Type A (=1a), although [ʝ] is unstable before a front vowel.

(11) Lathen (NLG; Schönhoff 1908; Map 4.1):

a.	ʒou̯t	[ɣout]	gut	'good'	183
b.	ʒœ̄vn	[ɣœːvn̩]	geben	'give-INF'	195
c.	ʒlyk	[ɣlyk]	Glück	'fortune'	175
d.	jɔ̄	[ʝɔː]	ja	'yes'	155

(12) Montzen (Rpn; Welter 1933; Map 5.1):

a.	ɣɑ̄ːdə	[ɣɑːdə]	Garten	'garden'	18
b.	ɣę̄ː.lt	[ɣɛːlt]	Geld	'money'	18
c.	ɣru·ə.t	[ɣruət]	groß	'large'	18
d.	jǭːr	[ʝɔːr]	Jahr	'year'	23

One difference between Lathen and Montzen on the one hand and Kalkar/Homberg on the other is that only Kalkar/Homberg have velar fronting in postsonorant position. By contrast, in both Lathen and Montzen the velars [x] and [ɣ] surface after front and back vowels. The pattern described here for Kalkar/Homberg is also attested in the Rpn variety of Ronsdorf (Holthaus 1887; Map 5.1), although velar fronting only affects the fortis fricative in postsonorant position.

8.3 Eastphalian (part 1)

Block (1910) describes the Eph dialect of Eilsdorf (Map 4.3). The phonemic front and back vowels are /iː ɪ eː e ɛː ɛ yː ʏ œː œ/ and /uː ʊ ɔ ɑː ɑ ə/ respectively.[1] The diphthongs ending in a front vowel are /oi ɑi/ and the ones ending in a back vowel are /ɑu oːə øːə eːə/. Eilsdorf has the four dorsal fricatives [x ç ɣ ʝ]. In contrast to the related Eph variety spoken in Dingelstedt am Huy (§8.4), Eilsdorf possesses no [g]. The only dorsal fricatives occurring word-initially are [ɣ ʝ], which contrast as in the varieties discussed in §8.2, e.g. Kalkar. The word-initial dorsal sounds have the distribution depicted in (9).[2]

The examples in (13) exemplify the occurrence of velar [ɣ] in word-initial position before a full back vowel in (13a) or a coronal consonant in (13b). The coronal (apical) rhotic ("Zungenspitzen-r") is realized consistently as [r], regardless of

[1] I omit the vowel Block (1910: 327) describes as an overshort open i-sound ("überkurzer offener i-Laut"), which appears to be a variant pronunciation of [ə].

[2] In postsonorant position the four dorsal fricatives of Eilsdorf are [x ç ɣ ʝ]. The two palatals surface after coronal sonorants and the two velars after back vowels, as in Eph variety of Dorste (§4.4). In the context after schwa, [ʝ] is a palatal quasi-phoneme (/ʝ/), e.g. [brɛdəʝɑm] 'groom' (=⟦brędəjɑm⟧).

whether or not it occurs in the onset or in the coda. The coronal consonant referred to here ([n l r]) can be followed by any type of vowel. Gaps involving the phonemic vowels listed above after word-initial [ɣ] are accidental. The word-initial sound in (13) derived from WGmc $^+$[ɣ].

(13) Word-initial [ɣ] (from /ɣ/):

a.	ʒuut	[ɣuːt]	gut	‘good’	342
	ʒu̧ln	[ɣʊln]	Gulden	‘guilder’	349
	ʒǫrts	[ɣɔrts]	Gottfried	‘(name)’	342
	ʒɑt	[ɣɑt]	Loch	‘hole’	342
	ʒåån	[ɣɑːn]	gehen	‘go-INF’	342
	ʒɑit	[ɣɑit]	geht	‘go-3SG’	335
	ʒɑus	[ɣɑus]	Gans	‘goose’	342
b.	ʒlɑs	[ɣlɑs]	Glas	‘glass’	340
	ʒleezər	[ɣleːzər]	Gläser	‘glass-PL’	333
	ʒriis	[ɣriːs]	Greis	‘old man’	340
	ʒnįtə	[ɣnɪtə]	kleine Mücke	‘small mosquito’	342

The examples in (14) reveal that palatal [ɟ] surfaces in word-initial position before a back vowel. The orthography indicates that the [ɟ] in question (etymological palatal) is the modern reflex of the WGmc palatal glide $^+$[j].[3]

(14) Word-initial [ɟ] (from /ɟ/):

jųŋk	[ɟʊŋk]	jung	‘young’	338
jɑmər	[ɟɑmər]	Jammer	‘lament’	338
jåå	[ɟɑː]	ja	‘yes’	338
jɑuln	[ɟɑul̩n]	jaulen	‘yowl-INF’	338

From the synchronic perspective, Eilsdorf exemplifies (1b). Block does not list words beginning with the etymological palatal followed by a front vowel, although the [ɟ] deriving from WGmc $^+$[ɣ] in the context before a front vowel are present in some of the examples discussed below.

[3] [ɟ] (<WGmc $^+$[ɣ]) – but never [ɣ] – occurs in word-initial position before schwa, e.g. [ɟəzʊnt] ‘healthy’ (=⟦jəzųnt⟧). As in a number of case studies discussed in Chapter 7, the palatal in that type of example represents the palatal quasi-phoneme /ɟ/. The presence of [ɟ] before a back vowel does not imply that Eilsdorf represents (1a) because there is no contrast between [ɟ] and [ɣ] before schwa. One very general question concerning all dialects with a contrast between a velar and the corresponding palatal is whether or not the a palatal quasi-phoneme is always present in those systems. If so, this suggests that the quasi-phonemicization of palatals is a necessary prerequisite for the phonemicization of palatals. Since this question can only be addressed after all case studies involving phonemicization have been investigated I delay discussion until §9.4.2.

As indicated in (13a) and (14), [ɣ] and [ʝ] contrast in word-initial position before a full back vowel. Note that some of these items illustrate the contrast between [ʝ] and [ɣ] holds before the same vowels, e.g. [ɣʊln] 'guilder' vs. [ʝʊŋk] 'young'. On the basis of contrasts like these, [ʝ] and [ɣ] are both phonemic (/ʝ/ and /ɣ/).

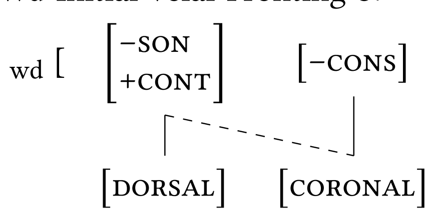
In word-initial position before a front vowel, [ʝ] (<WGmc $^{+}$[ɣ]) surfaces in many items, as in (15). The front vowels in examples like these were also etymological front vowels. From the synchronic perspective palatal [ʝ] in (15) does not alternate with [ɣ].

(15) Word-initial [ʝ] (from /ɣ/):

jiir	[ʝiːr]	Gier	'greed'	342
jįstərn	[ʝɪstərn]	gestern	'yesterday'	342
jüüstə	[ʝyːstə]	unfruchtbar	'barren'	342
jęlt	[ʝɛlt]	Geld	'money'	342
jeel	[ʝeːl]	gelb	'yellow'	342

As indicated above, I analyze the underlying representation for word-initial [ʝ] before a front vowel in (15) as velar (/ɣ/), which undergoes Wd-Initial Velar Fronting-3 (§4.3), repeated in (16). Velar /ɣ/ (as opposed to palatal /ʝ/) is justified in (15) because [ɣ] and [ʝ] never contrast before a front vowel, as in (1b). The word-initial palatals in (15), together with the ones discussed in (17) below, exemplify derived palatals (§2.4.3). Wd-Initial Velar Fronting-3 applies as a neutralization in (15) because the contrast between [ɣ] and [ʝ] is suspended in favor of [ʝ] in word-initial position before a front vowel. The neutralization property crucially differentiates Wd-Initial Velar Fronting-3 in Eilsdorf from the fronting processes discussed in other varieties of German in previous chapters. In those earlier (LG) case studies, the fronting of velars relates [x] and [ç] which do not contrast, e.g. Soest (§4.3), where [x] and [ç] are allophones, and in Elspe (§7.2), where the complementary distribution of word-initial [x] and [ç] is disrupted by the occurrence of the palatal quasi-phoneme [ç] (/ç/).

(16) Wd-Initial Velar Fronting-3:



Since fortis dorsal fricatives do not occur word-initially, it is not necessary to specify that the target for Wd-Initial Velar Fronting-3 be marked for a laryngeal feature. However, the trigger for that process is restricted to front vowels only. Were the trigger the set all coronal sonorants, then word-initial /ɣ/ would incorrectly surface as palatal in (13b).

Many words are attested with Umlaut alternations. The significance of those examples is that if the word begins with a lenis dorsal fricative, then that sound is realized as velar ([ɣ]) before a back vowel and as palatal ([ʝ]) before a front vowel. Representative examples are presented in (17). As indicated below, the sound underlying that alternation is /ɣ/, which shifts to the corresponding palatal by (16).[4]

(17) Word-initial [ɣ]~[ʝ] alternations (from /ɣ/):

a.	ʒǻårə	[ɣɑːrə]	Garten	‘garden’	342
	jęrtnęęr	[ʝɛrtnɛːr]	Gärtner	‘gardener’	342
b.	ʒɑus	[ɣɑus]	Gans	‘goose’	342
	jø̨səln	[ʝœsəln]	kleine Gänse	‘small goose-PL’	342
c.	ʒǻåf	[ɣɑːf]	gab	‘give-PRET’	329
	jeeəbm	[ʝeːəbm̩]	geben	‘give-INF’	342

The sound underlying the [ɣ]~[ʝ] alternation in (17) cannot be palatal (/ʝ/). If (16) were replaced with a neutralization converting word-initial /ʝ/ to [ɣ] before a back vowel then that process would incorrectly affect the /ʝ/ in words like [ʝʊŋk] (/ʝʊŋk/) from (14). The significance of the underlying velar is discussed in greater detail in §17.3.3.

The system described by Block in 1910 in which [ɣ] (/ɣ/) and [ʝ] (/ʝ/) contrast in word-initial position was the outgrowth of an earlier stage in which /ɣ/ surfaced as [ɣ] before any vowel; see Stage 1 in (18) for four representative examples showing that Eilsdorf illustrates pattern (5a). At some point during Stage 1, those velars succumbed to a coarticulatory (phonetic) fronting, which was then phonologized as an allophonic rule (Wd-Initial Velar Fronting-3) at Stage 2. At that point, word-initial [ɣ] surfaced in the neighborhood of a back vowel or consonant and word-initial [ʝ] in the neighborhood of a front vowel. When Glide Hardening altered underlying representations (Stage 3), contrasts between the new phonemic palatal /ʝ/ and the inherited velar phoneme /ɣ/ emerged in word-initial position before a full back vowel, as in the first and third example in (18).

[4] I ignore the idiosyncrasies in these Umlaut alternations (e.g. [ɑu] alternates with [œ]) because they are not relevant for my analysis. The important point is that the stem vowel in the second word in the two pairs is front and not back.

(18)	/jɑː/	/ɣuːt/	/ɣɑːf/	/ɣeːəbm̩/	
	[jɑː]	[ɣuːt]	[ɣɑːf]	[ɣeːəbm̩]	Stage 1
	/jɑː/	/ɣuːt/	/ɣɑːf/	/ɣeːəbm̩/	
	[jɑː]	[ɣuːt]	[ɣɑːf]	[ʝeːəbm̩]	Stage 2
	/ʝɑː/	/ɣuːt/	/ɣɑːf/	/ɣeːəbm̩/	
	[ʝɑː]	[ɣuːt]	[ɣɑːf]	[ʝeːəbm̩]	Stage 3
	ja	*gut*	*gab*	*geben*	StG
	'yes'	'good'	'give-PRET'	'give-INF'	

The word [ɣuːt] 'good'– representative of data set (13) – shows that a word-initial velar remains velar in the phonetic representation and in the underlying representation at all three stages. The example [ʝɑː] 'yes'– representative of data set (14) – reveals that a new phoneme entered the language at Stage 3 (/ʝ/). That sound is a phonemic palatal because it contrasts with /ɣ/ before full back vowels. The words [ɣɑːf] 'give-PRET' and [ʝeːəbm̩] 'give-INF' typify [ɣ]~[ʝ] alternations, as in (17). At Stage 2, /ɣ/ surfaced as [ʝ] before a front vowel in words like [ʝeːəbm̩] because the front vowel in /eːə/ belonged to the set of triggers for fronting. At Stage 3, the underlying representation for those alternating pairs did not change; hence, /ɣ/ from Stage 2 was inherited as /ɣ/ at Stage 3. Original /ɣ/ was likewise inherited in the nonalternating examples in (15).

The Eph pattern for word-initial dorsal fricatives in (13–15) is attested elsewhere in that dialect region. A representative example is the Eph variety of Lesse (Löfstedt 1933; Map 4.3), which is about 40 km from Eilsdorf. Löfstedt uses the same symbol for [ɣ] and [ʝ], although he is clear that the distribution of the two is a function of the following vowel. The data in (19) suggest that Lesse exemplifies (1b), although it appears that word-initial [ʝ] is unstable before a front vowel (Löfstedt 1933: 51).

(19) Word-initial dorsal fricatives in Lesse:

a.	ʒolt	[ɣolt]	Gold	'gold'	56
b.	ʒēbm̥	[ʝeːbm̩]	geben	'give-INF'	56
c.	glâs	[glɑːs]	Glas	'glass'	56
d.	jâr	[ʝɑːr]	Jahr	'year'	51

As in Eilsdorf, Lesse has a contrast between [ɣ] and [ʝ] in word-initial position before a full back vowel. Note that WGmc $^{+}$[ɣ] is realized as the velar stop [g] before a consonant in (19c) and not as [ɣ], as in (19b).

To summarize, the data described above for word-initial dorsal fricatives in Eilsdorf (and Lesse) represent one pattern for Eph (see §8.4 for another pattern). That system is also well-represented in varieties of ELG discussed in Chapter 11, e.g. Willuhnen (LPr; Natau 1937; Map 11.2), Kreis Bütow and Kreis Rummelsburg (EPo; Mischke 1936; Map 11.2).

8.4 Eastphalian (part 2)

Hille (1939) describes the Eph dialect of Dingelstedt am Huy (Map 4.3). The phonemic front and back vowels are /iː ɪ eː ɛː ɛ yː ʏ øː/ and /uː ʊ oː ɔ ɑː ɑ ə/ respectively. The phonemic diphthongs ending in a front vowel are /ɑːi oːy ʏø ɪe/ and the ones ending in a back vowel are /ɑːu ʊo/. Dingelstedt am Huy has the four dorsal fricatives [x ɣ ç ɟ], in addition to the stop [g], which is demonstrated below to be an allophone of /ɣ/. In word-initial position only [ɟ] and [g] surface, which both contrast before back vowels; that word-initial system is depicted in (20). In postsonorant position [x ɣ ç ɟ] pattern as in Eilsdorf (Footnote 2).

(20)

/ɣ/	/ɟ/
|	|
[g]	[ɟ]

Word-initial [g] (<WGmc $^{+}$[ɣ]) surfaces before a full back vowel in (21a) or a consonant in (21b). Recall from (13) that words like the ones in (21) are pronounced in Eilsdorf with an initial [ɣ]. The absence of items beginning with [g] followed by [oː ɔ] is accidental.

(21) Word-initial [g] (from /ɣ/):

a.	gūt	[guːt]	gut	‘good	30
	gus	[gus]	Guss	‘gush’	119
	gɑst	[gɑns]	ganz	‘quite’	101
	gɑ̄ist	[gɑːist]	Geist	‘intellect’	64
b.	glɑ̄s	[glɑːs]	Glas	‘glass’	64
	glükkə	[glʏkə]	Glücke	‘fortune-PL’	66
	grɑ̄s	[gʀɑːs]	Gras	‘grass’	64

In word-initial position before a back vowel, palatal [ɟ] (/ɟ/) likewise can occur, as in (22). The [ɟ] in examples like these is the etymological palatal. As in Eilsdorf (Footnote 3), in the context before schwa, [ɟ] (<WGmc $^{+}$[ɣ]) is present as a palatal quasi-phoneme, e.g. [ɟədɑŋkə] ‘thought’ (=⟦jədɑŋkə⟧).

(22) Word-initial [ʝ] (from /ʝ/):

jū	[ʝuː]	euer	'your-PL'	53
juŋk	[ʝʊŋk]	jung	'young'	27
jɑmmər	[ʝɑməʀ]	Jammer	'lament'	21
jɑ	[ʝɑː]	ja	'yes'	101

Palatal [ʝ] – but never [g] – surfaces in word-initial position before a front vowel in (23). The [ʝ] in these examples derives historically from WGmc $^{+}$[ɣ]. As indicated here, I analyze the initial sound in (23) as an underlying velar.[5] The [ʝ] in these examples is a nonalternating palatal (like the corresponding Eilsdorf items in 15).

(23) Word-initial [ʝ] (from /ɣ/) in nonalternating words:

jē̜rn̥	[ʝɛːʀn̩]	gären	'ferment-INF'	42
jelt	[ʝɛlt]	Geld	'money'	24
ji̜ejən	[ʝɪeʝən]	gegen	'against'	18

In word-initial position before a full back vowel, [g] and [ʝ] contrast. This is illustrated in the examples presented above in (21a) vs. (22), e.g. [guːt] 'good' vs. [ʝuː] 'your-PL'. Items like these show that the contrast between word-initial [ʝ] and word-initial [g] holds before the same full back vowels. Dingelstedt am Huy represents (1b), where [ɣ] in (1b) corresponds to [g].

The treatment of word-initial sequences like [gi] as systematic gaps is supported by alternating pairs like the ones in (24). The first word in each pair begins with [g] followed by a full back vowel and the second word shows the fronting of that back vowel to a front vowel via Umlaut. The important point is that the dorsal fricative is realized as [ʝ] before a front vowel.

(24) Word-initial [g]~[ʝ] alternations (from /ɣ/):

a.	gɑst	[gɑst]	Gast	'guest'	52
	jestə	[ʝɛstə]	Gäste	'guest-PL'	52
b.	gɑ̄us	[gɑːus]	Gans	'goose'	52
	jössələ	[ʝœsələ]	Gänseküken	'goose chick'	52

I analyze the word-initial consonant in (23) and (24) as an underlying velar (/ɣ/). That sound shifts to [ʝ] before a front vowel by Wd-Initial Velar Fronting-3 in (16) and elsewhere surfaces as [g] (see below for discussion). The trigger

[5]There are two words listed in the glossary of the original source (Hille 1939: 115–127) in which the etymological palatal occurs before a front vowel, namely [ʝiː] 'her' (=⟦jī⟧) and [ʝɪedəʀ] 'every-MASC.SG.'(=⟦ji̜edər⟧).

for fronting must be the class of front vowels and not the class of coronal sonorants, otherwise word-initial /ɣ/ would incorrectly surface as [ɟ] before sounds like /l/ and /r/ in (21b). As in Eilsdorf, the distribution of velars and palatals necessitates an underlying velar which surfaces as palatal and not an underlying palatal which is realized as velar. If the alternations in (24) were analyzed in the synchronic phonology with an underlying /ɟ/ which retracts to |ɣ| (→[g]) before a back vowel, then the /ɟ/ in (22) would incorrectly be affected as well.

It was noted above that Wd-Initial Velar Fronting-3 creates [ɟ] from /ɣ/ before a front vowel. Word-initial /ɣ/ in the elsewhere case (i.e. before a back vowel or consonant) surfaces as [g] by g-Formation-2 in (25). g-Formation-2 applies at the left edge of a word and not at the left edge of a syllable. The latter context cannot be correct because the /ɣ/ in a word-internal onset does not surfaces as [g], e.g. [fɔ.ɣəl] 'bird' (=⟦foggəl⟧).

(25) g-Formation-2:

$$\begin{bmatrix} -\text{SON} \\ +\text{CONT} \\ -\text{FORTIS} \\ \text{DORSAL} \end{bmatrix} \rightarrow [-\text{cont}] \;/\; {}_{\text{wd}}[\;\_\_$$

Wd-Initial Velar Fronting-3 (Wd-In Vel Fr-3) and g-Formation-2 (g-Form-2) have a very different status in the synchronic phonology. Since the former eliminates the contrast between underlying velar and underlying palatal to the latter, it is a neutralization. However, g-Formation-2 applies to any word-initial /ɣ/ that has not undergone Wd-Initial Velar Fronting-3. That type of /ɣ/ can be present in words that alternate with [ɟ], as in (24), or in words that have no such alternation (e.g. in [glʏkə] 'fortune-PL' from /ɣlʏkə/ in 21b). g-Formation-2 is therefore an allophonic rule. As indicated in (26a), Wd-Initial Velar Fronting-3 bleeds g-Formation-2 in the second example.

(26) a.

	/ɣɑst/	/ɣɛst-ə/
Wd-In Vel Fr-3	—	ɟɛst-ə
g-Form-2	gɑst	—
	[gɑst]	[ɟɛstə]
	'guest'	'guest-PL'

b.

	/ɣɑst/	/ɣɛst-ə/
g-Form-2	gɑst	gɛst-ə
Wd-In Vel Fr-3	—	—
	[gɑst]	*[gɛstə]

Were g-Formation-2 to precede Wd-Initial Velar Fronting-3 (see 26b), then the incorrect output would be obtained in the second example. Note that the ordering in (26b) is not counterbleeding. Instead, Wd-Initial Velar Fronting-3 bleeds g-Formation-2; hence, those two processes stand in a transparent (mutually bleeding) relationship (§2.2.4).

In (27) I provide three representative examples illustrating the development of dorsal sounds in word-initial position (as depicted in 5b). The first three stages are the same as the three stages presented earlier for Eilsdorf: Stage 1 represents the point where velars are phonologically [ɣ] even in the neighborhood of front sounds. Stage 2 depicts the point in the history of LG before Glide Hardening, in which [ɣ] and [ʝ] stood in an allophonic relationship. At that stage the palatal surfaced word-initially only before a front vowel and the velar elsewhere. When Glide Hardening restructured the initial palatal to the phoneme /ʝ/, Wd-Initial Velar Fronting-3 operated as a neutralization (Stage 3A). The difference between Dingelstedt am Huy and Eilsdorf can be observed at Stage 3B: The former dialect is more innovative than the latter because it added g-Formation-2.

(27)	/jɑː/	/ɣɑst/	/ɣɛstə/	
	[jɑː]	[ɣɑst]	[ɣɛstə]	Stage 1
	/jɑː/	/ɣɑst/	/ɣɛstə/	
	[jɑː]	[ɣɑst]	[ʝɛstə]	Stage 2
	/ʝɑː/	/ɣɑst/	/ɣɛstə/	
	[ʝɑː]	[ɣɑst]	[ʝɛstə]	Stage 3A
	/ʝɑː/	/ɣɑst/	/ɣɛstə/	
	[ʝɑː]	[gɑst]	[ʝɛstə]	Stage 3B
	ja	*Gast*	*Gäste*	StG
	'yes'	'guest'	'guest-PL'	

The example [ʝɑː] 'yes'– recall (22) – indicates that a new underlying dorsal fricative entered the language at Stage 3 (/ʝ/). That new palatal was a phoneme because it contrasted with /ɣ/ in words like [ɣɑst] 'guest'. [gɑst] 'guest' and [ʝɛstə] 'guest-PL' are representative of an alternating pair (see 24). At Stage 2, /ɣ/ surfaced as [ʝ] before a front vowel in items like [ʝɛstə] 'guest-PL' because /ɛ/ belonged to the set of triggers for fronting. At Stage 3A, the underlying representation for those alternating pairs did not change; hence, /ɣ/ from Stage 2 was inherited as /ɣ/ at Stage 3A and Stage 3B.

The word-initial pattern described above for Dingelstedt am Huy is well-attested in LG. Two very similar Eph varieties are presented in (28) and (29). The two dialects listed here exemplify (1b), although examples in Magdeburger Börde with word-initial [ɟ] before front vowels appears to be limited to names (Roloff 1902: 17).

(28) Magdeburger Börde (Roloff 1902; Map 4.3):

a.	gɑlə	[gɑlə]	Galle	‘bile’	22
b.	gråṃ	[grɑṃ]	graben	‘bury-INF’	18
c.	jęlt	[ɟɛlt]	Geld	‘money’	21
d.	juŋk	[ɟuŋk]	jung	‘young’	17

(29) Göddeckenrode and Isingerode (Lange 1963; Map 4.3):

a.	gau̯s	[gɑʊs]	Gans	‘goose’	227
b.	glā(ə)s	[glɑː(ə)s]	Glas	‘glass’	227
c.	ję̄l	[ɟɛːl]	gelb	‘yellow’	227
d.	juŋk	[ɟuŋk]	jung	‘young’	208
	jīək	[ɟiːək]	Joch	‘yoke’	208

ELG varieties displaying a similar pattern include Lauenburg (EPo; Pirk 1928; Map 11.2), Kreis Saatzig (EPo; Kühl 1932; Map 11.2), Neumark (Brb; Teuchert 1907b,c; Map 11.1), Letschin (Brd; Teuchert 1930; Map 11.1), and Neu-Golm (Brb; Siewert 1912; Map 11.1). Those places are discussed in Chapter 11.

8.5 Eastphalian (part 3)

Schütze (1953) describes the Eph dialect once spoken in the community of Neuendorf (Map 4.3). The phonemic front and back vowels in that variety are /iː ɪ eː ɛː ɛ/ and /uː ʊ oː ɔː ɔ ɑ ə/ respectively. The dialect possesses the dorsal fricatives [x ç ɣ ɟ], of which [x ç ɟ] surface word-initially. This section concerns itself with the contrast between [x ç] in word-initial position, which is depicted in (30). The etymological palatal [ɟ] (/ɟ/) (<Wmc ⁺[j]) is included for reference. I demonstrate below that [x] and the corresponding palatal [ç] contrast before front vowels, but only the velar occurs before back vowels, as in (1c). The changes that occurred in Neuendorf are shown below to exemplify pattern (6).

(30)

/x/	/ç/	/ɟ/
|	|	|
[x]	[ç]	[ɟ]

In word-initial position [x] occurs before a back vowel in (31a) or consonant in (31b) and [ç] before any front vowel in (32). The word-initial dorsal fricatives in all of these examples derived historically from WGmc ⁺[ɣ], which is reflected as *g* in the StG orthography in the third column. [x]~[ç] alternations are provided in (33). I discuss the correct underlying representations for the Neuendorf data below. There is no indication in the original source that there are constraints on the nature of the back vowel after [x] or the front vowel after [ç]. The kind of consonant after [x] is restricted to coronal sonorants.

(31) Word-initial [x] before back vowels or consonants:

a.	xolt	[xɔlt]	Gold	‘gold’	32
	xǭn	[xɔːn]	gehen	‘go-INF’	10
	xāwət	[xɑːvət]	gut	‘good’	32
b.	xlīk	[xliːk]	gleich	‘same’	15
	xnǭdə	[xnɔːdə]	Gnade	‘mercy’	22

(32) Word-initial [ç] before front vowels:

χītsiχ	[çiːtsiç]	geizig	‘stingy’	32
χistərn	[çɪstərn]	gestern	‘yesterday’	32
χēwl	[çeːvl̩]	Giebel	‘gable’	9
χę̄l	[çɛːl]	gelb	‘yellow’	32

(33) Word-initial [x]~[ç] alternations:

a.	xūl	[xuːl]	Gaul	‘horse’	17
	χīlə	[çiːlə]	Gäule	‘horse-PL’	18
b.	xot	[xɔt]	Gott	‘God’	10
	χetərə	[çɛtərə]	Götter	‘God-PL’	46
c.	xɑns	[xɑns]	Gans	‘goose’	27
	χenzə	[çɛnzə]	Gänse	‘goose-PL’	27

The etymological palatal [ɟ] (/ɟ/) occurs word-initially before front or back vowels, e.g. [ɟɔː] ‘yes’.

The data presented in (34b) indicate that Neuendorf also possesses many words in which [x] surfaces in word-initial position before a front vowel. As revealed in the StG orthography, the [x] in those examples derived historically from WGmc ⁺[ɣ] followed by [r] (by r-Deletion in 7). The examples in (34a) illustrate that r-Deletion also occurred between [x] and a back vowel. Observe that r-Deletion has the function of creating opaque velar plus front vowel sequences in (34b).[6]

[6]The final item in (34b) derives from OSax *grīpan*.

(34) Word-initial [x] before back vowels or front vowels:

a.	xunt	[xʊnt]	Grund	'reason'	11
	xošn	[xɔʃn̩]	Groschen	'penny'	26
	xof	[xɔf]	grob	'rough'	48
	xōwə	[xoːvə]	grobe	'rough-INFL'	48
	xǭs	[xɔːt]	groß	'large'	26
	xoin	[xoin]	grün	'green'	26
	xɑf	[xɑf]	Grab	'grave'	26
b.	xīs	[xiːs]	grau	'gray'	15
	xīpm	[xiːpm̩]	greifen	'grasp-INF'	15
	xitə	[xɪtə]	Grütze	'groat'	26
	xēln	[xeːln]	grölen	'bellow-INF'	28
	xetər	[xɛtər]	größer	'bigger'	20
	xēpm	[xɛːpm̩]	Mistgabel	'pitchfork'	18

Note that Neuendorf possesses words with [x]~[ç] alternations in (33) as well as words without such an alternation, e.g. [xɔːt] 'large' vs. [xɛtər] 'larger' in (34).[7]

The significance of the Neuendorf data is that [x] and [ç] contrast in word-initial position before a front vowel; see (32) vs. (34b). It is not difficult to find examples where [x] and [ç] contrast before the same front vowel, e.g. [çiːtsɪç] 'stingy' vs. [xiːs] 'gray'.

Schütze (1953) gives every indication that r-Deletion is an exceptionless, Neogrammarian-style sound change. I contend that r-Deletion altered underlying representations from one generation to the next. Thus, an older generation of speakers retained the [r], while the younger and clearly more innovative generation does not, e.g. [xrɪs] /xrɪs/ shifted to [xɪs] /xɪs/. The latter underlying representations are the ones present in the grammar of the informants for Schütze (1953).

In (35) I give representative examples for phonetic and underlying representations for all of the datasets presented above. In the context before a front vowel, [ç] and [x] contrast, and hence, they are phonemic (35c vs. 35e). (35f) represents [x]~[ç] alternations. Velar /x/ cannot be the underlying sound in that type of alternation, otherwise velar fronting (triggered by all front vowels) would incorrectly convert the /x/ in words like (35e) into [ç]. For this reason the underlying representation of the initial sound is /ç/; see (35f). In the context before a back

[7]The [x]~[ç] alternations in (33) are nouns, but the one example of a nonalternating pair referred to here is an adjective. I do not consider the lexical category to be significant. The reason the [x] in [xɔːt] 'large' fails to alternate with [ç] in [xɛtər] 'larger' is that the [x] in the latter word was once followed by [r] and not that it is an adjective.

vowel or consonant in nonalternating morphemes, surface [x] is underlyingly /x/; see (35a, 35b, 35d). Note that /x/ is inherited without change from earlier /x/. See below for discussion.

(35)	a.	[xɔlt]	/xɔlt/	'gold'	(=31a)
	b.	[xliːk]	/xliːk/	'same'	(=31b)
	c.	[çɛːl]	/çɛːl/	'yellow'	(=32)
	d.	[xʊnt]	/xʊnt/	'reason'	(=34a)
	e.	[xiːs]	/xiːs/	'gray'	(=34b)
	f.	[xɑns]	/çans/	'goose'	(=33c)
		[çɛnzə]	/çɛnzə/	'goose-PL'	(=33c)

Significantly, Neuendorf does not possess any version of word-initial velar fronting, but instead a rule backing a word-initial palatal, which I state in (36). Wd-Initial Palatal Retraction is a neutralization because it suspends the contrast between /x/ and /ç/ to [x]. I discuss the way in which that process might be analyzed featurally in §8.6.2.

(36) Wd-Initial Palatal Retraction:
/ç/ → [x] / $_{\mathrm{wd}}$[___ back vowel

Neuendorf is the only variety of German discovered in the present survey requiring a rule backing a palatal rather than one fronting a velar. Since the dialect as it was described in 1953 represents the outgrowth of an earlier one in which a velar fronted to palatal, the conclusion is that rule inversion transpired (Vennemann 1972, McCarthy 1991, Blevins 2004, Hall 2009b). In the following, I discuss how the original rule of velar fronting inverted itself into Wd-Initial Palatal Retraction.[8]

The emergence of the word-initial velar vs. palatal contrast as it was described in 1953 (=6) is illustrated with the four representative examples in (37). WGmc ⁺[ɣ] (/ɣ/) was restructured to [x] (/x/) by Wd-Initial ɣ-Fortition, which surfaced consistently as velar at Stage 1. At Stage 2, Wd-Initial Velar Fronting-3 (in 16) was phonologized as an allophonic process; hence, the /x/ in /xenzə/ was realized as [ç] because that sound was followed by a front vowel, but the same sound

[8] On the basis of data from English dialects involving intrusive-r, McCarthy (1991) argues that true rule inversion (i.e. the replacement of the original rule of r-Deletion with r-Epenthesis) never occurred. Instead, the original deletion exists side by side with the innovative rule of r-Deletion. In contrast to those English dialects, true rule inversion occurred in Neuendorf. For discussion of McCarthy's claim, the reader is referred to Hall (2009b).

surfaced as [x] before a back vowel or consonant. When r-Deletion restructured underlying representations at Stage 3 without /r/ as in the final two examples, [x] and [ç] contrasted in word-initial position before a front vowel.

(37)

	/xɑns/	/xɛnz-ə/	/xrɔːt/	/xrɛt-ər/	
	[xɑns]	[xɛnzə]	[xrɔːt]	[xrɛtər]	Stage 1
	/xɑns/	/xɛnz-ə/	/xrɔːt/	/xrɛt-ər/	
	[xɑns]	[çɛnzə]	[xrɔːt]	[xrɛtər]	Stage 2
	/çɑns/	/çɛnz-ə/	/xɔːt/	/xɛt-ər/	
	[xɑns]	[çɛnzə]	[xɔːt]	[xɛtər]	Stage 3
	Gans	*Gänse*	*groß*	*größer*	StG
	'goose'	'goose-PL'	'large'	'larger'	

The contrast between [x] and [ç] at Stage 3 is significant for two reasons. First, it triggered the phonemicization of /ç/ followed by a front vowel in every example given above. That restructuring therefore occurred in [çɛːl] 'yellow' in (35c) without a [x]-alternant, as well as in [çɛnzə] 'goose-PL', which alternates with [x] in [xɑns] 'goose'. Since the original /x/ was restructured to /ç/ in [çɛnzə], the /x/ in the alternant with [x] before a back vowel was likewise restructured, i.e. [xɑns] /xɑns/ > [xɑns] /çɑns/. By contrast, historical /x/ in nonalternating morphemes in (35a, 35b, 35d) is inherited at Stage 3 without change as /x/. Note that /x/ is the underlying sound here even though [x] never contrasts with [ç] in word-initial position before a back vowel. The same reasoning has been applied to underlying representations in languages like German with fortis-lenis alternations. Thus, underlying representations with a lenis sound are posited for alternating morphemes, e.g. final /d/ in [hʊnt] 'dog' vs. [hʊndə] 'dog-PL', but underlying representations with fortis sounds are postulated in nonalternating morphemes, e.g. /t/ in [ʃtɑt] 'city' (Kiparsky 1982a: 17 and subsequent work by many authors).

The second reason the contrast between [x] and [ç] is significant is that it led to rule inversion. In all likelihood rule inversion in Neuendorf was abrupt. As noted above, Schütze's description of Neuendorf suggests that r-Deletion was a regular (exceptionless) change. Since there was a large number of new r-less words like [xɛtər] 'larger' (from 34b) and since there were no restrictions on the type of front stem vowel situated after the deleted rhotic, language learners were confronted a plethora of [x] vs. [ç] contrasts. Those contrasts led to the restructuring of /x/ to /ç/ in pairs of words like [çɛnzə] 'goose-PL' and [xɑns] 'goose'.

The earlier allophonic process of Wd-Initial Velar Fronting-3 was consequently replaced with Wd-Initial Palatal Retraction.[9]

The word-initial pattern for Neuendorf is apparently unique; no other variety with contrastive [ç] and [x] in word-initial position has been discovered, nor is r-Deletion attested in other dialects. The varieties of German spoken closest to Neuendorf are Reinhausen (Eph; Jungandreas 1926, 1927; Map 4.3) in Lower Saxony (Niedersachsen) and Leinefelde (Thrn; Hentrich 1905; Map 7.2) in Thuringia (Thüringen). In Reinhausen WGmc $^{+}$[ɣ] is realized in word-initial position allophonically as [x] before back vowels and [ç] before front vowels or coronal consonants, although the palatal quasi-phoneme /ç/ occurs word-initially before /ʀ/. However, [x] and [ç] do not contrast in initial position. As in other Thrn dialects (and StG), the reflex of word-initial WGmc $^{+}$[ɣ] is [g] in Leinefelde.

8.6 Discussion

8.6.1 Velar fronting as a Neogrammarian change

Velar fronting was phonologized in word-initial position as an allophonic process in all of the Eph varieties discussed above, but Glide Hardening caused its status to change to a neutralization in both Eilsdorf and Dingelstedt am Huy. One point not discussed earlier concerns the exceptionless nature of velar fronting. Thus, WGmc $^{+}$[ɣ] shifted to palatal in word-initial position before a front vowel in true Neogrammarian fashion, meaning that there were no deviant items with a word-initial $^{+}$[ɣ] followed by a front vowel. That allophonic processes – both synchronic and diachronic – are exceptionless is hardly surprising, but the exceptionless nature of word-initial velar fronting has apparently continued even after the rule morphed into a neutralization. Examples were provided earlier for morphemes alternating between velar and palatal depending on whether or not the stem vowel showed the effects of a stem vowel mutation such as Umlaut

[9]In postsonorant position the four dorsal fricatives of Neuendorf are [x ç ɣ ʝ]. The basic pattern is that the palatals surface after coronal sonorants and the velars after back vowels; recall the Eph variety of Dorste (§4.4). However, Schütze (1953) also lists several words in her grammar with opaque palatals, such as [ç] after a back vowel that was historically front, e.g. [dɑːç] 'dough' (=⟦dɑχ⟧). Opaque palatals like those are underlying (/ç/) and not derived; see Chapter 9 for similar examples from other dialects. As I demonstrate in Chapter 9, in dialects where [x] and [ç] contrast after a back vowel velar fronting is present as a rule of neutralization in word pairs with Umlaut alternations (cf. StG [bɑx] 'stream' vs. [bɛçə] 'stream-PL'). Since Neuendorf contrasts [x] and [ç] after a back vowel, velar fronting is present in the synchronic grammar in postsonorant position. Thus, rule inversion occurred in Neuendorf only in word-initial position.

in (17) for Eilsdorf and in (24) for Dingelstedt am Huy. By definition, Umlaut is irregular in the sense that it is difficult if not impossible to predict which morphemes undergo fronting in which morphological context, but the point is that if the umlauted allomorph of a stem is present, then the velar fricative preceding that fronted vowel always shifts to palatal. The exceptionless nature of neutralizations is not unattested in the languages of the world, but many linguists have observed that the shift in status from a rule relating allophones to a neutralization often correlates with other changes, including the emergence of idiosyncratic exceptions, as well as the restriction of the rule to derived environments. One example discussed in the literature involves the progression from the originally allophonic rule which voiced (lenited) fricatives /f s θ/ to [v z ð] in OE to the phonemicization of /v z ð/ and then to the morphologization of the rule in ME (Ringe & Eska 2013: 141–144; Minkova 2014: 89–98). The conclusion drawn on the basis of the material discussed above (and below) is that the correlation described above does not hold in German dialects.

8.6.2 Irregularities and analogy

Both Block (1910) and Hille (1939) have identified a very small number of items in their respective dialects which contain a word-initial palatal [ʝ] (<WGmc $^{+}$[ɣ]) which is historically opaque because it stands before a back vowel. Those opaque examples can be placed into two categories. In the first category are words where the palatal can be shown to have undergone velar fronting because the back vowel was originally front. In the second category the palatal did not undergo velar fronting because the back vowel was always back.

The number of words belonging to both categories is very small. For Eilsdorf I have found one word belonging to the first category and four words in the second. The numbers are similar for Dingelstedt am Huy. With this in mind, consider the two examples in (38) from Eilsdorf (Block 1910):

(38)	a.	jų̧ŋk	[ʝʊŋk]	ging	‘go-PRET’	342
	b.	jų̧lt	[ʝʊlt]	galt	‘be valid-PRET’	342

The corresponding OSax etymon *gieng* ‘go-PRET’ reveals that the fricative in (38a) was followed by a historical front vowel. The change from front vowel to back vowel ([ʊ]) in that word can be thought of as specific instance of Vowel Retraction (recall 8). From a formal point of view, the palatal in (38a) arose just as palatal quasi-phonemes (Chapter 7): The feature [coronal] of the front vowel of the stem was simultaneously linked to the preceding palatal sound. When the front stem vowel was restructured to a back vowel by Vowel Retraction, the feature [coronal] was delinked from the vowel but remained anchored to the palatal, thereby creating the phoneme /ʝ/. That new phonemic palatal has an opaque history because it shows that Vowel Retraction counterbled velar fronting.

Consider now (38b). The [ʝ] in that item was likewise a historical velar (< WGmc $^{+}$[ɣ]), but it cannot have come about by the sound change that created the palatal in (38a) because the stem vowel in (38b) was always back (cf. OSax *gald*). The question is simple: What is the explanation for the emergence of the irregular palatal in (38b)?

The answer did not involve velar fronting in any sense of the word. There are two related reasons for why the palatal in (38b) has an explanation that lies outside of the domain of phonology and for why its emergence therefore does not fall into the scope of the present book. First, the change from velar to palatal before a back vowel only occurs in three other words in the Eilsdorf dialect, but that development failed to affect the [ɣ] in all other items beginning with [ɣ]; recall the examples in (13a) which are representative of a much larger class of words. Second, the change from velar to palatal in (38b) occurs in the context before a back vowel, but both the historical rule (Wd-Initial Velar Fronting-3) and the corresponding synchronic rule apply as assimilations, i.e. before front vowels. One cannot deny that many dialects saw a true sound change transforming a velar (WGmc $^{+}$[ɣ]) into palatal [ʝ] in word-initial position before any segment, including back vowels (Chapter 14). However, as discussed in that chapter, that nonassimilatory development was a true Neogrammarian sound change which applied in many LG and CG varieties without exception.

The most reasonable explanation for the irregular palatal in (38b) is analogy: The original velar in (38b) was restructured to a palatal (/ʝ/) under the influence of the [ʝ] in morphologically-related words, e.g. [ʝɪln] 'be valid-INF'. But analogy is not phonology. This means that any and all analogical developments involving the change from velar to palatal – changes that were irregular by definition – lie outside the domain of this book because they did not involve velar fronting.

8.6.3 Rule inversion

The originally allophonic process of velar fronting had a very different fate in Neuendorf. As in Eilsdorf and Dingelstedt am Huy, WGmc $^{+}$[ɣ] shifted to palatal in word-initial position before a front vowel in Neuendorf, but when r-Deletion restructured underlying representations, the velar vs. palatal contrast before front vowels led to the restructuring of word-initial /x/ to /ç/ in [x]~[ç] alterations. As described above, one of the consequences of that restructuring was rule inversion; hence, Wd-Initial Velar Fronting-3 was replaced with Wd-Initial Palatal Retraction.

Rule inversion has been discussed in a number of works cited earlier (Vennemann 1972, McCarthy 1991, Blevins 2004, Hall 2009b). One generalization discussed in that literature is that inverted rules are often typological oddities, two examples being English r-Epenthesis (Footnote 8) and Imst German Buccalization (/h/⟶[x] /__ $]_{wd}$; Hall 2009b, 2010, 2009b, 2011a). The inverted rule of Wd-Initial Palatal Retraction in Neuendorf may strike the reader as a counterexample, since it appears to be a clear-cut case involving the assimilation of a front sound to a back sound in the neighborhood of back vowels. However, the featural system adopted in this book does not allow one to characterize that process as an assimilation. The reason is that palatals like /ç/ are [coronal] and [dorsal], velars like /x/ are simplex [dorsal], while back vowels are [dorsal]. The change from /ç/ to [x] in the neighborhood of a back sound therefore requires [coronal] to delete in the context of a complex [coronal, dorsal] sound, clearly a textbook case for an ad hoc change.

One might conclude that the featural conundrum described above can be solved by simply replacing that presumably defective featural system with one which enables Wd-Initial Palatal Retraction to be expressed as an assimilation. Two points suggest that a reanalysis along those lines would not be prudent. First, (36) is the only example attested in the present survey requiring that a palatal shift to velar, while all other varieties necessitate some version of velar fronting (both word-initial and in postsonorant position). Second, Wd-Initial Palatal Retraction is the product of rule inversion. Since inverted processes are known to be CRAZY RULES (Bach & Harms 1972), I opt to retain the featural system and postulate that palatal to velar retraction rules like the one in (36) are not assimilatory. That treatment derives support from the typological literature on Palatalizations, which is silent on whether or not there are rules attested in natural languages that must involve a palatal changing into a velar.[10]

[10] Since (36) does not involve a Palatalization according to any definition of the word, it is understandable that the typological literature on Palatalizations (§2.3) has not investigated that type of change. One work to my knowledge in which the change from palatal to velar is discussed from the cross-linguistic perspective is Kümmel (2007: 241–243). However, his examples involve unconditioned changes or dissimilations. Noticeably absent from his list are languages with rules changing a palatal to a velar in the neighborhood of all back vowels. Kümmel's material is drawn from Semitic, Indo-European, and Uralic, but no comparable study is known to me at present which addresses the issue (i.e. cases of assimilation of palatals to velars) with a broader source of languages. I consider this to be a potentially promising area for future research.

8.7 Areal distribution of word-initial phonemic palatals

The survey of German dialects in this chapter indicates that phonemic palatals in word-initial position are well-attested throughout North Germany. Several of the dialects investigated in Chapter 11 can be added to the list as well. Tables 8.1, 8.2, and 8.3 list varieties of German exemplifying one of the three contrast types defined in §8.1. The EPo, LPr, and HPr varieties listed below are indicated on Map 11.2. All of the places listed in Tables 8.1, 8.2, and 8.3 are plotted on Map 8.1.

Table 8.1: Varieties of WLG and WCG illustrating Contrast Type A

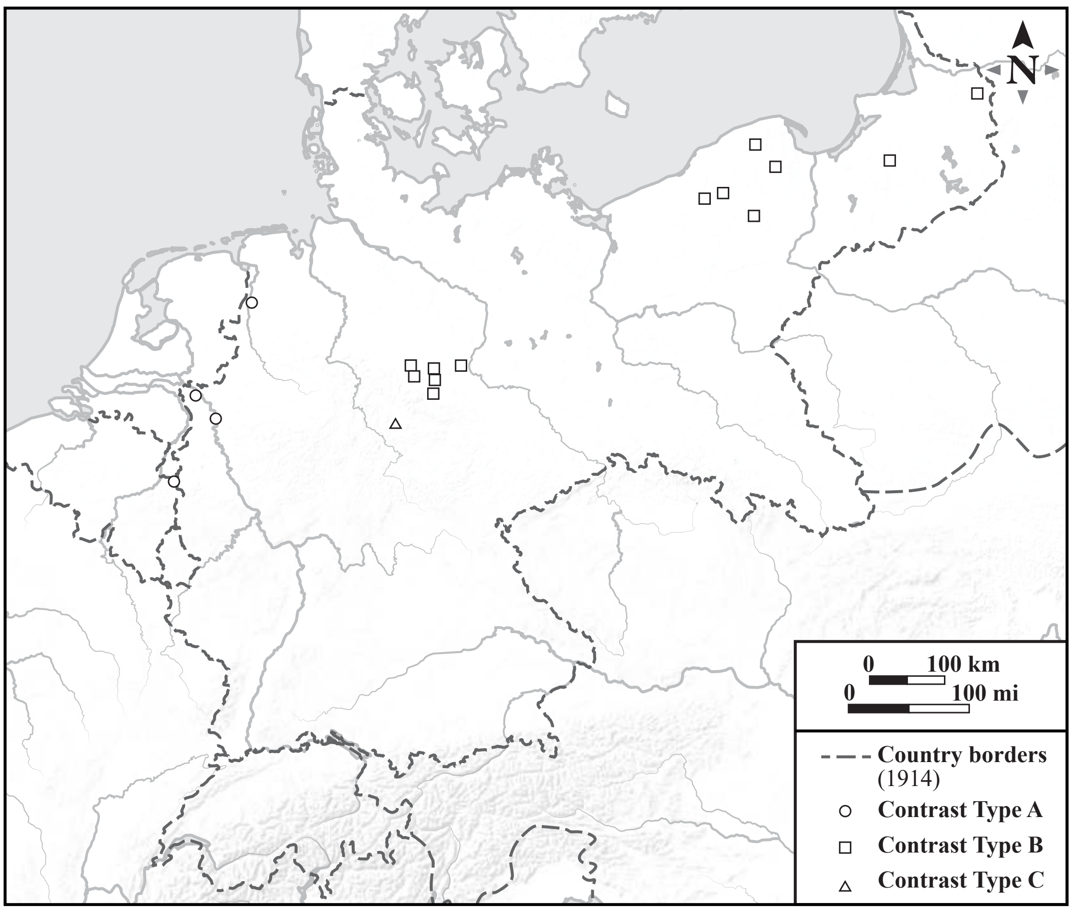
Place	Dialect	Source
Lathen	NLG	Schönhoff (1908)
Homberg	LFr	Meynen (1911)
Kalkar	LFr	Hanenberg (1915)
Ronsdorf	Rpn	Holthaus (1887)
Montzen	Rpn	Welter (1933)

Table 8.2: Varieties of LG and HPr illustrating Contrast Type B

Place	Dialect	Source
Magdeburger Börde	Eph	Roloff (1902)
Eilsdorf	Eph	Block (1910)
Cattenstedt	Eph	Damköhler (1919)
Lesse	Eph	Löfstedt (1933)
Dingelstedt am Huy	Eph	Hille (1939)
Isingerode/Göddeckenrode	Eph	Lange (1963)
Kreis Konitz	EPo	Semrau (1915a,b)
Lauenburg	EPo	Pirk (1928)
Kreis Bütow	EPo	Mischke (1936)
Kreis Rummelsburg	EPo	Mischke (1936)
Kamnitz	EPo	Tita 1921 [1965]
Willuhnen	LPr	Natau (1937)
Reimerswalde	HPr	Kuck & Wiesinger (1965)

Table 8.3: Variety of Eph illustrating Contrast Type C

Place	Dialect	Source
Neuendorf	Eph	Schütze (1953)



Map 8.1: Areal distribution of word-initial velar vs. palatal contrasts. Circles represent a contrast between velar ([ɣ]) and palatal ([ʝ]) in word-initial position before front and back vowels. Squares represent a word-initial contrast between velar ([ɣ] or [g]) and palatal ([ʝ]) before back vowels and triangles a word-initial contrast between velar ([x]) and palatal ([ç]) before front vowels.

An examination of some of the varieties of German spoken in the vicinity of the ones listed in Table 8.1 may uncover additional examples of Contrast Type A. Since the phonemic palatals in Contrast Type B arise historically when a trigger for velar fronting is eliminated a more in-depth investigation of the regions affected by the sound changes listed in (4) may reveal significant generalizations concerning the areal distribution of word-initial phonemic palatals like the ones in Table 8.2. To the best of my knowledge, Neuendorf is the only variety of German exemplifying Contrast Type C.

8.8 Conclusion

The case studies discussed above are characterized by word-initial contrasts between velars and palatals. In Chapter 9 I discuss the ways in which velar vs. palatal contrasts can arise in postsonorant position. There it is argued that a phonemic split as in (4) is triggered in many varieties by Vowel Retraction. In contrast to the dialects discussed above, opaque palatals resulting from Vowel Retraction are not the result of a sporadic change, but instead represent general developments in postsonorant position. In Chapter 10 I discuss a merger similar to the one in (5) which led to the phonemicization of the original palatal fricative allophone.

One issue not directly related to the topic of phonemicization concerns the set of triggers for velar fronting. In Eilsdorf and Dingelstedt am Huy the rule in question (Wd-Initial Velar Fronting-3) is induced by the set of all front vowels; however, examples from other varieties of German discussed in this book point to a broader context for fronting, namely before front vowels or coronal consonants (e.g. Wd-Initial Velar Fronting-6 in Elspe and Schieder-Schwalenberg in §7.2). In any case, both the narrow set of triggers and the broader set of triggers involve assimilatory changes, which stand in contrast to the German varieties investigated in Chapter 14. In that chapter I demonstrate that many dialects are attested in which word-initial velars (e.g. WGmc $^{+}$[ɣ]) regularly shifted to the corresponding palatals in word-initial position before any type of segment, i.e. front vowels, coronal consonants, and (most significantly) back vowels. That type of change is important because it represents the regular nonassimilatory fronting of velars.

9 Phonemicization of palatals (part 2)

9.1 Introduction

The present chapter probes dialects in which velars and the corresponding palatals contrast in postsonorant position. The case studies discussed below all have in common that the velar vs. palatal contrast occurs after certain back vowels, but not after front vowels, where only the palatal surfaces. That system is the mirror-image of the word-initial one referred to in Chapter 8 as Contrast Type B. The two Contrast Type B systems investigated below for postsonorant position are depicted in (1), where [i] and [ɑ] are cover symbols for front vowels and back vowels respectively. The dorsal fricatives in (1a) are fortis [x ç] and the ones in (1b) are the lenis counterparts ([ɣ ʝ]).

(1) Contrast Type B:

a.	[...iç...]	[...ɑç...]	b.	[...iʝ...]	[...ɑʝ...]
		[...ɑx...]			[...ɑɣ...]

The palatal vs. velar contrasts in (1) are the consequence of the phonemic split depicted in (2):

(2) Phonemic split in postsonorant position (Vowel Retraction):

/VE/	>	/VE/		>	/VE/	/PA/
[VE]		[VE]	[PA]		[VE]	[PA]

At Stage 1 the velar is realized as velar regardless of the nature of the preceding sound. At Stage 2 the same velar develops a palatal allophone in the context after coronal sonorants (or some subset thereof). The palatal allophone at Stage 2 is then phonemicized (/ç/ or /ʝ/) at Stage 3 when a front vowel triggering the palatal allophone at Stage 2 was restructured to a back vowel by Vowel Retraction (Chapters 7–8). As a result of that change, the velar and the palatal contrast in the context after certain back vowels. Note that the opaque post-back vowel palatal exemplifies the historical overapplication of velar fronting; recall Figure 2.11.

As described in Chapter 8, the phonemicization of the palatal at Stage 3 did not lead to the loss of velar fronting. Instead, that rule remains in that system as a rule of neutralization applying in the context after front segments.

In §9.2 and §9.3 I discuss several Contrast Type B varieties of CHes and RFr illustrating the phonemic split depicted in (2). In §9.4 I consider two questions, namely the status of Contrast Type A and Contrast Type C systems attested in word-initial position (Chapter 8) for postsonorant position and the relationship between the quasi-phonemicization of palatals and phonemic palatals. In §9.5 I discuss the areal distribution of German dialects with a contrast between post-sonorant velar and palatal fricatives. The chapter concludes in §9.6.

9.2 Central Hessian

Contrasts between [x] and [ç] after certain back vowels (=Contrast Type B in 1) are attested in several varieties of CHes, a point stressed throughout the survey of Hessian vocalism in R. D. Hall (1973: 30-34). In this section I consider five representative varieties.[1]

Kroh (1915) describes the dialect spoken in Wissenbach (Map 7.1), which has the phonemic front vowels /iː i eː e ɛ/ and back vowels /uː u oː o ɔː ɔ ɑː ɑ/. Velars ([x ɣ]) contrast with the corresponding palatals ([ç ʝ]). The four phonemic dorsal fricatives are listed in (3). Not depicted here is [g], which is phonemic (/g/) because it contrasts with both [ɣ] and [x]. In word-initial position the only dorsal fricative that surfaces is the etymological palatal [ʝ].

(3)

/x/	/ç/	/ɣ/	/ʝ/
|	|	|	|
[x]	[ç]	[ɣ]	[ʝ]

Although velars contrast with the corresponding palatals after certain back vowels, only palatals occur after a coronal sonorant.

The examples in (4) indicate that [x] (=⟦x⟧) surfaces after a back vowel. No examples were found in Kroh (1915) in which [x] occurs after [uː oː o]. These are accidental gaps.

[1] The palatal vs. velar contrast referred to above is also commented on in the recent survey of Hes dialects in Birkenes & Fleischer (2019: 447). I only discuss oral vowels below, concentrating primarily on monophthongs. Nasalized vowels are ignored because not enough data are presented in the original sources where those vowels are followed by dorsal fricatives to arrive at conclusions concerning the distribution of the latter sounds. The occurrence of dorsal fricatives after schwa (/ə/) and diphthongs are not considered in detail because palatals and velars typically do not contrast after those vocalic sounds.

(4) Wissenbach [x] (from /x/):

a.	šbrux	[ʃprux]	Spruch	‘saying’	110
	hǭx	[hɔːx]	zweizinkige Hacke	‘two-pronged hoe’	86
	fǫxə	[fɔxə]	fauchen	‘hiss-INF’	92
	āx	[ɑːx]	auch	‘also’	95
	dɑx	[dɑx]	Dach	‘roof’	70
b.	blę^{ɑ}x	[blɛɑx]	Blech	‘tin’	76

The items in (4a) have in common that the back vowel before [x] is etymologically back, while the diphthong [ɛɑ] in (4b) was etymologically front (e.g. MHG *blech*). For most of the examples given below the nature of the stem vowel (front vs. back) can be inferred from StG spelling.

The data in (5) exemplify the occurrence of the opaque palatal [ç] (=⟦χ⟧) after a back vowel ([ɑː ɑ ɔː ɔ]). The back vowels in the first column all derived historically from front vowels.[2]

(5) Wissenbach [ç] (from /ç/):

a.	blāχ	[blɑːç]	bleich	‘pale’	94
	wāχ	[vɑːç]	weich	‘soft’	94
b.	glɑχ	[glɑç]	gleich	‘same’	89
	dɑχ	[dɑç]	Deich	‘dike’	89
c.	ɑχ	[ɑç]	ich	‘I’	81
	mɑχ	[mɑç]	mich	‘me-ACC.SG’	81
d.	šǭχə	[ʃɔːçə]	scheuchen	‘shoo-INF’	97
e.	lǫχdə	[lɔçtə]	Leuchte	‘light’	97

The items listed in (4a) and (5) illustrate a contrast between [x] (/x/) and [ç] (/ç/) after the back vowels [ɑː ɑ ɔː ɔ]. Minimal pairs are not uncommon, e.g. [dɑx] ‘roof’ vs. [dɑç] ‘dike’.

Additional items illustrating the occurrence of opaque [ç] after [ɑ] are provided in (6). Unlike the words in (5b, 5c), the original tonic vowel in (6) was back (cf. MHG [ɑ]). However, I show below in (16) that there is evidence that the original back vowel shifted to a diphthong ending in a front vowel ([ɑi]) before reducing to the monophthong [ɑ].

[2] Behaghel (1911: 729) may have been the first linguist to observe that the ich-Laut occurs in certain varieties of Hes after back vowels ([ɑ]) that derived historically from diphthongs ending in a front vowel ([ɑi]).

(6) Wissenbach [ç] (from /ç/):

mɑχd	[mɑçt]	macht	'do-3SG'	74
mɑχst	[mɑçst]	machst	'do-2SG'	74
hɑχəl	[hɑçəl]	Hechel	'hatchel'	74

The following examples exemplify [x]~[ç] alternations in singular vs. plural pairs. Note that the stem vowels in (7) are back in both the singular and the plural. Significantly, the dorsal fricative is [ç] in the plural even though the preceding vowel is back. It is clear from the original source that back stem vowels in the singular regularly undergo fronting (Umlaut) before *-er* plurals if the consonant following that vowel is not an original velar, e.g. ⟦flǫs⟧ 'raft' ~ ⟦flęsər⟧ 'raft-PL' (Kroh 1915: 123–124). However, if the consonant after the original back stem vowel is a velar (e.g. [x]) then its fronted counterpart was once a diphthong ending in a front vowel which was later deleted, e.g. [dɑxər] > [dɑiçər] > [dɑçər], as noted above for (6).

(7) Wissenbach [x]~[ç] alternations (from /x/ or /ç/):

a.	dɑx	[dɑx]	Dach	'roof'	70
	dɑχər	[dɑçər]	Dächer	'roof-PL'	74
b.	lǫx	[lɔx]	Loch	'hole'	81
	lǫχər	[lɔçər]	Löcher	'hole-PL'	83
c.	šdrǫx	[ʃtrɔx]	Strauch	'shrub'	92
	šdrǫχə	[ʃtrɔçə]	Sträucher	'shrub-PL'	92

As indicated above, I analyze the dorsal fricatives as either /x/ or /ç/, e.g. /dɑx/ 'roof' and /dɑç-ər/ 'roof-PL' for (7a).

A very different set of [x]~[ç] alternations is presented in (8). Observe that the stem vowel is back before [x] and front before [ç] (via Umlaut).

(8) Wissenbach [x]~[ç] alternations (from /x/):

a.	bux	[bux]	Buch	'book'	90
	biχər	[biçər]	Bücher	'book-PL'	91
b.	brǭxdə	[brɔːxtə]	brachte	'bring-PRET'	87
	brę̄χdə	[brɛːçtə]	brächte	'bring-SUBJ'	87
c.	rɑ̄x	[rɑːx]	Rauch	'smoke'	95
	rǭiχərn	[rɔːiçərn]	räuchern	'smoke-INF'	96

I analyze the underlying sound in the [x]~[ç] alternations in (8) as /x/, which surfaces as [ç] after a front vowel by Velar Fronting-1, which is reproduced in (9):

(9) Velar Fronting-1:

$$\begin{array}{cc} [+\textsc{son}] & \begin{bmatrix}-\textsc{son}\\ +\textsc{cont}\end{bmatrix} \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

The sound underlying the [x]~[ç] alternations in (8) must be velar /x/ in the synchronic phonology and not palatal /ç/. If (9) were replaced with a neutralization retracting /ç/ to [x] after a back vowel then that process would incorrectly affect the /ç/ after [ɑː ɑ ɔː ɔ] in words like the ones in (5–7), e.g. [dɑçər] (/dɑç-ər/) ‘roof-PL’.

There is no contrast between [x] and [ç] after a coronal sonorant. Velar Fronting-1 is therefore a neutralization because the contrast between [x] and [ç] is suspended in favor of [ç] after any front vowel, e.g. [i ɛː ɔːi] in (8). The neutralization property crucially differentiates Velar Fronting-1 in Wissenbach from the fronting processes discussed in earlier chapters which relate noncontrasting [x] and [ç].

The data in (10) illustrate that [ç] – but never [x] – also occurs after a coronal sonorant in morphemes that have no [x] alternant. The front vowels in (10a) and coronal sonorant consonants like [l] in (10b) were historically front (coronal) sounds, as suggested by the StG forms in the third column. No examples were found in in Kroh (1915) in which [ç] occurs after [iː eː e]. These gaps are accidental.

(10) Wissenbach [ç] (from /x/):

a.	jiχd	[ʝiçt]	Gicht	‘gout’	79
	šlęχd	[ʃlɛçt]	schlecht	‘bad’	76
b.	melχ	[melç]	Milch	‘milk’	119

I analyze the underlying sound in nonalternating morphemes like the ones in (10) as velar (/x/). The reason palatal /ç/ is not the underlying sound is that there is no contrast between palatals and the corresponding velars after coronal sonorants (recall 1a). Put differently, dorsal fricatives are predictable palatal in the context after a coronal sonorant.

The items in (11) illustrate the occurrence of [ɣ] after a back vowel (which was also historically back), while the data in (12) reveal that there is also an opaque [ʝ], which surfaces after the back vowel [ɑː]. The back vowel in question ([ɑː]) derived historically from a front vowel (cf. MHG [ei]). The [ɣ] and [ʝ] in (11) and (12) are modern reflexes of WGmc $^{+}$[ɣ].

(11) Wissenbach [ɣ] (from /ɣ/):

mǭɣə	[mɔːɣə]	Magen	‘stomach’	120
āɣ	[ɑːɣ]	Auge	‘eye’	120

(12) Wissenbach [ʝ] (from /ʝ/):

ājə	[ɑːʝə]	eigen	‘own’	94
dājiχ	[dɑːʝiç]	teigig	‘doughy’	94
rājər	[rɑːʝər]	Reiher	‘heron’	94

Significantly, [ʝ] contrasts with [ɣ], which also surfaces after the same two back vowels, e.g. in the minimal pair [ɑːɣə] ‘eye-PL’ vs. [ɑːʝə] ‘own’.

Many morphemes exhibit [g]~[ʝ] alternations, as in (13). The [g] and [ʝ] in words like these derived historically from WGmc $^{+}$[ɣ].

(13) Wissenbach [g]~[ʝ] alternations (from /ɣ/):

a.	bədrug	[bədrug]	betrog	‘cheat-PRET’	121
	bədreijə	[bədreiʝə]	betrügen	‘cheat-INF’	121
b.	šwig	[ʃvig]	schwieg	‘be silent-PRET’	121
	šwɑijə	[ʃvɑiʝə]	schweigen	‘be silent-INF’	121

The sound underlying [g]~[ʝ] alternations is /ɣ/, which surfaces as [g] in coda position by (14) and as [ʝ] in a word-internal onset (by Velar Fronting-1).[3]

(14) g-Formation-3:

$$\begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \\ -\textsc{fortis} \\ \textsc{dorsal} \end{bmatrix} \rightarrow [-\text{cont}] \;/\; \_\_\; C_0\;]_{\sigma}$$

Palatal [ʝ] (<WGmc $^{+}$[ɣ]) – but never [ɣ] – surfaces after a front vowel in (15a) or coronal sonorant consonant in (15b).

(15) Wissenbach [ʝ] (from /ɣ/):

a.	blę̄jə	[plɛːʝə]	pflegen	‘care for-INF’	76
	rējəl	[reːʝəl]	Regel	‘rule’	77
	ēj	[eːʝ]	Egge	‘harrow’	120

[3] The reason /g/ cannot be the underlier in (13) is that the rule of spirantization required to convert that sound to a fricative would incorrectly affect /g/ in words like [vɑigə] ‘wake-INF’ (=⟦wɑ^{i}gə⟧). It is clear from the original source that the occurrence of [ɣ] and [ʝ] in postvocalic position is more involved than what is implied here; I refrain from providing details because that discussion would detract from the velar vs. palatal contrasts, which are the main concern in the present chapter.

b. foljə [folɟə] folgen 'follow-INF' 81

As indicated above, the underlying dorsal fricative in words like the ones in (15) is analyzed as velar (/ɣ/).

The occurrence of palatal fricatives after back vowels is the consequence of a phonemic split triggered by Vowel Retraction (=2). In (16) I provide seven representative examples (from 4a, 5a, 6, 7a, and 8a). Consider first the items in the first four columns. It is shown here that the velars and palatals in those words derived from an earlier stage in which the fricatives in question were allophones (=Stage 2). The most significant example involves the /x/ in [blɑːç] 'pale', which surfaced as [ç] at Stage 2 because it was preceded by the front vowel [ei]. When Vowel Retraction restructured underlying representations (e.g. /ei/ > /ɑː/) at Stage 3, contrasts between the newly created (opaque) phoneme /ç/ in words like [blɑːç] and the inherited phoneme /x/ in words like [ɑːx] 'also' emerged after back vowels such as [ɑː]. The example [blɑːç] therefore illustrates that the historical process eliminating front vowels (Vowel Retraction) counterbled Velar Fronting-1.

(16)	/ɑːx/	/bux/	/bix-ər/	/bleix/	/hɑxəl/	/dɑx/	/dɑix-ər/	
	[ɑːx]	[bux]	[bixər]	[bleix]	[hɑxəl]	[dɑx]	[dɑixər]	Stage 1
	/ɑːx/	/bux/	/bix-ər/	/bleix/	/hɑixəl/	/dɑx/	/dɑix-ər/	
	[ɑːx]	[bux]	[biçər]	[bleiç]	[hɑiçəl]	[dɑx]	[dɑiçər]	Stage 2
	/ɑːx/	/bux/	/bix-ər/	/blɑːç/	/hɑçəl/	/dɑx/	/dɑç-ər/	
	[ɑːx]	[bux]	[biçər]	[blɑːç]	[hɑçəl]	[dɑx]	[dɑçər]	Stage 3
	auch	*Buch*	*Bücher*	*bleich*	*Hechel*	*Dach*	*Dächer*	StG
	'also'	'book'	'book-PL'	'pale'	'hatchel'	'roof'	'roof-PL'	

Phrased in terms of the listener-driven model described in §2.5, a speaker utters [bleiç] (from /bleix/) at Stage 2. The listener misperceives the diphthong as [ɑː] but correctly hears the palatal [ç]. This results in the new (Stage 3) pronunciation [blɑːç]. Most importantly, the listener concludes that the Stage 3 underlying representation contains a palatal (/blɑːç/) because that fricative contrasts with the corresponding velar ([x]) after the same vowel.

The same explanation for the occurrence of [ç] after a back vowel holds for the examples in (5b–5e). The original front stem vowel in those items underwent Vowel Retraction to a back vowel ([ɑ ɔ ɔː]), but only after the original front stem vowel had created a palatal allophone. The reader is referred to R. D. Hall (1973), who discusses qualitative shifts among vowels in Hessian varieties.

It can be observed in (16) that the allophonic rule of Velar Fronting-1 at Stage 2 became a rule of neutralization at Stage 3. At that point the process neutralized the contrast between velar and palatal to the latter after front vowels in words like [biçər] (/bix-ər/) ‘book-PL’.

The example [hɑçəl] ‘hatchel’ in (16) is different from [blɑːç] ‘pale’ because its original stem vowel was back (cf. MHG [ɑ]). As indicated above, there is evidence that the original back vowel ([ɑ] /ɑ/) shifted to a diphthong ending in a front vowel ([ɑi] /ɑi/) and later restructured to a back vowel ([ɑ] /ɑ/) by Vowel Retraction. As discussed by Kroh (1915: 74), the change I dub Back Vowel Diphthongization (e.g. [ɑ] /ɑ/ > [ɑi] /ɑi/ for ‘hatchel’) occurred in the context before velar consonants (/x g k ŋ/), where it is retained as [ɑi] before velar noncontinuants ([g k ŋ]), e.g. [hɑiks] ‘witch’; cf. OHG [hɑgzussɑ]. The restructuring of the new diphthong [ɑi] (/ɑi/) to the monophthong [ɑ] (/ɑ/) by Vowel Retraction only occurred in the context before a palatal.[4] [hɑçəl] ‘hatchel’ and [dɑx] ‘roof’ illustrate that Back Vowel Diphthongization only affected a monophthong ([ɑ]) before [x] (/x/) if the latter sound was in an original open syllable (e.g. [dɑ.xər]). In a syllable closed by one consonant (e.g. [dɑx]), the monophthong failed to diphthongize and is retained as [ɑ].[5] As noted earlier in (7), the umlauted vowel in *-er* plurals in the CHes dialect of Wissenbach was [ɑi] before a velar. The second component of that diphthong was deleted at Stage 3 by Vowel Retraction, thereby creating a phonemic palatal.

From a formal point of view, the palatal in words like [blɑːç] ‘pale’, [hɑçəl] ‘hatchel’, and [dɑçər] ‘roof-PL’ arose just as palatal quasi-phonemes (Chapter 7): The frontness feature ([coronal]) of the second component of the earlier diphthong ([ei] or [ɑi]) was simultaneously linked to the following palatal sound ([ç]). When those diphthongs were restructured to back monophthongs by Vowel Retraction, the feature [coronal] was not deleted, but instead remained anchored to the palatal, which had been phonemicized. Note that the underlying /x/ in the first two examples in (16) was inherited without change as /x/ at Stage 3.

I now consider four additional varieties of CHes which are structurally similar to Wissenbach. In all of those dialects the contrast alluded to arose via Vowel Retraction, as depicted in (2) and (16).

Friebertshäuser (1961) describes the dialect spoken in and around Weidenhausen (Map 7.1). That source lists twenty-seven monophthongs, but not all of those vocalic elements are phonemic in the same community. In Weidenhausen the two fricatives [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are phonemic as in (3) because they contrast after certain back vowels.[6]

[4]The back vowel in the singular forms in (7b, 7c) likewise shifted to a diphthong ending in [i] by Back Vowel Diphthongization, which was later deleted (Kroh 1915: 83, 92–93).

[5]In a syllable closed by two consonants the original vowel ([ɑ]) lowered and rounded to [ɔ], e.g. [mɔxt] ‘power’ (cf. StG [mɑxt]).

[6]Weidenhausen also possesses the etymological palatal [ʝ] in word-initial position. The lenis

As illustrated in (17), [x] occurs after back vowels that were also historically back. By contrast, the examples in (18) show that the opaque palatal [ç] surfaces after a back vowel ([ɑ ɔ]) that was historically front. The change from front vowel to back vowel was accomplished by Vowel Retraction; recall the parallel examples from Wissenbach in (5b, 5c, 5e). The [x] and [ç] in (17) and (18) derived historically from velar sounds (WGmc +[k x ɣ]). Note that WGmc +[ɣ] (/ɣ/) restructured to fortis [x] (/x/), e.g. [kuːxəl] 'ball' and [boːxə] 'bow'.

(17) Weidenhausen [x] (from /x/):

kūxəl	[kuːxəl]	Kugel	'ball'	16
dụx	[dʊx]	Tuch	'towel'	18
bōxə	[boːxə]	Bogen	'bow'	15
pǫxt	[pɔxt]	Pacht	'lease'	15
dɑx	[dɑx]	Dach	'roof'	11
rę̄ɑx	[rɛːɑx]	Rauch	'smoke'	20

(18) Weidenhausen [ç] (from /ç/):

a.	dɑχ	[dɑç]	Teich	'pond'	18
	lɑχ	[lɑç]	Leiche	'body'	18
b.	ɑχ	[ɑç]	ich	'I'	14
	dɑχ	[dɑç]	dich	'you-ACC.SG'	14
c.	lǫχdə	[lɔçtə]	Leuchte	'light'	21
	fǫχd	[fɔçt]	feucht	'damp'	21

The examples listed above are important because they show contrasts between [x] and [ç] after [ɔ] in [pɔxt] 'lease' vs. [fɔçt] 'damp' and after [ɑ] in [dɑx] 'roof' vs. [dɑç] 'pond'.[7]

Weidenhausen also contrasts [x] and [ç] (<WGmc +[k x] or +[ɣ]) after the diphthong [ɔːə], as in (19a) vs. (19b). Unlike the words in (18), the diphthong in (19) was etymologically back (cf. MHG [ɑ]). Recall from (16) that in the related

velar [ɣ] is absent entirely. Palatal [ʝ] (<WGmc +[ɣ]) surfaces after a coronal sonorant and before a vowel, but Friebertshäuser (1961: 24) also includes one example in which that sound occurs after a back vowel, i.e. [fʊʝəl] 'bird-PL' (=⟦fụʝəl⟧). The velar stop [g] contrasts with palatal [ʝ] in postvocalic position, although many words exhibit alternations between [ʝ] and [g]. I leave open how to analyze that array of facts in a synchronic treatment.

[7] Friebertshäuser (1961: 63–64) notes that palatal [ç] occurs after the long low back vowel [ɑː], which derived historically from WGmc +[e] in closed syllables, e.g. [ʃlɑːçt] 'bad' (=⟦šlāχd⟧; cf. MHG *sleht*). The [ç] in that type of example is clearly an underlying palatal (/ç/). I interpret that [ç] as a quasi-phoneme and not as a phonemic palatal because no example was found in the original source where [x] surfaces after [ɑː].

variety spoken in Wissenbach, MHG [ɑ] (/ɑ/) underwent a shift to a diphthong ending in a front vowel ([ɑi] /ɑi/) which then monophthongized to [ɑ] (/ɑ/) before [ç]. I posit that there was a similar development in Weidenhausen; hence, the diphthong deriving from historical [ɑ] ended in a front vowel, which triggered Velar Fronting-1, thereby creating [ç]. Assuming that the diphthong in question was [ɔːi] (/ɔːi/), the change to [ɔːə] (/ɔːə/) in (19a) triggered the phonemicization of /ç/. The change from a diphthong ending in a front vowel to one ending in schwa is a specific example of Vowel Retraction.

(19) Weidenhausen [x] (from /x/) and [ç] (from /ç/)

a.	nǭəχd	[nɔːəçt]	Nacht	'night'	11
	gəmǭəχd	[gəmɔːəçt]	gemacht	'do-PART'	11
b.	mǭəxə	[mɔːəxə]	Magen	'stomach'	24
	grǭəxə	[grɔːəxə]	Kragen	'collar'	24

The examples in (19b) differ from the ones in (19a) in that the dorsal fricatives in the former examples derived from WGmc $^{+}$[ɣ]. It is not clear why [x] and not [ç] occurs in (19b). One possibility is that when velar fronting was first phonologized the trigger was restricted to [+fortis] sounds. Given that restriction, [ɣ] surfaced in a word-internal onset even after front vowels. WGmc $^{+}$[ɣ] was then restructured to [x] (/x/) at a later point. Since the details are not crucial for the present analysis, I do not discuss this issue.

The data in (20) exemplify [x]~[ç] alternations. Note that the stem vowel in the words as they were transcribed by Friebertshäuser in 1961 are back in both the singular and the plural but that the plural form has an (opaque) palatal fricative [ç]; recall the parallel examples from Wissenbach in (7).

(20) Weidenhausen [x]~[ç] alternations (from /x/ or /ç/):

a.	bu̧x	[bʊx]	Buch	'book'	22
	bu̧χər	[bʊçər]	Bücher	'book-PL'	22
b.	šdrǫx	[ʃtrɔx]	Strauch	'shrub'	34
	šdrǫχ	[ʃtrɔç]	Sträucher	'shrub-PL'	34

I analyze the dorsal fricatives in (20) as either /x/ or /ç/, e.g. /ʃtrɔx/ 'shrub' and /ʃtrɔç/ 'shrub-PL' for (20b).

Many words exhibit [x]~[ç] alternations triggered by a stem vowel mutation. The examples in (21a) illustrate that the vowel mutation in question can be Umlaut, while the items in (21b) show that dialect-specific vowel changes could also trigger the occurrence of [x] after a back vowel that was etymologically front. [x ç] in these examples derived historically from a velar sound (WGmc $^{+}$[k]).

(21) Weidenhausen [x]~[ç] alternations (from /x/):

a.	flųxə	[flʊxə]	fluchen	‘curse-INF’	18
	flįχ	[flɪç]	Flüche	‘curse-PL’	18
b.	šdįəx	[ʃtɪəx]	Stich	‘sting’	22
	šdįχ	[ʃtɪç]	Stiche	‘sting-PL’	22

The underlying sound in the [x]~[ç] alternations in (21) is /x/, which fronts to [ç] after a front vowel by Velar Fronting-1.

As in Wissenbach, there is no contrast between [x] and [ç] after a coronal sonorant. The data in (22) illustrate that [ç] (but never [x]) occurs in that context. The front vowels in (22a) and the coronal sonorant consonants like [l] in (22b) were historically front (coronal) sounds.

(22) Weidenhausen [ç] (from /x/):

a.	rįχə	[rɪçə]	riechen	‘smell-INF’	20
	dsēχə	[tseːçə]	Zeichen	‘sign’	19
	fęχdə	[fɛçtə]	fechten	‘fence-INF’	13
b.	mįlχ	[mɪlç]	Milch	‘milk’	14

I adopt underlying representations for words like the ones in (22) with /x/.

Bender (1938) describes a CHes variety spoken in and around Marburg, focusing in particular on the town of Ebsdorf (Map 7.1). The author lists twenty-six monophthongs (p. 14), but it is not clear how many of those sounds are phonemic in any one community. On the basis of the material in that source, it appears that Ebsdorf has the phonemic front and back vowels /i eː e ɛː ɛ/ and /u oː o ɔː ɔ ɑː ɑ/ respectively. Ebsdorf has the four dorsal fricatives [x ç ɣ ʝ]. [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are phonemic because they contrast after certain back vowels, whereas [ɣ] and [ʝ] stand in an allophonic relationship:

(23)

/x/	/ç/	/ɣ/	
[x]	[ç]	[ɣ]	[ʝ]

The data in (24) exemplify the occurrence of [x] after a back vowel, while the examples in (25) reveal that the opaque palatal [ç] surfaces after the back vowel [ɑ]. [x ç] in (24) and (25) derive from an etymological velar sound (WGmc $^{+}$[k x]). Note that [x] and [ç] contrast after [ɑ], e.g. [bɑx] ‘stream’ vs. [tɑç] ‘pond’. As in Wissenbach, Ebsdorf [ɑ] in examples like the ones in (25a) derived historically from a front vowel (cf. MHG [iː]). The original stem vowel in (25b) was back (cf. MHG [ɑ]), which underwent Back Vowel Diphthongization to [ɑi] and then Vowel Retraction to [ɑ] before [ç]; see the discussion in (16) involving the Wissenbach data in (6) and the parallel examples from Weidenhausen in (19). The vowel in (24) was etymologically back.

(24) Ebsdorf [x] (from /x/):

bux	[bux]	Buch	'book'	24
nōx	[noːx]	nach	'after'	23
wox	[wox]	Woche	'week'	20
nǭxt	[nɔːxt]	Nacht	'night'	16
kǫxə	[kɔxə]	kochen	'cook-INF'	20
bɑx	[bɑx]	Bach	'stream'	15

(25) Ebsdorf [ç] (from /ç/):

a.	glɑχ	[glɑç]	gleich	'soon'	24
	tɑχ	[tɑç]	Teich	'pond'	24
b.	hɑχəl	[hɑçəl]	Hechel	'hatchel'	17

As in the other varieties of CHes discussed above, the contrast between velar [x] (/x/) and palatal [ç] (/ç/) arose via a phonemic split triggered by Vowel Retraction (=2).[8]

A representative example illustrating [x]~[ç] (<WGmc ⁺[k x]) alternations triggered by an umlauted stem vowel is presented in (26). The underlying velar in that alternation surfaces as palatal by Velar Fronting-1. Morphemes containing a nonalternating palatal [ç] after coronal sonorants are listed in (27).

(26) Ebsdorf [x]~[ç] alternations (from /x/):

dux	[dux]	Tuch	'towel'	24
diχər	[diçər]	Tücher	'towel-PL'	25

(27) Ebsdorf [ç] (from /x/):

a.	fliχt	[fliçt]	Pflicht	'duty'	19
	keχ	[keç]	Küche	'kitchen'	22
	ę̄χə	[ɛːçə]	Eiche	'oak tree'	32
	bęχər	[bɛçər]	Becher	'cup'	18

[8]Palatal [ç] (<WGmc ⁺[k]) also occurs after a consonant in words like [hobç] 'hawk' (=⟦hobχ⟧). The palatal in that type of example was quasi-phonemicized (/ç/) when the original front vowel preceding it was syncopated (cf. MHG *habech, habich*). [ç] (<WGmc ⁺[x]) – but not [x] – also occurs in Ebsdorf after the back vowel [ɑː], which is the reflex of WGmc ⁺[e] in a closed syllable, e.g. [ʃlɑːçt] 'bad' (=⟦šlɑχt⟧). That palatal is a quasi-phoneme (/ç/), as in Weidenhausen.

b.	melχ	[milç]	Milch	‘milk’	19

The data in (28) illustrate the postsonorant distribution of [ɣ], which only occurs after a back vowel in (28a) and [ʝ], which only surfaces after a coronal sonorant in (28b, 28c). Both fricatives in question derive from an etymological velar (WGmc +[ɣ]). The palatal in examples like these derives synchronically from /ɣ/ by Velar Fronting-1.

(28) Ebsdorf [ɣ] and [ʝ] (from /ɣ/):

a.	mǫɣə	[mɔːɣə]	Magen	‘stomach’	33
	āɣə	[ɑːɣə]	Auge	‘eye’	33
b.	sējə	[seːʝə]	Säge	‘saw’	33
	lęjə	[lɛʝə]	legen	‘place-INF’	17
c.	mǫrjə	[mɔrʝə]	morgen	‘tomorrow’	33

Note that Velar Fronting-1 has a different status depending on the trigger: For /x/ the rule functions as a neutralization, but for /ɣ/ it continues to be an allophonic process (as it was for /x/ at Stage 2).

Knauss (1906) describes the CHes variety spoken in the neighboring localities of Atzenhain and Grünberg (Map 7.1). Atzenhain/Grünberg possesses the front vowels /i eː e ɛ ɛː æ/ and the back vowels /u o ɔː ɑ/. Note the presence of the low front vowel [æ] (<WGmc +[e]), which is absent in the CHes varieties discussed above. [x] (=⟦χ⟧) and [ç] (=⟦c⟧) are phonemic because they contrast after one of the phonemic back vowels ([ɑ]). The only lenis palatal fricative is [ʝ], which appears to have a distribution as in Weidenhausen (see Footnote 6).

In both Atzenhain and Grünberg [x] surfaces after a back vowel which is historically back in (29), while the opaque palatal [ç] occurs after the back vowel [ɑ] which derived historically from a front vowel (cf. MHG [iː]) in (30a). In Grünberg [ç] also occurs after [ɑː] in (30b, 30c), whose progenitor was a diphthong whose both components were front. The changes affecting the original vowels in (30) are specific examples of Vowel Retraction. A sample [x]~[ç] alternation in which the stem vowel is back before both sounds is presented in (31). The fricatives ([x ç]) in (29–31) derived historically from a velar sound (WGmc +[k x]).

(29) Atzenhain/Grünberg [x] (from /x/):

buχ	[bux]	Buch	‘book’	74
loχ	[lox]	Loch	‘hole’	58
dɑχ	[dɑx]	Dach	‘roof’	28
āχ	[ɑːx]	auch	‘also’	70

(30) Atzenhain/Grünberg [ç] (from /ç/):

a.	bɑcd	[bɑçt]	Beichte	‘confession’	57
	glɑc	[glɑç]	gleich	‘same’	57
b.	blɑ̄cə	[blɑːçə]	bleichen	‘bleach-INF’	68
c.	rɑ̄cn̥	[rɑːçn̩]	räuchern	‘smoke-INF’	68

(31) Grünberg [x]~[ç] alternations (from /x/ and /ç/):

rɑ̄χ	[rɑːx]	Rauch	‘smoke’	70
rɑ̄cn̥	[rɑːçn̩]	räuchern	‘smoke-INF’	71

[x]~[ç] (<WGmc +[k x]) alternations triggered by the quality of the preceding vowel (via Umlaut) are presented in (32). The palatal in that type of example derives from the velar by the rule of fronting posited below.

(32) Atzenhain/Grünberg [x]~[ç] alternations (from /x/):

a.	buχ	[bux]	Buch	‘book’	74
	bicər	[biçər]	Bücher	‘book-PL’	74
b.	nǭχd	[nɔːxt]	Nacht	‘night’	32
	nęcd	[nɛçt]	Nächte	‘night-PL’	41
c.	dɑχ	[dɑx]	Dach	‘roof’	28
	dęcr̥	[dɛçr̩]	Dächer	‘roof-PL’	45

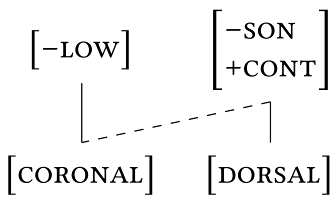
As indicated in (33), the distribution of dorsal fricatives after front vowels is not the same as in the other CHes varieties mentioned above: [x] surfaces after the low front vowel [æ] in (33a); see R. D. Hall (1973: 18) for discussion. By contrast, [ç] occurs after a nonlow front vowel in (33b) or a coronal sonorant consonant in (33c). Velar [x] never surfaces after nonlow front vowels, nor does palatal [ç] occur after [æ]. The dorsal fricatives in all of these examples derive from velars (WGmc +[k x]).

(33) Atzenhain/Grünberg [x] and [ç] (from /x/):

a.	blæχ	[blæx]	Blech	‘tin’	47
b.	gəsicd	[gəsiçt]	Gesicht	‘face’	53
	brẹ̄c	[breːç]	brechen	‘break-1SG’	52
	šdec	[ʃdeç]	Stiche	‘sting-PL’	54
	šlę̄cd	[ʃlɛːçt]	schlecht	‘bad’	48
	ɑic	[ɑiç]	ich	‘I’	56
c.	melc	[melç]	Milch	‘milk’	56

The data in (33) require the set of triggers for fronting to consist of nonlow front vowels. The rule required is Velar Fronting-2 (§3.4), which is reproduced in (34):

(34) Velar Fronting-2:



In a short (four page) summary of his dissertation of 1921, Siemon (1922) describes the CHes variety of Langenselbold, near Hanau (Map 7.1). The data in that source indicate that Langenselbold possesses front vowels (/i iː eː e ɛ ɛː/), back vowels (/u uː o oː ɔ ɔː ɑ ɑː/) and several diphthongs. Enough crucial examples in Siemon (1922) are provided to conclude that this CHes variety has both velar [x] (=⟦χ⟧) and palatal [ç] (=⟦c⟧). Those fricatives are both phonemic (=1a) because they contrast after one of the phonemic back vowels ([ɑː]). (The historical lenis fricatives WGmc $^+$[ɣ] and $^+$[ʝ] have merged with their fortis counterparts).

The data from Langenselbold presented in (35–38) are very similar to the examples in the neighboring CHes varieties discussed earlier. The words in (35) indicate that [x] surfaces after back vowels that are historically back. The two examples in (36) reveal that [ç] surfaces after a back vowel ([ɑː]) which was etymologically a diphthong ending in a front vowel. Note that [x] and [ç] contrast in the context after [ɑː], e.g. [ɑːx] ‘also’ vs. [vɑːç] ‘soft’; hence, they are both phonemic, as indicated in the headings for the two datasets. The [x ç] in all of the examples presented below derived historically from a velar sound (WGmc $^+$[k x]).

(35) Langenselbold [x] (from /x/):

hūx	[huːx]	hoch	‘high’	140
wuxə	[vuxə]	Woche	‘week’	142
nǭxd	[nɔːxt]	Nacht	‘night’	140
kǫxə	[kɔxə]	kochen	‘cook-INF’	142
bɑx	[bɑx]	Bach	‘stream’	139
ɑ̄x	[ɑːx]	auch	‘also’	140
flǫuxə	[flɔuxə]	fluchen	‘curse-INF’	140

(36) Langenselbold [ç] (/from /ç/):

glāχə	[glɑːçə]	gleichen	‘resemble-INF’	140
wāχ	[vɑːç]	weich	‘soft’	140

The additional data reveal that there are morphemes with [x]~[ç] alternations in (37) as well as nonalternating words in which [ç] surfaces after a front vowel or coronal sonorant consonant in (38).

(37) Langenselbold [x]~[ç] alternations (/from /x/):

a.	fuxəl	[fuxəl]	Vogel	‘bird’	140
b.	fiχəl	[fiçəl]	Vögel	‘bird-PL’	139

(38) Langenselbold [ç] (/from /x/):

a.	liχd	[liçt]	Licht	‘light’	139
	knē̜χd	[knɛːçt]	Knecht	‘vassal’	141
	šbrę̄χə	[ʃprɛçə]	sprechen	‘speak-INF’	142
	ɑiχ	[ɑiç]	ich	‘I’	142
b.	kęʳχ	[kɛrç]	Kirche	‘church’	139

As indicated in the headings for (37) and (38), the dorsal fricatives in these words are underlyingly /x/. That sound is realized as [ç] after a coronal sonorant by Velar Fronting-1.

The five places discussed above are very different from other CHes varieties in which velar and palatal fricatives do not contrast. For example, in Naunheim (Leidolf 1891; Map 7.1) [x] and [ç] stand in complementary distribution: [x] only surfaces after a back vowel, e.g. [tsʊxt] ‘breeding’ (=⟦tsŭcd⟧) and [ç] after a front vowel, e.g. [dɪçt] ‘tight’ (=⟦dĭçd⟧). The reason [ç] does not surface after back vowels is that Vowel Retraction did not occur, cf. Naunheim [blɑiç] ‘pale’ (=⟦blāʲç⟧; recall 5a), [loiçtə] ‘light’ (=⟦loiçdə⟧; recall 5e). Examples like [ʃlæçt] ‘bad’ (=⟦šlæçd⟧) indicate that the triggers for Velar Fronting-1 in Naunheim subsume all front vowels and not simply nonlow front vowels as in Atzenhain/Grünberg. A CHes dialect in closer proximity to the four velar vs. palatal contrasting varieties discussed above is the one spoken in Schlierbach (Schaefer 1907; Map 7.1). As in Naunheim, no Vowel Retraction occurred and hence there are no contrasts between velars and palatals, which stand in complementary distribution.

9.3 Rhenish Franconian

Two varieties of RFr are discussed below which exhibit Contrast Type B (=1a) in postsonorant position between [x] (/x/) and [ç] (/ç/). Since the sources have data very similar to the ones presented in §9.2 for CHes I do not discuss the RFr material in as much detail as the CHes varieties.

Freiling (1929) describes the variety of Zell im Mümlingtal in the Oldenwald (Map 5.3). Zell im Mümlingtal has a number of phonemic front vowels (/iː i eː e ɛː ɛ/), phonemic back vowels (/uː u oː o ɔː ɔ ɑː ɑ/) as well as several diphthongs. A representative dataset is presented in (39). The words in (39a) indicate that [x] surfaces after a back vowel that is etymologically back. The items presented in (39b) show that [ç] surfaces after the one back vowel [ɑː], which derived historically from a diphthong ending in a front vowel (cf. MHG [ei]). As in the CHes varieties discussed above, [x] and [ç] contrast in the context after the back vowel [ɑː]; hence, [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are both phonemic and illustrate Contrast Type B. (As in Langenselbold, historical [ɣ] and [ʝ] have merged with their fortis counterparts). The items listed in (39c) show that there are [x]~[ç] alternations, and the data in (39d) reveal that [ç] – but never [x] – surfaces after a front segment. The dorsal fricatives in (39c, 39d) is underlyingly /x/ and is realized as [ç] after any front segment by Velar Fronting-1.

(39) Zell im Mümlingtal [x] and [ç]:

a.	wux	[vux]	Woche	‘week’	75
	koxə	[koxə]	kochen	‘cook-INF’	75
	nǫxd	[nɔxt]	Nacht	‘night’	10
	lɑxə	[lɑxə]	lachen	‘laugh-INF’	75
	rāx	[rɑːx]	Rauch	‘smoke’	35
	āxə	[ɑːxə]	Augen	‘eye-PL’	35
b.	āχ	[ɑːç]	Eiche	‘oak tree’	33
	wāχ	[vɑːç]	weich	‘soft’	33
c.	nǫxd	[nɔxt]	Nacht	‘night’	10
	nęχd	[nɛçt]	Nächte	‘night-PL’	12
d.	siχə^{r}	[siçər]	sicher	‘certainly’	74
	beχ	[beç]	Bäche	‘stream-PL’	74
	gnę̄χd	[knɛːçt]	Knecht	‘vassal’	16

Seibt (1930) describes the dialect of Heppenheim (Map 5.3). He lists nineteen monophthongs, but it is probably not the case that all of those sounds are phonemic. On the basis of that source, Heppenheim has phonemic front vowels (/iː i eː e ɛː ɛ æ/) and back vowels (/uː u oː o ɔː ɔ ɑː ɑ/) as well as several diphthongs. Heppenheim has the four dorsal fricatives [x ç ɣ ʝ]. [x] (=⟦x⟧) and [ç] (=⟦χ⟧) are phonemic because they contrast after certain back vowels, whereas [ɣ] and [ʝ] stand in complementary distribution; see (23).

The examples in (40a) reveal that [x] surfaces after back vowels that are etymologically back. [ç] surfaces after the one back vowel [ɑː] in (40b), which derives historically from a diphthong ending in a front vowel. Since [x] and [ç] contrast after [ɑː] those two fricatives are phonemic. A representative example of a morpheme exhibiting [x]~[ç] alternations is given in (40c), and the words in (40d, 40e) show that the palatal but never the velar occurs after coronal sonorants. The final set of examples indicates that the lenis dorsal fricative [ɣ] (/ɣ/) surfaces after a front vowel in (40f) or back vowel in (40g).

(40) Heppenheim [x] (from /x/):

a.	bux	[bux]	Buch	‘book’	30
	doxdə^{r}	[doxtər]	Tochter	‘daughter’	58
	ǫxd	[ɔxt]	acht	‘eight’	58
	lɑxə	[lɑxə]	lachen	‘laugh-INF’	58
	rɑ̄x	[rɑːx]	Rauch	‘smoke’	33
b.	sɑ̄χə	[sɑːçə]	seichen	‘piss-INF’	32
c.	nǭxd	[nɔːxt]	Nacht	‘night’	68
	nę̄χd	[nɛːçt]	Nächte	‘night-PL’	68
d.	khiχ	[k^{h}iç]	Küche	‘kitchen’	30
	šlę̄χd	[ʃlɛːçt]	schlecht	‘bad’	58
	fęχdə	[fɛçtə]	fechten	‘fence-INF’	19
	rɑiχ	[rɑiç]	reich	‘rich’	57
e.	fęrχdə	[fɛrçtə]	fürchten	‘fear-INF’	45
f.	fę̄ɣə	[fɛːɣə]	fegen	‘sweep-INF’	56
	šdɑiɣə	[ʃtɑiɣə]	steigen	‘climb-INF’	56
g.	foɣl	[foɣl̩]	Vogel	‘bird’	56
	nɑɣl	[nɑɣl̩]	Nagel	‘nail’	56

The dorsal fricatives in (40c–40e) are underlyingly /x/, which surfaces as [ç] after a coronal sonorant. The target segment must be specified as [+fortis] to ensure that only /x/ but not /ɣ/ is affected; hence, the rule for Heppenheim is Velar Fronting-4 (§4.3, §7.2).

9.4 Discussion

I discuss first the status of Contrast Type A and Contrast Type C systems attested in word-initial position (Chapter 8) for postsonorant position (§9.4.1) and second the question of whether or not the quasi-phonemicization of palatals is a necessary prerequisite for the phonemicization of palatals (§9.4.2).

9.4.1 Velar vs. palatal contrasts

All of the case studies discussed in this chapter have in common that they exemplify Contrast Type B (=1), which involves a palatal vs. velar contrast after one or more back vowel, but in the context of front vowels, only palatals surface. The present survey of German dialects has failed to uncover Contrast Type A or Contrast Type C (as described in Chapter 8) in postsonorant position, as in (41):

(41) Nonoccurring contrasts:

a. Contrast Type A:

[…iç…]	[…ɑç…]	[…iʝ…]	[…ɑʝ…]
[…ix…]	[…ɑx…]	[…iɣ…]	[…ɑɣ…]

b. Contrast Type C:

[…iç…]		[…iʝ…]	
[…ix…]	[…ɑx…]	[…iɣ…]	[…ɑɣ…]

In (41a) velars and palatals contrast after back vowels and front vowels, but in (41b) that contrast occurs only after front vowels but not after back vowels, where only the velar surfaces. I speculate here on the absence of the two systems depicted in (41).

Consider first (41a). There is more than one way in which a system involving a contrast between [ɣ] and [ʝ] after front and back vowels might arise. One way would require the following developments: (a) Etymological $^{+}$[ɣ] is inherited without change as [ɣ] after a back vowel, (b) etymological $^{+}$[ɣ] surfaces as [ʝ] after a back vowel derived from an earlier front vowel (by Vowel Retraction), and (c) WGmc $^{+}$[j] undergoes Glide Hardening in a word-internal onset after front vowels and back vowels. Recall from §9.2 that (a) and (b) are well-attested, e.g. in Wissenbach examples (11) and (12). That point aside, it is difficult to find examples for (c) because the etymological palatal glide was typically either deleted in postvocalic position, or it merged together with the preceding vowel to form a diphthong (Appendix F).

Consider now (41b). Recall from Chapter 8 that the mirror-image of (41b) involving [x] and [ç] in word-initial position is attested in a single village. In that place the velar vs. palatal contrast before a front vowel arose when r-Deletion eliminated the /r/ between a word-initial velar (/x/) and a front vowel. A deletion process affecting a postvocalic /r/ is attested in German dialects (e.g. in the RFr varieties discussed by Karch 1981; see §9.5). If velar fronting applies after front vowels but not after coronal consonants, and if /r/ were elided between any vowel (including front vowels) and velar sounds (including /x/), then the surface sequence of front vowel plus velar fricative ([ix] /ix/) would be created, e.g. a sequence like [ɪrx] (/ɪrx/) > [ɪx] (/ɪx/) in a word like *Kirche* (cf. Erdmannsweiler [k^herç] /k^herx/ from §3.2). Although the deletion of a postvocalic /r/ is not at all uncommon in German dialects the scenario just described would be difficult to document because only a small number of German dialects restrict velar fronting to the context after front vowels but not after coronal consonants like /r/ (see Chapter 12).

9.4.2 Relationship between phonemic palatals and palatal quasi-phonemes

The dialects discussed in Chapter 7 all have in common that a Stage 2 allophonic rule of velar fronting developed into a Stage 3 system with a palatal quasi-phoneme, but none of those dialects also possess phonemic palatals. The question is whether or not the quasi-phonemicization of palatals is a necessary prerequisite for the phonemicization of palatals; see (42a). Recall from §7.4.4 that this is the historical progression predicted by Kiparsky (2015). Alternatively, quasi-phonemicization and phonemicization might not be directly related, in which case a system involving allophony could develop into either one, as depicted in (42b).

(42) a.

$$\begin{array}{c}\text{Allophony}\\ \downarrow\\ \text{Quasi-phonemicization}\\ \downarrow\\ \text{Phonemicization}\end{array}$$

b.

$$\begin{tikzcd}[column sep=tiny] & \text{Allophony} \arrow[dl] \arrow[dr] & \\ \text{Quasi-phonemicization} & & \text{Phonemicization}\end{tikzcd}$$

Most of the dialects discussed in this book with phonemic palatals also possess palatal quasi-phonemes, a system that can be accommodated with either (42a) or (42b). This is true for word-initial position in Eilsdorf (§8.3) and Dingelstedt am Huy (§8.4) as well as in the LG varieties discussed below in Chapter 11.

I tentatively suggest that (42b) is the correct path. The reason (42a) cannot always be correct is that there is at least one example of a dialect with phonemic palatals but no palatal quasi-phonemes, namely the CHes dialect of Wissenbach (§9.2). One could speculate that Wissenbach once had a palatal quasi-phoneme before the velar vs. palatal contrasts emerged and that the original palatal quasi-phoneme fell together with the new contrastive palatals, thereby obscuring its historical origin. That scenario is a plausible one, and for that reason I ultimately leave open for further research whether or not (42b) is the correct path.

9.5 Areal distribution of postsonorant phonemic palatals

The case studies discussed in this chapter have in common that they contrast velars and palatals in postsonorant position. I consider below the additional dialects known to me with this contrast. I discuss first those varieties of German spoken in Germany (§9.5.1), and then I turn to two velar fronting islands (§9.5.2).

9.5.1 Germany

Sources documenting a contrast between postvocalic /x/ and /ç/ in dialects spoken in Germany are listed in Table 9.1.

Table 9.1 includes the seven CHes/RFr case studies discussed above as well as works not discussed earlier, which I comment on below. All of these places are listed on the maps for the respective dialect areas.

In their discussion of the inflectional morphology of verbs in Großen-Buseck, Wagner & Horn (1900) list examples like [ʃlɑçə] 'creep-INF' (cf. StG *schleichen*) vs. [ʃtrɑçə] 'paint-INF' (cf. StG *streichen*) with [ç] after the back vowel [ɑ] that derived historically from [ɑi]. Significantly, they also include items like [mɑxə] 'do-INF' (cf. StG *machen*), where [x] occurs after [ɑ]. In a short excerpt from his dissertation, Schwing (1921) describes the historical phonology of the (CHes) area around Selters bei Weilburg, noting the existence of contrasts between [x] and [ç] in words like [ɑːxə] 'eye' (cf. StG *Auge*) vs. [tsɑːçələ] 'draw-INF' (cf. StG *zeichnen*). The same type of contrast can be found in the material presented in Schudt (1927) for Wetterfeld, e.g. [ɑːx] 'also' (cf. StG *auch*) vs. [blɑːç] 'pale' (cf. StG *bleich*), as well as in Christmann (1927) for Kaulbach, e.g. [rɑːxə] 'smoke-INF' (cf. StG *rauchen*) vs. [rɑːçə] 'be sufficient-INF' (cf. StG *reichen*) and Haster (1908) for Ober-Flörsheim, e.g. [rɑːxən] 'smoke-INF' vs. [rɑːçən] 'be sufficient-INF'. Merzig (Fuchs 1903) is geographically further removed from the others varieties listed in Table 9.1. Like the dialects listed above, historical [ei] is now realized as [ɑː] in Merzig; hence, there are contrastive pairs like [rɑːxən] 'smoke-INF' (cf. StG *rauchen*) vs. [blɑːçən] 'bleach-INF' (cf. StG *bleichen*). Similar examples involving

Table 9.1: Varieties of German with phonemic palatals (< WGmc +[k x]) in postsonorant position

Place	Dialect	Source
Großen-Buseck	CHes	Wagner & Horn (1900)
Atzenhain/Grünberg	CHes	Knauss (1906)
Wissenbach	CHes	Kroh (1915)
Selters bei Weilburg	CHes	Schwing (1921)
Langenselbold	CHes	Siemon (1922)
Wetterfeld	CHes	Schudt (1927)
Ebsdorf	CHes	Bender (1938)
Weidenhausen	CHes	Friebertshäuser (1961)
Mittelhessisch	CHes	Hasselberg (1979)
Ober-Flörsheim	RFr	Haster (1908)
Kaulbach	RFr	Christmann (1927)
Zell im Mümlingtal	RFr	Freiling (1929)
Heppenheim	RFr	Seibt (1930)
Area south of Mainz	RFr	Karch (1981)
Merzig	MFr	Fuchs (1903)
Dudenrode	Thrn	Guentherodt (1982)
Neuendorf	Eph	Schütze (1953)

a contrast between [x] and [ç] after the same back vowel can be found in the data in Hasselberg (1979), which were drawn from a number of places in Central Hesse. Karch (1981) is the description of the sound structure of five towns just south of Mainz, namely Wackernheim, Nackenheim, Alzey, Wallertheim, and Bechtheim. Karch (1981: 23) writes that /x/ and /ç/ must be separate phonemes because they contrast after certain back vowels, e.g. [dɑx] 'roof' (cf. StG *Dach*) vs. [dɑç] 'through' (cf. StG *durch*). In contrast to all of the other studies listed in Table 9.1, phonemic /ç/ arose when a postsonorant rhotic deleted, cf. [dɑç] 'through' < [dʊrç]. The original source for the one ECG dialect listed above (Guentherodt 1982) provides phonetic transcriptions for three speakers from Dudenrode and observes (p. 46) that [ç] and [x] contrast after the one low vowel (short and long), e.g. [ʃlaxt-] 'slaughter-VB STEM' (cf. StG *schlachten*) vs. [ʃlaçt] 'bad' (cf. StG *schlecht*). The status of velars and palatals in word-initial position in the one LG variety (Eph) cited above (Neuendorf) was discussed in §8.5. The original source for that dialect (Schütze 1953) gives examples of contrasts between velar [x] and palatal [ç] in the context after [ɑː], e.g. [dɑːç] 'dough' (cf. StG *Teig*) vs. [plɑːx] 'plow' (cf. StG *Pflug*).

The places listed above with a palatal vs. velar contrast can be complemented with data from linguistic atlases. Consider the following two examples:

Map 4 of ThürDA depicts the various realizations of the word *Egge* 'harrow' in the state of Thuringia. An examination of that map reveals that there is a small part of west Thuringia with a palatal fricative ([ç] or [ʝ]) after the back vowel [ɑː] – a point that is stressed with an exclamation point after the back vowel plus palatal sequence in the commentary to Map 4 in Volume 1 (p. 32). Since [x] surfaces after back vowels (including [ɑː]) throughout the area, those places with words containing [ɑːç] illustrate a contrast between [ç] and [x].

A second example for the palatal vs. velar contrast comes from SchlSA, which depicts an area far removed spatially from the places listed in Table 9.1, namely the former province of Silesia (Schlesien). Map 26 from that source depicts the realizations of the word *leuchten* 'glow-INF'. The initial vowel in that word (< MHG [yː]) is either a front monophthong or a diphthong ending in [i] in (43a) or a back monophthong in (43b). Significantly, the fricative in (43b) is always realized as palatal [ç]. As illustrated on my Map 5.2, velar fronting after coronal sonorants (or a subset thereof) is the norm throughout Silesia (§12.3.5).[9]

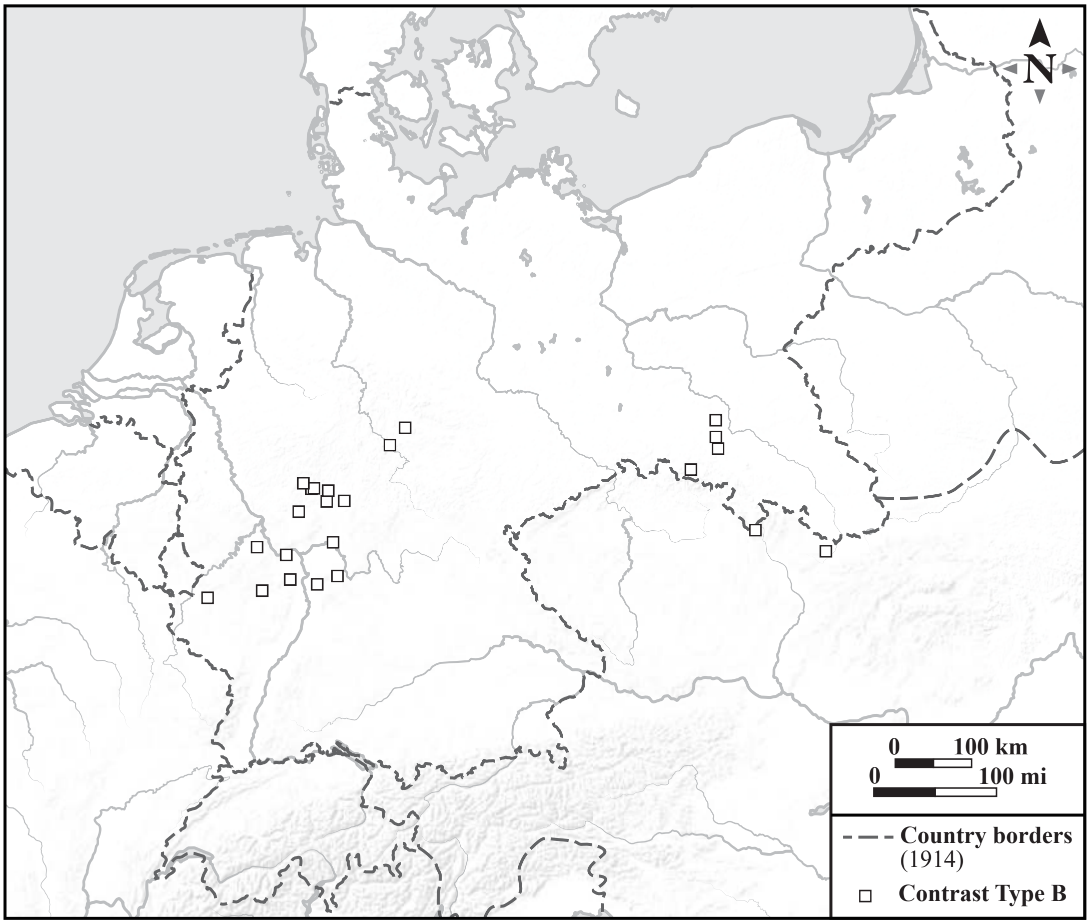
(43) a. [lɛçd̥n̩], [luiçd̥n̩], [lɔiçd̥n̩]
b. [laçd̥n̩], [lɔçd̥n̩]

Although the SchlSA does not provide a map with [x] after back vowels, it is clear from all of the descriptions of Sln dialects I have consulted (Appendix C, Table C.19) that words of that structure are common; hence, the places in Silesia where (43b) were once attested can be safely assumed to be areas where [ç] and [x] contrasted after back vowels.

Most of the places listed in Table 9.1 are CHes varieties situated within the same general vicinity in the German state of Hesse, although a few of the RFr/MFr outliers and the Sln varieties in (43b) indicate that contrasts between [x] and [ç] are not restricted to that specific area. No other areas with phonemic /x/ and /ç/ in German-speaking countries are known to the present writer.

[9]The symbol [a] in SchlSA is categorized as central (p. 5). On p. 13 of the introduction, G. Bellmann comments on how remarkable ("[b]emerkenswert") it is that [ç] occurs after a back vowel in items like the ones in (43b). The realization [lɔçd̥n̩] was attested just to the east of Grunlich and the variant [lɔçd̥a] about 70km southwest of Gleiwitz (see my Map 5.2). By contrast, the markers indicating [laçd̥n̩] are much more numerous, being interspersed with the transparent realizations in (43a) in a broad area in between Görlitz and Breslau.

Map 9.1 depicts all of the places listed in Table 9.1 as well as those Sln varieties with the pronunciations listed in (43b).



Map 9.1: Areal distribution of postsonorant velar vs. palatal contrasts. High German (Central German) and Low German (Eastphalian) varieties with a contrast between a fortis velar [x] (/x/) and a fortis palatal [ç] (/ç/) (< WGmc ⁺[k] or ⁺[x]) after a back vowel are indicated with white squares.

The contrast between [x] and [ç] in the context after back vowels is also documented in dialect dictionaries. A case in point is SHesWb for the south part of Hesse, which provides phonetic transcriptions with separate symbols for velars (⟦x⟧=[x]) and palatals (⟦χ⟧=[ç]). In SHesWb, multiple phonetic transcriptions corresponding to specific places in the broad region are provided for any given word. The regular pattern whereby [x] occurs after back vowels and [ç] after front vowels and liquids is clear from many common words, e.g. *Loch* 'hole', *Licht* 'light', *Dolch* 'dagger'. The important point is that words like the ones discussed earlier which contain an etymological front vowel now realized as back are transcribed with the symbol for the palatal fricative, e.g. *bleich* 'pale' (⟦blɑχ⟧), *Deich* 'dike' (⟦dɑχ⟧).

9.5.2 Velar fronting islands

Contrasts between /x/ ([x]) and /ç/ ([ç]) after the same back vowel are also attested in two German-language islands, namely Plautdietsch and Transylvania Saxon. Both illustrate the notion of a velar fronting island because velar fronting is active, as in the dialects discussed in §9.2 and §9.3. I provide below some brief discussion of the two aforementioned German language islands.[10]

9.5.2.1 Plautdietsch

Plautdietsch (also known as Mennonite Low German) is a LPr variety spoken by the ancestors of the people who emigrated from West Prussia to Russia and Ukraine beginning at the end of the eighteenth century (Siemens 2012). It is currently spoken in a number of countries in Europe (e.g. Russia, Ukraine), Asia (e.g. Russia, Kazakhstan), North America (e.g. Canada, the United States, Mexico), and South America (e.g. Brazil, Argentina). There is an extensive body of research documenting the varieties of Plautdietsch. I do not attempt to summarize that research here; the interested reader is referred to Siemens (2012) and Cox et al. (2013). For discussion of Plautdietsch in the larger context of LPr see see §11.6.

The sources for Plautdietsch I have consulted agree that there are two fortis dorsal fricatives ([x] and [ç]) and that those two sounds contrast in the context after certain back vowels. Some authors say explicitly that the two fricatives in question are phonemes, while others imply that this is the case with the examples cited. See, for example, Quiring (1928) for Chortitza (South Russia), Goerzen (1952), Lehn (1957), and Cox et al. (2013) for Canada, Mierau (1964) for Indiana (USA), Moelleken (1966) and Brandt (1992) for Mexico, Jedig (1966) and Nieuweboer (1999) for the Altai region between Russia and Kazakhstan, and te Velde & Vosburg (2021) for Kansas and Oklahoma (USA). Loewen (1988) discusses the

[10]There are probably additional German-language islands that could be added to this list. A lesser-known example is mentioned here: Sokolskaja & Sinder (1930) investigate a CHes colony consisting of six villages in North Ukraine which was founded in the eighteenth century. Their data show that the ich-Laut and the ach-Laut are close to being positional variants with the exception of the context after [ɑː], in which case the palatal ([ç]=⟦χ⟧) can occur, e.g. ⟦vāχ⟧ 'soft' (cf. StG *weich.*)

phonemes of Plautdietsch and their connection to the orthography, while Naiditch (2005) and Siemens (2012) give diachronically-oriented descriptions of Plautdietsch in general. Most of those sources also provide examples from the inflectional morphology in which [x] and [ç] alternate, meaning that some version of velar fronting applies synchronically as a rule of neutralization.[11]

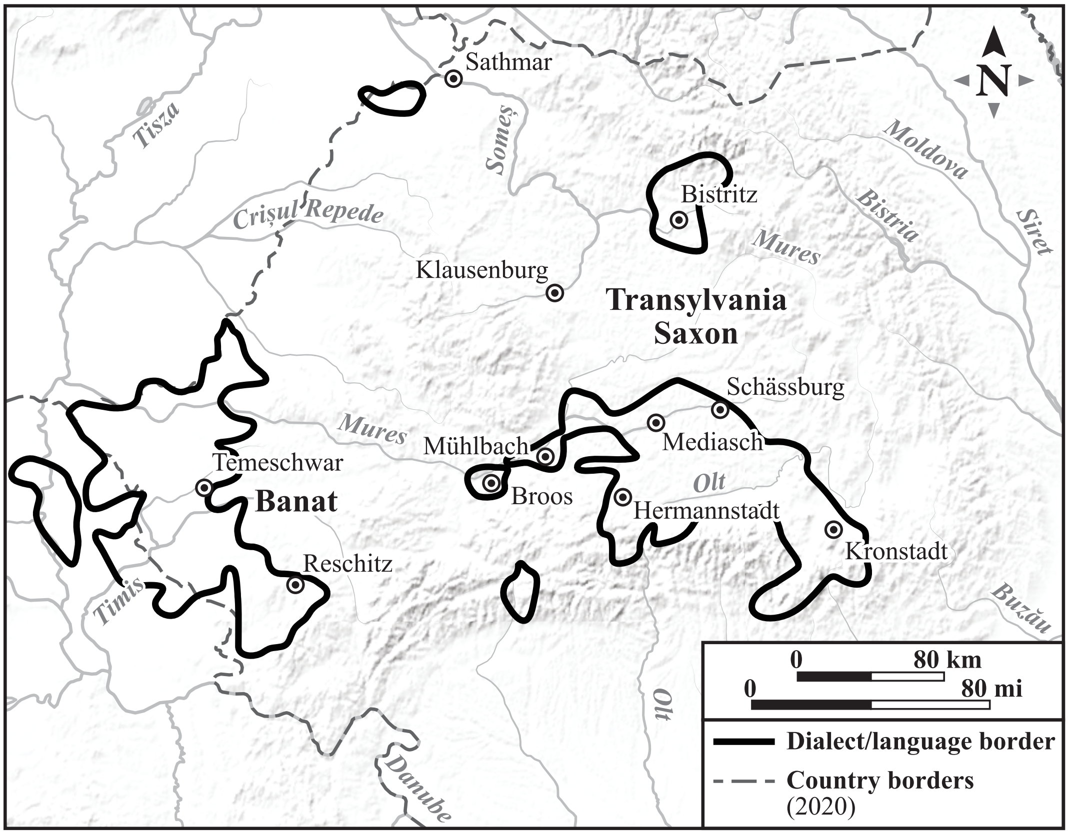
As a representative example, I consider the patterning of velar [x] and palatal [ç] in Chortitza. According to the copious data provided in the original source (Quiring 1928), only [ç] (=⟦χ⟧) occurs after coronal sonorants (e.g. ⟦liχt⟧ 'light', ⟦treχtɑ⟧ 'funnel', ⟦horχst⟧ 'hark-2SG'), and only [x] (=⟦x⟧) surfaces after back vowels (with the exception of [ɑ]), e.g. ⟦doxt⟧ 'think-PRET. In the context after [ɑ] the two fricatives contrast: ⟦ɑxt⟧ 'eight', ⟦lɑxən⟧ 'laugh-INF', ⟦nɑxt⟧ 'night' vs. ⟦blɑχ⟧ 'tin', ⟦frɑχ⟧ 'impudent', ⟦knɑχt⟧ 'knecht', ⟦šlɑχt⟧ 'bad'. The reason for the occurrence of the ich-Laut after [ɑ] is that that vowel was originally [e]; recall the examples from Wissenbach in (4) and (5) above. In the section on inflectional morphology, Quiring provides a number of examples in which [x] and [ç] alternate within the same paradigm, e.g. ⟦liχt⟧ 'lie-3SG' vs. ⟦lɑx⟧ 'lie-PRET'. That type of example requires an underlying velar which shifts to palatal after a front vowel. (In this case the underlying velar is /ɣ/, as in the case studies described in §9.2). As in Weidenbach, Chortitz also possesses alternating examples where [x] and [ç] both occur after a back vowel ([ɑ]), e.g. ⟦lox⟧ 'hole' vs. ⟦lɑχɑ⟧ 'hole-PL'; recall (20).[12]

9.5.2.2 Transylvania Saxon

Transylvania Saxon (Siebenbürgisch-Sächsich) is the traditional name for the German dialect spoken in Transylvania (Siebenbürgen), which is a large region in Central Romania (see Map 9.2). Despite its name, Transylvania Saxon is a MFr dialect, which is spoken by the descendants of emigrants from modern-day West Central Germany beginning in the twelfth century.

[11]The historical process of velar fronting in Plautdietsch is usually referred to in the literature as "Palatalization". In my view, that sound change fronted first the velar fricatives (/x ɣ/) and then later on the velar stops (/k g/) and the velar nasal (/ŋ/). By contrast, Siemens (2012: 92–98) apparently does not consider the fronting of /x ɣ/ to fall within the domain of (Velar) Palatalization, since he does not mention those fricatives in his discussion of that sound change. See Chapter 11 for discussion of German dialects like Plautdietsch with a broad set of velar fronting targets. The phonemicization of /ç/ in Plautdietsch was the direct result of a change fronting a back vowel (see below for discussion). That same change resulted in the phonemicization of palatal stops (/c ɟ/) and the palatal nasal (/ɲ/) (see Chapter 11.)

[12]Buchheit (1978) describes the variety of Plautdietsch spoken in parts of Nebraska (USA). In contrast to all of the works on Plautdietsch cited above, Buchheit (1978: 73) contends that [x] and [ç] are allophones of the same phoneme (/x/) because they stand in complementary distribution: [x] after back vowels and [ç] after front vowels.



Map 9.2: German-language islands in Romania. Source: Wikipedia.

There is no question that Transylvania is an area where velar fronting is the norm. This conclusion is clear from Map 12 (for *euch* 'you-ACC/DAT.PL'), Map 22 (*recht* 'right'), Map 33 (for *sprechen* 'speak-INF') and Map 58 (for *liegen* 'lie-INF') in the linguistic atlas for Transylvania German (SDSA). The same conclusion can be drawn from the detailed descriptions of the historical phonology in specific towns of Transylvania, e.g. Mediasch (Scheiner 1887), Bistritz (Kisch 1893, Klein 1927), and Schäßburg (Bruch 1966). Those sources all indicate that postvocalic [x] and [ç] (and their lenis counterparts) do not contrast because they occur after back vowels and front vowels respectively.

One variety of Transylvania Saxon is different, namely the one spoken in Burgberg (ca. 20km to the northeast of Hermannstadt). According to the Burgberg data provided by Maurer (1959), only [ç] (=⟦χ⟧) (but not [x]=⟦x⟧) occurs after coronal sonorants (e.g. ⟦laiχt⟧ 'light', ⟦šęχ⟧ 'shoe', ⟦durχ⟧ 'through'), while only [x] (but not [ç]) surfaces after back vowels (with the exception of [ɑː]), e.g. ⟦dox⟧ 'however', ⟦əuxt⟧ 'eight', ⟦laxən⟧ 'laugh-INF'. [x] and [ç] contrast in Burgberg in the context after ⟦ā⟧ (=[ɑː]), e.g. ⟦šprāx⟧ 'language' vs. ⟦āχt⟧ 'eight'. Palatal [ç] arose after the long low back vowel (e.g. in words like ⟦āχt⟧) because the original short low vowel (⟦a⟧) fronted and raised to ⟦ē⟧ and then retracted and lowered to ⟦ā⟧; see Maurer (1959: 12). Thus, ⟦ē⟧ triggered the change from /x/ to the earlier allophone [ç], which was then phonemicized to /ç/ when ⟦ē⟧ shifted to ⟦ā⟧. The ⟦ā⟧ in words like ⟦šprāx⟧ 'language' did not undergo the change to ⟦ē⟧ because that process of fronting and raising only affected an original short vowel. As in all of the case studies discussed in this chapter, Burgberg has alternations in the inflectional morphology between velar [x] and palatal [ç], meaning that some version of velar fronting operates as a neutralization.[13]

The phonemicization of /ç/ in Burgberg is attested in other places in Transylvania as well. This conclusion is clear from the material presented in Scheiner (1922), which investigates the historical development of vowels in Southeast Transylvania. According to the data provided in that source (Scheiner 1922: 61, 63), [ç] (=⟦χ⟧) occurs in the context after [ɑ] in a number of towns and villages in the general area around Kronstadt (see Map 9.2). For example, the towns of Zeiden, Nussbach, and Schirkronyen all have ⟦krɑχn⟧ 'crawl-INF'. That type of example is akin to the cases documented in this chapter because the historical rule of velar fronting overapplies. However, there are also cases attested in the same area (around Kronstadt) involving the historical underapplication of velar fronting, i.e. [x] occurs after a front vowel that was historically back. To cite one example, Scheiner (1922: 61) lists five towns with [x] after [e], e.g. ⟦bex⟧ 'book' (cf. StG [bu:x]). I do not attempt to document the cases of opacity in Transylvania Saxon and instead leave this undertaking open for future research.[14]

9.6 Conclusion

The case CHes/RFr studies discussed in this chapter have in common that velars and the corresponding palatals contrast in the context after certain back vowels.

[13] Historical /k/ and /g/ also exhibit fronting in postsonorant position and word-initially. The fronting of velar stops is referred to in the earlier literature as "Palatalisierung", e.g. Maurer (1959: 75).

[14] I have not been able to detect evidence for the phonemicization of /ç/ on the basis of the maps in SDSA. However, Map 58 (for *fliegen* 'fly-INF') indicates a few isolated pockets in Transylvania (e.g. the area around Mühlbach) where the lenis fricative [ʝ] occurs after the low back vowel [ɑ]. A contrast between velars and palatals is not attested in the other German-Language islands in Romania, i.e. in Sathmar in the northwest and the Banat region in the southwest (see Map 9.2). Barba (1982), Wolf (1987), Dama (1987), and Mileck (1997) all agree that [ç] and [x] have a transparent distribution in Banat Swabian, expressed in the present treatment with Velar Fronting-1. There is likewise no evidence for a contrast between velar and palatal fricatives in Sathmar (Moser 1937).

That type of contrast was the result of a phonemic split triggered by Vowel Retraction, after which a new contrast arose between velar and palatal after a back vowel. The consequence is that the original rule of velar fronting ceased to operate as an allophonic operation and became a rule of neutralization which only applied in the context after coronal sonorants (or a subset thereof).

In Chapter 10 I consider a set of German dialects that is similar to the ones discussed in the present chapter in the sense that phonemic palatals now stand in contrast with the corresponding velars after back vowels. In contrast to the systems examined above, the ones I investigate in the following chapter have in common that the phonemic palatals are realized in the phonetics as sibilants (i.e. as alveolopalatal [ɕ]).

10 Phonemicization of palatals (part 3)

10.1 Introduction

A common pattern characterized by many CG varieties involves the historical merger of the original palatal (nonsibilant) allophone [ç] (/x/), together with the inherited postalveolar (sibilant) fricative [ʃ] (/ʃ/) to a new sibilant fricative, namely alveolopalatal [ɕ] (/ɕ/). That change (ALVEOLOPALATALIZATION) is depicted provisionally in (1).[1] Not shown here is the retention of the original velar allophone [x] (/x/), which surfaces in the context after back vowels.

(1) Alveolopalatalization (first version):

    [ç]   [ʃ]

       [ɕ]

As a consequence of alveolopalatalization (StG) words like [ɪç] 'I', [fɪʃ] 'fish', and [frɔʃ] 'frog' are realized as [ɪɕ], [fɪɕ], and [frɔɕ] respectively, but words with historical [x] after a back vowel retain that velar, e.g. [lɔx] 'hole'. Since [ɕ] and [x] contrast in the context after a back vowel (cf. [frɔɕ] vs. [lɔx]), alveolopalatalization involves the phonemicization of /ɕ/. Significantly, the development in (1) did not result in the loss of velar fronting, which remains active as a rule of neutralization relating words with alternations triggered by back vs. front vowels, e.g. [lɔx] (/lɔx/) 'hole' vs. [lœɕɐ] (/lœx-ɐ/) 'hole-PL'.

Alveolopalatalization has been studied extensively in the German dialect literature where it has been demonstrated that the change has been ongoing in Central Germany from the late nineteenth century to the present day. Some of the works on this topic include Mitzka (1972), Robinson (2001), Hall (2014a), and

[1] Alveolopalatalization is referred to in much of the recent literature cited below as "Koronalisierung" ("coronalization"). I eschew the latter term because [ʃ], [ɕ] and [ç] are all [coronal]. Much has been written on the phonetics of the sibilants referred to here, both from the cross-linguistic perspective (e.g. Ladefoged & Maddieson 1996) and from the perspective of German dialects (e.g. Herrgen 1986, Gilles 1999). To simplify, alveolopalatal [ɕ] is usually described in the dialect literature as being articulated with unrounded (spread) lips, while postalveolar [ʃ] is pronounced with lip rounding and protrusion. I discuss the way in which phonological representations mirror those articulations below.

Féry (2017), although the most comprehensive treatment is undoubtedly Herrgen (1986).

In the system described above there is a contrast between velar ([x]) and alveolopalatal ([ɕ]) after certain back vowels (e.g. [frɔɕ] 'frog' vs. [lɔx] 'hole'), but in the context after front vowels only [ɕ] occurs (e.g. [ɪɕ] 'I', [lœɕɐ] 'hole-PL'). That system is therefore akin to the one for the postsonorant velar vs. palatal contrasts classified in Chapter 9 as Contrast Type B, which can be extended to alveolopalatalizing dialects as in (2), where [i] and [ɑ] are cover symbols for front vowels and back vowels respectively.

(2) Contrast Type B:

[...iɕ...]	[...ɑɕ...]
	[...ɑx...]

The occurrence of the front sound [ɕ] in the context after a back vowel in (2) does not involve overapplication opacity because it was not the product of velar fronting. For example, the [ɕ] in [frɔɕ] 'frog' derived historically from the coronal sibilant [ʃ] and not from a velar (cf. MHG *vrosch*).

I argue that the changes in (1) involved an intermediate stage not depicted above:

(3)	/x/	/ʃ/	>	/x/		/ʃ/	>	/x/		/ʃ/	>	/x/	/ɕ/
	[x]	[ʃ]		[x]	[ç]	[ʃ]		[x]	[ɕ]	[ʃ]		[x]	[ɕ]

In (3) the original velar is realized as velar after any kind of sound, and later the palatal (nonsibilant) allophone ([ç]) develops. The intermediate stage absent in (1) is one in which the earlier palatal allophone ([ç]) is realized as alveolopalatal [ɕ], which exists side by side with the inherited sibilant [ʃ]. In the final stage of (3) the earlier allophone [ɕ] and the inherited fricative [ʃ] merge to [ɕ]. At that point [x] and [ɕ] contrast only in the context after a back vowel, as in (2). The final stage of (3) illustrates another instantiation of a phonemic split triggered by merger (Chapter 8).

Evidence for the final two stages in (3) comes from German dialects. Some dialects reveal the Contrast Type B system in the final stage in (3), while others represent the pre-Contrast Type B system where [ɕ] is still an allophone of [x] (/x/) which exists side by side with [ʃ].

In §10.2 I provide a more in-depth discussion of the historical stages depicted in (3). In the remainder of the chapter I discuss Contrast Type B dialects (§10.3) as well as dialects in which [ɕ] is still an allophone of [x] (§10.4). In §10.5 I discuss the areal distribution of alveolopalatalizing varieties. §10.6 considers three topics in greater detail, namely the origin and spread of alveolopalatalization, the realization of the lenis fricative [ʝ] as an alveolopalatal sibilant, and the way in which certain underlying representations are restructured in the course of alveolopalatalization. In §10.7 I conclude.

10.2 Alveolopalatalization deconstructed

It is argued below that alveolopalatalization consists of the stages depicted in (3), which are made more explicit in (4). Stage A corresponds to what has been referred to in earlier chapters as Stage 2 (Figure 2.2). Reference is made at Stage A to the distinctive features for [ʃ] (/ʃ/) described in §2.2.2. Recall from that section that the category "sibilant" is not relevant for the phonology of German dialects under investigation in the present book and that phonological representations for sounds like /s/ and /ʃ/ consequently lack the nondistinctive feature [±strident]. The realization of sounds like /s/ and /ʃ/ as sibilants at the level of Speech is accomplished with rules of phonetic implementation, which are discussed in greater detail below.

(4) Historical stages for alveolopalatalization:

Stage A: Velar ([x]) and palatal ([ç]) are allophones related by velar fronting (from /x/). Phonemic [ʃ] (/ʃ/) is also present; that segment is phonologically a simplex coronal distinct from [s] (/s/) by either [±anterior] or [±high]. Phonetic implementation ensures that all simplex coronal fricatives (but crucially not the complex segment [ç]) are realized at the level of Speech as sibilants.

Stage B: Velar fronting continues to be active. It has the same form as the eponymous process at Stage A and therefore creates a [coronal, dorsal] fricative. [ʃ] (/ʃ/) is also present, which is reanalyzed phonologically as a complex [coronal, labial] segment. [coronal, labial] and [coronal, dorsal] fricatives are interpreted by phonetic implementation at the level of Speech as the sibilants [ʃ] and [ɕ] respectively.

Stage C: Phonemic [ʃ] (/ʃ/) undergoes a change to a complex segment ([coronal, dorsal]), thereby merging with the Stage B [coronal, dorsal] which itself was the product of velar fronting. That complex fricative is interpreted in phonetic implementation as the alveolopalatal sibilant [ɕ]. Velar fronting remains active as a neutralization rule capturing alternations between velar [x] and its fronted variant.

A simplification of the progression from Stage A to Stage C is given in (5). In the final column I list the dialects discussed below representing Stages B and C. In the remainder of this chapter I discuss first Stage C dialects because the descriptions for those varieties are more detailed (and impressionistically more common) than the ones for Stage B.

(5) Alveolopalatalization (final version):

[ç]	[ʃ]	Stage A (many dialects)
[ɕ]	[ʃ]	Stage B (Cologne, Frankfurt am Main/Montabaur)
[ɕ]		Stage C (Schlebusch, Lxm, Leipzig)

The palatal fricative [ç] undergoing alveolopalatalization can have more than one synchronic (and diachronic) source. As described above, Stage A [ç] can derive synchronically from /x/. What is not depicted in (5) is that the original [ç] that undergoes alveolopalatalization can also be the coda realization of lenis /ɣ/ after a front segment, e.g. Stage B/C /iɣ/⟶|ix|⟶[iɕ]. In dialects like those, /ɣ/ undergoes velar fronting after a front segment in a word-internal onset, surfacing as nonsibilant [ʝ] but not as the lenis alveolopalatal fricative [ʑ].

Velar fronting at Stage B/C necessitates the same change as in other dialects, namely one in which the feature [coronal] from a front segment spreads to [dorsal] sound, thereby creating a complex corono-dorsal segment. However, velar fronting does not create alveolopalatal [ɕ] directly; instead, the [coronal, dorsal] sound produced by velar fronting is interpreted as alveolopalatal by the phonetic implementation made explicit below.

An analogy can be made involving the rhotic consonant /r/. That segment is defined phonologically with a particular feature complex (e.g. [+consonantal, +sonorant, +continuant, coronal]), but those features tell us nothing about whether or not /r/ is realized in Speech as a trill or approximant (or something else). The feature complex [+consonantal, +sonorant, +continuant, coronal] is the phonological representation for /r/, but rules of phonetic implementation specify whether or not that segment is articulated as a trill (in one language, dialect, idiolect) or approximant (in another language, dialect, idiolect). Likewise the features [coronal, dorsal] for a fortis fricative say nothing about whether or not that segment is a sibilant ([ɕ]) or a nonsibilant ([ç]). That kind of fine-grained distinction is captured in the phonetics and not in the phonology.

There are a number of different ways to express the place contrast involving /s/, /ʃ/, and /ɕ/ According to one – alluded to briefly in §2.2.2 – /s/ and /ʃ/ (e.g. in StG) are distinguished with either [±anterior] or [±high]. My analysis adopts the proposal made in some of the recent work on alveolopalatalization referred to above that lip rounding (recall Footnote 1) is phonologically distinctive for /ʃ/ in alveolopalatalizing dialects; hence, /ʃ/ is analyzed as [coronal, labial], /s/ is [coronal] without a [labial] component, and /ɕ/ is [coronal, dorsal]. One advantage of that treatment (not discussed below) is that it expresses the connection between alveolopalatalization and the unrounding of front rounded vowels (Hall 2014a). A second advantage is that the complex segment analysis of /ʃ/ simplifies the rules of phonetic implementation referred to above. As indicated below, phonetic implementation specifying sibilancy for one or more coronal fricative differs slightly according to the historical stage. I only list phonetic symbols for fortis fricatives here.

(6) Phonetic Implementation (Stage A):
   a. Fortis complex fricatives ([coronal, dorsal]) are interpreted as nonsibilants ([ç]).
   b. Simplex [coronal] fricatives are interpreted as sibilants ([s ʃ]).

(7) Phonetic Implementation (Stage B):
   a. Fortis complex fricatives are interpreted as sibilants ([coronal, labial] as [ʃ], [coronal, dorsal] as [ɕ]).
   b. Simplex [coronal] fricatives are interpreted as sibilants ([s]).

(8) Phonetic Implementation (Stage C):
   a. Fortis complex fricatives ([coronal, dorsal]) are interpreted as sibilants ([ɕ]).
   b. Simplex [coronal] fricatives are interpreted as sibilants ([s]).

Significantly, (6–8) refer to whether or not the phonological structures are simplex coronals or if they have a complex place structure. The important point to observe is that there were two changes involving (6–8). First, the requirement that complex fricatives surface as nonsibilants (=6a) changed to one specifying those sounds as sibilants (=7a). Second, the phonological representation of /ʃ/ changes from a simplex coronal at Stage A and a complex sound at Stage B.

10.3 Stage C dialects

10.3.1 Ripuarian (part 1)

Bubner (1935) describes the Rpn dialect spoken in Schlebusch (Leverkusen) in the German state of North Rhine-Westphalia (Nordrhein-Westfalen; Map 5.1), which has the phonemic front vowels /iː y yː e eː ɛ ɛː ø øː œ œː/ and the phonemic back vowels /u uː o oː ɔ ɔː ɑ ɑː ə/. Three diphthongs end in a front vowel (/ɑi ei øy/) and one ends in a back vowel (/ou/).

As in many other varieties of Rpn, Schlebusch has the three dorsal fricatives [x ɣ ʝ], (=⟦x ɣ j⟧) but no fortis palatal [ç]. In addition to [s z] (=⟦s z⟧), the dialect has a third sibilant fricative (=⟦š⟧), which Bubner describes (p. 6) as an alveolar-cerebral fricative ("alveolarer-zerebraler Reibelaut"). Since no further details are given, it is not possible to determine with certainty whether or not that sound corresponds to [ʃ] or [ɕ]. On the basis of phonological patterning I argue that ⟦š⟧ is alveolopalatal [ɕ] and not postalveolar [ʃ]. Further support that ⟦š⟧ represents [ɕ] is that other Stage C dialects are attested in which the output of that change is [ɕ], but no Stage C dialect to my knowledge is attested in which the output is [ʃ].

Schlebusch has the palatal nonsibilant lenis fricative [ʝ] – but no fortis counterpart ([ç]) – and the coronal (alveolopalatal) sibilant fricative [ɕ], but no lenis counterpart ([ʑ]). The phonemic fricatives in question and their allophones are illustrated for word-initial and postsonorant position in (9). Not depicted here is /g/, which contrasts with the fricatives listed in (9).

(9)	a.	/ɕ/	/ʝ/	b.	/x/	/ɕ/	/ɣ/	
		|	|		|	|	|	\
		[ɕ]	[ʝ]		[x]	[ɕ]	[ɣ]	[ʝ]

The two velars [x] (/x/) and [ɣ] (/ɣ/) differ in terms of a laryngeal dimension. As implied by the phonetic symbols, [ʝ] and [ɕ] represent two distinct places of articulation from the point of view of phonetics. Bubner (1935: 6) therefore describes the place of articulation for [ʝ] (=⟦j⟧) as "palatal", which is different from the "alveolar-cerebral" category for [ɕ] (=⟦š⟧). In (10) I list the four fricatives in (9) from the point of view of phonetics; hence, each of the four columns reflect a separate place of articulation. For comparison, I also include [s] and [z], which are uncontroversially underlying segments.

(10) Coronal and dorsal fricatives (arranged according to phonetics):

fortis	[s]	[ɕ]		[x]
lenis	[z]		[ʝ]	[ɣ]

From the point of view of phonology, fortis [ɕ] (/ɕ/) and lenis [ʝ] (/ʝ/) are paired together just as other fortis vs. lenis pairs, namely [s] (/s/) and [z] (/z/); [x] (/x/) and [ɣ] (/ɣ/). Alternations between [x] and [ɕ] described below are likewise juxtaposed the same way alternations involving [ɣ] and [ʝ] are. The sibilant [ɕ] therefore occupies the slot other dialects fill with the nonsibilant [ç]. The analysis described here is depicted in (11).

(11) Coronal and dorsal fricatives represented phonologically:

[+fortis]	[s] (/s/)	[ɕ] (/ɕ/)	[x] (/x/)
[−fortis]	[z] (/z/)	[ʝ] (/ʝ/)	[ɣ] (/ɣ/)

I demonstrate below that the three pairs in (11) are alike featurally: /s z/ are simplex [coronal], /x ɣ/ simplex [dorsal], and /ɕ ʝ/ complex ([coronal, dorsal]).

In word-initial position [ɕ] surfaces before any type of vowel or before a coronal consonant in (12a). The alveolopalatal in such examples derives from historical coronal sounds (cf. MHG *schūm*, MHG *slōz*). Palatal [ʝ] occurs word-initially before any vowel in (12b). [ʝ] in examples like those derives from a historical palatal (WGmc $^{+}$[j]) or velar (WGmc $^{+}$[ɣ]). The fronting of an original velar before any kind of segment (as in Schlebusch) is investigated in Chapter 14.

(12) Schlebusch [ɕ] (from /ɕ/) and [ʝ] (from /ʝ/):

a.	šum	[ɕum]	Schaum	‘foam’	78
	šlǫs	[ɕlɔs]	Schloss	‘lock’	78
b.	jęl	[ʝɛl]	gelb	‘yellow’	72
	jǭ	[ʝɔː]	ja	‘yes’	88

The following data illustrate that [x] surfaces after back vowels in (13) and [ɕ] after front vowels in (14a) or back vowels in (14b). The [x] in (13) derived historically from a velar (WGmc $^{+}$[k] or $^{+}$[x]) and the [ɕ] in (14) from coronal [ʃ] (cf. MHG *zwischen, visch, droschen, vrosch*).

(13) Schlebusch [x] (from /x/):

bux	[bux]	Bauch	‘stomach’	65
lǫx	[lɔx]	Loch	‘hole’	65
bōːx	[boːx]	Buch	‘book’	65
hǫːx	[hɔːx]	Haken	‘hook’	65
wāx	[βɑːx]	wach	‘awake’	65
bāx	[bɑːx]	Bach	‘stream’	65

(14) Schlebusch [ç] (from /ç/):

a.	krīšə	[kriːçə]	weinen	'cry-INF'	79
	tøšə	[tøçə]	zwischen	'between'	78
	veš	[veç]	Fisch	'fish'	78
	flę̄š	[flɛç]	Flasche	'bottle'	78
	vlēš	[vleːç]	Fleisch	'meat'	78
b.	rūšə	[ruːçə]	rauschen	'rustle-INF'	79
	drošə	[droçə]	droschen	'thresh-PRET'	110
	vrǫš	[vrɔç]	Frosch	'frog'	21

Significantly, [x] and [ç] contrast after a back vowel, e.g. [vrɔç] 'frog' vs. [lɔx] 'hole', but after a front vowel only [ç] occurs (=2).

The absence of [x] after a front vowel is also reflected in the regular replacement of [x] with [ç] after a front vowel in morphophonemic alternations like the ones in (15). As indicated here, [x] after a back vowel corresponds to [ç] after a stem vowel mutation. The material presented in the original source suggests that there are no exceptions to the alternating pattern in (15), e.g. a stem with a back vowel plus [x] in which the [x] surfaces without change as [x] and not as [ç] after the alternant with a front vowel. The dorsal fricatives in words like the ones in (15) derived historically from a fortis velar (WGmc $^{+}$[k] or $^{+}$[x]).

(15) Schlebusch [x]-[ç] Alternations (from /x/):

a.	ruxə	[ruxə]	riechen	'smell-INF'	35
	ryš	[ryç]	riecht	'smell-3SG'	35
b.	lǫx	[lɔx]	Loch	'hole'	96
	lø̄šə	[løːçə]	Löcher	'hole-PL'	96
c.	šprōːxə	[ʃproːxə]	sprachen	'speak-PRET'	112
	šprę̄šə	[ʃprɛçə]	sprechen	'speak-INF'	112

The alternating examples in (15) are captured synchronically with an underlying /x/ which undergoes the version of velar fronting posited below. The reason /ç/ cannot be taken as basic with a rule retracting that sound to [x] after a back vowel is that there are a number of morphemes containing a nonalternating [ç], as in (14b). Additional examples are provided in (16). Note that the stem vowels in (16) set display the same kind of vowel alternations as in (15). Were /ç/ the sound underlying the alternations in (15), then the rule retracting that sound to [x] after a back vowel would incorrectly apply to some of the examples in (16).

(16) Schlebusch nonalternating [ç] (from /ç/):

a.	dręšə	[drɛçə]	dreschen	'thresh-INF'	110
	drošə	[droçə]	droschen	'thresh-PRET'	110
b.	vrǫš	[vrɔç]	Frosch	'frog'	21
	vrøš	[vrøç]	Frösche	'frog-PL'	22
c.	wūəš	[βuːəç]	Wurst	'sausage'	26
	wȳəš	[βyːəç]	Würste	'sausage-PL'	26

The [ç] in (16) derives synchronically from /ç/, but the diachronic source for that sound was [ʃ].

The items listed in (17) contain a surface [ç] deriving etymologically from a fortis velar sound (WGmc $^{+}$[k]) in the context after a front vowel. No examples were found in the original source in which [ç] occurs after a coronal sonorant consonant.

(17) Schlebusch nonalternating [ç] (from /x/):

eš	[eç]	ich	'I'	65
zēš	[zeːç]	kurze Sense	'short scythe'	65
bręšə	[brɛçə]	brechen	'break-INF'	65
jøšə	[ʝøçə]	jucken	'itch-INF'	65

As indicated above, the [ç] in (17) – in contrast to the examples in (15) – does not alternate with [x]. As a Contrast Type B dialect, Schlebusch does not contrast [x] and [ç] after front vowels; hence, I analyze the underlying representation in words like the ones in (17) with a velar (/x/), which is simply inherited from pre-Schlebusch (Stage B in 4). Note that there are two types of words with [ç] after a front vowel: Those in which [ç] is underlyingly /ç/ (=16) and those in which [ç] derives from /x/ (=17). A question I discuss in §10.6.3 is how speakers acquiring the Schlebusch system who are not knowledgeable about etymology are able to determine the correct underlying representation.

Velar [ɣ] surfaces in a word-internal onset only after a full back vowel in (18a), while palatal [ʝ] is found in a word-internal onset only after a front vowel in (18b). The items in (18c) indicate that [ʝ] can also occur in a word-internal onset after a schwa if that schwa is preceded by a coronal consonant. I analyze the [ʝ] in (18b, 18c) as a realization of /ɣ/. The [ɣ ʝ] in these examples derives historically from the lenis velar fricative (WGmc $^{+}$[ɣ]).

(18) Schlebusch [ɣ] and [ʝ] (from /ɣ/):

a.	ōːɣə	[oːɣə]	Augen	'eye-PL'	73
	zɑ̄ːɣə	[zɑːɣə]	sagen	'say-INF'	73

b.	bē:jə	[be:ɟə]	biegen	'bend-INF'	73
	zę̄jə	[zɛ:ɟə]	sägen	'saw-INF'	73
c.	o·rəjəl	[o·rəɟəl]	Orgel	'organ'	73
	he·ləjə	[he·ləɟə]	Heiligen	'saint-PL'	73
	zā:nəjə	[zɑ:nəɟə]	sandiger	'sandy-INFL'	73

I argue that the pre-[ɟ] schwa in (18c) is epenthetic and that it acquires [coronal] from the segment to its left (/r l n/). That fronted schwa then spreads [coronal] to /ɣ/, thereby creating a palatal (recall §5.4), e.g. /o·rɣəl/ ⟶ |o·rəɣəl| ⟶ |o·rə̧ɣəl| ⟶ [o·rə̧ɟəl]. In contrast to the varieties discussed in §5.4, the rule fronting schwa is triggered by all coronal sonorants, while schwa epenthesis applies between a coronal sonorant and a noncoronal consonant (/ɣ/) that can be in a word-internal onset. I do not indicate the fronted schwa in the phonetic representations in (18c) and in similar examples presented below because my transcriptions are broad and not narrow.

Postsonorant /ɣ/ (<WGmc +[ɣ] /ɣ/) participates in alternations involving laryngeal and place features like the ones in (19). In coda position, /ɣ/ undergoes Final Fortition to [x], as in the second example in (19a, 19b). If /ɣ/ is preceded by a front vowel, it is realized as [ɟ] in a word-internal onset, as in the first example in (19b–19e) and as [ɕ] in the coda, as in the final example in (19c–19e). That palatals in (19e) result when [ə̧] spreads its [coronal] feature to /ɣ/.

(19) Schlebusch laryngeal and place alternations (from /ɣ/):

a.	zā:ɣə	[zɑ:ɣə]	sagen	'say-INF'	73
	zā:x	[zɑ:x]	sage	'say-1SG'	74
b.	bədrē:jə	[bədre:ɟə]	betrügen	'cheat-INF'	108
	bədrox	[bədrox]	betrog	'cheat-PRET'	108
c.	zę̄jə	[zɛ:jə]	sägen	'saw-INF'	73
	zę̄š	[zɛ:ɕ]	sägt	'saw-3SG'	74
d.	fle:jə	[fle:ɟə]	fliegen	'fly-INF'	73
	flyšt	[flyɕt]	fliegt	'fly-3SG'	74
e.	zā:nəjə	[zɑ:nəɟə]	sandiger	'sandy-INFL'	73
	zā:nəš	[zɑ:nəɕ]	sandig	'sandy'	73

In sum, [ɣ] and [ɟ] do not contrast; hence, those two sounds derive synchronically from /ɣ/, as indicated in the heading for (19). Velar fronting thus not only must capture the relationship between [x] and [ɕ] in (15) but also the one between [ɣ] and [ɟ] in (18) and (19).

In (20) I provide representations for the four fricatives discussed above (/ç x ɣ ʝ/). I also include /s/ for comparison. The structures given here are the ones present at the underlying level and in the phonetic representation. Recall from (9) that [ʝ] is an allophone of /ɣ/ in postvocalic position, but that it is an underlying palatal in word-initial position.

(20) a. [s] /s/

$$\begin{array}{c}\begin{bmatrix}-\textsc{son}\\+\textsc{cont}\\+\textsc{fortis}\end{bmatrix}\\ | \\ \left[\textsc{coronal}\right]\end{array}$$

b. [ç] /ç/

$$\begin{array}{cc}\multicolumn{2}{c}{\begin{bmatrix}-\textsc{son}\\+\textsc{cont}\\+\textsc{fortis}\end{bmatrix}}\\ / & \backslash \\ \left[\textsc{coronal}\right] & \left[\textsc{dorsal}\right]\end{array}$$

c. [x] /x/

$$\begin{array}{c}\begin{bmatrix}-\textsc{son}\\+\textsc{cont}\\+\textsc{fortis}\end{bmatrix}\\ | \\ \left[\textsc{dorsal}\right]\end{array}$$

d. [ɣ] /ɣ/

$$\begin{array}{c}\begin{bmatrix}-\textsc{son}\\+\textsc{cont}\\-\textsc{fortis}\end{bmatrix}\\ | \\ \left[\textsc{dorsal}\right]\end{array}$$

e. [ʝ] /ʝ/

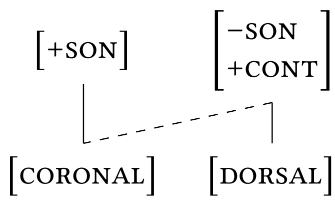
$$\begin{array}{cc}\multicolumn{2}{c}{\begin{bmatrix}-\textsc{son}\\+\textsc{cont}\\-\textsc{fortis}\end{bmatrix}}\\ / & \backslash \\ \left[\textsc{coronal}\right] & \left[\textsc{dorsal}\right]\end{array}$$

The most important structure here is the one for /ç/ in (20b), which I analyze as a complex corono-dorsal segment.

My claim that the place structure for [ç] and [ʝ] is the same derives support from the patterning of those two sounds after coronal sonorants. The examples in (19c–19e) show that [ʝ] in a word-internal onset surfaces as [ç] in coda position. Since Final Fortition uncontroversially only alters a laryngeal feature, the implication is that [ʝ] and [ç] have the same place structure.

The fronting of velar (/x ɣ/) to a complex segment is accomplished with (21). The set of triggers for the /x/ target consists of front vowels. As noted above, no examples are attested for /x/ after a coronal sonorant consonant, although the data in (18c) illustrate that liquids indirectly trigger the fronting of /ɣ/ by spreading [coronal] to schwa, which feeds (21). Velar Fronting-1 – together with Final Fortition – also accounts for derived corono-dorsal sounds ([ɕ ʝ]) in (19).

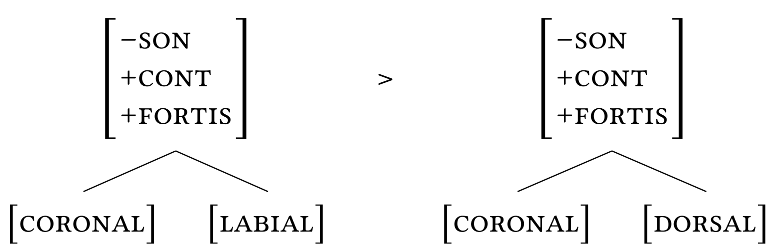
(21) Velar Fronting-1:



Velar Fronting-1 creates a derived corono-dorsal fricative which is realized at the level of Speech as the sibilant [ɕ] given the [+fortis] target segment /x/. The rule of phonetic implementation is stated in (8a) above. By contrast, the palatal ([ʝ]) created from the lenis velar fricative /ɣ/ is not interpreted as a sibilant (e.g. alveolopalatal [ʑ]) because (8a) only affects a [+fortis] sound. [ʝ] is also not affected by (8b), which targets simplex coronal fricatives.

Recall from (5) that there were two historical progenitors of alveolopalatal [ɕ], namely palatal [ç] and postalveolar [ʃ]. Since [ç] are [ɕ] are the same segment phonologically, the change from the former to the latter simply involves only the change in phonetic implementation rule (6a) to (7a) or (8a); see below for discussion. The shift from [ʃ] to [ɕ] necessitates a restructuring of the former to the latter. It was proposed earlier that Stage B (pre-Schlebusch) /ʃ/ was complex [coronal, labial]. The alveolopalatalization of that /ʃ/ therefore required (22), which entailed both the loss of [labial] as well as the addition of [dorsal]. The segments to the left and to the right of the wedge in (22) are interpreted as a sibilants by phonetic implementation (=7a or 8a).

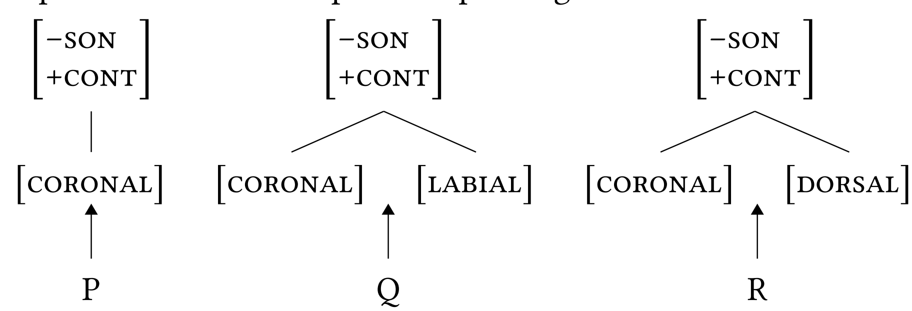
(22) Delabialization:



Delabialization was a historical merger because the representation to the right of the wedge is identical to the representation created by Velar Fronting-1 with the target segment /x/ or with the target segment /ɣ/ in coda position. As stated in (22) the change was context-free; hence any [ʃ] (/ʃ/) was restructured to alveolopalatal. However, some evidence discussed below in §10.4.2 indicates that there are alveolopalatalizing dialects in which Delabialization occurs only in a specific context.

In (24) I present six examples at the three historical stages in (4). The first two words represent a [x]~[ɕ] alternating pair in which the two fricatives derived historically from an earlier velar. The third and fourth items exemplify words with [ɣ] after a back vowel and [ʝ] after a front vowel. The fifth and sixth items are words with [ɕ] (<[ʃ]) which do not have an alternant with [x]. Stage C represents Schlebusch as it was described in 1935. Stage B (Pre-Schlebusch) is the point before Delabialization entered the language when Velar Fronting-1 was an allophonic rule for both /x/ and /ɣ/. I indicate in (23) with subscripts whether or not a fricative is simplex ([coronal] only) or complex (corono-labial) for [ʃ] or corono-dorsal (for [ɕ], [ʝ], or [ç]).

(23) Representations for simplex/complex segments:



(24)

/lɔx/	/lø:x-ə/	/o:ɣə/	/be:ɣ-ə/	/vrɔʃ$_{\text{P}}$/	/veʃ$_{\text{P}}$/	
[lɔx]	[lø:ç$_{\text{R}}$ə]	[o:ɣə]	[be:ʝ$_{\text{R}}$ə]	[vrɔʃ$_{\text{P}}$]	[veʃ$_{\text{P}}$]	Stage A
/lɔx/	/lø:x-ə/	/o:ɣə/	/be:ɣ-ə/	/vrɔʃ$_{\text{Q}}$/	/veʃ$_{\text{Q}}$/	
[lɔx]	[lø:ɕ$_{\text{R}}$ə]	[o:ɣə]	[be:ʝ$_{\text{R}}$ə]	[vrɔʃ$_{\text{Q}}$]	[veʃ$_{\text{Q}}$]	Stage B
/lɔx/	/lø:x-ə/	/o:ɣə/	/be:ɣ-ə/	/vrɔɕ$_{\text{R}}$/	/veɕ$_{\text{R}}$/	
[lɔx]	[lø:ɕ$_{\text{R}}$ə]	[o:ɣə]	[be:ʝ$_{\text{R}}$ə]	[vrɔɕ$_{\text{R}}$]	[veɕ$_{\text{R}}$]	Stage C
Loch	*Löcher*	*Augen*	*biegen*	*Frosch*	*Fisch*	StG
‘hole’	‘hole-PL’	‘eye-PL’	‘bend-INF’	‘frog’	‘fish’	

At Stage A, [ʃ$_{\text{P}}$] and [ç$_{\text{R}}$] were distinct in the phonological component: The former was a simplex coronal, while [ç] was a complex corono-dorsal segment, as in all of the dialects discussed in the present work with that sound. At Stage A, Velar Fronting-1 affected both /x/ and /ɣ/. Since the output ([ç$_{\text{R}}$]/[ʝ$_{\text{R}}$]) was not an underlying segment, Velar Fronting-1 was an allophonic rule. [ʃ$_{\text{P}}$] is interpreted as a sibilant by (6b). At Stage B Velar Fronting-1 remains active as an allophonic rule in examples [be:ʝ$_{\text{R}}$ə] ‘bend-INF’ and [lø:ɕ$_{\text{R}}$ə] ‘hole-PL’. [ɕ] in the latter word and [$ʃ_Q$] in words like [vrɔ$ʃ_Q$] 'frog' and [ve$ʃ_Q$] 'fish' are interpreted as sibilants by (7a). At Stage C, Delabialization altered the underlying representation of /$ʃ_Q$/ to /$ɕ_R$/ in [vrɔ$ɕ_R$] 'frog' and [ve$ɕ_R$] 'fish'; hence that new sibilant merged with the [$ɕ_R$] allophone from Stage C in [løː$ɕ_R$ə] 'hole-PL'. At this point (Schlebusch in 1935), Velar Fronting-1 remained in the grammar by applying as a neutralization to /x/ in alternating morphemes after a front vowel, e.g. in the second example in (24). Stage C [$ɕ_R$] is interpreted as a sibilant by (8a).

10.3.2 Moselle Franconian (Luxembourgish)

Gilles (1999) provides a detailed account of the phonetics and phonology of several varieties of Lxm (Map 5.3). In terms of German dialectology, Lxm is classified as a variety of MFr (Appendix A). Lxm has the phonemic front vowels /i iː e eː ɛ/ and the phonemic back vowels /u uː o oː ɑ ɑː ə/ as well as diphthongs ending in a back vowel, i.e. /iə uə ɑu ɑːu ou/ and diphthongs ending in a front vowel, i.e. /ei ɑi ɛːi/. In the following discussion I concentrate on the realization of fortis dorsal fricatives, i.e. the change from historical [ç ʃ] to alveolopalatal [ɕ]. I do not discuss lenis fricatives ([ʝ ɣ]) which can have different realizations depending on the dialect. See Gilles (1999) for discussion and Hall (2014a) for a phonological treatment.

Gilles (1999) notes that traditional sources for Lxm invariably transcribe the historical dorsal fricatives as [x] after a back vowel and elsewhere (e.g. after front vowels) as [ç] – as in StG – and that these same sources likewise render etymological [ʃ] in modern Lxm as [ʃ]. An example of that type of source is LSA, which has [heiç] 'high' (Map 122) and [ʃɔn] 'already' (Map 121) throughout the central and southern parts of Luxembourg. According to the acoustic-phonetic investigation conducted by Gilles (1999), there is no evidence that the sound usually transcribed as [ç] is a palatal fricative. Instead, the author concludes that the historical palatal allophone of the phoneme /x/ has undergone an exceptionless, context-free shift to the sound he transcribes as [ɕ], which he calls "alveolar-palatal". The change referred to here appears to be ongoing and subject to some speaker-specific variation. Gilles writes (p. 238): "In keiner der Aufnahmen wurde ein Beleg mit *ç* transkribiert. Es findet sich ausschliesslich koronalisiertes *ɕ*. Auch in der [sic.] Aufnahmen der älteren Generation konnte kein *ç* gefunden werden". ("In none of the recordings was a token transcribed with *ç*. Only a coronalized *ɕ* was found. In the recordings of the older generation no instance of *ç* could be found either").[2]

[2]Gilles's observation is corroborated by Newton (1993: 636), who writes that many speakers of Lxm have extreme difficulty in acquiring the ich-Laut, substituting instead an allophone approximating to the [ʃ], though realized without the labialization associated with StG.

Examples illustrating the shift from palatal to alveolopalatal are presented in (25). Gilles does not give the phonetic representations for these words, but in his phonetic investigation of these examples he determined that the fricative corresponding to *ch* is alveolopalatal [ɕ] and not palatal [ç] or postalveolar [ʃ].[3] The data in (25) and below are drawn from speakers from Central, South, and East Lxm. By contrast, North Lxm (Nordösling) displays a very different pattern (§14.5).

(25) Alveolopalatalization of Lxm [ç] (/x/) to [ɕ] (/x/):

héich	hoch	'high'	239
Kichen	Küche	'kitchen'	239
Dicher	Tücher	'towel-PL'	239
fiicht	feucht	'damp'	239

The examples in (25) are intended to show that all instances of the historical palatal fricative participated in the shift to alveolopalatal.

It is clear from the discussion in Gilles (1999) that the velar fricative [x] (/x/) is also present in the context after a back vowel, e.g. [nɑx] 'still'. As in all other velar fronting dialects, alternations between [x] and [ɕ] are presumably present. For example, the third item in (25) has [ɕ] after the front vowel [i], but the corresponding fricative in the singular form (cf. StG *Tuch*) has [x] because the preceding vowel is back.

The acoustic measurements made by Gilles were intended not only to determine whether or not the dorsal fricatives in (25) are alveolopalatal (which they are), but also to consider the nature of the historical postalveolar sibilant [ʃ]: Does this sound surface for the speakers of Lxm who have the alveolopalatal in (25) as [ʃ] or did the historical [ʃ] also undergo a change to [ɕ]? The results of Gilles's investigations showed the latter result. Examples of words with the etymological postalveolar are presented in (26). Gilles is clear that the fricative corresponding to *s* or *sch* in the examples in (26) is alveolopalatal [ɕ] and not postalveolar [ʃ]; hence, the historical postalveolar [ʃ] shifted to [ɕ] by Delabialization in (22).

(26) Alveolopalatalization of Lxm [ʃ] (/ʃ/) to [ɕ] (/ɕ/):

a.	Spigel	Spiegel	'mirror'	239
	stoen	stehen	'stand-INF'	239
	schléit	schlägt	'beat-3SG'	239
	schéin	schön	'beautiful'	239

[3] Gilles's evidence (1999: 237, 239–241) is based on sonograms of the relevant fricatives. He concludes that [ɕ] is characterized by a higher tonality than [ʃ]. What is more, [ɕ] differs from [ç] in that the latter lacks a local maximum at the lowest frequency (see the spectrograms for [ʃ ɕ ç] in Gilles 1999: 237).

b.	Dësch	Tisch	'table'	239
	Biischt	Bürste	'brush'	239
	éischten	erster	'first-MASC.SG'	239
	Fräsch	Frosch	'frog'	239

From the synchronic perspective, Lxm exemplifies the Contrast Type B system depicted in (2) and possesses the representations for the fortis corono-dorsal fricatives presented in (20a-c). The [ɕ] in (25) derives synchronically from /x/ by Velar Fronting-1 and is interpreted as an alveolopalatal sibilant by (8a). The /ɕ/ in (26) is a [coronal, dorsal] fricative also targeted by (8a).

10.3.3 Upper Saxon

Große (1957) documents a series of sound changes which were occurring in the 1950s in colloquial speech in primarily urban varieties of USax (Map 7.2). He concentrates on the dialect as it is spoken in Leipzig, although Große observes that the facts are similar in other urban areas in the same region, e.g. Dresden and Chemnitz (formerly Karl-Marx-Stadt). Große does not give a list of the phonemic vowels, although it can be concluded from the data presented in that source that the dialect possesses the phonemic front (unrounded) vowels /i iː ɛ e eː æː/, the phonemic back vowels /u uː ɔ oː ɑ ɑː ə/, and the diphthongs /ɑe/ and /ɑo/.

Leipzig possesses one dorsal fricative ([x]) as well as the sibilant fricative Große transcribes as ⟦χ´⟧), which he describes as a (fortis) fricative acoustically between ('akustisch und schallphysiologisch zwischen'; p. 182) [ç] (=⟦χ⟧) and [ʃ] (=⟦š⟧). I transcribe ⟦χ´⟧ below as [ɕ], which Große (1957: 182) observes is articulated without lip rounding or lip protrusion, as opposed to [š] (Große 1957: 182). The dialect has no [ɣ] or [ʝ] because those historical fricatives (from WGmc ⁺[ɣ]) merged with the corresponding fortis sounds. Contrasts between [x] and [ɕ] in postsonorant position require that those sounds be phonemic, as depicted in (27). The only dorsal fricative surfacing in word-initial position is [ɕ].

(27)
$$\begin{array}{cc} /\mathrm{x}/ & /\text{ɕ}/ \\ | & | \\ [\mathrm{x}] & [\text{ɕ}] \end{array}$$

The postsonorant system in (27) exemplifies (2).

Examples illustrating the occurrence of [ɕ] are presented below in the context after a front vowel in (28a) and after a coronal sonorant consonant in (28b). Example (28c) reveals the occurrence of velar [x] after a back vowel. [ɕ] and [x] in these examples derived historically from a velar (WGmc ⁺[x] or ⁺[ɣ]).

(28) Leipzig [ɕ] (/ɕ/) and [x] (/x/):

a.	līχ´n	[li:ɕn̩]	liegen	'lie-INF'	183
	niχ´	[niɕ]	nicht	'not'	183
	wāχ´	[væ:ɕ]	Weg	'path'	183
b.	mōrχ´n	[mo:rɕn̩]	morgen	'tomorrow'	183
	fęlχ´n	[fɛlɕn̩]	Felgen	'wheel rim-PL'	183
c.	mɑxə	[mɑxə]	mache	'do-1SG'	189

Since Große's concern is the change from [ç ʃ] to [ɕ], he does not discuss the distribution of [x], although it can be inferred that there are many morphemes displaying an alternation between [ɕ] and [x] depending on the quality of the preceding vowel. For example, the fricative [ɕ] in [lɛɕɔr] (=⟦lęχ´ɔ^{r} ⟧) 'hole-PL' is [ɕ] after the front vowel, but the fricative in the singular noun *Loch* (cf. StG [lɔx]) is presumably [x] because the preceding vowel is back. The [x] and [ɕ] in alternating pairs like that one derived historically from a velar (WGmc $^{+}$[k]).

The examples in (29) illustrate the occurrence of [ɕ] after a front vowel in (29a), back vowel in (29b), noncoronal consonant in (29c), or word-initially in (29d). The [ɕ] in these examples derived from historical [ʃ] (/ʃ/) by Delabialization.

(29) Leipzig [ɕ] (/ɕ/):

a.	ęŋliχ´	[ɛŋliɕ]	englisch	'English'	183
b.	mɑχ´ə	[mɑɕə]	Masche	'mesh'	189
c.	lębχ´	[lɛpɕ]	läppisch	'petty'	183
d.	χ´leχ´d	[ɕleɕt]	schlecht	'bad'	183

The examples in (28) and (29) together exemplify (2): [ɕ] surfaces after front vowels and back vowels, but [x] only occurs after back vowels. Note the minimal pair in (28c) vs. (29b).

In word-initial position [ɕ] surfaces before back vowels in (30a) or front vowels in (30b).

(30) Leipzig [ɕ] (/ɕ/) in word-initial position:

a.	χ´ḁ̂^{r}	[ɕɑ:ɐ]	Jahr	'year'	182
b.	χ´ęds	[ɕɛts]	jetzt	'now'	182

The [ɕ] in (30) is different from all of the other examples discussed above (including the ones in Schlebusch). The reason is that the historical source for [ɕ] was neither [ʃ] nor the palatal ([ç]) created by velar fronting. Instead, the initial sound in (30) is the etymological palatal (<WGmc $^{+}$[j] /j/), which underwent

Glide Hardening to [ɟ] (/ɟ/). When the fortis vs. lenis contrast among fricatives was neutralized that distinctive laryngeal feature was subsequently lost.

Leipzig displays Stage C: The original palatal allophone of /x/ ([ç]) merged with the historical postalveolar sibilant [ʃ] (/ʃ/) to [ɕ] (/ʃ/). Große (1957: 183) emphasizes that this is a true merger on the basis of word pairs like the ones in (31), which are completely homophonous.

(31) Leipzig merger of /x/ ([ç]) and [ʃ] (/ʃ/) to [ɕ] (/ʃ/):

a.	diχ´	[diɕ]	Tisch	'table'	183
	diχ´	[diɕ]	dich	'you-ACC.SG'	183
b.	lȩ^{r}χ´ɔ^{r}	[lɛɕɔr]	Löscher	'extinguisher'	183
	lȩ^{r}χ´ɔ^{r}	[lɛɕɔr]	Löcher	'hole-PL'	183
c.	brȩχ´n	[brɛɕn̩]	brechen	'break-INF'	183
	brȩχ´n	[brɛɕn̩]	breschen	'breach-INF'	183
d.	lɑon^{i}χ´	[lɑoniɕ]	launig	'witty'	183
	lɑon^{i}χ´	[lɑoniɕ]	launisch	'moody'	183

From the formal perspective, Leipzig has two phonemic dorsal fricatives (/x ɕ/), which are represented as in (32).

(32) a. /ɕ/

$$\begin{bmatrix}-\text{SON}\\+\text{CONT}\end{bmatrix}$$

$$[\text{CORONAL}] \quad [\text{DORSAL}]$$

b. /x/

$$\begin{bmatrix}-\text{SON}\\+\text{CONT}\end{bmatrix}$$

$$[\text{DORSAL}]$$

The alternations involving [x] and [ɕ] alluded to above are captured with underlying /x/, which shifts to a [coronal, dorsal] fricative |ç| by Velar Fronting-1. That feature complex is interpreted as [ɕ] by (8a).[4]

[4]The difference between (32) and the ones in (20b, 20c) for Schlebusch /ɕ x/ is the presence/absence of a distinctive laryngeal feature. As noted above, Schlebusch /x/ must be marked [+fortis] because it contrasts with [−fortis] /ɣ/. Since Leipzig fricatives do not display a laryngeal contrast, the two fricatives in that dialect lack specification for [±fortis]. The dialect possesses the rules of phonetic implementation in (8), although (8a) makes no reference to fortis fricatives.

10.4 Stage B dialects

10.4.1 Ripuarian (part 2)

Heike (1964) offers a phonetic study grounded in traditional phonemic theory of the Stage B variety spoken in Cologne (Köln; Map 5.1). Note that Cologne is in the direct vicinity of Stage C Schlebusch (§10.3.1). Stage B is also implicit in the phonetic transcriptions provided in one of the dictionaries for Cologne German (KWb).[5]

The Cologne variety has large number of vocalic contrasts, which Heike analyzes as phonemic. Those segments consist of the front vowels /ɪ iː ʏ yː ɛ ɛː e eː œ œː ø øː/, the back vowels /ʊ uː ɔ ɔː o oː ɑ ɑː ə/, and the diphthongs /ei/, /øy/ and /ou/.[6] Heike observes that his dialect possesses a fricative reflex of historical [ç], which I interpret as [ɕ] (=⟦£ʽ⟧), as well as [ʃ] (=⟦ʃ⟧). The author describes ⟦£ʽ⟧ a "… a more or less strongly palatalized [ʃ] … and is articulated with unrounded lips". ("… ist ein mehr oder weniger stark palatalisiertes [ʃ] … und wird mit entrundeten Lippen artikuliert", p. 45).

In postsonorant position the Cologne dialect has two phonemic velar fricatives: /x/ and /ɣ/. As indicated in the postsonorant system depicted in (33) the former is realized as [x] (=⟦x⟧) or [ɕ] (=⟦£ʽ⟧) and the latter as [ɣ] (=⟦ɣ⟧) or [ʝ] (=⟦j⟧). [ɕ] only occurs after a front vowel and [x] after a back vowel. The distribution of [ɣ] and [ʝ] is essentially the same as their fortis counterparts, although palatal [ʝ] (/ʝ/) also occurs word-initially (as in Schlebusch). It is demonstrated below that [ʃ] never contrasts with [ɕ].

(33)

/x/		/ʃ/	/ɣ/	
[x]	[ɕ]	[ʃ]	[ɣ]	[ʝ]

The system in (33) does not illustrate Contrast Type B in (2) because [ɕ] only occurs in the context after a front segment but not after a back vowel. Instead, Cologne exemplifies Stage B in (5): [ɕ] (<[ç]) and [ʃ] (<[ʃ]) have not yet merged together and are still distinct.

[5] Two other sources for Stage B can be mentioned here: (i) the phonetic study of Gleuel (Rpn; Map 5.1) conducted by Heike (1970) and (ii) the treatment of Gabsheim (RFr; Map 5.3) offered by Post (1987: 40).

[6] Heike's choice of symbols for the phonemic vowels and diphthongs is not exactly the same as my own. The differences between the two transcriptional systems are immaterial.

Examples illustrating the occurrence of [ɕ] in the context after a front vowel are presented in (34a) and [x] after a back vowel in (34b). [ɕ] derives historically from a velar (WGmc ⁺[k]). The [ɣ]~[ʝ] alternation in (34c) exemplifies the allophonic relationship involving /ɣ/, which is realized as [ɣ] after a back vowel and as [ʝ] after a front vowel. I analyze [ɕ] in (34a) as an allophone of /x/ and [ʝ] in (34c) as an allophone of /ɣ/. It is not possible to provide a complete set of data with [ɕ ʝ] after every phonemic front vowel because Heike does not give them. In contexts other than after a front vowel, [ʃ] occurs. A representative example for word-initial position is presented in (34d).[7]

(34) Cologne [ɕ] (/x/):

a.	ɪ£ʿ	[ɪɕ]	ich	‘I’	45
	mɪ£ʿ	[mɪɕ]	mich	‘me-ACC.SG’	45
	œːntlɪ£ʿ	[œːntlɪɕ]	ordentlich	‘orderly’	46
	jəzeː£ʿ	[ʝəzeːɕ]	Gesicht	‘face’	46
	bøː£ʿɒ	[bøːɕɒ]	Bücher	‘book-PL’	46
	kʀeː£ʿpɔts	[kʀeːɕpɔts]	Griechenpforte	‘(street name)’	112
b.	˙baːx	[bɑːx]	Bach	‘stream’	90
c.	fUɣəl	[fʊɣəl]	Vogel	‘bird’	50
	fɣjəl	[fʏʝəl]	Vögel	‘bird-PL’	50
d.	ʃlai£ʿə	[ʃlaiɕə]	schleichen	‘creep-INF’	84

It is clear from the discussion in the original source that [ʃ] and [ɕ] never contrast. In Heike’s own words: “Oppositionen zwischen ʃ and £ʿ … existieren nicht … ”. (“Oppositions between ⟦ʃ⟧ and ⟦£ʿ⟧ … do not exist … ”). For example, in the context after a front vowel, dialect speakers are unable to distinguish historical [ʃ] from [ɕ]. Recall from (31) that Leipzig has completely neutralized that contrast to [ɕ] in words like *Löscher* ‘extinguisher’ (cf. StG [lœʃɐ]) vs. *Löcher* (cf. StG [lœçɐ]) ‘hole-PL’. Heike (1964: 46) observes that a similar generalization holds for Cologne, suggesting that Delabialization occurred – or is in the process of occurring – although only in the context after a front vowel. The complementary distribution of [ʃ] and [ɕ] is also clear in the narrow transcription of two

[7]Heike (1964: 46) analyzes [g] (not depicted in 33) and [ɣ] as allophones. I do not discuss the patterning of [g] because that topic is peripheral. Most of Heike’s examples are given in broad transcriptions in diagonal slashes representing phonemes (//). It is possible to reach conclusions on the distribution of the sounds in (33) on the basis of the author’s remarks on allophones and on the basis of his narrow transcriptions enclosed in square brackets. In contrast to my treatment, Heike analyzes [ʃ] and [ɕ] as allophones of the same phoneme because they never contrast.

texts read by native dialect speakers (pp. 131–132): [ɕ] (=⟦£ʿ⟧) surfaces after front vowels and [ʃ] elsewhere. The [ɕ] in those examples derives historically from a velar.[8]

From the formal perspective, the velars /x ɣ/ are represented as in (20c,d) and /ʃ/ as [coronal, labial]. Both /x ɣ/ serve as targets for Velar Fronting-1. In the case of target /ɣ/ Velar Fronting-1 creates |ʝ|, which surfaces as the nonsibilant [ʝ] in a word-internal onset, e.g. [fʏ.ʝəl] ‘bird-PL’ from (34c). In the case of target /x/ the same process produces a complex corono-dorsal segment which is interpreted as the sibilant [ɕ] by (7a).

10.4.2 West Central German

Féry (2017) provides the results of a phonetic investigation involving alveolopalatalization in the speech of four speakers of WCG dialects. Three of the four speakers are from Frankfurt am Main (CHes; Map 7.1), and the fourth is from Montabaur (MFr; Map 5.3). I do not provide a list of the phonemic vowels because they are not made explicit in the original source.

In Féry’s experiment the four speakers were asked to read sentences which included a selection of words containing StG [ç] and [ʃ]. The result showed that there is a strong tendency to replace [ç] and [ʃ] with [ɕ], although there was not a complete neutralization indicative of Stage C dialects. Instead, the alveolopalatalization of [ç ʃ] to [ɕ] (also Féry’s symbols) led to a system in which both [ʃ] and [ɕ] are present. In contrast to all of the dialects discussed above the experiment also indicates the change from historical [ç] to [ʃ]. The results of the experiment are summarized in (35) and (36). Some of the items listed there are loanwords not discussed in the case studies in Chapters 3–9. Féry does not provide full phonetic transcriptions for the German examples; the type of vowels and consonants referred to in the categories listed below can be inferred from the orthography. The realization of [ʃ] as [ɕ] in (35d) and of [ç] as [ʃ] in (36a, 36b) indicate a tendency and not Neogrammarian sound change. By contrast, the change from [ç] to [ɕ] in (36c) is a regular development. I have simplified the categories presented in Féry (2017) in (35) and (36), although those changes are immaterial. Féry (2017) notes that all of her speakers retain [x] in the context after a back vowel, e.g. *noch* ‘still’, *Kuchen* ‘cake’.

[8]In contrast to Große (1957), Heike (1964) does not say explicitly that words like *Löscher* ‘extinguisher’ and *Löcher* ‘hole-PL’ are homophonous, only that dialect speakers cannot distinguish the fricatives in question.

(35) Reflexes of historical [ʃ] in Frankfurt am Main/Montabaur:

a. [ʃ] in syllable-initial position before a back vowel or consonant:
schon ‘already’, Schuhe ‘shoe-PL’, Schnee ‘snow’

b. [ʃ] after a back vowel:
rasch ‘quick’, Sushi ‘sushi’

c. [ʃ] after a (front or back) rounded vowel optionally separated by a consonant:
Kusch ‘shoo!’, Bosch ‘(name)’, Lösch ‘delete-IMP.SG’, hübsch ‘pretty’

d. [ɕ] after a front unrounded vowel:
Fisch ‘fish’, Tisch ‘table’, Fleisch ‘meat’

(36) Reflexes of historical [ç]:

a. [ʃ] in syllable-initial position before a front vowel:
China ‘China’, Chemie ‘chemistry’

b. [ʃ] in coda position after a consonant:
Dolch ‘dagger’, Mönch ‘monk’, durch ‘through’

c. [ɕ] after a front unrounded vowel optionally separated by a consonant:
ich ‘I’, Blech ‘tin’, echt ‘genuine’, Milch ‘milk’

The results of the experiment illustrate the merger of historical [ç ʃ] to [ɕ], but only in the context after a front unrounded vowel. In contrast to all of the other dialects discussed in this chapter, the data presented above also reveal the change from [ç] to [ʃ] in word-initial position before a front vowel or after a consonant.

From the synchronic perspective, the CHes/RFr speakers described above have the system of fortis fricatives as in (37). That system captures both postsonorant and word-initial position.

(37) /x/ /ʃ/

[x] [ɕ] [ʃ]

[x] and [ɕ] never contrast because the former only surfaces after a back vowel and the latter only after a front unrounded vowel; hence, (37) does not reflect (2). The [ɕ] in examples like the ones in (36c) is an allophone of /x/ which is realized as [coronal, dorsal] by Velar Fronting-1 and is interpreted as the sibilant [ɕ] by

(7a).[9] Postalveolar /ʃ/ is clearly phonemic; note that [ʃ] and [x] contrast after a back vowel, e.g. *noch* 'still' with [x] vs. *Bosch* '(name)' with [ʃ]. In contrast to all of the other dialects discussed in this chapter, Delabialization as stated in (22) does not apply. Instead, that change is restricted to the context after front unrounded vowels. Thus, /ʃ/ is realized as [ɕ] in words like *Fisch* 'fish', but otherwise surfaces without change as [ʃ]. See Féry (2017) for an analysis of that change. From the historical perspective [ç] changed to [ʃ] in the contexts specified in (36a, 36b).

10.5 Areal distribution of alveolopalatalization

Table 10.1 provides a list of the alveolopalatalizing varieties of German discussed earlier, but I also include a number of others. All of these places are indicated on the maps for the dialect listed in the second column. Sępóno Krajeńskie (in the final box in that table) can be found on Map 11.2. Many of the sources listed here have been cited in the earlier literature on alveolopalatalization (in particular Herrgen 1986). I do not indicate which of the stages from §10.2 are attested in which variety because that information is not always clear from the source.[10] The sources given here are placed into four separate boxes corresponding to dialect area.

Table 10.1: Alveolopalatalizing varieties of HG and LG

Place	Dialect	Source
Mainz	RFr	Reis (1892)
Ludwigshafen am Rhein	RFr	Krell (1927)
Saarbrücken	RFr	Kuntze (1932), Steitz (1981)
Bad König	RFr	Freiling (1929)
Plankstadt	RFr	Treiber (1931)
Speyer	RFr	Waibel (1932)
Pfungstadt	RFr	Grund (1935)

[9] Based on (35d) and (36c) it appears that [ɕ] is restricted in its occurrence to the context after a front unrounded vowel. No example was found in the original source in which [ɕ] surfaces after a rounded vowel (e.g. StG *Löcher* 'hole-PL'); hence, one cannot know for sure whether or not the set of triggers for velar fronting consists solely of front unrounded vowels.

[10] A few of the works listed in Table 10.1 make only passing reference to alveolopalatalization. For example, Freiling (1929: 8) observes that the articulation in question (constriction between the alveolar ridge and the hard palate) is typical for Bad König, which is about 4km from Zell am Mūmlingtal. (Freiling's data discussed in §9.3 from the latter place do not contain alveolopalatal segments).

Place	Dialect	Source
Nußdorf	RFr	Bertram (1937)
Eberbach	RFr	Kilian (1951)
South Odenwald/Ried	RFr	Bauer (1957)
Darmstadt	RFr	Keller (1961)
Oftersheim	RFr	Liébray (1969)
Zweibrücken	RFr	Castleman (1975)
Wackernheim, Nackenheim, Alzey, Wallertheim, Bechtheim	RFr	Karch (1981)
Gabsheim	RFr	Post (1987)
Michelstadt	RFr	Durrell & Davies (1989)
Birkenfeld	MFr	Baldes (1896)
Kenn	MFr	Thomé (1908)
Kreis Ottweiler	MFr	Scholl (1912)
Arzbach	MFr	Bach (1921)
Burg-Reuland	MFr	Hecker (1972)
Bell	MFr	Mattheier (1987)
Horath (Hunsrück)	MFr	Reuter (1989)
Beuren	MFr	Peetz (1989)
Luxembourg	MFr	Gilles (1999)
Montabaur	MFr	Féry (2017)
Cologne	Rpn	Wahlenberg (1877)
Area north of Aachen	Rpn	Schmitz (1893)
Schlebusch	Rpn	Bubner (1935)
Aachen	Rpn	Welter (1938)
Cologne	Rpn	Heike (1964)
Gleuel	Rpn	Heike (1970)
Elsenborn	Rpn	Hecker (1972)
Burscheid	Rpn	Heinrichs (1978)
Krefeld	Rpn	Bister-Broosen (1989)
Erp (Erftstadt)	Rpn	Kreymann (1994)
Niederbachem, Oberbachem	Rpn	Fuss (2001)
Frankfurt am Main	CHes	Rauh (1921), Bethge & Bonnin (1969), Féry (2017)
Petersberg (Fuda)	EHes	Schwarz (1992)
Kreis Rosenberg	HPr	Kuck (1933)
In and around Chemnitz	USax	Große (1955)

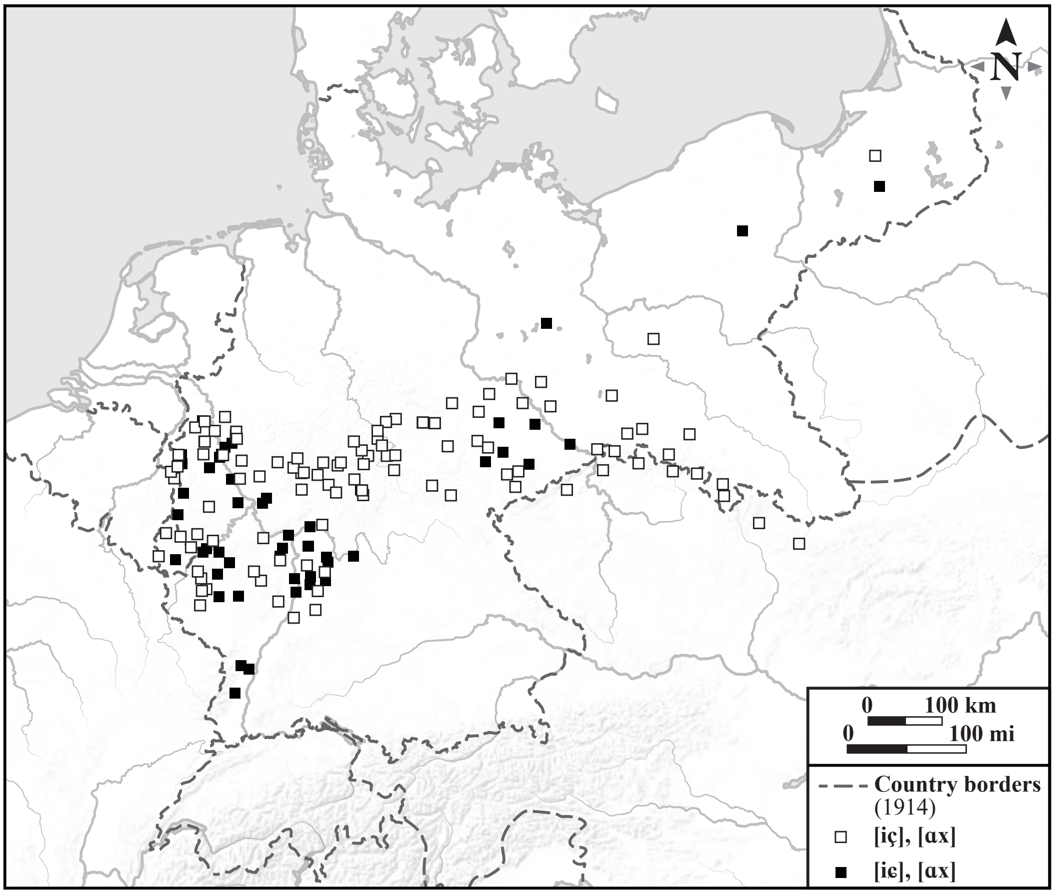
Place	Dialect	Source
Leipzig	USax	Große (1957)
Vorerzgebirge	USax	Bergmann (1965)
Kreis Oschatz	USax	Bethge & Bonnin (1969)
Chemnitz	USax	Kahn & Weise (2013)
Gera	Thrn	Dietrich (1957)
East Thuringia	Thrn	Spangenberg (1974, 1989)
Berlin	NUSax-SMk	Schönfeld (2001)
Aschafftal	EFr	Hirsch (1971)
Barr	LAlmc	Keller (1961)
Benfeld	LAlmc	Rünneburger (1985)
Colmar	LAlmc	Philipp & Bothorel-Witz (1989)
Sępóno Krajeńskie	EPo	Darski (1973)

Data from linguistic atlases complement my own findings on the areal distribution of alveolopalatalization in Table 10.1. In particular, the following three atlases reveal that alveolopalatalization is the norm throughout the Rpn/MFr/RFr dialect areas: (a) MRhSA for MFr/RFr; (b) SNBW for the northwest corner of the German state of Baden Württemberg between Mannheim and Heidelberg (RFr); and (c) SUF for Northwest Bavaria in the general vicinity of Aschaffenburg (RFr).[11,12]

The most important conclusion to be drawn from Table 10.1 is precisely what Herrgen (1986) determined over thirty years ago: Alveolopalatalization is feature of CG. That assessment is illustrated visually in Map 10.1, which indicates that alveolopalatalizing varieties (black squares) predominate in CG areas. Also indicated on Map 10.1 are the CG varieties listed in Appendix C which make no reference to alveolopalatalization (white squares).

[11] Maps 8 and 11 in WSAH document alveolopalatalization in parts of the German state of Hesse between Gießen and Darmstadt (CHes and RFr). Other linguistic atlases reveal that there are parts of WCG with very little alveolopalatalization, e.g. ALLG. The maps in that source (e.g. Map 269 for *Milch* 'milk') show that alveolopalatalization (=⟦š⟧) is the exception rather than the rule in German Lorraine.

[12] In several dialect dictionaries alveolopalatalization is either commented on in the pronunciation guide and/or expressed directly in the spelling *sch* (for etymological [ç]). Examples for Rpn include AaWb, DrWb, KWb, TrWb, WbKM. RFr is represented by SaWb. Alveolopalatalization is also evident from the phonetically transcribed texts in towns and villages throughout the Rpn/MFr dialect areas in Cornelissen et al. (1989). Several places from that source in the Rpn dialect region are indicated on Map 5.1.



Map 10.1: Areal distribution of alveolopalatalization. High German (Central German and Low Alemannic) varieties (and one variety of Low German) with alveolopalatalization are indicated with black squares. Varieties of Central German without alveolopalatalization are indicated with white squares.

On the basis of Table 10.1 and Map 10.1 five generalizations can be made: (A) Alveolopalatalization is much more robustly attested in WCG than in ECG; (B) within WCG, alveolopalatalization is considerably more common in CFr (Rpn/MFr) and RFr than in NHes/CHes/EHes; (C) within ECG, alveolopalatalization is typical of USax and (East) Thrn but not at all for Sln; (D) even in the CG regions where alveolopalatalization is most prevalent, there are still conservative places which retain the original palatal fricative [ç]; and (E) alveolopalatalization is also attested in a few places outside of the CG dialect region (i.e. one attestation for HPr and three for LAlmc). I consider below (D) in more detail. (E) is discussed in §10.6.

Generalization (D) is shown on Map 10.1 by the presence of many white squares. (D) can also be illustrated by focusing on specific alveolopalatalizing areas. Consider RFr (Map 5.3). As indicated on that map, many of the sixteen alveolopalatalizing RFr places from Table 10.1 are situated within close proximity. However, the other sources for RFr indicated on Map 5.3 do not document alveolopalatalization, e.g. Heeger (1896: 4), Wanner (1908: 67), Wenz (1911: 44), Reichert (1914: 9, 74), and Seibt (1930: 57–58) to name a few. A similar finding for Rpn is discussed in Cornelissen (2000: 398–399), who provides a map of alveolopalatalizing and non-alveolopalatalizing towns in the area between Rpn and LFr (recall Map 5.1). Map 349 for *Kirche* 'church' in volume 4 of MRhSA similarly depicts a number of places with [ç] surrounded by places with the alveolopalatal.

Although a number of conclusions concerning alveolopalatalization can be drawn from Table 10.1 and Map 10.1, there is an additional factor that has unfortunately not been taken into consideration, namely the time dimension. The point is that it is possible for a dialect in a particular place to be be non-alveolopalatalizing at one point in time but as alveolopalatalizing at a later point. Consider the following two examples:

Jardon (1891) discussed the Rpn dialect spoken in and around Aachen at the end of the nineteenth century and gave no indication in his book for alveolopalatalization. Forty-seven years later Welter (1938) also described the Aachen dialect, but he consistently transcribed the fortis palatal fricative [ç] with ⟦š⟧, suggesting that the various stages of alveolopalatalization posited above had been complete at the time he conducted his fieldwork. Welter's observations concerning the realization of [ç] has also been documented in the 1970 dictionary for the Aachen dialect (AaWb), p. XL, XLI. A similar conclusion can be drawn for descriptions of the Saarbrücken dialect: Kuntze (1932) transcribed the historical palatal fricative with the traditional symbol ⟦χ⟧ and only mentioned in passing (p. 94) that ⟦χ⟧ is often replaced with ⟦š⟧. Forty-nine years later, Steitz (1981) transcribed historical [ç] – and historical [ʃ] – consistently as ⟦ʃ⟧ in his description of the Saarbrücken dialect, but he made no mention at all of the earlier pronunciation with [ç]. In the pronunciation guide of the 1984 dictionary for the Saarbrücken dialect (SbWb) the distinction between *ch* ([ç]) and *sch* ([ʃ]) is likewise completely neutralized to *sch* ([ʃ]), e.g. *Fisch* 'fish' and *Biescher* 'book-PL' (pp. 11–22). No mention is made in SbWb of the ich-Laut.[13]

[13] On the other hand, alveolopalatalization is attested early in other places, e.g. Rauh (1921: 11) is explicit that Frankfurt am Main already had it in 1921, long before Féry's (2017) study confirmed that finding for a later generation of speakers. See §10.6.1 for even earlier attestations of alveolopalatalization in other cities.

These examples confirm the conclusion already made by Große (1957) for USax: Alveolopalatalization is an example of change in progress. The shortcoming of Map 10.1 is that the status the of the non-alveolopalatalizing places (white squares) is subject to change through time. Those markers depict places that were described without alveolopalatalization many years ago, but a closer examination of those same places today may reveal that the change from [ç] to [ɕ] has already taken place.

10.6 Discussion

The present section considers three topics alluded to earlier, namely the origin and spread of alveolopalatalization (§10.6.1), the realization of the lenis nonsibilant fricative [ʝ] (§10.6.2), and changes involving underlying representations (§10.6.3).

10.6.1 Origin and spread of alveolopalatalization

Alveolopalatalization is a relatively recent phenomenon with its first attestations in the second half of the nineteenth century (Herrgen 1986: 97ff.). To the best of my knowledge the earliest sources referring to the phenomenon are Wahlenberg (1877: 21) for Cologne, Trautmann (1884–1886: 281) for the area south of Leipzig, Reis (1892) for Mainz, and Schmitz (1893: 150) for the area north of Aachen. Wahlenberg (1877: 281) writes of the pronunciation of ch:

> ...mit harter, gutturaler Aussprache, nach a o ǫ u au und mit weicher, palataler und dem sch liegender Aussprache nach e ę i ö ǫ̈ ü ei äu ...
>
> “ ... with [a] hard, guttural pronunciation after a o ǫ u au and with [a] soft, palatal pronunciation close to [that of] sch after e ę i ö ǫ̈ ü ei äu ...”

A scrutiny of the literature cited throughout this chapter on alveolopalatalization reveals that the emergence of [ɕ] did not simply occur at one particular time and place (monogenesis), but that it instead transpired at different places – typically urban areas – within the CG dialect area and at different times for any given area (polygenesis). The dialects referred to here can therefore be thought of as ALVEOLOPALATALIZING ISLANDS. To cite one of the sources cited above, Reis (1892) observes the change to [ɕ] (=⟦sch⟧) in the late nineteenth century pronunciation of Mainz German (Map 5.3), but some of the related MFr varieties indicated on Map 5.3 in the neighborhood of Mainz (written during the same general time frame) made no mention of alveolopalatalization. Recall from the previous section that the RFr varieties in Table 10.1 are surrounded by other RFr varieties without alveolopalatalization.

The clearest case of an alveolopalatalizing island in Europe is the variety of HPr described by Kuck (1933), which was once spoken in Kreis Rosenberg in West Prussia (Map 11.2). In particular, Kuck (1933: 148) observes that the fortis palatal fricative [ç] (=⟦χ⟧) is pronounced as ⟦š⟧, especially among young speakers. Significantly, Kreis Rosenberg appears to be unique for its area because alveolopalatalization has not been documented for other varieties of German once spoken in that general region (Chapter 11).

There are two additional examples of alveolopalatalizing islands listed in Table 10.1. The first is the only LG variety known to me with alveolopalatalization (Sępóno Krajeńskie). The original source for that place (Darski 1973) consistently transcribes the modern reflex of historical [x] as [x] after back vowels and as [ɕ] after front vowels, e.g. [hɛʊx] 'high' vs. [rɛɕt] 'right'. The second example is a cluster of three places (LAlmc) in Alsace, namely Barr, Benfeld, and Colmar (Map 3.1). The sources listed earlier for those three varieties are clear that alveolopalatalization is under way, especially among the younger generation of speakers. That alveolopalatalization for Alsace is exceptional is clear from an examination of the maps in ALA. For example, Map 217 shows the realization of the etymological palatal [ç] as alveolopalatal (⟦š⟧) for the word *Hecht* 'pike' is restricted to a small area (Sainte-Marie-aux-Mines) to the northwest of Colmar.

Alveolopalatalization is not typical for the German-language islands discussed in this book, but two cases are known to me of alveolopalatalization within German-language islands in the United States.

The first is the LG variety spoken in Concordia, Missouri (USA) described by Ballew (1997). According to that source (Ballew 1997: 57), Concordia German has both [ç] and [x], but the former fricative tends to be indistinguishable from [ʃ] in the context after high front vowels. The two examples cited are *Geschichte* 'history' (/kəʃɪçtə/ or /kəʃɪʃtə/) and *durstig* 'thirsty (/dɛstɪç/ or /dɛstɪʃ/). In the absence of phonetic evidence, it is not possible to know if Ballew's [ʃ] is [ʃ] or [ɕ], but the important point is that this is an alveolopalatalizing island (restricted to the post-high front vowel context) in a German-language island geographically far removed from its point of origin.

The second case is Texas German (Boas 2009). The earliest work on that dialect was an unpublished dissertation by Fred Eikel from 1954, which I was unable to find (see Pierce et al. 2018 for discussion). However, a description of the phonology of that dialect was published twelve years later (Eikel 1966). It is clear from Eikel (1966) that Texas German – referred to more specifically in that source as New Braunfels German – had [x] and [ç], which were distributed as in StG

(Eikel 1966: 258–260). Eikel also observed that the lenis fricatives [ɣ ʝ] had a parallel distribution; hence, in present terms Texas German in 1966 and before had Velar Fronting-1 but no alveolopalatalization. The data from Eikel (1966) are corroborated in many of the maps in the linguistic atlas for this area (LATG), which appeared in 1972. Significantly, in the introduction to that atlas the author (Glenn G. Gilbert) writes (p. 2): "For many speakers, [ç] and [ʃ] coalesce in all positions." That coalescence is expressed formally with Gilbert's phonological rule (6), which converts [ç] into a (nonanterior) sibilant fricative. The important point is that those speakers with coalescence retained Velar Fronting-1 with alveolopalatalization (Stage C).[14]

The investigation of alveolopalatalization from the sociolinguistic perspective also points to alveolopalatalizing islands. See, for example, Auer (2002: 25ff.), Wiese (2012: 38), and Jannedy & Weirich (2014) on the realization of [ʃ ç] as [ɕ] in various ethnolects spoken in Berlin.

The upshot of all of the studies cited above is the following: Alveolopalatalization did not occur in a single place and from there spread outwards in terms of space (and time). Instead, the evidence suggests that polygenesis is the correct interpretation.

It has been asserted repeatedly in the literature that alveolopalatalization is an intergenerational change (§2.5). For example, Kuck (1933) observes that alveolopalatalization in Kreis Rosenberg was initiated by young speakers. That alveolopalatalization involves intergenerational change is especially prominent in descriptions of USax and Thrn. For example, in his study of the Thrn dialect spoken in Gera (Map 7.2), Dietrich (1957: 61) notes that [ç] shows the effects of alveolopalatalization among younger speakers (especially female). In one of his study on USax, Große (1955: 49) writes: "Man kann sagen, daß die älteste Generation nur ganz selten, die mittlere occassionell, die jüngere schon mit vielen Vertretern usuell χ‘ artikuliert". ("One can say that the oldest generation articulates χ (=[ç], T.A.H.) only rarely, the middle generation occasionally, and the younger generation quite often (lit. "with many representatives")".)

[14]In his earlier work on the German dialect of Kendall and Gillespie counties, Gilbert did not mention the coalescence referred to above (Gilbert 1963, 1964, 1970). The palatal [ç] was also documented many years later (Roesch 2012: 115) in a variety of Texas German which historically has no velar fronting (Texas Alsatian). The case of Texas German can be contrasted with the most well-known and well-researched German-language island in the United States (Pennsylvania German), where [ç] and [x] occur as positional variants without any sign of alveolopalatalization. See Reed (1947: 277), who describes a pattern for [ç] and [x] analogous to StG. Additional references include Frey (1942: 4), Buffington & Preston (1954: 7), and Kelz (1971: 78–79; 91–93).

Although it is not possible to conclude from the works cited in Table 10.1 that alveolopalatalization involves more than one stage, this conclusion can be reached on the basis of the CG dialects described in §10.3 and §10.4. Those studies suggest that alveolopalatalization affected first the palatal allophone [ç] produced by velar fronting (Stage B) and only later [ʃ] (Stage C). As noted above, the data from Frankfurt am Main/Montabaur suggest that Delabialization (/ʃ/ > /ɕ/) did not simply restructure every instance of /ʃ/ to /ɕ/ in one fell-swoop in a context-free fashion. Instead, the data from Féry's speakers indicate that the change from /ʃ/ to /ɕ/ occurs only in the context after front unrounded vowels.

One can speculate that Delabialization in all alveolopalatalizing dialects exhibits a gradual broadening of the context according to the rule generalization model described in §2.4.1: The change occurs first after front unrounded vowels and only later is the change extended to all other contexts. The Frankfurt am Main/Montabaur data reflect the first stage and the remaining dialects discussed above the second stage. Future research on dialects currently undergoing alveolopalatalization may shed light on the incremental changes described here.

Stage C dialects (e.g. Schlebusch, Luxembourgish, Leipzig) represent focal areas because they exhibit alveolopalatalization to its fullest extent. When alveolopalatalization was first phonologized in those places it reflected the more narrow Stage B dialects.

In any case, the evidence is clear that alveolopalatalization affected first [ç] and only later [ʃ] – a generalization deriving support from the modern dialects discussed above. Additional evidence for my claim comes from unattested dialects. In particular, no dialect has been uncovered in the present survey in which alveolopalatalization affects only [ʃ] but not [ç]. The type of unattested synchronic system described here is depicted in (38a). Likewise no dialect is known in which there is a three-way contrast among velar, palatal, and alveolopalatal (=38b). Note that the system in (38b) would be a dialect like the ones described in Chapter 9 in which /x/ and /ç/ are phonemic together with Delabialization of earlier /ʃ/ to /ɕ/.

(38) a. /x/ → [x] [ç]; /ɕ/ → [ɕ]

b. /x/ → [x]; /ç/ → [ç]; /ɕ/ → [ɕ]

If the systems in (38) are truly unattested then the conclusion is that alveolopalatalization affected first the palatal [ç] and only later on the postalveolar [ʃ], which is precisely the progression presupposed in the present chapter (recall

3–5). Only future studies on alveolopalatalization in progress can lend further support to my observation.[15]

10.6.2 Realization of the lenis palatal fricative [ʝ] in German dialects

Recall from §10.3.1 that Schlebusch targets both /x/ and /ɣ/ for velar fronting but that of the two [coronal, dorsal] sounds created by that process only the fortis one is interpreted as a sibilant by (8a). By contrast, the lenis palatal fricative ([ʝ]) fails to surface as alveolopalatal (*[ʑ]). It interesting to observe that the realization of [ʝ] as a nonsibilant holds for any [ʝ] in Schlebusch, regardless of the synchronic or diachronic source. In particular, there is the palatal [ʝ] deriving from /ɣ/ by velar fronting in words like [beːʝə] 'bend-INF' (=⟦bēːjə⟧) from (18b) as well as word-initial [ʝ] deriving from either WGmc ⁺[j] in words like [ʝɔː] 'yes' (=⟦jǫ⟧) or fromWGmc ⁺[ɣ] in items like [ʝɛl] 'yellow (=⟦jęl⟧); recall (12b).

The same generalizations involving [ʝ] hold for the other two dialects discussed above with that sound. In Cologne (§10.4.1) the lenis fricative [ʝ] surfaces as a nonstrident sound in a word-internal onset, e.g. [fʏʝəl] 'bird-PL' (=⟦fyjəl⟧) from (34c), and word-initially, e.g. [ʝəzeːɕ] 'face' (=⟦jəzeː£⟧) from (34a). The facts are essentially the same in for Lxm [ʝ] alluded to in §10.3.2. See Gilles (1999) for discussion.

There are two lenis palatal fricatives that need to be distinguished: (a) Palatal [ʝ] that is the modern reflex of an earlier velar (WGmc ⁺[ɣ]), and (b) palatal [ʝ] that is the modern reflex of the palatal glide (WGmc ⁺[j]). The [ʝ] in (a) appears to be immune to phonetic implementation rules akin to the ones in (6–8) in all dialects discussed in the present book. That generalization holds for [ʝ] in word-initial position, as well as [ʝ] in a word-internal onset. Examples for both contexts were given above for Schlebusch. For additional dialects with [ʝ] the reader is referred to the case studies discussed below in Chapters 11–12 and 14.

One might suggest that there are CG dialects in which the [ʝ] from an earlier velar is in fact a sibilant ([ʑ]) but that the linguists describing the dialects in question chose to ignore that detail. I consider that scenario to be unlikely. Authors of Ortsgrammatiken placed a great deal of emphasis on phonetic detail. Recall from Chapter 1 that many of the authors of those works were well-versed in phonetics and also that phonological notions like phonemes and allophones had not yet been discovered. If historical [ç] is realized as a sibilant and assigned a new phonetic symbol, why not do the same with historical [ʝ]? It is also important to stress that a sound similar to the lenis equivalent of [ɕ] was known to all of the

[15]In a dialect I discuss below (Dithmarschen), I point out that a possible interpretation of the system of fortis fricatives is precisely the one depicted in (38a).

authors of Ortsgrammatiken, namely the lenis counterpart to the postalveolar fricative [ʃ] (=[ʒ]), which is present in many loanwords from French, e.g. *Etage, Journal*.

It is surprisingly difficult to find descriptions of German dialects in which historical [ʝ] (<WGmc $^{+}$[ɣ]) is realized as alveolopalatal. I tentatively consider this gap as systematic because the facts follow from the way the phonetic implementation rules in (6–8) are stated. Future research might investigate whether or not there are dialects like the ones I have been unable to find.[16]

Several dialects are reported to have a lenis – presumably sibilant – realization of the etymological palatal. Nine such dialects (all LG) are known to me. I present data and a brief analysis for one of those dialects below and make passing reference to the other eight. In contrast to the alveolopalatalizing dialects discussed in the first part of this chapter very little is known about the dialects discussed below.

Kohbrok (1901) describes a NLG dialect spoken in the county of Dithmarschen on the west coast of the German state of Schleswig-Holstein (Map 4.1). The significance of Dithmarschen is that the modern reflex of the etymological palatal is a lenis fricative Kohlbok represents as ⟦ž⟧, which he describes (pp. 15–16) as the voiced (lenis) equivalent of [ʃ] (=his ⟦š⟧). I interpret Kohlbok's ⟦ž⟧ as the lenis alveolopalatal fricative and therefore transcribe it below as [ʑ].[17]

The realization of WGmc $^{+}$[j] in Dithmarschen as [ʑ] is illustrated for word-initial position before any type of vowel in (39a) or in a word-internal onset in (39b). [ʑ] does not surface in syllable-final position. The data in (39c, 39d) demonstrate that Dithmarschen also has [x] in the context after a back vowel and [ç] after a front vowel. Significantly, the [ç] in (39d) is not realized as an alveolopalatal ([ɕ]). There is no lenis fricative [ʝ] (<WGmc $^{+}$[ɣ]) in Dithmarschen because that historical sound either deleted or restructured to [g] (/g/) by g-Formation-1 (§4.2). Fortis postalveolar [ʃ] (=⟦š⟧) occurs initially and finally (in 39e). That fricative derived historically from WGmc $^{+}$[sk].

[16]Schirmunski (1962: 369–370) observes that certain LG dialects realize [ʝ] (<$^{+}$[j]) as a sibilant but his source (Grimme 1922) does not provide clear examples indicating that change. More recently, Goltz & Walker (1989: 42) note without comment that the etymological palatal in NLG (their North Saxon) is "… often realized as the fricative [ʒ] or the affricate [dʒ]".

[17]Stammerjohann (1914) offers a phonetic study of the sounds in the NLG community of Burg in the county of Dithmarschen. While he concurs that Burg possesses ⟦ž⟧, he stresses that the phonetic facts of the Burg variant of that sound are not exactly the same as they are for Kohbrok's speakers. In particular, the tongue tip for ⟦ž⟧ lies closer to the alveolar ridge than it does for ⟦š⟧; Stammerjohann (1914: 67).

(39) Dithmarschen fricatives:

a.	žōɑ	[ʑoːɐ]	Jahr	'year'	75
	žym	[ʑym]	ihr, euch	'you-PL'	71
	žyg	[ʑyg]	Joch	'yoke'	30
	žø̄ɑn	[ʑøːɐn]	Jürgen	'(name)'	71
b.	kɒužə	[kɒuʑə]	Koje	'berth'	75
c.	ɑχdɑ	[ɑxdɐ]	hinter	'behind'	72
	doχtɑ	[doxtɐ]	Tochter	'daughter'	75
	hɒuχ	[hɒux]	hoch	'high'	75
d.	ryx	[ryç]	Rücken	'back'	70
	rex	[reç]	recht	'right'	27
	stīx	[stiːç]	Steig	'hill-climbing'	32
e.	šūɑ	[ʃuːɐ]	Schauer	'shower'	74
	šrĩm	[ʃrĩm]	schreiben	'write-INF'	74
	diš	[diʃ]	Tisch	'table'	74

As in all other LG varieties investigated in this book, WGmc $^+$[j] (/j/) underwent Glide Hardening to pre-Dithmarschen $^+$[ʝ] (/ʝ/). Dithmarschen is unique in that the new palatal fricative is now realized as [ʑ]. The phonological representation for the two fricatives in question ([ʝ] and [ʑ]) is identical, namely [coronal, dorsal]. The change from the former to the latter therefore did not involve phonology at all, but instead fell within the realm of phonetic implementation. At the pre-Dithmarschen stage only simplex coronal fricatives were interpreted by phonetic implementation as sibilants (by 6b). The change from pre-Dithmarschen to Dithmarschen therefore involved the retention of (6b), which is restated in (40b), and the addition of a special provision for complex lenis fricatives in (40a).[18]

(40) Phonetic Implementation:

a. Lenis complex fricatives ([coronal, dorsal]) are interpreted as sibilants ([ʑ]).

b. Simplex [coronal] fricatives are interpreted as sibilants ([s, z, ʃ]).

[18] As noted earlier, virtually nothing is known about the phonology and phonetics of data like the ones in (39). Hence, other analyses are conceivable. For example, one could analyze [ʃ] as [coronal, labial] and restate (40a) so that [coronal, labial] fricatives (both lenis and fortis) are interpreted as sibilants. It might also be the case that what I transcribe as [ʃ] is really alveolopalatal [ɕ], suggesting that Dithmarschen represents the unattested system in (38a).

The original source for Dithmarschen also makes clear that the dialect possesses other simplex coronal fricatives: (a) a voiceless ("stimmlose") dental fricative (=⟦ʃ⟧) occurring word-initially before a vowel (e.g. [siːd] (=⟦ʃīd⟧ 'side'), and (b) a (nonstrident) lenis dental fricative [ð], e.g. [foːðɐ] 'father' (=⟦fōðɑ⟧), which is the modern reflex of WGmc +[d] in the context after a vowel, but only before the vocalized-r. It appears that [ð] is still an allophone of /d/ in the synchronic phonology. I leave open how to analyze those additional fricatives, but in any case those structures must be made immune to (40a).

Eight additional varieties are known to me of LG dialects in which the etymological palatal is realized as a lenis – presumably alveolopalatal sibilant – fricative [ʑ̥]. Those places (together with Dithmarschen) are listed in Table 10.2, which I comment on below.

Table 10.2: Varieties of WLG and ELG in which WGmc +[j] is realized as a sibilant fricative ([ʑ̥]).

Place	Dialect	Source
Burg (Dithmarschen)	NLG	Kohbrok (1901), Stammerjohann (1914)
Bergenhusen	NLG	Sievers (1914)
Heide (Dithmarschen)	NLG	Jörgensen (1928/1929)
Diepenau	NLG	Schmeding (1937)
Altenwerder	NLG	Höder (2010)
Lüneburger Wendland	Brb	Selmer (1918)
West Mecklenburg	MeWPo	Kolz (1914)
South Mecklenburg	MeWPo	Jacobs (1925a,b, 1926)
Kaarβen	MeWPo	Dützmann (1932)

The closest place listed in Table 10.2 to Dithmarschen geographically is Heide (Jörgensen 1928/1929); Map 4.1. In that work, Jörgensen consistently transcribes the etymological lenis palatal fricative as ⟦ž⟧. A similar example is Bergenhusen (Sievers 1914). An examination of the words listed in the historical part of that book with WGmc +[j] reveals that that sound has been replaced with a sibilant. The facts are the same in Diepenau (Schmeding 1937; Map 4.1). According to that source (pp. 43–44), WGmc +[j] is regularly realized as ⟦ž⟧ in word-initial position, e.g. ⟦žǭ⟧ 'yes' (cf. StG *ja*), ⟦žūxn⟧ 'cheer-INF' (cf. StG *jauchzen*). Höder (2010: 7) similarly notes that WGmc +[j] can be realized in Altenwerder as a sibilant fricative in initial position. The ELG varieties in Table 10.2 are depicted on Map 11.1. For the Brb variety of the Lüneburger Wedland, Selmer (1918: 55–57) observes that WGmc $^{+}$[j] is realized as ⟦ž⟧, which he refers to as the assibilated ("assibilierte") realization of the etymological palatal. The same generalization holds in the three varieties of MeWPo listed above. Kolz (1914: 148) writes that for speakers in rural areas (his "Lingua vulgaris=Lv.") WGmc $^{+}$[j] is realized as a sibilant fricative. According to Jacobs (1925b: 123), WGmc $^{+}$[j] is regularly realized as ⟦ž⟧ in onset position ("Anlaut"), e.g. ⟦žå˙⟧ 'yes', ⟦ho˙žå˙n̄⟧ 'yawn-INF' (cf. MLG *hojanen*).[19] Finally, in his list of consonants for Kaarβen, Dützmann (1932: 12) lists no [j] (or fricative [ʝ]). In his discussion of the phonetics (p. 14), he remarks that the etymological palatal (his ⟦ž⟧) is "formed like [š]". ("Es bildet sich wie das *š*").[20]

10.6.3 Underlying representations

Recall from the discussion of Schlebusch (§10.3.1) that there are two types of words with [ɕ] after a front vowel: Those in which [ɕ] is underlyingly /ɕ/ in (14) and those in which [ɕ] is underlyingly /x/ in (17). As noted earlier, the [ɕ] in the latter dataset does not alternate with another sound. Underlying and phonetic representations for representative examples from those two datasets are presented in (41a) and (41b) respectively. The Stage C column represents Schlebusch as it was described in 1935 by Rudolf Bubner. Stage B represents the pre-Schlebusch stage before Delabialization restructured /ʃ/ to /ɕ/. I discuss Stage D below. In the final column I indicate the diachronic source of alveolopalatal [ɕ] in these items.

(41)		Stage B:	Stage C:	Stage D:		
	a.	/veʃ/ [veʃ]	/veɕ/ [veɕ]	/veɕ/ [veɕ]	'fish'	< [ʃ]
	b.	/ex/ [eɕ]	/ex/ [eɕ]	/eɕ/ [eɕ]	'I'	< [ç]

The examples here are drawn from a specific Rpn-speaking community (Bubner 1935), although the issue discussed here holds for all Stage C varieties.

The underlying representations for pre-Schlebusch (Stage B) are justified because [ɕ] at that point was still an allophone of /x/ and /ʃ/ was uncontroversially a contrastive (phonemic) sound. At issue are the underlying representations at

[19] Jacobs (1925b: 130) gives one example in which the modern reflex of historical [ɣ] is ⟦ž⟧, namely ⟦brü˙žå˙m⟧ 'bridegroom' (cf. StG *Bräutigam*). This appears to be an irregular form (§12.8.3), since historical [ɣ] is usually realized in South Mecklenburg as [g] between vowels.

[20] The dictionary for the Schleswig-Holstein dialect (SchlHWb) consistently transcribes [ʝ] as ⟦ž⟧ (=[ʒ]), e.g. *Gicht* 'gout' (⟦žixt⟧) and *jung* 'young' (⟦žuŋ⟧). Since SchlHWb is intended to reflect a large area, the implication is that the realization of [ʝ] as a sibilant is much more widespread than what is suggested by the small list of places in Table 10.2.

Stage C: How are post-1935 speakers of Schlebusch not knowledgeable of the history of their dialect able to deduce that surface [ç] is /ç/ in (41a) but /x/ in (41b)?

I argue that /veç/ 'fish' and /ex/ 'I' were correct for the first generation of Stage C speakers of Schlebusch. The first generation individuals referred to here were those speakers who were the first to restructure underlying representations like /veʃ/ to /veç/. However, once later generations were exposed to words like [veç] and [eç] it was inevitably the case that the Stage B (and first generation Stage C) underlying representation for /ex/ was restructured to /eç/. That modification occurs at Stage D. The reason for that restructuring is that those speakers were ignorant of the history of their dialect and that there was no evidence for analyzing [eç] as anything other than /eç/. This point aside, Stage D speakers inherited Velar Fronting-1 in order to account for [x]~[ç] alternations like the ones in (15). The underlying and phonetic representations for a representative example for Pre-Schlebusch (Stage B) and Schlebusch (Stage C/D) are presented in (42):

(42)

	Stage B:	Stage C/D:		
a.	/lɔx/ [lɔx]	/lɔx/ [lɔx]	'hole'	< [x]
b.	/løːx-ə/ [løːçə]	/løːx-ə/ [løːçə]	'hole-PL'	< [ç]

Significantly, the restructuring of /ex/ 'I' to /eç/ by Stage D speakers in (41b) did not affect the underlying representations of alternating examples like the ones in (42). That restructuring did not occur in items like [løːçə] 'hole-PL', which continued to be analyzed with /x/ as /løːx-ə/ because of the related form with [x] (i.e. [lɔx]).

Recall from earlier chapters that underlying palatals which derived historically from velars – palatal quasi-phonemes and phonemic palatals – invariably occur in the context of a back vowel. The treatment of Stage D nonalternating morphemes in (41b) is significant because it reveals that there are also some dialects in which underlying palatals (/ç/) deriving from etymological velars also occur in the context of front vowels. The change from Stage C /x/ to Stage D /ç/ after a front vowel in (41b) may appear to involve a version of velar fronting, but closer examination reveals that the change in question was not phonological. First, the replacement of /x/ with /ç/ after front vowels failed to affect the /x/ in alternating examples in (42b). And second, the change from velar fricative to its fronted counterpart involved the restructuring of underlying representations, but no version of velar fronting in any of the dialects discussed in Chapters 3–9 alters underlying representations. It is also possible that the change from /x/ to /ç/ in (41b) might not have affected all words like /eç/ 'I' at once, but instead that it occurred on a word-by-word basis. Since no evidence is present in any of the original sources for Stage C dialects which bears on this question I leave that possibility open.

10.7 Conclusion

This chapter has investigated alveolopalatalization ([ç ʃ] > [ɕ]), which is a common feature of CG dialects. It was argued above that the historical change from [ç ʃ] to [ɕ] involved two distinct changes, namely (a) the change from [ç] to [ɕ] (Stage B) followed by the change from [ʃ] to [ɕ] (Stage C). At Stage B [ɕ] was still an allophone of /x/ and had not yet merged with [ʃ] (/ʃ/). At Stage C the alveolopalatal fricative [ɕ] is phonemic (/ɕ/) because it contrasts with [x] (/x/) in the context after back vowels. The allophonic rule of velar fronting at Stage B was inherited at Stage C as a rule neutralizing the contrast between /x/ and /ɕ/ in the context after front vowels. Velar fronting at Stage B and at Stage C does not differ formally from the eponymous rule discussed for other dialects in earlier chapters: The feature [coronal] spreads from a front segment to a [dorsal] target (/x/), thereby producing a complex [coronal, dorsal] segment. That feature complex is interpreted as a sibilant ([ɕ]) at Stage B and Stage C by phonetic implementation.

11 Velar noncontinuants as targets

11.1 Introduction

The focus of the present chapter lies in German dialects in which the set of velar fronting targets includes at least one velar noncontinuant in addition to at least one velar fricative (/ç/ or /ʝ/). Velar noncontinuants are defined here as velar stops (/k g/) and the velar nasal (/ŋ/). When those sounds undergo fronting, the corresponding palatals are created, namely [c ɟ ɲ]. The investigation is oriented towards those palatal noncontinuants in native words which derived from either etymological velars or from new velars created by independent changes. It is demonstrated below that the historical rule of velar fronting is active synchronically, although the version of that process can differ depending on the type of segments that serve as targets and/or triggers.

In terms of area, the dialects investigated are – for the most part – situated in the northeast of pre-1945 Germany (Map B.1 in Appendix B), a region comprising the former provinces of East Pomerania (Ostpommern), Posen, West Prussia (Westpreußen), and East Prussia (Ostpreußen). From the perspective of dialect affiliation, the varieties in question belong to ELG (EPo, LPr) and ECG (HPr). Three places outside of the region described above are attested in which velar noncontinuants serve as triggers for fronting. Those three outliers are (a) one variety of ELG (MeWPo) in the far west of the modern-day German state of Mecklenburg-Vorpommern and (b) two ECG varieties (both Sln) in the southeast of the modern-day German state of Saxony (Sachsen).

The material presented below is significant because it provides evidence from dialects described in the modern era for two distinct stages of velar fronting: A first stage with a narrow set of targets (fricatives) and a later stage with an expanded set (velar consonants).

Since most of the places discussed below were situated in the eastern realm of the German-speaking world prior to 1945, they were therefore coterritorial with Slavic languages which possess consonants phonetically similar to [c ɟ ɲ]. Although the change from velar noncontinuants to the corresponding palatals was uncontroversially endemic to German, I suggest that contact with Slavic languages probably played a role in their phonologization.

As indicated in the title of this chapter, dialects are investigated below with an expanded set of target segments for velar fronting. However, this chapter also considers the extent to which velar fronting triggers can differ depending on dialect. The generalizations concerning targets, triggers, and outputs are stated here:

Targets: These segments can consist of some subset of the class of velar consonants (/x ɣ k g ŋ/). In some places that set of target sounds can be broad (velar consonants), and in others narrow (velar fricatives).

Triggers: These sounds can vary from place to place. Many varieties have the broadest set of triggers (coronal sonorants), while others have a narrower set (e.g. front vowels, nonlow front vowels).

Outputs: In the dialects described below the target sound does not change its manner of articulation when fronted; hence, the manner of the target sound is the same as the manner of the output (after velar fronting). This means that the velar fricatives /x ɣ/ surface as palatal fricatives – alveolopalatalization is not a typical feature of this area – and that the velar nasal /ŋ/ surfaces as the palatal nasal. Generally speaking, the same statement holds for stops, so /k g/ surface as the corresponding palatals ([c ɟ]). For one variety discussed below in §11.5 /k g/ are realized as palatal fricatives when fronted; however, it is demonstrated in that section that velar fronting only alters place (velar→palatal) and that the change in continuancy (stop→fricative) is the result of a separate process.

It has been observed (e.g. Mitzka 1943: 125) that the fronted realization of velar stops /k g/ in EPo can be affricates (e.g. [tʃ dʒ]). I do not dispute that observation, although it needs to be stressed that the affricate realization is not well-documented in the sources cited below. It is possible that velar fronting is simply responsible for shifting /k g/ to palatal stops and the realization of those palatal stops as affricates is due to phonetic implementation (§2.2.1). It is also conceivable that the change from /k g/ to affricates is accomplished in the phonology and not in the phonetics; if so, that interpretation suggests that the change reflects an instance of the broader set of outputs characterized by Velar Palatalization (§2.3.1). Since the data discussed below do not allow one to decide which of the two interpretations is correct, I simply leave the question open.[1]

[1] Recall from Appendix I that the historical process usually referred to as Velar Palatalization typically has affricates as output sounds in Slavic, Romance, North Germanic, and West Germanic (OE, OFr).

Since the output parameter does not play a significant role, I concentrate below on triggers/targets. The trigger/target parameters are important because they shed light on the way in which velar fronting spread through time and space – a topic dealt with at greater length in Chapter 12.

The sounds that constitute the set of targets for velar fronting consist not only of historical velars, but also of velars created from etymologically non-velar sounds. The two changes referred to are presented in (1):

(1) a. Wd-Initial Nasal Place Assimilation: [n] > [ŋ] / $_{\text{wd}}$[k ___
    b. Velarization: [nd nt] > [ŋ] / ___

Wd-Initial Nasal Place Assimilation creates [kŋ] clusters that are realized as [kn] in other dialects (cf. MStGm [knɔxən] 'bone'). That new [kŋ] sequence is a potential target for velar fronting if that process applies in word-initial position. I make the noncrucial assumption here that postvocalic velar nasal plus velar stop sequences ([ŋk]) were inherited (from WGmc $^{+}$[ŋk]) and that there never was a stage in which [nk] was attested. Velarization is the name for the change from alveolar to velar depicted in (1b); see Schirmunski (1962: 395–400) and Werlen (1983), who use the traditional term "gutturalization". For example, the cluster [nt] preserved in StG words like *unten* [ʊntən] 'under' is realized in velarizing dialects as [ŋ]. That sound is a potential target for velar fronting provided that a front segment precedes it.[2]

Many of the dialects discussed in this chapter possess underlying palatal non-continuants (palatal quasi-phonemes and/or phonemic palatals), i.e. /c ɟ ɲ/. All dialects have the etymological palatal (/j/). Since the following case studies are quite complex, I attempt to economize by referring on occasion to underlying palatals without specifying the type of palatal and only make passing reference to the distinction between palatal quasi-phonemes, phonemic palatals, and etymological palatals.

I economize in another way as well. In particular, given the large number of targets and triggers it is not feasible to provide a sample word for each phonemic vowel in the neighborhood of every target segment for word-initial and post-sonorant position in each of the dialects investigated. The correct context for each case study was determined on the basis of the data in the original sources; hence, I typically provide only one or two examples representing a particular

[2] In many dialects Velarization only applies after high vowels like /i u/. The target segments can also include the singleton velar nasal as well as velar stops. These are unessential details and are therefore not discussed. The reader is referred to Streck (2012: Chapter 8), who shows that Velarization is much more widespread geographically than suggested above.

context (e.g. a word containing /ex/ for all front vowels before /x/). I likewise do not provide a complete set of phonemic vowels for every case study.

In places with phonemic palatals those sounds exhibit the Contrast Type B system discussed at length in Chapters 8–10. As illustrated in (2), such dialects possess a contrast between velars and palatals in the context of back vowels (represented as [ɑ]), but in the context of front vowels (represented as [i]) only palatals occur.

(2) Contrast Type B in word-initial (=2a) and postsonorant (=2b) position:

a.

[PA i...]	[PA ɑ...]
	[VE ɑ...]

b.

[...i PA...]	[...ɑ PA...]
	[...ɑ VE...]

Phonemic palatal noncontinuants – as well as palatal noncontinuant quasi-phonemes – can arise the same way as their fricative counterparts. For example, an original velar like [k] (/k/) in the context of a front vowel can develop a palatal allophone ([c]) which is realized at a later stage as an underlying palatal (/c/) when the original front vowel trigger is eliminated by changes discussed in previous chapters (Vowel Reduction, Vowel Retraction, Syncope).

Many of the varieties discussed below have another quirk in common: Velar fronting can occur even when a segment intervenes between the target and trigger, e.g. the velar (/k/) after a front vowel plus liquid sequence (/il/) is realized as palatal ([ilc]), but the velar remains a velar if a back vowel precedes the liquid (/ɑlk/⟶[ɑlk]). Recall from Chapter 6 that examples like these are also attested in two HstAlmc varieties. It was argued in that chapter that velar fronting is fed by a change merging the coronal feature of a front vowel with the coronal feature of the liquid (Coalescence-1). A mirror-image process for word-initial position is shown to be active in some varieties as well.

In §11.2 I provide some general remarks on the status of velar noncontinuants as targets outside of the area investigated in the present chapter. In §11.3 and §11.4 I discuss those systems in MeWPo and Sil. The bulk of the material discussed below is devoted to a description and brief analysis of those varieties once spoken in East Pomerania and Posen (§11.5) and East Prussia (§11.6, §11.7). A summary of the findings and the relevance for palatalization typology is presented in §11.8. In §11.9 I discuss the extension of velar fronting targets historically in the rule generalization model and the connection between the development of palatal noncontinuants and the existence of Slavic loanwords containing sounds phonetically similar to [c ɟ ɲ]. In §11.10 I consider the areal distribution of German dialects with a broader set of targets. I provide a brief conclusion in §11.11.

11.2 General remarks on velar noncontinuants as targets

The set of targets for velar fronting in all German dialects discussed in previous chapters consists of velar fricatives only. That /k g ŋ/ do not have palatal allophones in the neighborhood of front vowels is also implicit in the literature on StG, although that presupposition is rarely stated explicitly.

In some of the late nineteenth and early twentieth century descriptive work on German dialects, velar noncontinuants like [k] and [ŋ] are described as having palatal variants in the neighborhood of front vowels, even in regions outside of the ones investigated below. I make no attempt to document the kind of grammar referred to here. Instead, I cite one representative example (NLG), namely Greetsiel in the far western part of the German state of Lower Saxony (Niedersachsen; Hobbing 1879; Map 4.1). Hobbing's work is an articulatory phonetic description of the consonants and vowels in which he states (p. 24) clearly that [k] can have two articulations (reflected in two distinct symbols): ⟦k^1⟧ in the neighborhood of front vowels and ⟦k⟧ in the neighborhood of back vowels.

It is difficult to know with certainty whether or not the palatal stop ⟦k^1⟧ is phonological ([c] as an allophone of /k/ created by velar fronting) or simply the byproduct of phonetics, i.e. a prevelar which is a consequence of coarticulation. I assume here that the latter is the correct interpretation, although it would be also consistent with the theme of this book to analyze ⟦k^1⟧ as phonological. Thus, I assume that the fronted realization of [k] in dialects like Greetsiel is a phonetic variant on par with the fronted [k] in English words like *keep*. I speculate that the reason Hobbing as well as many of his contemporaries included the fronted realization of sounds like [k] in their grammars is that there was no distinction at that time between phonetics (which was already well-established in the late nineteenth century in Germany) and phonology (which did not yet exist). Since the concept of phonemes and allophones lay a number of years in the future, phonetically-trained linguists like Hobbing had no alternative but to treat the palatal realization of [k] on par with segments that are uncontroversially phonemes.

In contrast to dialects like Greetsiel, palatal noncontinuants in the dialects discussed below are phonological and not phonetic. The reason for my conclusion is that the segments in question display the same degrees of phonologization as the corresponding fricatives [ç ʝ] by occurring as palatal quasi-phonemes or even as contrastive sounds (phonemic palatals).

11.3 Mecklenburgish-West Pomeranian

Kolz (1914) describes a MeWPo variety spoken in the northwest corner of Landkreis Nordwestmecklenburg (Map 11.1). Kolz refers to his variety as the West Mecklenburg dialect ("Westmecklenburgischer Dialekt").

The dorsal consonants of West Mecklenburg are listed in (3a) and (3b) for word-initial and postsonorant position respectively. Kolz adopts a wide array of phonetic symbols and diacritics expressing laryngeal distinctions. The relevant symbols for velars and palatals are [x ɣ]=⟦x g⟧, [ç ʝ]=⟦χ g⟧, [k g]=⟦k g⟧, [c ɟ]=⟦c g⟧. The lenis palatal fricative [ʝ] is transcribed in two ways depending on the etymological source: ⟦g⟧ (< WGmc +[ɣ]) and ⟦j⟧ (< WGmc +[j]). [ŋ] and [ɲ] are both rendered as ⟦ꞥ⟧.

(3) a.

/ʝ/	/k/		/g/	/ɟ/
[ʝ]	[k]	[c]	[g]	[ɟ]

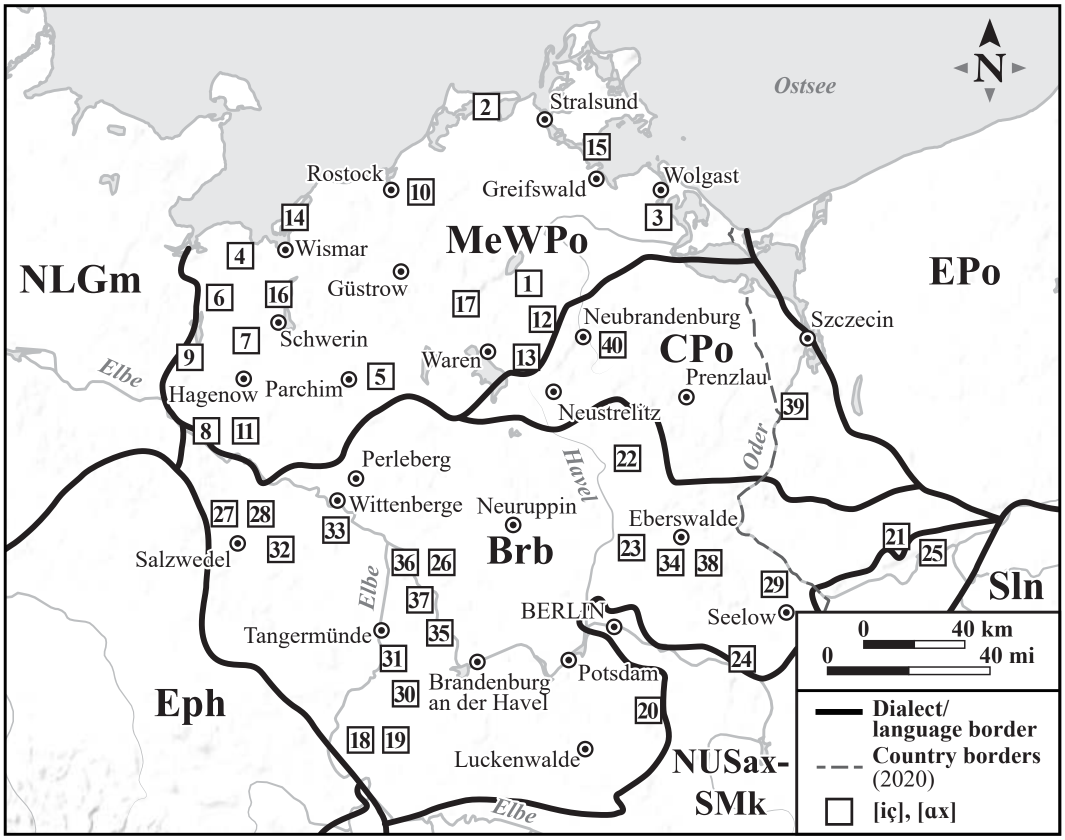
b.

/x/		/ɣ/		/k/	/c/	/g/		/ŋ/	
[x]	[ç]	[ɣ]	[ʝ]	[k]	[c]	[g]	[ɟ]	[ŋ]	[ɲ]

Consider first the stops [k c g ɟ] (<WGmc +[ɣ k]) in word-initial position. In that context the velars [k g] never contrast with the corresponding palatals ([c ɟ]): [k g] occur before a full back vowel in (4a, 4e) or a consonant followed by a full back vowel in (4b, 4f) and [c ɟ] before a front vowel in (4c, 4g) or a consonant followed by a front vowel in (4d, 4h). [k g] never occur before a front vowel or a consonant plus front vowel sequence. [ɟ] (<WGmc +[ɣ]) also surfaces before schwa in (4i) and [ʝ] (<WGmc +[j]) before any vowel in (4j).

(4) Word-initial dorsal obstruents:

a.	kus	[kʊs]	Kuss	'kiss'	135
b.	krum	[krʊm]	krumm	'bent'	127
	knuᵊdn	[knuədn̩]	Knorren	'gnarl'	67
c.	cind	[cɪnt]	Kind	'child'	17
d.	cli·f	[clif]	Klette	'burr'	127
	cneχt	[cneçt]	Knecht	'vassal'	28
e.	gɔ·bl	[gɔ·bl̩]	Gabel	'fork'	129



Map 11.1: Mecklenburgish-West Pomeranian (MeWPo), Brandenburgish (Brb), and Central Pomeranian (CPo). Squares indicate postsonorant velar fronting. 1=Holst (1907), 2= Schmidt (1912a), 3=Warnkross (1912), 4=Kolz (1914), 5=Jacobs (1925a,b, 1926), 6=Teuchert (1927) (Rehna), 7=Teuchert (1927) (Schwerin), 8=Dützmann (1932), 9=Teuchert & Schmitt (1933) (Ratzeburg), 10=Teuchert & Schmitt (1933) (Rostock), 11=Teuchert & Schmitt (1933) (Lank), 12=Blume (1933a,b,c,d), 13=Teuchert (1934), 14=Bethge & Bonnin (1969), 15=Prowatke (1973) (Greifswald), 16=Prowatke (1973) (Schwerin), 17=Schönfeld (1989) (Teterow), 18=Krause (1895), 19=Krause (1896), 20=Siewert (1907), 21=Teuchert (1907b,c), 22=Teuchert (1907a), 23=Seelmann (1908), 24=Siewert (1912), 25=Seelmann (1913), 26=Hildebrand (1913), 27=Selmer (1918), 28=Götze (1922), 29=Teuchert (1930), 30=Bathe (1932), 31=Bathe (1937), 32=Törnqvist (1949), 33=Bretschneider (1951), 34=Teuchert (1964), 35=Bathe (1965), 36=Gebhardt (1965), 37=Schönfeld (1965), 38-Schönfeld (1989) (Tempelfelde), 39=Brose (1955), 40=Prowatke (1973).

f.	grɑm	[grɑm]	böse	'angry'	124
	gnɑ·dn	[gnɑdn̩]	knarren	'creak-INF'	59
g.	gelt	[ɟelt]	Geld	'money'	27
h.	glīnt	[ɟliːnt]	Lattenzaun	'picket fence'	21
i.	gəsiχt	[ɟəsɪçt]	Gesicht	'face'	17
j.	juȵk	[ʝʊŋk]	jung	'young'	15

After a sonorant, velar fricatives ([x ɣ]) and their palatal counterparts ([ç ʝ]) are allophones: The velars occur after a back vowel in (5a, 5e) and the palatals after a front vowel in (5c, 5f). [x] also occurs after a liquid preceded by a back vowel in (5b) and [ç] after a liquid preceded by a front vowel in (5d). No parallel example like (5d) was found for [ʝ]. Velar stops ([k g]) and their palatal counterparts ([c ɟ]) display a parallel distribution in (5g–5n).[3] The dorsal sounds referred to above ([x ç ɣ ʝ k c g ɟ]) are all modern reflexes of velars (WGmc ⁺[ɣ k] or ⁺[gg]). The items in (5o, 5p) show that nasal plus stop sequences (<WGmc ⁺[ŋk]) are homorganic. After a front vowel, the nasal and stop are palatal, and after a back vowel they are both velar; the distinction between the two nasals in examples like these is clear from the original source (Kolz 1914: 147): "as ȵ vor gutturalem Verschlusslaut … ist … erhalten als palatales ȵ vor palatalem, als velares ȵ vor velarem Verschlusslaut". ("Old Saxon ȵ … is palatal ȵ before palatal stops and velar ȵ before velar stops"). The [c] in (5q) occurs in the context after a historically elided front vowel (by Syncope; recall Chapter 7).

(5) Postsonorant dorsal consonants:

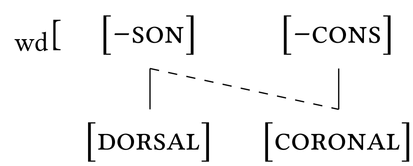
a.	tuxt	[tʊxt]	Zucht	'breeding'	68
b.	tɑlx	[tɑlx]	Talg	'tallow'	52
c.	liχt	[lɪçt]	Licht	'light'	15
d.	fel·χ	[felç]	Felge	'wheel rim'	27
e.	fogl	[fɔɣl̩]	Vogel	'bird'	15
f.	flɛ·gl	[flɛ·ʝl̩]	Flegel	'boor'	15
g.	rók	[rok]	Rauch	'smoke'	127
h.	kɑlk	[kɑlk]	Kalk	'lime'	45

[3] The velar stop [g] in (5k, 5l) and the palatal stop [ɟ] in (5n) are followed by the (syllabic) velar nasal [ŋ] and the (syllabic) palatal nasal [ɲ] respectively. Examples like these suggest that the place features of a syllabic nasal spread from the place features of a preceding obstruent (Progressive Nasal Place Assimilation). Since that process is independent of velar fronting it is not discussed here; see Hall (2020), who shows that Progressive Nasal Place Assimilation is active in several WGmc languages.

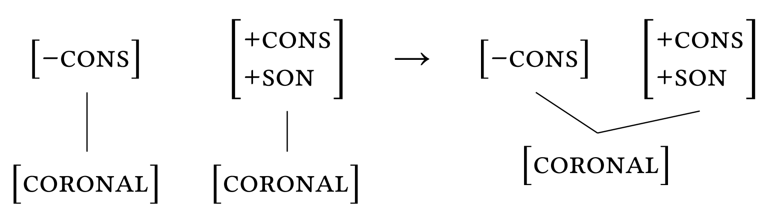
i.	dic	[dɪc]	dick	'fat'	17
j.	melc	[melc]	Milch	'milk'	24
k.	bɑgꞥ	[bɑgŋ̇]	backen	'bake-INF'	43
l.	bɑlgꞥ	[bɑlgŋ̇]	Balken	'beam'	53
m.	egᵊ	[eɟə]	Egge	'harrow'	28
n.	mėlgꞥ	[mɛlɟɲ̇]	melken	'milk-INF'	35
o.	diꞥc	[dɪɲc]	Ding	'thing'	125
p.	lɑꞥk	[lɑŋk]	lang	'long'	125
q.	v́ɛdc	[vɛdc]	Enterrich	'gander'	33

The initial stops in (4a–4h) are underlying velars (/k g/), which surface as the corresponding palatals before a front vowel in (4c–4g) by the specific version of velar fronting stated in (6). In (4d, 4h), the [coronal] feature of the front vowel and the [coronal] feature of the preceding sonorant consonant undergo (7b), which feeds (6), e.g. /gliːnt/⟶|g**li**ːnt|⟶[**ɟli**ːnt], where the segments in bold reflect the application of (7b) and (6). The word-initial consonant in (4i) is a palatal quasi-phoneme (/ɟ/), and in (4j) it is the etymological palatal (/ʝ/).[4]

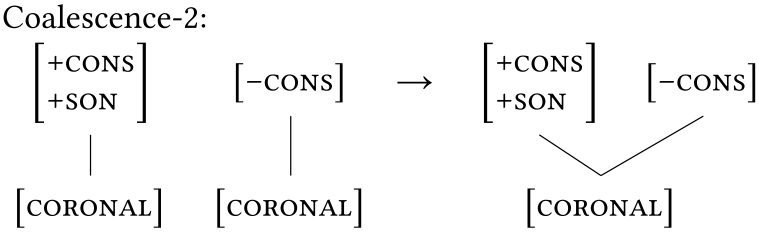
(6) Wd-Initial Velar Fronting-6:



(7) a. Coalescence-1:



b. Coalescence-2:



[4] As stated in (7b) the leftmost segment of Coalescence-2 is a coronal sonorant consonant, e.g. the /l/ in [ɟliːnt] 'picket fence' from (4h). Data not presented above show that (6) also affects a word-initial velar before the labial [v], e.g. [cveə] 'across' (from /kveə/). I do not discuss this complication here; see §12.8.1.

All postvocalic palatals in (5) derive from the corresponding velars by the mirror-image of (6), stated in (8). If the target sound (/x ɣ k g/) follows a liquid, then it surfaces as the corresponding palatal if the vowel preceding the liquid is front, otherwise it is velar (cf. 5b vs. 5d; 5h vs. 5j; 5l vs. 5n); recall Visperterminen and Obersaxen (Chapter 6). Front vowel plus liquid sequences in (5d, 5j, 5n) share [coronal] by Coalescence-1 (=7a). That merged [coronal] feature spreads to a following velar by Velar Fronting-8, thereby creating a palatal. In postvocalic nasal plus stop clusters in (5o, 5p) the sequence (/ŋk/) has a single place feature dominating [dorsal]. If the vowel preceding /ŋk/ is front then [coronal] spreads from that vowel to the right by Velar Fronting-8, e.g. /dɪŋk/⟶[dɪ**ɲc**]. The final segment in (5q) is an underlying palatal (quasi-phoneme), i.e. /c/.

(8) Velar Fronting-8:

[−cons] [−son]

[coronal] [dorsal]

Kolz's variety of West Mecklenburg is unique for its region in more than one way. First, the target segments for all fronting operations consist of velar consonants, but the corresponding targets in neighboring places are restricted to one (/x/) or two (/x ɣ/) velar fricatives. Second, velar fronting word-initially and after a sonorant is fed by one of the coalescence processes, but in all but one of the sources discussed here, coalescence is absent. Third, there are underlying palatal stops (quasi-phonemes) in West Mecklenburg, but such palatals are absent in the dialects discussed below. I conclude this section by discussing briefly the status of velar fronting in some of the other places in the MeWPo region. All of these places are indicated on Map 11.1.

Consider first Teuchert's (1927) phonetic transcriptions of native speakers from two places close geographically to the area investigated by Kolz (1914), namely Rehna and Schwerin. On the basis of the material in Teuchert (1927) it can be safely concluded that coronal sonorants are the triggers for postsonorant fronting and that /x/ is the sole target for (postsonorant) velar fronting. Velar fronting does not occur word-initially. Significantly, Teuchert (1927) gives no evidence that noncontinuants undergo velar fronting. The same generalizations hold for the phonetic transcriptions of native speakers from Ratzeburg, Rostock, and Lank from Teuchert & Schmitt (1933).

None of the other sources for MeWPo indicate that velar noncontinuants serve as targets for velar fronting: In a series of detailed studies, Jacobs (1925a,b, 1926) investigates the dialects spoken in the south of Mecklenburg-Vorpommern

("South Mecklenburg") between Lübz and Hagenow (§10.6.2; §12.7.1). Jacobs (1925b) presents copious data indicating that the set of targets for velar fronting is the velar fricative [x] (<WGmc ⁺[x ɣ]), e.g. [vɛç] 'path' (=⟦vęχ⟧), [væːç], 'path-PL' (=⟦vā̄χ⟧) vs. [tʊxt] 'breeding' (=⟦tų̄xt⟧), [oːx] 'eye' (=⟦ōx⟧). However, there is no indication in Jacobs (1925a,b, 1926) that [k g] have palatal variants after front vowels.[5] That /x/ is the only target for velar fronting is clear in descriptions of Ivenack-Stavenhagen (Holst 1907), e.g. [bryç] 'bridge' (=⟦brüχ⟧) vs. [nɔx] 'still' (=⟦nox⟧) and Wolgast (Warnkross 1912), e.g. [brøːç] 'bridge' (=⟦brȫχ⟧) vs. [dox] 'day' (=⟦dox⟧). Neither Holst (1907) nor Warnkross (1912) mention a fronted realization of [k g ŋ].[6]

Among the dialects discussed in the preceding paragraph South Mecklenburg (Jacobs 1925a,b, 1926) is the only one in which Coalescence-1 is clearly not active, cf. [fɛlx] 'wheel rim' (=⟦fęl̄x⟧). That type of example is not mentioned in Holst (1907) or Dützmann (1932) and therefore one cannot know for certain whether or not Coalescence-1 is present. By contrast, Wolgast is a dialect with Coalescence-1, cf. [balx] 'brat' (=⟦bɑlx⟧) vs. [telç] 'branch' (=⟦telχ⟧).[7] Finally, none of the sources cited above appears to have palatal quasi-phonemes.

Velar noncontinuants do not serve as targets for velar fronting in those NLG varieties spoken in Lower Saxony or Schleswig-Holstein which border West Mecklenburg. The closest of those dialects to West Mecklenburg for which a source is available is the NLG variety of Hemmelsdorf (Pühn 1956; Map 4.1), but that work is clear that the sole target for velar fronting is /x/, e.g. [knɛç] 'vassal' (=⟦knęχ⟧) vs. [hoːx] 'high' (=⟦hōx⟧) and that velar stops and the velar nasal surface without change even after front vowels. The same point holds for the NLG variety of Kreis Herzogtum Lauenburg (Heigener 1937; Map 4.1), e.g. [lɪçt] 'light' (=⟦licd⟧) vs. [ɑxt] 'eight' (=⟦ɑχd⟧), and (NLG) Bleckede (Rabeler 1911; Map 4.1), e.g. [gəziçt] 'face' (=⟦gəzixd⟧) vs. [hoːx] 'high' (=⟦ʿōχ⟧). No examples were found in any of the aforementioned sources for words consisting of a back vowel plus liquid followed by /x/ which could potentially shed light on whether or not a Coalescence-1 is active. Likewise no palatal quasi-phonemes were found in any of the sources cited above.

[5] A brief statement can be found in Jacobs (1925a: 47) asserting that [ŋ] has a fronted variant after a front vowel, though that type of example is not discussed further.

[6] The velar fronting targets in Kaarβen (Dützmann 1932) are /x ɣ/, e.g. [nɪç] 'not' (=⟦nįχ⟧), [zœːʝ] 'sow' (=⟦zœ̂ːɣ⟧) vs. [lɑxn̥] 'laugh-INF' (=⟦lɑxn̥⟧), [dɑoɣ] 'day' (=⟦då̄oːɣ⟧). (⟦ɣ⟧ represents either velar [ɣ] or palatal [ʝ]). Dützmann (1932: 12) has palatal and velar stops as well as palatal and velar nasals, but he does not discuss the distribution of those sounds. The same point holds for Barth (Schmidt 1912a), where /x/ is the sole target for fronting, e.g. [tyːç] 'stuff' (=⟦tȳç⟧) vs. [oːx] 'eye' (=⟦ōx⟧).

[7] That type of example might also be attested in Barth: Schmidt (1912a) mentions [felç] 'wheel rim' (=⟦felç⟧). However, no examples in that source have a back vowel followed by /lx/.

11.4 Silesian

Meiche (1898) describes the Sln variety of Sebnitz (Map 5.2). The patterning of dorsal consonants is depicted in (9).

(9) a.

/ɟ/	/k/	/c/	/$\mathrm{k^h}$/		/ŋ/	
[ɟ]	[k]	[c]	[$\mathrm{k^h}$]	[$\mathrm{c^h}$]	[ŋ]	[ɲ]

b.

/x/	/ç/	/k/		/$\mathrm{k^h}$/		/ŋ/	
[x]	[ç]	[k]	[c]	[$\mathrm{k^h}$]	[$\mathrm{c^h}$]	[ŋ]	[ɲ]

Meiche refers to the lenis and fortis contrast among stops in terms of aspiration, which is the way in which I transcribe the difference between lenis and fortis sounds, e.g. ⟦g⟧ and ⟦k⟧ are depicted below as [k] and [$\mathrm{k^h}$] respectively. An added complication not discussed here is that the aspirated sounds (e.g. [$\mathrm{k^h}$]) only occur initially before vowels but not before consonants. Palatal stops are rendered in the original source either with separate symbols or with diacritics making them distinct from the corresponding velars, e.g. [c $\mathrm{c^h}$] =⟦gˊ c⟧ and [ɟ ç]=⟦j χ⟧. [ɲ] and the [ŋ] are transcribed as ⟦η⟧ and ⟦ɴ̵⟧ respectively. There are four qualities among low vowels. One is front (=⟦ȧ⟧=[æ]), while three are back (⟦ɑ⟧=[ɑ], ⟦å⟧=[a], ⟦ɒ⟧=[ɒ]).

In word-initial position velars never contrast with the corresponding palatals: [k $\mathrm{k^h}$] (<WGmc $^+$[ɣ k]) occur before a full back vowel in (10a, 10e) or a liquid followed by a full back vowel in (10b), and [c $\mathrm{c^h}$] before a front vowel in (10c, 10f) or a liquid followed by a front vowel in (10d). The examples in (10g, 10h) illustrate that the original nasal (WGmc $^+$[n]) has undergone Wd-Initial Nasal Place Assimilation in (1a). The derived velar sequence ([kŋ]<WGmc $^+$[kn]) surfaces as velar if a back vowel follows those clusters in (10g) and as palatal if a front vowel follows in the first example in (10h). [c] (<WGmc $^+$[ɣ]) surfaces before schwa in (10i) and [ɟ] (<WGmc $^+$[j]) before any vowel in (10j).

(10) Word-initial dorsal consonants:

a.	gåst	[kast]	Gast	'guest'	88
b.	gloɒs	[kloɒs]	Glas	'glass'	88
c.	gˊȩdər	[cɛtər]	Götter	'God-PL'	43

d.	g′lyg′ə	[clʏcə]	Glück	‘fortune’	45
e.	kū	[kʰuː]	Kuh	‘cow’	90
f.	cę̄nər	[cʰɛnəʀ]	keiner	‘none-MASC.SG’	90
g.	gʀādn̩	[kŋɑːtn̩]	kneten	‘kneed-INF’	90
h.	g′ηīə	[cɲiːə]	Knie	‘knee’	91
	g′η̄ā̇χt	[cɲæːçt]	Knecht	‘vassal’	90
i.	g′əbūrt	[cəpuːʀt]	Geburt	‘birth’	88
j.	jumər	[ɟʊməʀ]	Jammer	‘lament’	31

Velar vs. palatal contrasts are also absent in postsonorant position. In that context [x] surfaces after back vowels in (11a) and [ç] after front vowels in (11b) or coronal sonorant consonants in (11c, 11d). The form in (11d) exemplifies a difference from West Mecklenburg (cf. 5b vd. 5d). However, the same conclusion cannot be drawn concerning the distribution of velar and palatal stops: [k kʰ] occur after a back vowel in (11e, 11i) or after a liquid preceded by a back vowel in (11f, 11j) and the corresponding palatals [c cʰ] after a front vowel in (11g, 11k) or a liquid preceded by a front vowel in (11h). The data in (11l, 11m) illustrate the patterning of the velar nasal and the palatal nasal is precisely as in West Mecklenburg (cf. 5o, 5p). Many of the examples containing [ç] listed in the original source occur after a historically elided front vowel in (11n via Syncope) or after the historical coronal rhotic /r/ in (11o via r-Retraction, recall Chapter 7). The dorsal consonants referred to in the present paragraph derived historically from velars (WGmc ⁺[x ɣ k]). The place of articulation of the syllabic nasal in (11d, 11h) is determined by Progressive Nasal Place Assimilation (Footnote 3).

(11) Postsonorant dorsal consonants:

a.	nɑxt	[nɑxt]	Nacht	‘night’	27
b.	hɑ̇χt	[hæçt]	Hecht	‘pike’	57
c.	milχ	[mɪlç]	Milch	‘milk’	37
d.	gɑ̊lχη	[kalçɲ̍]	Galgen	‘gallows’	88
e.	flugs	[flʊks]	flugs	‘quickly’	88
f.	fɑ̊lgə	[falkə]	Falke	‘falcon’	29
g.	dyg′ə	[tʏcə]	dick	‘fat’	91
	undərwɑ̇̄g′s	[untəʀvæːcs]	unterwegs	‘underway’	88
h.	mɑ̇lg′η	[mælcɲ̍]	melken	‘milk-INF’	35
i.	sāk	[sɑːkʰ]	Sack	‘sack’	91

j.	fulk	[fʊlk^h]	Volk	‘people’	91
k.	drǡc	[dʀæːc^h]	Dreck	‘dirt’	91
l.	zwɑɴ̶k	[tsvɑŋk^h]	Zwang	‘compulsion’	91
m.	diɳc	[tɪɲc^h]	Ding	‘thing’	91
n.	kāfχ	[kɑːfç]	Käfig	‘cage’	34
o.	mårχt	[maʀçt]	Markt	‘market’	91

For word-initial position, palatal stops ([c c^h]) in pre-vocalic position (=10c, 10f) derive from the corresponding velars (/k k^h/) by Wd-Initial Velar Fronting-6. Coalescence-2 merges the [coronal] feature of the front vowel and the preceding liquid in (10d), and the fronting of the velar preceding that liquid is accomplished with Wd-Initial Velar Fronting-6, e.g. /klʏcə/⟶|k**lʏ**cə|⟶[**clʏ**cə]. The homorganic nasal plus stop sequences in (10g, 10h) have a single [dorsal] feature (/kŋ/). If /kŋ/ is followed by a front vowel, then the feature [coronal] spreads to the left by Wd-Initial Velar Fronting-6, e.g. /kŋiːə/⟶[**cɲi**ːə]. The initial consonant in (10i, 10j) is an underlying palatal, i.e. the palatal quasi-phoneme /c/ in (10i), and the etymological palatal /j/ in (10j).

After a front vowel (in 11b, 11g, 11k), palatal stops and fricatives derive from velars (/x k k^h/) by Velar Fronting-8, and after a back vowel those velars surface without change as [x k k^h] in (11a, 11e, 11i). If a front vowel is followed by a liquid in (11c, 11h) then Coalescence-1 applies, e.g. /mɪlx/⟶|m**ɪl**x|; /mælkŋ̍/⟶|m**æl**kŋ̍|. If the liquid is preceded by a back vowel in (11d) then the feature [coronal] from the liquid spreads to /x/ by Velar Fronting-1 in (12), e.g. /kalxŋ̍/⟶|ka**lç**ŋ̍|. Since the target for (12) is a velar fricative, spreading occurs in (11d) but not in (11f, 11j), e.g. /fʊlk^h/⟶[fʊlk^h]. The merged [coronal] feature in (11c, 11h) spreads to the following velar by either Velar Fronting-1 in (12) or Velar Fronting-8, thereby creating a palatal.

(12) Velar Fronting-1:

$$\begin{array}{cc} [+\textsc{son}] & \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

Nasal plus stop clusters in (11l, 11m) bear a single [dorsal] feature in the underlying representation. If a front vowel precedes that cluster in (11m) then the feature [coronal] of the front vowel spreads to the left by Velar Fronting-8, thereby creating [ɲc^h]. [ç] in (11n, 11o) is an underlying palatal (quasi-phoneme), i.e. /ç/.

Michel (1891) describes the Sln variety of Seifhennersdorf (Map 5.2). That dialect possesses velar and palatal fricatives [x ɣ] (=⟦χ ʒ⟧) and [ç ʝ] (=⟦ȷ j⟧), velar and palatal stops [kʰ k] (=⟦kh k⟧) and [cʰ c] (=⟦ch c⟧), the velar nasal [ŋ] (=⟦ꞥ⟧), and the palatal nasal ([ɲ]=⟦ŋ⟧). The distribution of those sounds is illustrated in (13).[8]

(13) a.

/ʝ/	/k/	/c/	/kʰ/		/ŋ/	
[ʝ]	[k]	[c]	[kʰ]	[cʰ]	[ŋ]	[ɲ]

b.

/x/	/ç/	/ɣ/		/k/		/ŋ/	
[x]	[ç]	[ɣ]	[ʝ]	[k]	[c]	[ŋ]	[ɲ]

Velars never contrast with the corresponding palatals. In word-initial position [kʰ k] occur before a full back vowel in (14a, 14e) or a consonant followed by a full back vowel in (14b) and [cʰ c] before a front vowel in (14c, 14f) or a consonant followed by a front vowel in (14d).[9] The stops referred to here ([kʰ k cʰ c]) derived from historical velars (WGmc ⁺[ɣ k]). A stop plus nasal sequence (<WGmc ⁺[kn]) via Wd-Initial Nasal Place Assimilation in (1a) surfaces as velar before a back vowel in (14g) and palatal before a front vowel in (14h). Palatal [c] (<WGmc ⁺[ɣ]) occurs before schwa in (14i) and [ʝ] (<WGmc ⁺[j]) before any vowel in (14j).

(14) Word-initial dorsal obstruents:

a.	kut	[kʊt]	gut	‘good’	57
b.	kl̯ɑs	[klɑs]	Glas	‘glass’	7
c.	cȩstăn	[cɛstɐn]	gestern	‘yesterday’	57
d.	cliŋcĕ	[clɪɲcə]	Klinke	‘handle’	50
e.	khālt	[kʰɑːlt]	kalt	‘cold’	55

[8] In his description of the neighboring dialect spoken in Groβschönau (see below), Wenzel (1919: 2–3) refers to the dialect spoken in Seifhennersdorf as “de[m] merkwürdigsten aller Dialekte der Oberlausitz”. (“The most peculiar of all dialects of the Oberlausitz”). At the time he wrote those words (in 1919) he considered both Seifhennersdorf and Sebnitz to be already archaic (“bereits historisch”).

[9] Most of Michel’s examples belonging to category (14d) have [i] after the liquid. In some of his data the initial sound is transcribed as velar (⟦k⟧) if the post-liquid vowel is nonhigh, e.g. [knæçt] ‘vassal’ (=⟦knɑχt⟧). It is therefore possible that the set of triggers for the process of word-initial velar fronting described below consists of nonhigh front vowels.

f.	chind	[c^hɪnt]	Kind	'child'	55
g.	kꞥoutn	[kŋoutn̩]	Knoten	'node'	13
h.	cɲī	[cɲiː]	Knie	'knee'	20
i.	cĕbūrt	[cəpuːrt]	Geburt	'birth'	11
j.	ĭumɑ	[ɟʊmɐ]	Jammer	'lament'	42

In postsonorant position [x ɣ] occur after back vowels and [ç ʝ] after front vowels or coronal sonorant consonants in (15a–15g). [x ɣ ç ʝ] in these examples derive from historical velars (WGmc $^+$[x k ɣ]). [k] and [c] have a distribution that mirrors their fricative counterparts in (15h–15j). On the basis of (15d, 15g, 15j) it can be deduced that Coalescence-1 is not active in the phonology of Seifhennersdorf. The dorsal stops ([k c]) in (15h–15j) derive from etymological velars (WGmc $^+$[ɣ k] or $^+$[gg]). The clusters [ŋk ɲc] (<WGmc $^+$[ŋk]) surface after back vowels and front vowels respectively in (15k, 15l). Example (15m) indicates that [ç] (<WGmc $^+$[ɣ]) is also present after a historically elided front vowel (by Syncope).

(15) Postsonorant dorsal consonants:

a.	woχĕ	[vɔxə]	Woche	'week'	56
b.	hɑɟet	[hæçt]	Hecht	'pike'	6
c.	mylɟ	[mʏlç]	Milch	'milk'	46
d.	molɟ	[mɔlç]	Molch	'newt'	46
e.	ouʒĕ	[ouɣə]	Auge	'eye'	57
f.	ęjĕ	[ɛʝə]	Egge	'harrow'	57
g.	foljĕ	[fɔlʝə]	Folge	'consequence'	58
h.	pflūk	[pfluːk]	Pflug	'plow'	57
i.	mycĕ	[mʏcə]	Mücke	'mosquito'	57
j.	khɑ̨lc	[k^hɑlc]	Kalk	'lime'	45
k.	fɑ̨ꞥk	[fɑŋk]	fang	'catch-IMP.SG'	6
l.	tiŋc	[tɪɲc]	Ding	'thing'	50
m.	chęfɟ	[k^hɛfç]	Käfig	'cage'	42

For word-initial position, palatal stops in pre-vocalic position (in 14c, 14f) derive synchronically from the corresponding velars (/k k^h/) by Wd-Initial Velar Fronting-6. In (14d) Coalescence-2 merges the [coronal] feature of the front vowel and the coronal feature of the preceding liquid, thereby feeding fronting, e.g. /klɪŋkə/→|**klɪ**ŋkə|→|**clɪ**ŋkə|. The nasal plus stop sequences in (14g, 14h) are underlying velar (/kŋ/). If the [dorsal] feature of /kŋ/ is followed by a front vowel, then its [coronal] feature spreads to the left by Wd-Initial Velar Fronting-6, e.g. /kŋiː/⟶[**cɲiː**]. The word-initial consonants in (14i, 14j) are underlying palatals, i.e. /ɟ c/.

After a sonorant, palatals derive from velars by Velar Fronting-9 in (16). Given the broad set of triggers (i.e. coronal sonorants), (16) spreads [coronal] from a front vowel in (15b, 15f, 15i) or liquid in (15c, 15g, 15j) to a following velar (/x ɣ k/). In examples (15k, 15l) the nasal stop clusters (/ŋk/) bear one [dorsal] feature. If a front vowel precedes that cluster in (15l) then the feature [coronal] of that front vowel spreads to the right by (16), e.g. /tɪŋk/⟶[**tɪɲc**]. The final segment in (15m) is an underlying palatal (quasi-phoneme), i.e. /ç/.

(16) Velar Fronting-9:

$$\begin{array}{cc} [+\textsc{son}] & [+\textsc{cons}] \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

Note the difference between Seifhennersdorf and Sebnitz: In the former variety, palatals derive from velars after front vowels and sonorant consonants alike. However, in Sebnitz the choice of velar vs. palatal is determined by the vowel preceding the liquid, but only in the case of palatal stops (recall 11h, 11j), but not palatal fricatives (recall 11c, 11d).

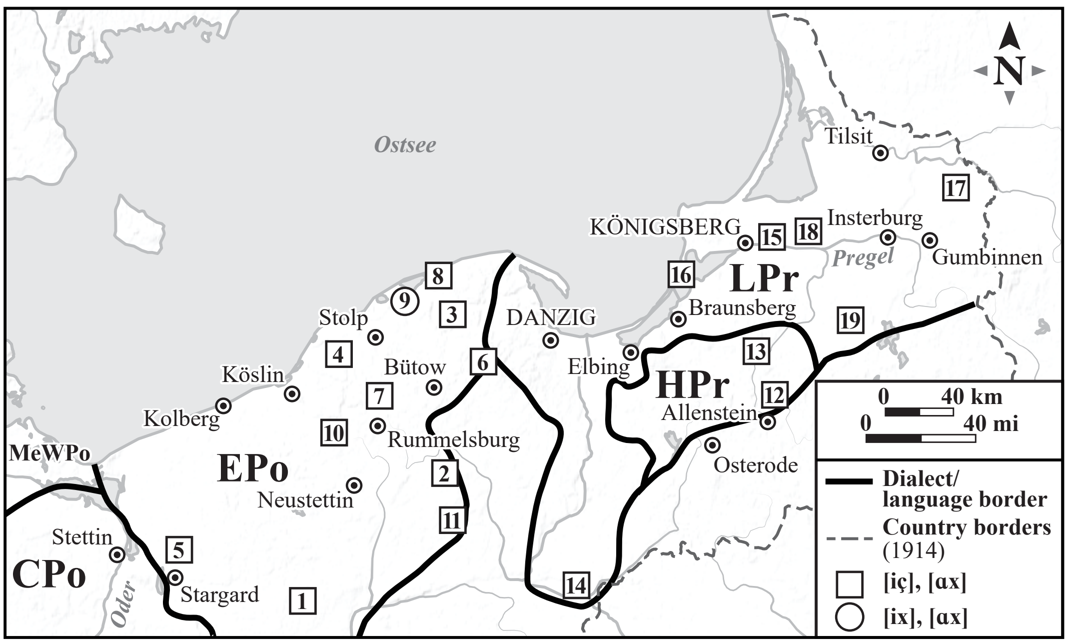
Like West Mecklenburg, the two Sln varieties described above are unique in more than one way. In particular, none of the neighboring communities are reported to have velar noncontinuants as targets for velar fronting. The Sln variety closest geographically to Sebnitz and Seifhennersdorf for which a description is available is Wenzel (1919) (Map 5.2; recall Footnote 8). It is clear from that source that the set of targets for velar fronting consists solely of /x/ and that velar noncontinuants do not have palatal realizations, e.g. [lɪçt] 'light' (=⟦liχt⟧) vs. [lɑxŋ̍] 'laugh-INF' (=⟦lɑχʀ̥⟧). The original sources for the USax varieties spoken in Schokau (Pompé 1907; Map 7.2) and the broad area in West Lausitz (Protze 1957; Map 7.2) devote considerable discussion to the phonetics of consonants and vowels. It is clear from both sources that the sole target for velar fronting is /x/ but that velar noncontinuants do not have a palatal realization. No examples were found in any of the aforementioned sources for words consisting of a back vowel plus liquid followed by /x/ which could potentially shed light on whether or not Coalescence-2 is active.

Sln dialects located further away from Sebnitz and Seifhennersdorf are not reported to have noncontinuants as targets for velar fronting either. See in particular the varieties referred to in §5.3.2 (Map 5.2), namely Kreis Jauer (Halbsguth

1938), Kieslingswalde (Kreis Habelschwerdt; Pautsch 1901), and the supraregional Sln dialect described by von Unwert (1908).[10]

11.5 East Pomeranian

Mischke (1936) describes the EPo dialects spoken once in Kreis Bütow and Kreis Rummelsburg, which I consider in that order (Map 11.2). The synchronic distribution of dorsal consonants in Kreis Bütow is depicted in (17).



Map 11.2: East Pomeranian (EPo), Low Prussian (LPr), and High Prussian (HPr). Squares indicate postsonorant velar fronting, and the circle indicates the absence of postsonorant velar fronting. 1=Teuchert (1913), 2=Semrau (1915a,b), 3=Pirk (1928), 4=Mahnke (1931), 5=Kühl (1932), 6=Mischke (1936) (Kreis Bütow), 7=Mischke (1936) (Kreis Rummelsburg), 8=Stritzel (1937) (Kreis Lauenburg), 9=Stritzel (1937) (Kreis Stolp), 10=Tita 1921 [1965], 11=Darski (1973), 12=Kuck (1933), 13=Kuck & Wiesinger (1965), 14=Wagner (1912), 15=Mitzka (1919), 16=Mitzka (1922), 17=Natau (1937), 18=Bink (1953), 19=Tessmann (1966).

[10]SchlSA makes no reference to palatal noncontinuants either. For example, on Map 51 for *kein* 'none', all of the realizations begin with the velar [k] (cf. 10f with [c]). In the introduction to that atlas the list of consonants (p. 5) includes palatal fricatives (both lenis and fortis), but only velar stops. In a separate chart on the same page there is a symbol for a palatalized ("palatalisiert[e]") velar nasal, but no tokens with that segment were found in the maps.

(17) a.

/ɣ/	/ʝ/	/x/	/k/	
[ɣ]	[ʝ]	[x]	[k]	[c]

b.

/x/		/ɣ/		/k/		/g/		/ŋ/	/ɲ/
[x]	[ç]	[ɣ]	[ʝ]	[k]	[c]	[g]	[ɟ]	[ŋ]	[ɲ]

[x] surfaces word-initially before a consonant in (18a), but not before a vowel. [ɣ] and [ʝ] in (18b–18d) exemplify Contrast Type B in (2a). The vowel [ɑːi] in (18c) was historically front (cf. OSax *giotan*). An example of a [ɣ]~[ʝ] alternation is listed in (18e). The initial segment in (18a–18e) derived historically from a velar (WGmc ⁺[ɣ]). Palatal [ʝ] (<WGmc ⁺[j]) occurs before any type of vowel in (18f). Word-initial dorsal stops ([k c]) stand in an allophonic relationship: [k] (=⟦k⟧) surfaces before back vowels or consonants in (18g) and [c] (=⟦k´⟧) before front vowels in (18h). No data are given for a word beginning with a dorsal stop followed by a liquid plus front vowel; hence, it cannot be determined if Coalescence-2 is active. The formal rule of fronting of velars in word-initial position (see below) is triggered by all front vowels in contrast to the fronting process in neighboring Kreis Rummelsburg.

(18) Word-initial dorsal fricatives:

a.	xrɑf	[xrɑf]	Grab	‘grave’	39
	xlı̯k	[xlɪk]	Glück	‘fortune’	39
	xnōuʒə	[xnoːuɣə]	nagen	‘gnaw-INF’	39
b.	ʒɑu̯t	[ɣɑːut]	gut	‘good’	39
	ʒu̯lt	[ɣʊlt]	Gold	‘gold’	39
c.	jāi̯tə	[ʝɑːitə]	gießen	‘water-INF’	39
d.	ji̯rtl	[ʝɪrtl̩]	Gürtel	‘belt’	39
e.	ʒå·	[ɣɑ·]	gehen	‘go-INF’	64
	jiŋ	[ʝiŋ]	ging	‘go-PRET’	64
f.	jo·pə	[ʝo·pə]	Joppe	‘jacket’	40
	jǟ·kə	[ʝæːkə]	jucken	‘itch-INF’	40
g.	kōukə	[koːukə]	kochen	‘cook-INF’	38
	kno·p	[kno·p]	Knopf	‘button’	38
h.	k´i·k´ə	[ci·cə]	gucken	‘look-INF’	38

In the context after a sonorant, velar obstruents do not contrast with the corresponding palatals. Thus, velars ([x ɣ k g]) surface after a back vowel in (19a, 19c, 19f, 19i) and palatals ([ç ʝ c ɟ]) after a front vowel in (19b, 19d, 19g, 19j) or coronal sonorant consonant in (19e, 19h). The palatals and velars referred to in (19a–19j) derive historically from velars (WGmc ⁺[x ɣ k]).

(19) Distribution of postsonorant dorsal fricatives:

a.	jūx	[ʝuːx]	euer	‘your-PL’	26
	dǫxtə(r)	[dɔxtə(r)]	Tochter	‘daughter’	12
b.	nįχ	[nɪç]	nicht	‘not’	35
	flēχ	[fleːç]	Floh	‘flea’	24
	ǟχ	[æːç]	stumpf	‘blunt’	10
c.	būʒə	[buːɣə]	bauen	‘build-INF’	26
d.	štījə	[ʃtiːʝə]	steigen	‘climb-INF’	20
	lǟjə	[læːʝə]	legen	‘place-INF’	10
e.	mǫrjə	[mɔrʝə]	morgen	‘tomorrow’	13
	bɑlχ	[bɑlç]	Balg	‘brat’	48
f.	klāųk	[klɑːuk]	klug	‘clever’	38
g.	āįk´	[ɑːic]	Eiche	‘oak tree’	38
h.	mälk´	[mælc]	Milch	‘milk’	38
i.	bɑgdə	[bɑgdə]	backte	‘bake-PRET’	39
j.	bįg´ə	[bɪɟə]	picken	‘pick-INF’	39
k.	tųŋ	[tʊŋ]	Zunge	‘tongue’	15
	ɑŋəs	[ɑŋəs]	anders	‘different’	36
l.	bįŋ´əl	[bɪɲəl]	Bengel	‘rascal’	32
m.	drɑŋ´k	[drɑɲc]	Trank	‘drink’	32

The distribution of [ŋ] in (19k) and [ɲ] in (19l, 19m) exemplifies Contrast Type B in (2b). Historical [nd] sequences shifted to [ŋ] via Velarization in (1b), e.g. the second example under (19k). Historical [ŋ] surfaces as [ŋ] after a back vowel in the first example in (19k) and as [ɲ] after a front vowel in (19l). Palatal [ɲ] in (19m) was historically [ŋ] (cf. StG [trɑŋk]).

The initial sound in (18c, 18f) is an underling palatal (/ʝ/). In all other examples in dataset (18) the leftmost sound is an underlying velar (/x ɣ k/) which surfaces as palatal before front vowels by Wd-Initial Velar Fronting-6. The postsonorant dorsal consonants in (19a–19l) are underlyingly velar (/x ɣ k g ŋ/) which surface as palatal after a coronal sonorant by Velar Fronting-9. The postvocalic nasal plus stop sequence in (19m) is underlyingly palatal. Since the back vowel in that example was also etymologically back (cf. MHG *tranc*), the phonemicization of palatal /ɲ/ in that word was probably a consequence of analogy (§8.6.2), cf. [drɪŋkə] 'drink-INF' (=⟦dri̞ŋ´kə⟧).[11]

Consider now the patterning of dorsal obstruents in Kreis Rummelsburg (Mischke 1936; Map 11.2) in (20). Note that [g] is absent entirely. All instances of [g] in Kreis Bütow are realized as [k] in Kreis Rummelsburg, e.g. Kreis Bütow [bɑgdə] backte 'bake-PRET' (=19i) vs. Kreis Rummelsburg [bɑ:kdə] (=⟦bɑkdə⟧).

(20) a. /ɣ/ → [ɣ]; /ʝ/ → [ʝ]; /x/ → [x]

b. /x/ → [x], [ç]; /ɣ/ → [ɣ], [ʝ]

A significant difference between Kreis Bütow and Kreis Rummelsburg is that the former dialect possesses palatal noncontinuants (recall 17), but the latter does not. This point is clear in the description of the reflexes of MLG [k] in Mischke (1936: 38–39). For example, Mischke transcribes the Kreis Bütow realization of ⟦k´i·k´ə⟧ 'look-INF' in (18h) with palatal stops, but the same word is rendered with velar stops (⟦ki·kə⟧) in Kreis Rummelsburg. Likewise palatal [ɲ] in Kreis Bütow is absent in Kreis Rummelsburg, which is decidedly velar ("ausgesprochen guttural"; Mischke 1936: 32).

A second significant difference between Kreis Bütow and Kreis Rummelsburg is the set of triggers for postsonorant velar fronting. Kreis Rummelsburg has the phonemic monophthongs in Table 11.1. All phonemic vowels are included here with the exception of placeless schwa (/ə/). The three-way length distinction among certain vowels is ignored.

Table 11.1: Distinctive features for vowels (Kreis Rummelsburg)

	i i· i	ɪ	e e·	ɛ	æ: æ·	u: u· u	ʊ	o: o·	ɔ	ɑ: ɑ	a: a·
[coronal]	✓	✓	✓	✓	✓						
[dorsal]						✓	✓	✓	✓	✓	✓
[high]	+	+	−	−	−	+	+	−	−	−	−
[tense]	+	−	+	−	+	+	−	+	−	+	−
[low]			−		+						

[11]No words were found in the original source in which [ŋ] and [ɲ] alternate, although I consider that gap to be accidental. Examples in which Velarization (=1b) applies after a front vowel which could potentially feed velar fronting are apparently absent.

Among front vowels, /i i· i ɪ/ are [+high] and /eː e· ɛ æː æ·/ are [−high]. Within both groups, the split is then made between [+tense] and [−tense]. In the [coronal, −high, +tense] category, [±low] distinguishes /eː e·/ from /æː æ·/. Within each of the three [coronal, +tense] columns, length units distinguish the individual members. The same procedure assigns the features listed above to the [dorsal] vowels. It is demonstrated below that [±tense] is crucial in defining the set of triggers for postsonorant fronting.

Mischke (1936) lists seven diphthongs; the ones important for my treatment are the two ending in a front vowel, which he transcribes as ⟦ɑį ei⟧. Note that the second component of ⟦ɑį⟧ is rendered with the traditional symbol for a lax vowel, while the second part of ⟦ei⟧ with the traditional symbol for a tense vowel. I treat the second part of both diphthongs as phonologically [+tense] (=[ɑːi ei]) because their right edges behave as [+tense] vowels. As in StG, no word in Kreis Rummelsburg can end in a lax vowel. For example, there are words ending in [i·] but not [ɪ], e.g. [fri·] 'free' (=⟦fri·⟧); Mischke (1936: 20). Significantly, there are words ending in both [ei] and [ɑːi], e.g. [ʃnɑːi] 'snow' (=⟦šnɑį⟧), [dei] 'you-DAT.SG' (=⟦dei⟧); Mischke (1936: 17, 20). The existence of words like those suggests that the second component of the diphthongs [ei] and [ɑːi] is phonologically [+tense].

The patterning of dorsal fricatives in word-initial position is the same as in the related variety of Kreis Bütow (recall 18). What is important is the distribution of [x ɣ] and their palatal counterparts in postsonorant position. The following datasets demonstrate that the velars never contrast with the corresponding palatals. In (21) it can be seen that [ç] surfaces after a front [+tense] monophthong in (21a) and [x] after a front [−tense] monophthong in (21b) or a back vowel in (21c). The historical reflex of the postvocalic dorsal fricatives in (21) and below is a velar sound (WGmc $^{+}$[ɣ x k]). Examples like [liçt] 'light' with a short front tense vowel [i] in (21a) are important because they show that the trigger for fronting is the tenseness feature and not a feature for length.

(21) [ç] and [x] (from /x/):

a.	miːχt	[miːçt]	möchte	'would like-3SG'	15
	liχt	[liçt]	Licht	'light'	12
	flēχ	[fleːç]	Floh	'flea'	24
	dre·χ	[dre·ç]	trocken	'dry'	40
	zǟχ	[zæːç]	Sau	'sow'	25
b.	nįx	[nɪx]	nicht	'not'	35
	mįxəl	[mɪxəl]	Michel	'(name)'	12
	trȩxlə	[trɛxlə]	Trichter	'funnel'	35
c.	jūx	[ʝuːx]	euer	'your-PL'	26
	ru·x	[ru·x]	rauh	'rough'	26

rōx	[roːx]	Ruhe	'quiet'	23
dǫxtə(r)	[dɔxtə(r)]	Tochter	'daughter'	12
blå·x	[bla·x]	blau	'blue'	34
šlāx	[ʃlɑːx]	schlackiges Wetter	'wet weather'	8

[ʝ] and [ɣ] have the same distribution as their fortis counterparts: [ʝ] occurs after a front [+tense] monophthong in (22a) and [ɣ] after a back monophthong in (22b). There are a number of gaps that I consider to be accidental, e.g. there are apparently no short front tense monophthongs before [ʝ] and no short back vowels before [ɣ].

(22) [ʝ] and [ɣ] (from /ɣ/):

a.	līјə	[liːʝə]	leihen	'lend-INF'	17
	bēјə	[beːʝə]	biegen	'bend-INF'	24
	brǟјə	[bræːʝə]	Gehirn	'brain'	19
b.	būʒə	[buːɣə]	bauen	'build-INF'	26
	kōʒə	[koːɣə]	kauen	'chew-INF'	23
	rōʒə	[roːɣə]	ruhen	'rest-INF'	23
	måʒə	[zaːɣə]	Magen	'stomach'	16
	ɑʒərə	[ɑːɣərə]	ärgern	'annoy-INF'	11

[ç] (/ɣ/) occurs after a [+tense] monophthong in (23a) and [x] (/ɣ/) after a [−tense] monophthong in (23b) or a back vowel in (23c). [x ç] in these examples derives historically from a velar (WGmc $^{+}$[ɣ]). As indicated in the first row of (23), I assume that /ɣ/ is the underlying sound for [x ç] in the synchronic phonology, although it is also possible that the original lenis sound (WGmc $^{+}$/ɣ/) restructured to /x/ in those words where there is no longer a lenis alternant. Underlying /ɣ/ remains velar in (23b, 23c) and shifts to palatal in (23a) by the fronting rule I posit below. In both sets of examples, the underlying lenis sound undergoes Final Fortition in coda position.

(23) [ç] and [x] (from /ɣ/):

a.	fli·χt	[fli·çt]	Flügel	'wing'	15
	ti·χ	[ti·ç]	Zeug	'stuff'	27
	twi·ntiχ	[twintiç]	zwanzig	'twenty'	12
	šte·χ	[ʃte·ç]	stieg	'climb-PRET'	41
b.	zęxt	[zɛxt]	sagt	'say-3SG'	9
c.	dro·x	[dro·x]	trog	'deceive-PRET'	40
	zåx	[zaːx]	Säge	'saw'	16
	dɑx	[dɑx]	Tag	'day'	8

Palatals occur after a diphthong whose second member is [+tense] in (24a) and velars elsewhere in (24b):

(24) Palatals (from /x ɣ/) after a diphthong:

a.	dāįχ	[dɑːiç]	Teig	‘dough’	17
	tāįjəl	[tɑːiʝəl]	Ziegel	‘clay brick’	18
	šteijə	[ʃteiʝə]	steigen	‘climb-INF’	20
b.	mį·əx	[mɪəx]	Mücke	‘mosquito’	40
	lį·əʒə	[lɪəɣə]	liegen	‘lie-INF’	40
	ę·əx	[ɛəx]	stumpf	‘blunt’	10
	lę·əʒə	[lɛəɣə]	legen	‘place-INF’	10
	bǫ·əx	[bɔəx]	Eber	‘boar’	13
	mǫ·əʒə	[mɔəɣə]	morgen	‘tomorrow’	13
	plāųx	[plɑːux]	Pflug	‘plow’	22

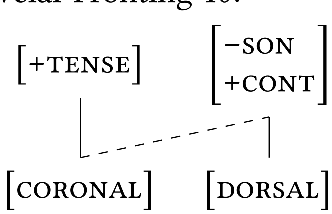
After a coronal sonorant consonant ([r l n]) palatals surface, as in (25). The realization of /x ɣ/ as palatal after [r l n] is not conditioned by the type of vowel preceding that consonant; hence, Coalescence-1 is not present in the phonology of this dialect.

(25) Palatals (from (from /x ɣ/) after a coronal consonant:

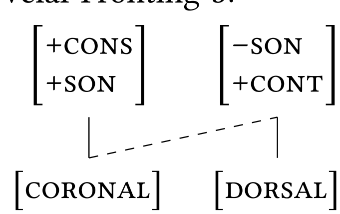
a.	lųrχ	[lʊrç]	schlechter Kaffee	‘bad coffee’	29
	dįrχ	[dɪrç]	durch	‘through’	29
	ārjərə	[ɑːrʝərə]	ärgern	‘annoy-INF’	29
b.	bɑlχ	[bɑlç]	Kind	‘child’	48
c.	fęnχt	[fɛnçt]	voriges	‘previous-INFL’	28

Postsonorant palatal fricatives in (21a, 22a, 23a, 24a) derive from the corresponding velars after a front [+tense] vowel by (26a) and after a consonant in (25) by (26b); recall §3.4. Since [±tense] is distinctive for vowels but not for consonants the two rules cannot be collapsed into one.

(26) a. Velar Fronting-10:



b. Velar Fronting-3:



Tita (1921 [1965]) discusses the EPo dialect once spoken in the town of Kamnitz (Map 11.2). That author does not consider whether or not the velar nasal [ŋ] has a palatal realization. The dorsal obstruents for Kamnitz are listed in (27). The dialect does not have [g].

(27) a. /ɣ/ /ʝ/ /k/

[ɣ] [ʝ] [k] [c]

b. /x/ /ɣ/ /k/ /c/

[x] [ç] [ɣ] [ʝ] [k] [c]

The phonemic front vowels are /i ɪ eː ɛː ɛ/, the phonemic back vowels are /u ʊ oː o ɔː ɔ ə ɑː ɑ/, and the phonemic diphthongs are /ɑi ɛi ɑu ɛu/. I demonstrate below that velar fronting is active in postsonorant position and that it requires /ɛ/ – but not its long counterpart /ɛː/ – to be analyzed phonologically as [+low]; recall Rheintal (§3.4). The distinctive features for the phonemic vowels (excluding placeless schwa) are presented in Table 11.2.

Table 11.2: Distinctive features for vowels (Kamnitz)

	i	ɪ	eː	ɛː	ɛ	u	ʊ	oː o	ɔː ɔ	ɑː ɑ
[coronal]	✓	✓	✓	✓	✓					
[dorsal]						✓	✓	✓	✓	✓
[low]	−	−	−	−	+	−	−	−	−	+
[high]	+	+	−	−		+	+	−	−	
[tense]	+	−	+	−		+	−	+	−	

Front vowels and back vowels are [coronal] and [dorsal] respectively. Within those two groups, the feature values [+low] and [−low] are assigned, and then within the two [−low] groups, the vowels are marked as [±high] and [±tense].

Kamnitz exhibits Contrast Type B in (2a) for word-initial [ɣ] and [ʝ]. [ɣ] (<WGmc $^+$[ɣ]) occurs before a consonant in (28a) or any back vowel with the exception of [ɑi] or [ə] in (28b), but never before a front vowel. The original velar ($^+$[ɣ]) is now realized as a palatal [ʝ] before the back vowels [ɑi] or [ə] in (28c) or front vowels in (28d). As in many other dialects, the original velar now participates in [ɣ]~[ʝ] alternations in (28e). Palatal [ʝ] (<WGmc $^+$[j]) occurs before

any type of vowel in (28f). Note that [ɣ] and [ɟ] contrast before the same back vowel in examples like [ɣɔːn] 'yarn' in (28b) vs. [ɟɔːɣə] 'hunt-INF' in (28f). Tita (1921 [1965]: 57) observes that [k] (⟦k⟧) is realized as velar or palatal depending on the context. On the basis of his data it can be concluded that [k] occurs before a consonant in (28g) or any back vowel in (28h) and [c] before any front vowel in (28i).

(28) Word-initial dorsal obstruents:

a.	ɣlik	[ɣlik]	gleich	'soon'	49
b.	ɣǭn	[ɣɔːn]	Garn	'yarn'	64
c.	jɑitə	[ɟɑitə]	gieβen	'water-INF'	60
	jənɑitə	[ɟənɑitə]	genieβen	'enjoy-INF'	52
d.	jįlə	[ɟɪlə]	gelten	'be valid-INF'	60
	ję̄l	[ɟɛːl]	gelb	'yellow'	60
	jęsəl	[ɟɛsəl]	Gänschen	'goose-DIM'	60
e.	ɣɑst	[ɣɑst]	Gast	'guest'	59
	jęst	[ɟɛst]	Gäste	'guest-PL'	59
f.	jų̄ŋk	[ɟʊŋk]	jung	'young'	64
	jǭɣə	[ɟɔːɣə]	jagen	'hunt-INF'	64
g.	kręuts	[krɛuts]	Karausche	'crucian carp'	57
h.	kōl	[koːl]	Kohl	'cabbage'	57
i.	kēl	[ceːl]	Kerl	'fellow'	57
	kęinə	[cɛinə]	keimen	'germinate-INF'	57

In postsonorant position, [x ɣ] and [ç ʝ] never contrast. The generalization is that [x] occurs after a back vowel in (29a) or [ɛ] in (29b), while [ç] surfaces after front vowels other than [ɛ] in (29c) or a coronal sonorant consonant in (29d). The same generalizations hold for [ɣ ʝ] in (29e–29g) and for [x ç] derived historically from WGmc ⁺[ɣ] in (29h–29k). Umlaut alternations of the type [ɔ]~[ɛ] provide further support that [x] occurs after [ɛ] (see 29l). Velar [k] and palatal [c] (both from WGmc ⁺[k]) never contrast; the former occurs after back vowels in (29m) and the former after front vowels in (29n). No examples were found in the original source with [k] or [c] after a coronal sonorant consonant. At least one example (29o) has palatal [c] (< WGmc ⁺[k]) in the context after a historically syncopated front vowel (which is visible in the StG orthography).[12]

[12] Tita (1921 [1965]) does not provide an example for [c] after [ɛ], although he does give the one item [vɛlc] 'which' (=⟦węlk⟧), in which [c] (=⟦k⟧) occurs after the sequence [ɛl]. Two treatments

(29) Postsonorant dorsal obstruents:

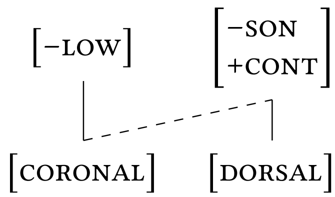
a.	hōx	[hoːx]	high	‘high’	62
	tǭx	[tɔːx]	zähe	‘tough’	62
b.	dęxt	[dɛxt]	Docht	‘wick’	62
	ręxt	[rɛxt]	recht	‘right’	43
	fręx	[frɛx]	frech	‘impudent’	62
c.	lįχt	[lɪçt]	leicht	‘light’	49
	tēχt	[teːçt]	zehnte	‘tenth’	76
d.	dįrχ	[dɪrç]	durch	‘through’	62
e.	truɣə	[truɣə]	trauen	‘trust-INF’	50
	bǭɣə	[bɔːɣə]	Bogen	‘bow’	59
f.	krijə	[kriɟə]	kriegen	‘get-INF’	49
	tę̄jəl	[tɛːɟəl]	Zügel	‘rein’	48
g.	bɑljə	[bɑlɟə]	streiten	‘argue-INF’	60
h.	nɑux	[nɑux]	genug	‘enough’	49
i.	vęx	[vɛx]	Weg	‘path’	43
j.	tiχ	[tiç]	Zeug	‘stuff’	52
k.	tęlχ	[tɛlç]	Zweig	‘branch’	43
l.	trǫx	[trɔx]	Trog	‘trough’	45
	tręx	[trɛx]	Tröge	‘trough-PL’	73
m.	rǫk	[rɔk]	Rock	‘skirt’	57
n.	zɑikə	[zɑicə]	suchen	‘search-INF’	57
o.	morętk	[morɛtc]	Meerrettich	‘horseradish’	57

The set of targets for the fronting of velars in word-initial position in (28) is /ɣ k/, and the set of triggers consists of front vowels but not coronal consonants. Synchronically derived [ɟ] is situated before a front vowel in (28d) and the second word in (28e). The palatal allophone [c] in (28i) derives from /k/. The fronting of word-initial /ɣ k/ is accomplished by Wd-Initial Velar Fronting-6. All other instances of [ɟ] are underlying palatals (28c, 28f).

For postsonorant position, the target segments are /ɣ x k/ and the triggers are (a) the front [−low] vowels or (b) coronal sonorant consonants. Fronting in (a) and (b) is accomplished with (30) and (26b) respectively.

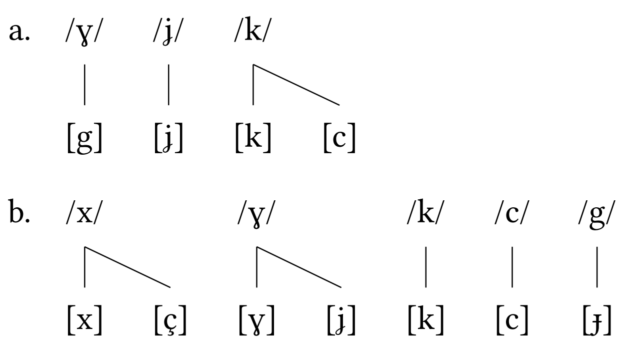
suggest themselves for the fronting of /k/ in [vɛlc]: (a) velar fronting is triggered by /l/ (recall 26b), or (b) the fronting of /k/ is indirectly triggered by the vowel /ɛ/: Coalescence-1 merges the [coronal] feature for /ɛ/ and /l/, and then velar fronting spreads [coronal] from any front vowel to a velar stop. Since no additional examples are provided I leave this question open.

(30) Velar Fronting-2:



The distribution of dorsal obstruents in the town of Lauenburg (Pirk 1928; Map 11.2) is depicted in (31). Word-initial [g] is an allophone of /ɣ/. I comment on the status of dorsal nasals below.

(31)



As illustrated in (32a–32f), Lauenburg exhibits Contrast Type B in (2a) for word-initial [g] and [ʝ]. The post-palatal back vowel in (32c) was historically front and shifted to a back vowel by either Vowel Retraction or Vowel Reduction. [g ʝ] in (32a–32e) derive from a historical velar (WGmc ⁺[ɣ]). Palatal [ʝ] (<WGmc ⁺[j]) in (32f) stands before any type of vowel. [c] and [k] never contrast: The latter surfaces before a back vowel in (32g) or consonant in (32h) and the former before a front vowel in (32i). [k]~[c] alternations are attested in (32j). I interpret Pirk's ⟦ɑ⟧ as a low front vowel ([æ]) because it is one of the umlauted (fronted) realizations of back vowels.

(32) Word-initial dorsal obstruents:

a.	got	[gɔt]	Gott	'God'	8
b.	glåt	[glɑt]	glatt	'smooth'	22
	glęk´	[glɛc]	Glück	'fortune'	9
c.	gåršt	[ʝɑrʃt]	Gerste	'barley'	8
	gəšāinə	[ʝəʃɑːinə]	geschehen	'happen-INF'	10
d.	gistrə	[ʝɪstrə]	gestern	'yesterday'	7
	gęlt	[ʝɛlt]	Geld	'money'	8

e.	gāus	[gɑːus]	Gans	'goose'	19
	gɑnz	[ʝænz]	Gänse	'goose-PL'	19
f.	gå^u r	[ʝɑur]	Jahr	'year'	10
g.	kāu	[kɑːu]	Kuh	'cow'	18
h.	krīgə	[kriːʝə]	kriegen	'get-INF'	10
i.	k′int	[cɪnt]	Kind	'child'	7
	k′ɑstər	[cæstər]	Küster	'sexton'	8
j.	kop	[kɔp]	Kopf	'head'	14
	k′ɑp	[cæp]	Köpfe	'head-PL'	14

Velar fricatives [x ɣ] never contrast with the corresponding palatals in postsonorant position: The velars occur after back vowels in (33a, 33c) and the palatals [ç ʝ] after front vowels in (33b, 33d). No examples were found in which dorsal fricatives occur after consonants. The lenis palatal stop [ɟ] is the reflex of an earlier geminate (⁺[gg]) after a front vowel in (33e); cf. OSax *hruggi* 'back'. No examples are provided in the original source for modern reflexes of a phonetic [g] (<WGmc ⁺[gg] after back vowels). The relationship between [k] and [c] is not the same as the relationship between the other velar and palatal pairs discussed above. Velar [k] occurs after back vowels in (33f) but never after front vowels, and [c] can be found in many items after a front vowel in (33g). [k]~[c] alternations in (33h) are also attested. However, palatal [c] also occurs in a context other than after a front vowel in diminutives in (33i) and at the right edge of nouns and certain verbs in (33j). [k c] in the examples referred to here derive from WGmc ⁺[k].

(33) Postsonorant dorsal obstruents:

a.	doxtər	[dɔxtər]	Tochter	'daughter'	8
b.	knɑχt	[knæçt]	Knecht	'vassal'	18
c.	zūʒə	[zuːɣə]	saugen	'suck-INF'	16
d.	lāigə	[lɑːiʝə]	lügen	'lie-INF'	16
e.	rig′ə	[rɪɟə]	Rücken	'back'	9
	zɑg′ə	[zæɟə]	sagen	'say-INF'	8
f.	bāuk	[bɑːuk]	Buch	'book'	12
g.	ęk′	[ɛc]	ich	'I'	17
h.	bok	[bok]	Bock	'buck'	14
	bɑk′	[bæc]	Böcke	'buck-PL'	14

i.	āik′sk′ə	[ɑːicscə]	Eiche, dim	‘oak-DIM’	18
	buŋksk′ə	[bʊŋkscə]	Käfer, dim	‘bug-DIM’	18
	hęltk′əs	[hɛltcəs]	Holzäpfel	‘crab apple-PL’	14
	kręlk′əs	[krɛlcəs]	Pellkartoffeln	‘potato-PL in the skin’	40
j.	mɑlk′	[mælc]	Milch	‘milk’	8
	mɑlk′ə	[mælcə]	melken	‘milk-INF’	8
	mulk	[mʊlk]	melkte	‘milk-PRET’	30
	mulk′ə	[mʊlcə]	melkten	‘milk-PRET.PL’	30
	molk′ə	[mɔlcə]	gemolken	‘milk-PART’	30

The word-initial sound in (32a, 32b, 32d, 32e) is velar /ɣ/, which surfaces as [ʝ] before a front vowel by Wd-Initial Velar Fronting-6. Elsewhere (before a back vowel or consonant) that /ɣ/ is realized as [g] by g-Formation-2 (§8.4). In the context before a back vowel in (32c, 32f), the word-initial [ʝ] is an underlying palatal (/ʝ/). The word-initial sound in (32g–32j) is /k/, which surfaces as [c] before a front vowel by Wd-Initial Velar Fronting-6 and otherwise as [k].

In postsonorant position velar /x ɣ/ are realized as palatal after a front vowel in (33b, 33d) by Velar Fronting-8. I analyze the stop in (33e) as an allophone of /g/, which surfaces as palatal [ɟ] by Velar Fronting-8. The same process creates [c] from /k/ in (33f–33h). The [c] in (33i, 33j) is an underlying palatal (/c/).[13] [14]

Two varieties of EPo that are the essentially the same in terms of velar fronting are the ones once spoken in close proximity, namely Sępóno Krajeńskie (Darski

[13]Pirk (1928) does not comment on whether or not [ŋ] has a palatal realization in the neighborhood of front vowels. A few words in his grammar suggest that the sound transcribed as ⟦ŋ⟧ is phonetically [ɲ] after a front vowel because the palatal stop (and not the velar stop) follows that nasal, e.g. [pɪɲcstə] ‘Pentecost’ (=⟦piŋk′stə⟧). I tentatively conclude that /ŋ/ is one of the targets for velar fronting. This suggests that the [ɲc] in words like ⟦piŋk′stə⟧ is underlyingly /ŋk/, which surfaces as [ɲc] by Velar Fronting-8.

[14]It is not clear what the generalization is involving the alternations in (33j), but the occurrence of [k] and [c] after a back vowel plus [l] suggests that /c/ is a phonemic palatal because it contrasts with /k/. One could argue that the occurrence of [k] or [c] after a liquid in word-final position is a consequence of the stem vowel, i.e. [k] if that vowel is back and [c] if it is front. However, after [r], only [c] surfaces, even if the vowel preceding that [r] is back, e.g [mɑrcə] ‘notice-INF’ (=⟦mårk′ə⟧). (The same generalization holds for the palatal fricatives [ç ʝ], e.g. [bɑrç] ‘mountain’ (=⟦bårχ⟧), [bɑrʝə] ‘mountain-PL’ (=⟦bårgə⟧)). It is conceivable that the set of triggers for postsonorant velar fronting includes all front vowels and /r/, but not /l/. If this were the correct treatment, it would be the only case in the present study in which only /r/ but not /l/ serves as trigger. Alternatively, there may be words not mentioned in Pirk (1928) containing [k] after [r], which would contrast with [c], as in (33j) for the context after /l/. I leave this question open.

1973; Map 11.2) and Kreis Konitz (Semrau 1915a,b; Map 11.2). I describe below the latter variety.[15]

The phonemic dorsal consonants for Kreis Konitz are depicted in (34). In that system there are velar and palatal fricatives ([ɣ]/[ʝ] and [x]/[ç]), velar and palatal nasals ([ŋ]/[ɲ]), and the velar stop [k]. There is no palatal stop ([c]) corresponding to [k].

(34) a.

/ɣ/	/ʝ/	/ç/	/k/
|	|	|	|
[g]	[ʝ]	[ç]	[k]

b.

/x/	/ç/	/ɣ/	/ʝ/	/k/	/ŋ/	/ɲ/
|	|	|	|	|	|	|
[x]	[ç]	[ɣ]	[ʝ]	[k]	[ŋ]	[ɲ]

In Semrau's system [k x g ɣ ŋ] correspond to ⟦k x ɡ ʒ ŋ⟧. For palatals, [ç]=⟦c⟧ or ⟦tc⟧ depending on the etymological source: ⟦c⟧ is historically a fricative (<$^{+}$[x] or $^{+}$[ɣ]) and ⟦tc⟧ a historical stop (<$^{+}$[k]) The dialect-specific sound change from [k] to [ç] is shown to be active synchronically. [ʝ] (=⟦^{d}j⟧) is described as a voiced lenis palatal fricative ("palataler Reibelaut, stimmhafte lenis"). As implied by the raised "d", [ʝ] (=⟦^{d}j⟧) can be realized as an affricate in some places within Kreis Konitz (recall Footnote 15). Semrau is clear that her ⟦tc⟧ is a voiceless fortis palatal fricative ("palataler Reibelaut, stimmlose fortis"), which is rendered in my transcription as [ç].

Word-initial position exemplifies Contrast Type B in (2a) for [k] (/k/) and [ç] (/ç/) as well as [g] (/ɣ/) and [ʝ] (/ʝ/): Velar [k g] surface before a back vowel in (35a, 35b), but never before a front vowel, while palatal [ç ʝ] occur before front vowels in (35c, 35d) or back vowels in (35e, 35f, 35p). In word-initial position before a consonant, [k g] only surface if the vowel following the consonant is back in (35g, 35h), while [ç ʝ] can surface if the stem vowel is front in (35i, 35j) or back in (35k, 35l). The back stem vowel in (35e, 35f, 35k, 35l) was etymologically front (e.g. [ʝɑːʃt] 'barley'; cf. OSax *gersta*); [çnɑi] 'knee'; cf. OSax *knio*). Regular

[15] One difference between the two varieties is the nature of the velar fronting outputs. Recall from §10.5 that Sępóno Krajeńskie is the only known LG variety with alveolopalatalization. The discussion in Semrau (1915a,b) does not provide a clear indication that her variety can also be so classified. The transcriptions in Darski (1973) indicate that the output for velar fronting for a velar stop target is a (sibilant) affricate (e.g. historical [k] is realized as [tɕ] in the context of front segments).

alternations involving [k]~[ç] and [g]~[ɟ] are attested in word-initial position (in 35m–35o). [k ç] in (35) derived historically from WGmc $^{+}$[k], [ɟ] in (35p) from WGmc $^{+}$[j] and [g ɟ] in the remaining examples from WGmc $^{+}$[ɣ].

(35) Dorsal obstruents in word-initial position

a.	kǫp	[kɔp]	Kopf	‘head’	192
b.	gɑɑv	[gɑːv]	Garbe	‘sheaf’	194
c.	tcįn	[çɪn]	Kinn	‘chin’	193
d.	^{d}jelt	[ɟelt]	Geld	‘money’	194
e.	tcǫǫtcən	[çɔːçən]	Küche	‘kitchen’	193
f.	^{d}jɑɑšt	[ɟɑːʃt]	Gerste	‘barley’	195
g.	knųt	[knʊt]	Flachsknoten	‘flax knot’	185
h.	groot	[groːt]	groβ	‘large’	195
i.	tcleet	[çleːt]	Kleid	‘dress’	193
j.	^{d}jrų̈t	[ɟrʏt]	Grütze	‘groat’	195
k.	cnɑi	[çnɑi]	Knie	‘knee’	195
l.	^{d}jrooiə	[ɟroːiə]	grüne	‘green-INFL’	195
m.	kǫǫ’f	[kɔːf]	Korb	‘basket’	194
	tcǫ̈ǫ̈’v	[çœːv]	Körbe	‘basket-PL’	194
n.	kraants	[krɑːnts]	Kranz	‘wreath’	193
	tcrįnnts	[çrɪnts]	Kränze	‘wreath-PL’	193
o.	gɑɑs	[gɑːs]	Gans	‘goose’	194
	^{d}jęę’z	[ɟɛːz]	Gänse	‘goose-PL’	195
p.	^{d}jum	[ɟum]	Junge	‘boy’	196

Contrast Type B is also attested in postsonorant position (=2b). In that context velars [k x ɣ] surface after a back vowel in (36a–36c) but never after a front vowel or coronal sonorant consonant. The palatals [ç ɟ] occur after a front vowel in (36d, 36e), coronal sonorant consonant in (36f, 36g) or back vowel in (36h, 36i). The [ç] in (36h) was once preceded by a coronal sonorant consonant (cf. MHG *arc* ‘bad’). Example (36i) illustrates that palatal [ɟ] can occur after a back vowel. Alternations in postsonorant position between [k]~[ç] in (36j) and [ɣ]~[ɟ]/[ç] in (36k) are common. All dorsal stops and fricatives referred to above derive from historical velars (WGmc $^{+}$[ɣ k]).

(36) Dorsal obstruents in postsonorant position:

a.	brukə	[brukə]	brauchen	‘need-INF’	193
b.	dɑxt	[dɑxt]	Docht	‘wick’	196

c.	fǭʒ̨əl	[fɔːɣəl]	Vogel	‘bird’	194
d.	slęct	[slɛçt]	schlecht	‘bad’	196
	fę̄tcə	[fɛːçə]	Ferkel	‘piglet’	193
e.	rę̄^{d}jənə	[rɛːɟənə]	regnen	‘rain-INF’	149
f.	bɑɑltcə	[bɑːlçə]	Balken	‘beam’	194
	vųų’ltcə	[vʊːlçə]	Wolken	‘cloud-PL’	251
g.	mų̈ r^{d}jəl	[mʏrɟəl]	Mergel	‘marl’	195
h.	bǫǫtc	[bɔːç]	Borke	‘bark’	194
	ɑɑc	[ɑːç]	arg	‘bad’	196
i.	zǫǫ^{d}j	[zɔːɟ]	Sau	‘sow’	195
j.	brę̄tcə	[breːçə]	brechen	‘break-INF’	242
	brętcst	[brɛçst]	brichst	‘break-2SG’	242
	brętct	[brɛçt]	bricht	‘break-3SG’	242
	brɑk	[brɑk]	brach	‘break-PRET.3SG’	242
	breetcst	[breːçst]	brachst	‘break-PRET.2SG’	242
k.	drǭʒ̨ən	[drɔːɣən]	tragen	‘carry-INF’	195
	drö̜ct	[drœçt]	trägt	‘carry-3SG’	195
	fǭʒ̨əl	[fɔːɣəl]	Vogel	‘bird’	194
	fö̜ö̜^{d}jəls	[fœːɟəls]	Vögel	‘bird-PL’	252

The (2b) contrast also holds for nasals: [ŋ] surfaces only after a back vowel in (37a), but never after a front vowel or consonant, and [ɲ] after a front vowel in (37b) or a back vowel in (37c). Note the near minimal pair [zuŋə] ‘sing-PART’ in (37a) vs. [fuɲə] ‘find-PART’ in (37c). [ŋ]~[ɲ] alternations as in (37d) are common.

(37) Dorsal nasals in postsonorant position:

a.	slɑŋ	[slɑŋ]	Schlange	‘snake’	201
	zuŋə	[zuŋə]	gesungen	‘sing-PART’	171
b.	fiŋ̄ə	[fɪɲə]	Finger	‘finger’	201
	iŋ̄	[ɪɲ]	Ende	‘end’	202
c.	huŋ̄ət	[huɲət]	hundert	‘hundred’	202
	fuŋ̄ə	[fuɲə]	gefunden	‘find-PART’	171
d.	tviŋ̄ə	[tviɲə]	zwingen	‘force-INF’	241
	tvuŋk	[tvuŋk]	zwang	‘force-PRET’	241

Palatal [ɲ] in (37b) derived historically from [ŋ] by velar fronting. That velar could be either an original [ŋ] (e.g. [fɪɲə] < [fɪŋə]) or a new [ŋ] created by Velarization (=1b), e.g. [ɪɲ] < [ɪŋ] < [ɪnd]). It is not clear from the original source what triggered the change from [ŋ] to [ɲ] in (37c).

The word-initial palatal before a back vowel in (35e, 35f, 35p) or before a liquid followed by a back vowel (35k, 35l) is an underlying palatal (/ɟ/ or /ç/). Word-initial [g]~[ɟ] alternations in (35o) are accounted for with an underlying velar (/ɣ/) that surfaces as [ɟ] before a front vowel by Wd-Initial Velar Fronting-6 and as [g] in the elsewhere case by g-Formation-2 (§8.4); recall Lauenburg in (31a). Nonalternating [ɟ] before a front vowel in (35d) is likewise analyzed as /ɣ/. In (35j) the [coronal] feature of the front vowel and of the preceding sonorant consonant merge to a single instantiation of [coronal] by Coalescence-2. The latter process feeds Wd-Initial Velar Fronting-6, thereby creating [ɟ]. Word-initial velars before back vowels in (35a, 35b) or before back vowels separated by a consonant in (35g, 35h) are underlying velars (/k ɣ/). As described above, /ɣ/ is realized as [g] by g-Formation-2.

Kreis Konitz is the only dialect uncovered in the present survey with regular [k]~[ç] alternations. The sound underlying [k]~[ç] alternations for word-initial position (in 35m, 35n) is /k/, which undergoes fronting to the corresponding palatal (|c|) by Wd-Initial Velar Fronting-6. That palatal stop surfaces as [ç] by (38). The change from stop to fricative is stated without a context because any derived palatal stop (|c|) is realized as the corresponding fricative, regardless of whether or not it is word-initial or postsonorant (see below). Given the distribution of [k] and [ç], I analyze [ç] in nonalternating examples like (35c) as /k/ as well. Example (35i) is accounted for formally as (35j) described in the preceding paragraph.

(38) c-Spirantization:

$$\begin{bmatrix} -\textsc{son} \\ -\textsc{cont} \\ \textsc{coronal} \\ \textsc{dorsal} \end{bmatrix} \rightarrow \begin{bmatrix} +\textsc{cont} \end{bmatrix}$$

After a back vowel (=36h, 36i) [ç ɟ] are underlying palatals (/ç ɟ/). All other postsonorant dorsal obstruents in (36) are underlying velars (/k x ɣ/), which shift to the corresponding palatals after a coronal sonorant in (36d–36g, 36j, 36k) by Velar Fronting-9. The derived palatal (|c|) from /k/ surfaces as [ç] by c-Spirantization. The nasal (/ŋ/) in (37a, 37b, 37d) bears the [dorsal] feature and surfaces as palatal after a front vowel in (37b) by Velar Fronting-9. In the context after back vowels in (37c), [ɲ] is an underlying palatal (/ɲ/).[16]

[16]The patterning of velars and palatals in Kreis Konitz is essentially the same in the variety of Zipser German in Hobgarten (modern-day Slovakia), as described by Gréb (1921). Zipser German was a German-language island which developed from the CG dialect spoken by the people who originally settled that region at the onset of the thirteenth century. The area is

Although velar noncontinuants typically pattern together with the velar fricatives as targets for velar fronting in EPo, other EPo varieties have a narrower set of targets. One dialect in which velar noncontinuants fail to serve as triggers for velar fronting was mentioned above, namely Kreis Rummelsburg (=20), which contrasts with the broad set of targets in the neighboring variety once spoken in Kreis Bütow in (17). A second example not mentioned earlier is Kreis Schlawe (Mahnke 1931; Map 11.2). As in Lauenburg (=31), Kreis Schlawe has a version of velar fronting that shifts /ɣ/ to [ʝ] in word-initial position before a front vowel; before a back vowel or consonant, /ɣ/ surfaces as [g] by g-Formation-2, e.g. [ʝɛlt] 'money' (=⟦ĝelt⟧) vs. [gɑːə] 'go-INF' (=⟦gå̊ə⟧). In postsonorant position, the two velars that undergo fronting to palatal are /x ɣ/, e.g. [lɑxə] 'laugh-INF' (=⟦lɑxə⟧) vs. [ʃlɛçt] 'bad' (=⟦šleχt⟧); [oːɣ] 'eye' (=⟦ōʒ⟧) vs. [ʃwiːʝə] 'be silent-INF' (=⟦swīĝə⟧). Mahnke (1931: 35) makes no reference to a palatal realization of [k], noting that MLG [k] is preserved in all positions as [k] (=⟦k⟧). No mention is made of a palatal realization of [ŋ]. From the formal perspective, the set of targets for velar fronting in the Kreis Schlawe variety is restricted to velar fricatives (=Wd-Initial Velar Fronting-3 in §4.3 and Velar Fronting-1).

11.6 Low Prussian

In several varieties of LPr it is clear from the original sources that the targets for velar fronting (both word-initial and postsonorant) consist of velar fricatives and velar noncontinuants. In some sources for LPr the palatal realization of sounds like /k/ and /ŋ/ is simply commented on but not expressed with separate phonetic symbols, but other sources provide distinct symbols for velars and palatals and therefore enable one to draw conclusions concerning the triggers and targets for velar fronting. I consider data from one LPr variety and then conclude by discussing briefly some of the other sources for this dialect area.

a velar fronting island because it is completely surrounded by a language with [x] (/x/) with no [ç] realization (Slovak); see Hanulíková & Hamann (2010). It is interesting to observe that descriptions of other varieties of Zipser German have a more restricted set of velar fronting targets and triggers than in Hobgarten. For example, postsonorant velar fronting only affects /x/ after a coronal sonorant in the town of Leibitz, as described by Lumtzer (1894, 1896), e.g. ⟦nęχ⟧ 'not', ⟦knǣ̂χt⟧ 'vassal', ⟦hɑrχn̥⟧ 'hark-INF' vs. ⟦gəbrǫxt⟧ 'bring-PART'. By contrast, the phonetically transcribed entries in the dictionary for Dobschau (WbMD) and the phonetically transcribed texts in Kövi (1911) for Käsmark point to a narrower set of velar fronting triggers, namely the front vowels but not the coronal sonorant consonants, e.g. ⟦iχ⟧ 'I' vs. ⟦mɑnx⟧ 'many', ⟦pox⟧ 'stream'. These facts are expressed formally with Velar Fronting-13, which is discussed in §13.3.4 and §15.2.

Natau (1937) describes the LPr dialects once spoken in the northeastern part of East Prussia, concentrating on the small village of Willuhnen (Map 11.2). That dialect has the phonemic dorsal sounds and their realizations depicted in (39). Among those sounds are the two palatal noncontinuants [c ɲ]. Natau transcribes those sounds with the same phonetic symbol for the corresponding velars (⟦k⟧ and ⟦ŋ⟧), but he gives very clear statements regarding the velar vs. palatal distribution (p. 31–32). The stop [g] (=⟦g⟧) is present as the reflex of WGmc +[gg], e.g. ⟦rigə⟧ 'back', but Natau does not discuss whether or not his ⟦g⟧ is velar or palatal after a front vowel.

(39) a. /ɣ/ /ʝ/ /k/

[ɣ] [ʝ] [k] [c]

b. /ɣ/ /x/ /k/ /ŋ/

[ɣ] [ʝ] [x] [ç] [k] [c] [ŋ] [ɲ]

Word-initial position (=40a–40g) illustrates Contrast Type B in (2a) for [ɣ] and [ʝ]. The initial palatal in (40f) was historically velar (WGmc +[ɣ]) and the one in (40g) was the etymological palatal. Velar and palatal stops [k]/[c] stand in an allophonic relationship. In word-initial position [k] occurs before any back vowel in (40h) or consonant in (40i) and [c] before any front vowel in (40j); Natau (1937: 31). Examples (40b, 40i) illustrate that Coalescence-2 is not active in this dialect.

(40) Word-initial dorsal obstruents:

a.	ɣuldə	[ɣʊldə]	Gulden	'guilder'	15
b.	ɣrīs	[ɣriːs]	grau	'gray'	35
c.	jēərn	[ʝeːərn]	gern	'gladly'	56
	jǣəršt	[ʝæːərʃt]	Gerste	'barley'	34
d.	ɣast	[ɣɑst]	Gast	'guest'	57
	jæst	[ʝæst]	Gäste	'guest-PL'	57
e.	ɣrōət	[ɣroːət]	groß	'large'	56
	ɣretər	[ɣrɛtər]	größer	'larger'	56
f.	jəkoft	[ʝəkɔft]	gekauft	'buy-PART'	21
g.	juŋ	[ʝʊŋ]	Junge	'boy'	55

h.	korf	[kɔrf]	Korb	'basket'	31
i.	kreb	[krɛb]	Krippe	'crib'	31
j.	ken	[cɛn]	Kinn	'chin'	31
	kæp	[cæp]	Köpfe	'head-PL'	31

In postsonorant position [x ɣ] only occur after a back vowel in (41a, 41d) and [ç ʝ] after a front vowel in (41b, 41e) or liquid in (41c, 41f). [k] and [c] have a parallel distribution in (41g–41i). As in West Mecklenburg (§11.3) and Sebnitz (§11.4), [ŋk] occurs after a back vowel and [ɲc] after a front vowel.[17] From the historical perspective, [x ç] derive from WGmc ⁺[x], [ɣ ʝ] from WGmc ⁺[ɣ], [k c] from WGmc ⁺[k], and [ŋ ɲ] from WGmc ⁺[ŋ].

(41) Postsonorant dorsal consonants:

a.	brux	[brʊx]	Bruch	'fracture'	32
b.	hæχt	[hæçt]	Hecht	'pike'	32
c.	štorχ	[ʃtɔrç]	Storch	'stork'	32
d.	frǭəɣə	[frɔːəɣə]	fragen	'ask-INF'	36
e.	ne·ijə	[neiʝə]	neigen	'incline-INF'	21
f.	zorjd	[zɔrʝd]	sorgte	'care for-PRET'	36
g.	dak	[dɑk]	Dach	'roof'	31
h.	ek	[ɛc]	ich	'I'	32
i.	molkə	[mɔlcə]	Molke	'whey'	32
j.	baŋk	[bɑŋk]	Bank	'bank'	32
k.	driŋkə	[drɪɲcə]	trinke	'drink-1SG'	32

From the formal point of view, the initial sound in (40a–40e) is /ɣ/, and in (40h–40j) it is /k/. Those velars surface as palatal in word-initial position before a front vowel by Wd-Initial Velar Fronting-6. In the context before a back vowel the initial sound in (40f, 40g) is an underlying palatal (/ʝ/). In postsonorant position (=41), /x ɣ k/ shift to the corresponding palatals after a coronal sonorant by Velar Fronting-9.

In Willuhnen, velar noncontinuants and velar fricatives serve as targets for velar fronting. However, other LPr varieties once spoken in the same region (East

[17] Natau (1937: 26) transcribes the diminutive suffix as ⟦kə⟧, but he does not say whether or not the ⟦k⟧ is phonetically [k] or [c], e.g. ⟦kīəlkə⟧ 'wedge-DIM'. In certain EPo varieties, the consonant in that suffix is realized consistently as [c], regardless of the nature of the preceding sound (e.g. Lauenburg; recall 33i).

Prussia) have a narrower set of targets. Two very similar varieties are the ones described by Bink (1953) in and around the village of Mandtkeim and Mitzka (1919) for Königsberg (Map 11.2). It is clear from both sources that the palatal fricatives [ç ʝ] are allophones of the corresponding velars in postsonorant position, e.g. Königsberg [vʊxt] 'impact' (=⟦wuxt⟧) vs. [kɪç] 'kitchen' (=⟦kĭχ⟧); [tuːɣənt] 'virtue' (=⟦tûɣənt⟧) vs. [kriːʝə] 'get-INF' (=⟦krîjə⟧). However, neither Mitkza nor Bink give any indication that there are palatal stops or a palatal nasal. From the formal perspective the set of target segments for velar fronting consists solely of velar fricatives (/ɣ x/). This requirement suggests that the correct rule is Velar Fronting-1.[18]

Several sources for EPr indicate that the alternation between [ɣ] and [ʝ] in word-initial position is different than in Willuhnen (recall 40). For example, in his discussion of the various subdivisions of the EPr dialect area, Ziesemer (1924) observes that in the area to the north of Königsberg, word-initial [ʝ] (< WGmc $^+$[ɣ]) occurs before a front vowel or before a liquid followed by a front vowel (e.g. ⟦jenz⟧ 'goose-PL', ⟦jrēwə⟧ 'greave-PL'), while [ɣ] surfaces before a back vowel or before a liquid followed by a back vowel (e.g. ⟦ɣǭnə⟧ 'go-INF', ⟦ɣlɑs⟧ 'glass'). Ziesemer (1924) does not say whether or not word-initial [k] has a palatal realization. The same pattern involving word-initial [ɣ] and [ʝ] (< WGmc $^+$[ɣ]) is reflected in the material presented in Wagner (1912) for Alt-Thorn, Mitzka (1919) for Königsberg, and Tessmann (1966) for Bieberstein bei Barten. General descriptions of EPr either give clear statements expressing the distribution of word-initial [ɣ] and [ʝ] (< WGmc $^+$[ɣ]), or they present data with distinct symbols so that the generalizations concerning their patterning can be deduced, e.g. Förstemann (1850), Fischer (1896), Kantel (1900), and Betcke (1924). Note that consonants (liquids) in onset position are transparent to velar fronting, as in West Meckenburg (§11.3),

[18] The narrow set of velar fronting targets is also attested in the LG dialect once spoken to the northeast of Königsberg (Map 11.2), in modern-day Estonia and Latvia. That variety is known as Baltic German (Sallmann 1872, Mitzka 1923a,b, Masing 1926, Deeters 1939). The data presented in those sources reveal that the Baltic German region was a velar fronting island because the area was completely surrounded by languages without velar fronting (Latvian and Estonian). In Baltic German, velar fronting applied word-initially and in postsonorant position for dorsal fricative targets (/x ɣ/). In postsonorant position the triggers are coronal sonorants. Representative examples from Mitzka (1923a) are ⟦līјən⟧ 'lie-INF', ⟦niχ⟧ 'not', ⟦berjə⟧ 'mountain-PL', ⟦foljən⟧ 'follow-INF', ⟦tūɣənt⟧ 'virtue', and ⟦jāxt⟧ 'hunt'. That pattern is captured formally with Velar Fronting-1. In word-initial position, /x/ does not occur, but /ɣ/ surfaces as the corresponding palatal before a front vowel and as [g] before a back vowel or consonant, e.g. ⟦jên⟧ 'go-INF' vs. ⟦golt⟧ 'Gold', ⟦grāpən⟧ 'iron pot', ⟦grikən⟧ 'buckwheat'. Recall the Eph pattern represented by Dingelstedt am Huy from §8.4, which was expressed with Wd-Initial Velar Fronting-3 and g-Formation-2.

Sebnitz (§11.4), and Kreis Konitz (§11.5). See also HPr (§11.7) below. From the formal perspective, the transparency of liquids in word-initial onsets requires a version of velar fronting (Wd-Initial Velar Fronting-3) and Coalescence-2, as in the aforementioned case studies.

The patterning of velars and palatals in word-initial and postsonorant position throughout the EPr dialect area is summarized in Schönfeldt (1977: 84–87). That source confirms that there are two types of dialect defined according to how word-initial [ɣ] and [ʝ] (<WGmc $^{+}$[ɣ]) are distributed. First, there are places like Willuhnen – representing the eastern region in general –, where [ɣ] surfaces before back vowels or liquids, even if the vowel following the liquid is front, while [ʝ] (<WGmc $^{+}$[ɣ]) occurs only before a front vowel (henceforth "Pattern P"). Second, there are the remaining regions, which obey liquid transparency, as described in the preceding paragraph (henceforth "Pattern Q"). Pattern Q is expressed in the statements Schönfeldt (1977: 84) gives for the distribution of fortis velar and palatal stops in word-initial and postsonorant position. According Schönfeldt's survey of the dialects once spoken in East Prussia and West Prussia, Pattern Q is the norm, and Pattern P is geographically restricted to a few places in the east, e.g. Willuhnen.

The two types of system described here have been known among dialectologists since the early 1840s. Lehmann (1842: 30–32) observes that for his speakers of LPr word-initial /g/ is realized as palatal ([ʝ]) before front vowels or /r l n/, but only if a front vowel follows those consonants (Pattern Q). Lehmann writes: "Das *g* wird vor *a, o* und *u* sowie vor Konsonanten richtig augesprochen, nähert sich dagegen vor *e, i, ä, ö* und *ü*, ferner vor *l, n* und *r*, wenn auf diese ein *e, i* oder Umlaut folgt, ganz dem *j*". For Lehmann's speakers there is no fronting of the other word-initial velar ([k]). Lehmann's system can be contrasted with the LPr variety described by Gortzitza (1841: 29–30), who is clear that for his speakers, all word-initial velars (/g k x/) are fronted to palatals before a front vowel but not before a back vowel or /r l n/ (Pattern P). Gortzitza lists several dozen words (in StG orthography) which illustrate the distribution of palatal ("Gaumlaut") and velar ("Kehllaut") sounds. For example, the palatal fricative ([ʝ]) occurs in words like *Geld* 'money' and *Gift* 'poison', while the corresponding velar ([g]) is realized in words like *Gans* 'goose', *Gott* 'God', *Glück* 'fortune', and *Glas* 'glass'. The same pattern obtains for word-initial [k], with the palatal segment ("Gaumlaut") attested in words like *Kinn* 'chin' and *Kerze* 'candle' and the velar ("Kehllaut") in items like *Kalk* 'lime', *Kuh* 'cow', *Klang* 'sound', and *Krieg* 'war' (Gortzitza 1841: 24-25). The same distribution of velars and palatals applies to [x] and [ç] in loanwords, e.g. palatal ("Gaumlaut") in *Chemie* 'chemistry' and *Cherub* 'cherub', but velar ("Kehllaut") in *Chaos* 'chaos' and *Christ* 'Christian' (Gortzitza 1841: 29-30).

From the formal point of view, the data in Gortzitza (1841) representing Pattern P point to Wd-Initial Velar Fronting-6. By contrast liquid transparency characterized by Pattern Q as described by Lehmann (1842) requires Wd-Initial Velar Fronting-6 and Coalescence-2, as in West Mecklenburg.[19]

Another variety of LPr with liquid transparency for word-initial position (Pattern Q) is Plautdietsch (§9.5.2). For example, in his treatment of Chortitza, Quiring (1928) has ⟦jelt⟧ 'money' and ⟦jlek⟧ 'fortune' vs. ⟦ɣɑust⟧ 'guest' and ⟦ɣrunt⟧ 'reason'. It is clear from Quiring's description of [k] on p. 68 that there is a palatal allophone, although he does not indicate this in his phonetic transcriptions. That palatal stop occurs word-initially before a front vowel or before a consonant followed by a front vowel; elsewhere the velar stop surfaces. The facts of Chortitza therefore suggest that Wd-Initial Velar Fronting-6 and Coalescence-2 are active in the synchronic phonology, as in West Mecklenburg.

In postsonorant position, liquids are not transparent in Chortitza (recall 43 for Willuhnen). Thus, [x] surfaces after back vowels and [ç] after coronal sonorants (front vowels or liquids) regardless of the nature of the vowel preceding the liquids (recall the discussion on the phonemic contrast between /x/ and /ç/ in Plautdietsch in §9.5.2). The examples cited earlier with [ç] after coronal sonorants are ⟦liχt⟧ 'light', ⟦treχtɑ⟧ 'funnel', ⟦horχst⟧ 'hark-2sg' and with [x] after back vowels is the example ⟦doxt⟧ 'think-pret. The same pattern holds for the lenis counterparts [ɣ] and [ʝ], e.g. ⟦krîʝən⟧ 'get-inf' and ⟦borʝən⟧ 'borrow-inf' vs. ⟦hō̆oɣəl⟧ 'hail'. The velar stops [k] and [g] surface as velar after back vowels and as palatals after front vowels or liquids, regardless of the nature of the vowel preceding the liquid. (Palatal stops are not indicated in Quiring's phonetic transcriptions). The velar nasal surfaces after back vowels, but it is realized as palatal after front vowels; see Quiring (1928: 75). From the formal perspective, Chortitza requires Velar Fronting-9 in (16).

11.7 High Prussian

I discuss first a specific variety in detail. At the end of this section I turn to additional sources for HPr.

[19]Lehmann (1842) does not discuss the distribution of velars and palatals in postsonorant position. Gortzitza (1841) provides many concrete examples of words illustrating that velars ([k g x]) occur after a back vowel and the corresponding palatals after a front vowel or liquid even if a back vowel precedes the liquid. (Gortzitza does not discuss the status of the velar nasal; hence it is not possible to know if his speakers fronted that sound to palatal after coronal sonorants). The data in that source therefore point to Velar Fronting-6.

The dorsal consonants of the HPr variety once spoken in Reimerswalde (Kuck & Wiesinger 1965; Map 11.2) have the distribution depicted in (42):

(42) a.

/ʝ/	/k/	/c/	/g/	/ɟ/
[ʝ]	[k]	[c]	[g]	[ɟ]

b.

/x/		/ʝ/	/k/	/c/	/g/	/ɟ/	/ŋ/	
[x]	[ç]	[ʝ]	[k]	[c]	[g]	[ɟ]	[ŋ]	[ɲ]

The word-initial examples in (43a–43m) exhibit Contrast Type B in (2a) for [k g] (<WGmc $^+$[k ɣ]) and the corresponding stops [c ɟ]. [ʝ] occurs before any type of vowel. The palatal in (43n) derives from WGmc $^+$[j] and the one in (43o) from WGmc $^+$[ɣ].

(43) Word-initial dorsal obstruents:

a.	kū	[kuː]	Kuh	'cow'	130
b.	gǭrə	[gɔrə]	Garn	'yarn'	144
c.	ḱen	[cen]	Kinn	'chin'	137
d.	gęlt	[ɟɛlt]	Geld	'money'	143
e.	ḱāvɒ	[cɑːvɐ]	Käfer	'bug'	137
	ḱɑen	[cɑen]	Keim	'germ'	124
f.	gāršt	[ɟɑːrʃt]	Gerste	'barley'	144
	gɑest	[ɟɑest]	Geist	'intellect'	128
g.	krɑot	[krɑot]	Kraut	'herb'	137
	klǭgə	[klɔːgə]	klagen	'complain-INF'	137
	knǫpə	[knɔpə]	Knoten	'knot'	137
h.	ḱrāfs	[crɑːfs]	Krebs	'crab'	139
	ḱlɑe	[clɑe]	Kleie	'bran'	124
i.	grɑp	[grɑp]	Grab	'grave'	141
j.	grɑbələ	[ɟrɑbələ]	greifen	'grasp-INF'	140
	glɑeχ	[ɟlɑeç]	gleich	'soon'	139
k.	glek	[ɟlek]	Glück	'fortune'	143
	ḱnepə	[cnepə]	knüpfen	'tie-INF'	137

l.	kǫp	[kɔp]	Kopf	‘head’	119
	ḱęp	[cɛp]	Köpfe	‘head-PL’	120
m.	klųk	[klʊk]	klug	‘clever’	131
	ḱlīgɒ	[cliːɟɐ]	klüger	‘more clever’	131
n.	jūgənt	[ʝuːgənt]	Jugend	‘youth’	117
	ję̄nɒ	[ʝɛːnɐ]	jener	‘that-MASC.SG’	146
o.	jəblēivə	[ʝəbleːivə]	geblieben	‘stay-PART’	143

In postsonorant position, [x] and [ç] never contrast: [x] occurs after back vowels in (44a) and [ç] after front vowels in (44b) or coronal sonorant consonants in (44c, 44d). [k g] and [c ɟ] illustrate Contrast Type B in (2b); see (44e–44m). Alternations between velar and palatal stops are well-attested in (44n). In contrast to [k], [g] never surfaces after a consonant, but [ʝ] does in (44o). [ʝ] surfaces after a historically elided front vowel in (44p). No examples were found in the original source for [x] after [uː], which is not a common vowel in the dialect.

(44) Postsonorant dorsal obstruents:

a.	vǫx	[vɔx]	Woche	‘week’	119
	dɑx	[dɑx]	Dach	‘roof’	142
b.	rįχə	[rɪçə]	riechen	‘smell-INF’	130
	hęχt	[hɛçt]	Hecht	‘pike’	118
c.	štǫrχ	[ʃtɔrç]	Storch	‘stork’	139
d.	melχ	[melç]	Milch	‘milk’	115
e.	krųk	[krʊk]	Krug	‘jug’	131
f.	māgə	[mɑːgə]	Magen	‘stomach’	122
g.	reḱ	[rec]	Rücken	‘back’	117
h.	špįgəl	[ʃpɪɟəl]	Spiegel	‘mirror’	144
i.	vāḱ	[vɑːc]	Weg	‘path’	147
j.	flāgə	[flɑːɟə]	pflegen	‘care for-INF’	121
k.	štɑrk	[ʃtɑːrk]	stark	‘strong’	122
l.	vęrḱ	[vɛrc]	Werk	‘work’	121
	męlḱə	[mɛlcə]	melken	‘milk-INF’	121
m.	bārḱ	[bɑːrc]	Berg	‘mountain’	121
n.	zɑogə	[zɑogə]	saugen	‘suck-INF’	124
	zɑeḱst	[zɑecst]	säugst	‘suck-2SG’	125

o.	mǫrjə	[mɔrʝə]	morgen	'tomorrow'	119
	fęnj	[fɛnʝ]	Pfennige	'penny-PL'	143
p.	lāvχ	[lɑːvç]	lebendig	'lively'	121
	rūχ	[ruːç]	ruhig	'quiet'	132
	rūjɒ	[ruːʝɐ]	ruhiger	'more quiet'	143

The velar nasal and the palatal nasal stand in an allophonic relationship: [ŋ] only surfaces after a back vowel in (45a) and [ɲ] only after a front vowel in (45b–45d). The palatal nasal has two historical sources: WGmc $^{+}$[ŋ] by velar fronting in (45b) or WGmc $^{+}$[nd] by Velarization from (1b) in (45c). [ŋ]~[ɲ] alternations are attested in (45e).

(45) Dorsal nasals in postsonorant position:

a.	tsųŋ	[tsʊŋ]	Zunge	'tongue'	116
b.	eή̃əl	[eɲəl]	Engel	'angel'	149
c.	lįή	[lɪɲ]	Linde	'linden tree'	115
d.	hųįήt	[hʊɪɲt]	Hund	'dog'	142
e.	jəfųŋə	[ʝəfʊŋə]	gefunden	'find-PART'	116
	fįήə	[fɪɲə]	finden	'find-INF'	115

In word-initial position, underlying velar stops (/k g/) surface as palatal ([c ɟ]) before a front vowel in (43c, 43d, 43l) by Wd-Initial Velar Fronting-6. If /k g/ are followed by a liquid plus front vowel in (43k, 43m) then the feature [coronal] of that front vowel merges with the [coronal] feature of the liquid by Coalescence-2, which then feeds Wd-Initial Velar Fronting-6. Word-initial palatal stops are underlyingly palatal (/c ɟ/) before a back vowel in (43e, 43f) or before a consonant followed by a back vowel in (43h, 43j). [ʝ] is likewise an underlying palatal in (43o).

In postsonorant position the allophones [x] and [ç] in (44a–44d) derive from /x/, which is realized as palatal [ç] after a coronal sonorant by Velar Fronting-1. For the nasal allophones [ŋ ɲ] in (45) the underlying sound is /ŋ/, which surfaces as [ɲ] after a front vowel by Velar Fronting-8. The latter process also accounts for the realization of /k g/ as [c ɟ] after a front vowel in (44g, 44h, 44n). If /k g/ are preceded by a front vowel plus liquid sequence in (44l) then Coalescence-1 merges [coronal] from the front vowel and the liquid, thereby feeding Vel-Fr-8, e.g. /vɛrk/→|v**ɛr**k|→[v**ɛrc**]. In postsonorant position palatal stops are underlying sounds (/c ɟ/) after back vowels in (44i, 44j) and after consonants preceded by back vowels in (44m). [ç ʝ] are likewise underlying sounds (quasi-phonemes /ç ʝ/) in (44p).

Additional sources for varieties of HPr are Stuhrmann (1896), Ziesemer (1924), Kuck (1927, 1933), and Tessmann (1969). The data presented in those works were drawn from various towns and villages in the HPr dialect area. There is no significant difference for any of those authors concerning the distribution of [x] (=⟦x⟧) and [ç] (=⟦χ⟧), which surface as predictable positional variants. The sources also agree that HPr has both velar and palatal stops, although separate phonetic symbols for the palatal sounds are rarely given, e.g. Ziesemer (1924: 123). It is interesting to consider what Tessmann (1969: 116) writes on this topic. He justifies his use of a single symbol for velars and palatals because the distinction between those two places of articulation is predictable based on context, suggesting that they are allophones. However, on the same page Tessmann notes that separate symbols for the palatal series is only necessary "in special cases" ("in besonderen Fällen"). Those instances where Tessmann has separate symbols for palatal stops (⟦k'⟧ and ⟦g'⟧) are precisely the ones where the palatals occur in the context of a back vowel that was historically front, e.g. ⟦k'ɑ̄fər⟧ 'bug' (cf. StG *Käfer*), ⟦wɑ̄g'⟧ 'path' (cf. StG *Weg*), ⟦bɑ̄rg'⟧ 'mountain' (cf. StG *Berg*). A parallel example from Ziesemer (1924) is ⟦kɑinə⟧ 'germinate-INF', which the author gives as a word with an initial fortis palatal fricative; recall the parallel example from Reimerswalde in (43e). In present terms, the palatal stops in the aforementioned examples are phonemic.

11.8 Summary

There are two clearly identifiable patterns for the set of velar fronting targets for both word-initial and postsonorant position, namely (A) the broad group consisting of all velar consonants, or (B) the narrow set of sounds comprising all and only velar fricatives.

Pattern (A) holds for postsonorant velar fronting in West Mecklenburg, Sebnitz, Seifhennersdorf, Kreis Bütow, Kamnitz, Laueburg, Kreis Konitz, Willuhnen, and Reimerswalde, while the narrow group of target sounds in pattern (B) is attested in Kreis Rummelsburg, Kreis Schlawe (§11.5), and Königsberg (§11.6). There are no clear-cut cases in which the set of targets consists of velar fricatives and velar stops but not the velar nasal (recall the discussion of targets in the typological literature discussed in §2.3.2). Kamnitz is a potential example, but this conclusion cannot be definitive because the original source is not clear on whether or not the velar nasal has a palatal variant after front vowels. In one dialect mentioned earlier (Bleckede; §11.3) both /x/ and /ɣ/ appear after a sonorant, but only /x/ undergoes fronting. In a number of localities there is a single dorsal fricative as a target (/x/) with velar noncontinuants not undergoing fronting, i.e. South Mecklenburg, Ivenack-Stavenhagen, Wolgast, Hemmelsdorf, Kreis Herzogtum Lauenburg from §11.3 and Groβschönau, Schokau, West Lausitz from §11.4. Since /ɣ/ is not present in those dialects it cannot be known whether or not the set of targets consist of all velar fricatives or only /x/, as in Bleckede. In Kaarβen and Barth (§11.3) it cannot be determined whether or not all velar consonants are undergoing fronting (=A) or only the fricatives (=B). Note that Barth is also a potential example of the Bleckede system where only /x/ but not /ɣ/ undergoes fronting.

The predominant pattern for word-initial position is for any velar consonant present in that context to undergo fronting (=A), i.e. West Mecklenburg, Sebnitz, Seifhennersdorf, Kreis Bütow, Kamnitz, Lauenburg, Kreis Konitz, Willuhnen, Reimerswalde.

The broadest context (coronal sonorant consonants) is well-attested in postsonorant position, i.e. Seifhennersdorf, Kreis Bütow, Kreis Konitz, Willuhnen. However, those triggers are not attested in all dialects. First, the set of triggers for a number of varieties listed above consists of front vowels but crucially not the coronal sonorant consonants. That narrow set of triggers is particularly well-attested in word-initial position, e.g. Kamnitz, Kreis Lauenburg, Willuhnen. Second, two dialects are documented with an even narrower group of triggers for postsonorant fronting: nonlow front vowels (Kamnitz) and front tense vowels (Kreis Rummelsburg). Nonlow triggers are attested in German dialects outside of the region investigated in this chapter, i.e. Rheintal (§3.4), Rhoden (§5.2), Obersaxen (§6.3). However, the front tense vowel context is otherwise without precedent in German dialects (see §12.7.1).

Several dialects discussed in the present chapter exhibit the effects of Coalescence-1 or Coalescence-2. As noted earlier, places with one of those processes are situated in the same area as the ones in which they are absent. For example, in West Mecklenburg, the /x/ after a sequence of back vowel plus liquid surfaces as [x], but after a front vowel plus liquid as [ç] (=5b,d). By contrast in South Mecklenburg /x/ surfaces in both contexts as [ç]. See §12.8.1 for further discussion of how the two processes of coalescence fit into German dialects as a whole.

11.9 Velar noncontinuant targets viewed historically

I consider first (§11.9.1) the historical interpretation of the two types of dialect referred to in §11.8 and then the influence non-Gmc language on that development (§11.9.2).

11.9.1 Extension of velar fronting targets

The two patterns referred to in §11.8 – broad targets (A) and narrow targets (B) – mirror two distinct historical stages. In particular, velar fronting was originally phonologized with a smaller set of targets (B), and later the set of targets was expanded to include all velar consonants (A); recall the rule generalization model from §2.4.1. That historical progression supports the implication in (46) (from §2.3.2), which German dialects obey without exception.[20]

(46) Implicational Universal for Velar Fronting Targets-1:
If a velar stop (/k g/) undergoes velar fronting then the corresponding fricative (/x ɣ/) does as well.

As stated above, (46) correctly predicts that there are dialects in which velar stops and velar fricatives serve as targets (A) as well as dialects where only velar fricatives undergo fronting (B). However, the same implication precludes dialects in which only velar stops undergo the change but velar fricatives in the same context fail to exhibit fronting. The final clause in the preceding sentence ("…velar fricatives in the same context…") is important because there are dialects in which velar fronting targets stops, but velar fricatives are not present in that context. One example is West Mecklenburg, in which velar fronting targets /k g/ in word-initial position (=4). Significantly, neither /x/ nor /ɣ/ occur word-initially.

Although (46) holds without exception for German, it cannot be universally valid (recall the discussion on the typology of Velar Palatalization targets in §2.3.2). Since there are many languages where velar stops undergo fronting/Velar Palatalization but not the velar fricatives, it should come as no surprise that there is no phonetic motivation for (46).

The reason (46) is correct for German is due to the history of velar fronting targets, as described above: The first targets historically were velar fricatives, while the velar noncontinuants were only added to that set at a later stage. The narrow targets have been in the language for such a long time that that version of velar fronting has had time to diffuse geographically through virtually all of modern-day Germany and most of Austria; hence, there are very few places in Germany and Austria where velar fronting could be phonologized with only velar noncontinuants as the sole targets.

[20] In (46) and below I juxtapose velar fricatives (/x ɣ/) with velar stops (/k g/). It may be possible to propose a similar generalization for the velar nasal (/ŋ/).

11.9.2 Influence from non-Germanic languages

The palatal noncontinuants investigated in this chapter ([c ɟ ɲ]) derived historically from the corresponding velars by some version of velar fronting. That assessment is not controversial because the original velars are preserved in other dialects. For example, in Reimerswalde (§11.7), the initial sound in the native German word 'money' is palatal ([ɟ]), i.e. [ɟɛlt], but that palatal surfaces in other dialects as velar ([g]), e.g. StG [gɛlt]. Sounds like [c ɟ ɲ] therefore have the same history as the palatal fricatives [ç ʝ] in the dialects discussed in previous chapters in the sense that both sets of sounds arose via some version of velar fronting. Those noncontinuants that are now palatal quasi-phonemes or phonemic palatals were once allophones of velars in the neighborhood of front segments that served as triggers for velar fronting. When those front sounds elided or shifted to back sounds, the palatal noncontinuant allophones were encoded directly in underlying representations.

Most dialects with expanded targets are coterritorial with at least one Slavic language, in particular either Polish and/or Kashubian (both West Slavic). Slavic languages possess phonemic sounds that are similar phonetically to [c ɟ ɲ]. Although the palatal noncontinuants discussed below had an endogenous (German-internal) history whose emergence is structural (phonological), I suggest that social factors (contact with Slavic languages) probably played a role in their phonologization as well.[21]

Before discussing the Slavic influence on German dialects, consider the way in which palatal noncontinuants arose in native German words. As a representative example, I provide three items in (47) from Reimerswalde illustrating the development of WGmc ⁺[k] in word-initial position. These three concrete examples from one particular variety are representative of the palatal noncontinuants in the other varieties discussed above. Stage 1 represents the point where velar fronting was absent and /k/ surfaced without change as [k], although phonetic (coarticulatory) fronting is also assumed to have been present. At Stage 2, velar fronting was phonologized. That process applied in the context before front vowels, as indicated in the first and third examples. At Stage 3, Vowel Retraction restructured the vowel /iː/ to /ɑe/, a change that triggered the restructuring of the original /k/ to the phoneme /c/ at Stage 3. The change from /yː/ to /iː/ in the

[21]This question has been discussed in the literature for a number of years; a representative example of the type of publication that was common over one century ago is Gréb (1921) for Zipser German, who discusses the findings of Semrau (1915a,b) at length (§11.5). Another linguist who draws a correlation between palatal stops in ELG dialects and Slavic languages is Mitzka (1959: 120–124). See also the discussion in Siemens (2012: 92–98) on Plautdietsch (§9.5.2 and §11.6).

final example is assumed to have postdated the change from /iː/ to /ɑe/. Velar fronting continued to operate before front vowels, as in the final two examples.

(47)

/kiːn/	/kuː/	/kyː/	
[kiːn]	[kuː]	[kyː]	Stage 1
/kiːn/	/kuː/	/kyː/	
[ciːn]	[kuː]	[cyː]	Stage 2
/cɑen/	/kuː/	/kiː/	
[cɑen]	[kuː]	[ciː]	Stage 3
Keim	*Kuh*	*Kühe*	StG
'germ'	'cow'	'cow-PL'	

Examples like [cɑen] 'germ' show that the etymological front vowel /iː/ (cf. OHG *kīmo*) has left its trace in the form of the palatal [c] (/c/), which was formerly a positional variant of /k/.[22]

Why did velar fronting affected velars like /k/ predominantly in those German-speaking areas coterritorial with Slavic languages? There was unarguably contact between speakers of Slavic languages and speakers of the German dialects examined in this chapter, and I claim that this contact probably played a role in the extension of velar fronting to velar noncontinuants.

There is more than one way in which language-contact might have played out. I describe a possible scenario which involves the acquisition of Slavic loanwords, although variations on the same theme are also conceivable. It needs to be stressed that the progression of changes described here is highly speculative. First, not all of the original sources cited earlier discuss Slavic loanwords, and second – even in those works where that type of loanword is included – not all of them contain palatal noncontinuants. Consider now the following three historical stages. WeSl designates a West Slavic language (see discussion below) and EaGm those varieties of ELG and ECG with palatal noncontinuants.

Stage P: EaGm had velar fronting, which only affected velar fricatives (/x ɣ/); velar noncontinuants may have been subject to coarticulatory (phonetic) fronting;

[22]The historical derivations in (47) are intended to illustrate that velar fronting affected velar noncontinuants like [k] in native words. Some of the examples discussed in the present chapter reveal that velar fronting also applied in loanwords; however, examples like those involve loanwords that have been well-integrated into the language, e.g. the word 'head' (and its plural) StG [kɔpf]~[kœpfə] from (43l) was originally borrowed from Latin *cūpa, cuppa*.

Stage Q: WeSl loanwords with palatal noncontinuants were acquired by speakers of EaGm;

Stage R: The presence of palatal noncontinuants in WeSl loanwords in EaGm served as a catalyst for the extension of the set of triggers for velar fronting from velar fricatives to all velar consonants.

Stage P corresponds to Stage 2 in (47) and Stage R to Stage 3. Stage Q therefore represents a point not depicted above between Stage 2 and Stage 3.

Linguistic evidence points to a phonologization of velar fronting in WCG at a very early date, namely around the ninth century (Chapter 16). The northeastern parts of pre-1945 Germany discussed in this chapter were originally populated by Slavic peoples, and German-speaking settlers only entered that region via the OSTSIEDLUNG in a series of waves beginning in the eleventh century; see Hirt (1925: 135ff.), Bach (1950: 180ff.), Mitzka (1959), and Bach (1970: 169ff.). I speculate that many of those settlers brought Stage P/Stage 2 velar fronting with them in that migration eastwards.

One difficulty involving Stage Q is that the historical rule of velar fronting was phonologized many centuries ago, and for that reason it is not clear what the nature of the palatal noncontinuants in loanwords was at that point in time. For example, modern Polish and modern Kashubian (Map A.1) have no phonemic palatal stops ([c ɟ]), although they both possess alveolopalatal affricates ([tɕ dʑ]). Did the WeSl loanwords at Stage Q contain [tɕ dʑ], or perhaps an earlier reflex of those sounds ([c ɟ])? Could [c ɟ] have been present in loanwords from a Baltic language?[23] Regardless of how one answers these questions, the point is that loanwords in EaGm referred to here served as a signal to speakers that palatal noncontinuants are sounds distinct from the corresponding velars.

Consider now the connection between the acquisition of loanwords (Stage Q) and the extension of VeFr to velar noncontinuants (Stage R). Stage Q is clearly a sufficient condition for Stage R, because there are many varieties discussed above with the broad set of targets that possess WeSl loanwords. However, it remains unclear whether or not Stage Q is a necessary condition for Stage R.

As noted earlier, not all original sources for EaGm dialects discuss WeSl loanwords, so this question will ultimately need to remain open for further study. Some evidence that there is a direct correlation between the influence of WeSl

[23]Three candidates are Latvian, Lithanian (both East Baltic), and the extinct West Baltic language Old Prussian. Latvian contrasts /c ɟ/ and /k g/ (Urek 2016). Both Lithuanian (Augustaitis 1964) and Old Prussian (Schmalstieg 1964) contrast /k g/ and the secondarily palatalized sounds /k^j g^j/.

(which might be deduced on the basis of the sheer number of Slavic loanwords) and the broader set of targets for velar fronting in postsonorant position can be observed in two neighboring EPo varieties discussed earlier (§11.5): Kreis Bütow (with a broad set of targets) and Kreis Rummelsburg (with a narrow set of targets): The source for both dialects (Mischke 1936: 73) notes that Kreis Bütow has more Slavic loanwords than Kreis Rummelsburg ("B.M. [=Kreis Bütow] hat mehr slaw. Lehnwörter als R.M. (=Kreis Rummelsburg)"). In Kreis Schlawe (narrow set of targets), Mahnke (1931: 83) similarly observes that the number of Slavic loanwords is relatively very small ("verhältnismässig sehr gering").[24] [25]

Recall from §2.4.1 that sound change begins in a focal area and then spreads both temporally and geographically from that point of origin. As pointed out in that earlier section, the focal area is the place where that process has the most general set of triggers/targets. The implication is that dialects like Reimerswalde in (47) with an expanded set of target segments (all velar consonants) must have been a focal area. This is a possible interpretation, although the role of loanwords suggests that there might be an alternative. In particular, dialects like Reimerswalde might have an expanded set of targets not because they are older than dialects with a narrow set of targets (fricatives) but instead because their speakers had a greater exposure to loanwords. Since there are two conceivable interpretations for dialects like Reimerswalde with a broad set of target segment I do not consider this issue further.

In sum, the emergence of palatal noncontinuants in German dialects once spoken in the east clearly had a structural (phonological) justification, but in all likelihood a social one as well (loanwords from Slavic languages). These two factors therefore provide evidence for polycausality, as described briefly in §2.4.4. As noted in that section, my analysis of the phonemicization of [c ɟ ɲ] in LG varieties once spoken in the eastern parts of pre-1945 Germany strongly resembles the treatment for the phonemicization of lenis (voiced) fricatives in the history of English ([v z ð]); Ringe & Eska (2013: 142) and Minkova (2014: 91–93) and §8.6.1.

[24] A potential argument against a necessary connection between Stage Q and Stage R is posed by Kreis Konitz (§11.5). The author of the orginal source (Semrau 1915a: 144) stresses that even though her EPo dialect is surrounded by Polish-speaking communities, there was no comingling of the two languages ("keinerlei Vermischung [hat] stattgefunden").

[25] One EPo variety discussed earlier (Lauenburg; Pirk 1928) lists the nativized realization of a small number of Slavic loanwords containing [c] (=⟦kʹ⟧). Those examples are significant because the [c] realization corresponds to [k] in the donor language (Polish), e.g. ⟦borōvkʹə⟧ 'blueberry' < Polish *borówka*. Since there is no evidence that the final vowel in the Polish example was ever front, it appears that speakers of the Lauenburg dialect treat [c] as a sound whose distribution is governed by the phonology of Lauenburg. Recall from (33i) that [c] (and not [k]) surfaces before schwa. See Jacobs (1996: 157) for similar examples involving [l^j] in Central Yiddish loanwords from Polish.

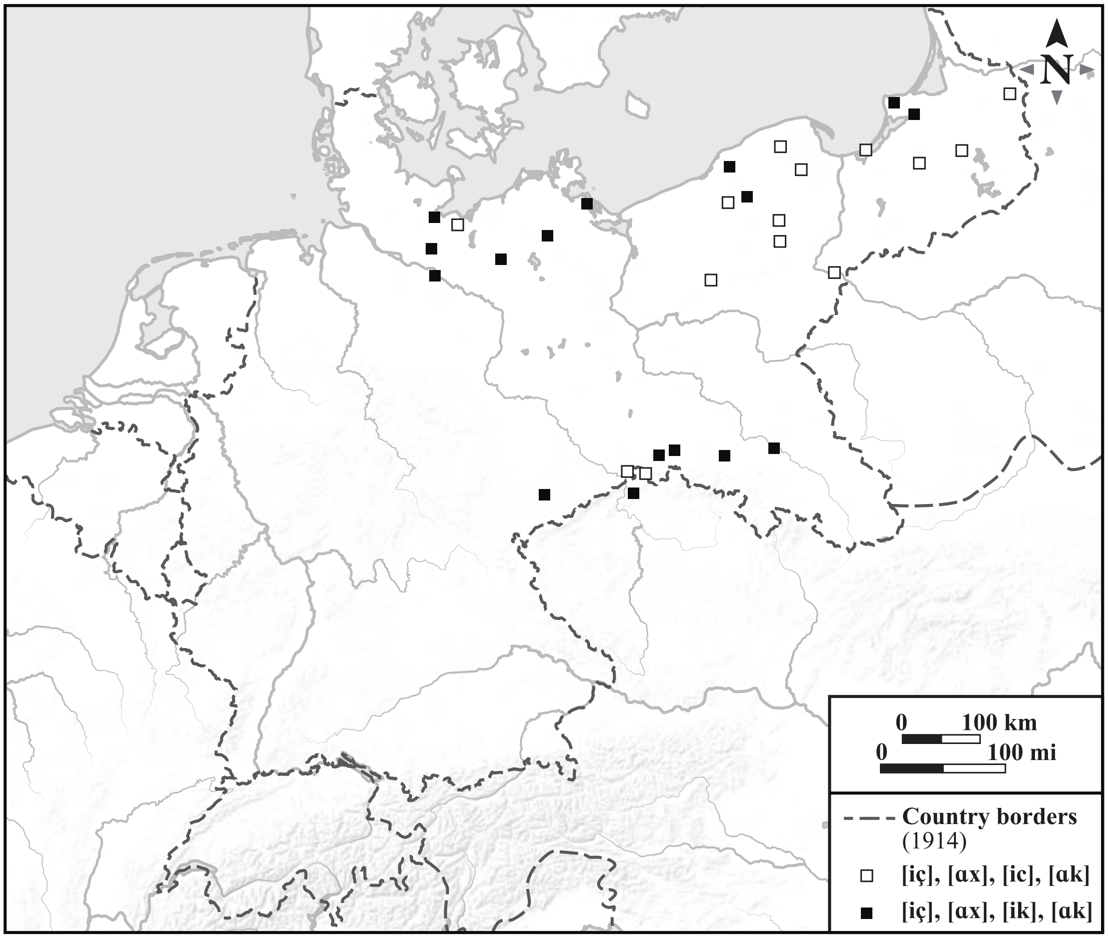
The literature on this topic is in agreement that one of the reasons for phonemicization was the occurrence of French loanwords with those sounds. For example, in OE the two fricatives [f] and [v] were allophones, where the latter occurred between lenis sounds (e.g. intervocalically) and the former in the elsewhere case (e.g. word-initially). Minkova (2014) notes that there was an influx of over 800 French loanwords beginning with [v] after the eleventh century (in ME) that were not adapted with [f]; this means that there were now minimal pairs involving the inherited (Gmc) [f] and the new [v] in loanwords, e.g. *fēle* 'many' (cf. StG [fi:l]) vs. *vēle* 'veal' (< Old French). Loanwords with intervocalic [f] which failed to surface as [v] were also attested in ME, e.g. *sacrifice* < French *sacrifice*.

11.10 Areal distribution of palatal noncontinuants

This chapter has taken a close look at the phonology of German dialects in which at least one velar noncontinuant serves as a target for velar fronting. It is possible to talk about those targets in more than one way. First, one could draw a distinction between velar fronting targets in word-initial position and postsonorant position. Second, one could classify those varieties in which the palatal noncontinuant outputs of velar fronting are allophones (synchronically derived palatals) vs. those in which the output sounds are underlying palatal noncontinuants (recall 2). Third, one could ask whether or not the output for a target velar stop is itself a stop, or an affricate. Instead of giving a series of tables in which such distinctions are made individually, I simply give one (Table 11.3), which includes all of the relevant studies discussed in this chapter in addition to a few others once spoken in the same region. All of these places are indicated on Map 11.3.

All of the sources listed above make it clear that the targets for velar fronting must also include velar noncontinuants even though some authors (e.g. Teuchert 1913) do not give separate symbols for those sounds (e.g. [k] vs. [c]). In that type of source no conclusions can be drawn concerning the triggers for velar fronting; hence, I do not discuss them further.

One point stressed throughout this chapter is that the more general targets characterized by the places in Table 11.3 might be narrower for other places in the same region. This point is made clear in Map 11.3, which includes all of the varieties listed in Table 11.3 (white squares) as well as the varieties in the same area discussed in this chapter where the target for velar fronting consists only of fricatives (black squares).



Map 11.3: Areal distribution of velar noncontinuant targets. Low Prussian, High Prussian, East Pomeranian, Mecklenburgish-West Pomeranian, and Silesian varieties with at least one velar noncontinuant as target for word-initial and/or postsonorant velar fronting are indicated with white squares. Varieties in the same general area in which velar fronting (word-initial and/or postsonorant) targets consist only of fricatives are indicated with black squares.

Table 11.3: Selection of LG/HG varieties in which velar noncontinuants serve as targets for velar fronting in postsonorant/word-initial position

Place	Dialect	Source
West Mecklenburg	MeWPo	Kolz (1914)
Seifhennersdorf	Sln	Michel (1891)
Sebnitz	Sln	Meiche (1898)
Putzig (Posen)	EPo	Teuchert (1913)
Kreis Konitz	EPo	Semrau (1915a,b)
Kamnitz	EPo	Tita (1921 [1965])
Lauenburg	EPo	Pirk (1928)
Kreis Bütow	EPo	Mischke (1936)
Sępóno Krajeńskie	EPo	Darski (1973)
Reimerswalde	HPr	Kuck & Wiesinger (1965)
Alt-Thorn	LPr	Wagner (1912)
Danziger Nehrung	LPr	Mitzka (1922)
Willuhnen	LPr	Natau (1937)
Bieberstein bei Barten	LPr	Tessmann (1966)

11.11 Conclusion

This chapter has examined German dialects in which the set of targets for velar fronting consists of velar fricatives like (/x ɣ/) as well as velar noncontinuants (/k g ŋ/). Thus, in contrast to the dialects discussed in Chapters 3–10 velar fronting in the case studies investigated in the present chapter has a broader set of targets. It was also demonstrated the original palatal allophones of velar noncontinuants (i.e. [c ɟ ɲ]) can have an opaque history and either quasi-phonemicize or phonemicize (i.e. /c ɟ ɲ/) according to the same paths described in Chapters 7–10.

12 Targets, triggers, and rule generalization

12.1 Introduction

Rule generalization (§2.4.1) postulates that change begins with a highly restricted trigger and/or target in which phonetic conditions are particularly favorable and then progressively spreads through time and space to include more general triggers and/or targets. Recall how that model was applied in §11.9.1 to German dialects with an expanded set of velar fronting target segments (noncontinuants) which developed out of a narrower set (fricatives).

In this chapter I apply the model of rule generalization to a larger selection of German dialects. It is argued that velar fronting in both postsonorant and word-initial position was originally induced by a narrow set of front segments and that the target segment was likewise restricted to a single velar (fortis) fricative. Later stages expanded the set of triggers to include more and more front sounds, while the set of targets analogously increased to include the lenis velar and then finally velar noncontinuants. The spread from a narrow set of triggers/targets to a larger one occurred both spatially and temporally. Rule generalization is depicted abstractly in Figure 2.1.

In order to successfully implement the rule generalization model it is necessary to provide an in-depth discussion of attested triggers and targets for velar fronting in word-initial and postsonorant position for a selection of varieties of German dialects. In principle, those varieties should be well-distributed geographically and should also represent all of the subdivisions of German dialects (Appendix A). To achieve that end I consider over two hundred fifty varieties of German that meet those criteria. That number includes most of the places discussed in the preceding chapters, as well as many others.

It is not feasible to provide detailed case studies for all of the works cited below. The discussion in the present chapter is therefore necessarily superficial, although care has been taken to classify those varieties in terms of targets and triggers that is consistent with the way in which those dialects are described in the original sources.

Since the focus below is on the set of targets and the set of triggers I do not discuss other aspects of velar fronting investigated in previous chapters. Hence, velar fronting may be allophonic in some dialects (Chapters 3–4), while in others there may be palatal quasi-phonemes (Chapter 7) or phonemic palatals (Chapters 8–10). It is also conceivable that velar fronting is counterfed by another process in the synchronic phonology (Chapter 5).

In §12.2 I introduce a methodology that enables all dialects to be classified into a small number of trigger types and target types and in §12.3 I present a survey of triggers/targets for velar fronting in German dialects (Appendix A) based on that methodology. §12.4 considers the areal distribution of triggers and targets, and §12.5 matches the trigger/target types with a series of incremental historical stages. In doing so, I demonstrate that there are certain regions where the postulated stages are represented by dialects described in the latter nineteenth century. §12.6 discusses a small number of German dialects with very rare requirements governing triggers. §12.7 investigates how the present treatment sheds light on the typological literature on Velar Palatalization. In §12.8 I discuss three additional properties of velar fronting: the adjacency of its triggers and targets (§12.8.1), its domain (§12.8.2), and the status of irregularities (§12.8.3). §12.9 considers the ways in which velars like /x/ are realized in the phonetics if they do not undergo velar fronting. A brief conclusion is provided in §12.10.

12.2 Preliminary discussion

12.2.1 Velar fronting triggers

The preceding chapters have demonstrated that the set of triggers for velar fronting differ minimally from dialect to dialect. The way in which those triggers can vary is reflected in the different versions for those fronting processes, expressed featurally (Appendix D). The data presented in Chapters 3–11 reveal that there are five triggers for velar fronting which account for virtually all of the dialects discussed.[1] Those triggers are given in (1). In the notation adopted here and below, HFV=high front vowels, MHV=mid front vowels, LFV=low front vowels, and CC=coronal sonorant consonants.

[1]The set of triggers for Kreis Rummelsburg (front tense vowels) from §11.5 is omitted from the present discussion because it does not involve the height dimension. That unique example is discussed in §12.6.2 in the context of other rare dialects with nonheight features defining the triggers for velar fronting.

(1) Five attested triggers for velar fronting:

a. $\{\text{HFV}\}$ b. $\begin{Bmatrix}\text{HFV}\\ \text{MFV}\end{Bmatrix}$ c. $\begin{Bmatrix}\text{HFV}\\ \text{MFV}\\ \text{CC}\end{Bmatrix}$ d. $\begin{Bmatrix}\text{HFV}\\ \text{MFV}\\ \text{LFV}\end{Bmatrix}$ e. $\begin{Bmatrix}\text{HFV}\\ \text{MFV}\\ \text{LFV}\\ \text{CC}\end{Bmatrix}$

Table 12.1 refines the way in which the triggers in (1) are to be interpreted. In the first column I indicate with letters the names of the Trigger Types, which are defined in the second and third columns.

Table 12.1: Definition of Trigger Types

Type	Trigger	Presence in fronting context	
		Present	Not present
A	HFV	MFV, LFV, CC	
B	HFV, MFV	LFV, CC	
C	HFV, MFV, CC	LFV	
D	HFV, MFV, LFV	CC	
E	HFV, MFV, LFV, CC		
AA	HFV, MFV	LFV	CC
BB	HFV, MFV	CC	LFV
CC	HFV, MFV, CC		LFV
DD	HFV, MFV, LFV		CC
EE	HFV, MFV		LFV, CC

For Trigger Type A, the sole set of segments inducing fronting are high front vowels (HFV), but other front segments do not serve as triggers. In order to determine whether or not Trigger Type A is the correct one, it is therefore crucial that front segments other than high front vowels ({MFV, LFV, CC}) occur in the context of the velar that undergoes fronting. Trigger Type B holds if fronting is induced by {HFV, MFV} but not by {LFV, CC}, Trigger Type C if the context for fronting is {HFV, MFV, CC} but not {LFV}, and Trigger Type D if fronting is induced by {HFV, MFV, LFV} but not by {CC}. If the context for fronting is the entire set of front segments then Trigger Type E holds.

In many dialects the set of triggers involves gaps. The attested patterns with certain front segments absent in the context of velar fronting are illustrated in the last five rows in Table 12.1, where the gaps in question are indicated with the segment type listed in the final column. If a segment type is listed in the final column this means that either: (a) that segment type is entirely absent in the dialect, (b) that segment type is present in the dialect but not in the context for fronting, or (c) that it cannot be determined on the basis of the original source whether or not that segment type induces fronting.

Consider Trigger Type BB as an example: A target segment (e.g. /x/) undergoes fronting in the context of {HFV, MFV}; since {CC} is present in the context for fronting it can be safely concluded that {CC} is not included in the set of triggers. By contrast, {LFV} does not occur in the context for velar fronting. Because of that gap it cannot be known with certainty whether or not {LFV} is a trigger.

A few remarks are in order concerning the three Trigger Types where {CC} is not present in the fronting context (AA, DD, EE). In several varieties discussed earlier (e.g. Sörth; §5.4) schwa intervenes between a coronal consonant and the fronted velar (e.g. [rəç] from /rx/), but a sequence of coronal consonant plus dorsal fricative is not attested without schwa (e.g. [rç]). Recall from §5.4 that processes of schwa epenthesis and schwa fronting are active in such systems, e.g. /kɛrx/⟶|kɛrəx|⟶|kɛrə̟x|⟶[kɛrə̟ç]; cf. StG *Kirche* 'church'. Likewise some dialects (Chapter 6 and Chapter 11) were shown to require that coalescence feeds velar fronting, e.g. /milx/⟶|m**i**lx|⟶[m**ilç**]; cf. StG *Milch* 'milk'. In the present chapter I only consider {CC} to be a trigger for velar fronting if that consonant and the velar are adjacent; this assumption means that dialects in which schwa epenthesis and schwa fronting or coalescence are active are classified as one of the three Trigger Types where {CC} is absent from the fronting context (AA, DD, EE). See §12.8.1 for a synopsis of German dialects where a sound intervenes between the target and trigger.

The Trigger Types listed in Table 12.1 all treat coronal sonorant consonants ({CC}) uniformly. Put differently, if /r/ is a trigger for velar fronting, then /l/ and /n/ will be as well. This assumption is confirmed in the case studies discussed throughout this book, although it is conceivable that there are systems in which the consonants described by {CC} should be treated individually.

The conclusions concerning Table 12.1 are important because they either support or refute claims made in the literature on velar fronting in German or in the cross-linguistic literature on Velar Palatalization (§2.3). Three patterns and the corresponding Trigger Types are listed in (2):

(2) a. Trigger Types indicating that {MFV, LFV} does not induce fronting: A
    b. Trigger Types indicating that {LFV} does not induce fronting: A, B, C, AA
    c. Trigger Types indicating that {CC} does not induce fronting: A, B, D, BB

I discuss the relevance of (2) for my analysis of rule generalization in German dialects in §12.4.1 and for typology in §12.7.

12.2.2 Velar fronting targets

In the velar fronting varieties discussed in Chapters 3–10 the targets are restricted to one or both of the velar fricatives listed in (3a). In Chapter 11 it was demonstrated that a number of places with velar fronting select their targets from the expanded list of velar consonants listed in (3b).[2]

(3) Targets for velar fronting:
  a. /x/, /ɣ/
  b. /x/, /ɣ/, /k/, /g/, /ŋ/

The segments in (3) can either be underlying velars or velars created from other synchronic rules. For example, the latter situation obtains in dialects for a target fortis velar fricative, which can be either underlying /x/ or |x| derived from /ɣ/ by Final Fortition.

Table 12.2 defines the way in which the targets in (3) are to be interpreted. In the first column I indicate with letter names of the Target Types, which are defined below. /g/ is enclosed in parentheses in the first four Target Types because that sound is absent in many dialects.

Table 12.2: Definition of Target Types

Type	Target	Presence in fronting context	
		Present	Not present
L	/x/	/ɣ k (g) ŋ/	
M	/x ɣ/	/k (g) ŋ/	
LL	/x/	/k (g) ŋ/	/ɣ/
MM	/ɣ/	/k (g) ŋ/	/x/
Type	Target drawn from		
N	/x ɣ k g ŋ/		

[2] I do not consider the affricate /kx/, which serves as a target segment in various UG dialects, because that sound behaves the same way as the corresponding fricative /x/.

Target Types L and M are well-attested in the data presented earlier: They have in common that only fricatives serve as triggers. For Target Type L, the sole fricative undergoing fronting is /x/, but for Target Type M both /x/ and /ɣ/ serve as targets for that change.

Table 12.2 lists two Target Types with potential targets absent from the velar fronting environment, namely Target Type LL and Target Type MM. Those systems hold if only one of the two dorsal fricatives is present in the fronting context but not the other. The segments listed in the final column mean either: (a) that the segment type (/x/ or /ɣ/) is absent entirely in the dialect, (b) that the segment type (/x/ or /ɣ/) is present in the dialect but not in the context for fronting, or (c) that it cannot be determined on the basis of the original source whether or not the segment in question (/x/ or /ɣ/) is present as a target.

The final row in Table 12.2 describes many of the dialects discussed in Chapter 11 with the expanded set of target segments listed in (3b). Target Type N clearly obtains if all velar consonants listed in (3b) undergo velar fronting. However, Target Type N also holds if only a subset of the velar consonants serve as targets. For example, several dialects were discussed in Chapter 11 in which the set of sounds undergoing velar fronting in word-initial position consist of /ɣ k/, but other velar sounds (e.g. /x ŋ/) do not occur in that context. Target Type N also obtains if the set of undergoers includes only /k g/, but other velars do not occur in that context.[3]

The classification in Table 12.2 makes it possible to reach conclusions concerning the types of sounds that can or cannot undergo velar fronting. Two patterns and the corresponding Target Types are listed in (4):

(4) a. Target Types indicating that /ɣ/ does not undergo fronting: L
    b. Target Types indicating that /k (g) ŋ/ do not undergo fronting: L, M, LL, MM

The significance of (4) for my analysis of rule generalization in German dialects is discussed in §12.4.2.

[3]Target Type N is admittedly a grab bag category because it does not differentiate the individual manner types among the sounds in (3b). The drawback with Target Type N is that dialects classified as such cannot be properly interpreted without additional discussion. For example, if /ɣ k/ serve as targets (Target Type N), then one cannot know for sure whether or not both /x/ and /ŋ/ also undergo fronting. It is demonstrated below that this type of information is important in able to draw conclusions regarding velar fronting from the typological perspective (§12.7). A similar point holds for the way in which triggers and targets spread in terms of time and space (§12.5).

It is assumed above that the set of triggers are the same for any two target segments. This generalization is correct for most of the varieties investigated in previous chapters, although there are some systems attested in which one target segment (e.g. /x/) has a different set of triggers than for another target segments (e.g. /ɣ/). One example discussed in this chapter is the RFr variety spoken in Beerfelden (§12.7.1). In §12.3 I focus on those varieties of German where the triggers are the same for all target segments. Some discussion of varieties of German in which the triggers for /x/ are not the same as the triggers for /ɣ/ can be found in Chapter 14.

12.3 Survey of triggers and targets for velar fronting in German dialects

In the following paragraphs I classify a representative selection of HG and LG varieties in terms of the Target Types and Trigger Types defined in §12.2. The discussion is organized into subsections corresponding to the major dialects presented in Appendix C. All of the places cited in this section can be found on the respective locator maps (Maps 3.1–7.2 and Maps 11.1–11.2).

12.3.1 High and Highest Alemannic

In H(st)Almc there is a single dorsal fricative (/x/); some varieties also possess the corresponding affricate (/kx/). Those velars are realized consistently as velar (e.g. [x]) in the overwhelming majority of H(st)Almc varieties; recall, for example, Glarus (Streiff 1915; §3.3). Additional H(st)Almc varieties of Switzerland in which [x]/[kx] are described as velar include Kerenzen (Winteler 1876: 17), Urserental in the canton of Uri (Abegg 1910: 9), Kesswil in the canton of Thurgau (Enderlin 1910: 8), St. Gallen (Hausknecht 1911: 16), Entlebuch in the canton of Lucern (Schmid 1915: 14, 17), Jaun in the canton of Freiburg (Stucki 1917: 21), the Berner Seeland (Baumgartner 1922: 11), the Zürcher Oberland (Weber 1923: 18), the Sensebezirk and the Southeast Seebezirk in the canton of Freiburg (Henzen 1927: 20), Unterschächental in the canton of Uri (Clauss 1929: 20), Schaffhausen (Wanner 1941: 8-9), Brienz in the canton of Bern (Susman Schulz 1951: 37), and Zürich (Fleischer & Schmid 2006: 244). The same generalization holds for HAlmc varieties spoken in the German state of Baden-Württemberg. For example, Kaiser (1910: 9-10) writes that there is no palatal fricative in Todtmoos-Schwarzenbach and that [x] surfaces even after front vowels (“Ein palatales *ch*, das in der nhd.

Gemeinsprache nach den hellen Vokalen eintritt, kennt die Mundart nicht, indem auch nach den hellen Vokalen stets gutturales *x* steht"). Beck (1926: 56) similarly observes that [x] is velar in every context ("*x* ist in jeder Stellung velar") in the Markgräflerland. A similar assessment is made for [x] in Jestetten by Keller (1963).

The varieties of H(st)Almc discussed in previous chapters (§3.3, §3.4, Chapter 6) with some version of velar fronting are therefore exceptions to the general pattern. In all of those places the target for that process is /x/ (and /kx/, if present). Variation among the velar fronting varieties of SwG involves the sets of sounds comprising the triggers.

In Table 12.3, I list the four velar fronting dialects of SwG discussed in previous chapters. In this and in all subsequent tables I give the corresponding Target Type and Trigger Type in the first two columns and the place where the dialect in question is/was spoken and the source in the third and fourth columns respectively. In the heading for each table I give the historical source for the target velar segment. For more detailed information concerning the location of the places listed in Table 12.3 and in all subsequent tables in §12.3 the reader is referred to Appendix C. As indicated in the heading below, the Trigger and Target Types hold for velar fronting in postsonorant position.

Table 12.3: Targets and triggers for (postsonorant) velar fronting in H(st)Almc (<WGmc ⁺[k x])

Target	Trigger	Place	Source
LL	A	Visperterminen	Wipf (1910)
LL	B	Obersaxen	Brun (1918)
LL	C	Rheintal	Berger (1913)
LL	E	Maienfeld	Meinherz (1920)

It can be seen that all four SwG varieties have the same Target Type. As indicated in the second column of Table 12.3, the differences among those four places is the Trigger Type: In Visperterminen the trigger is the set of high front vowels, in Obersaxen it is the high front vowels and the mid front vowels, in Rheintal it is the high front vowels, mid front vowels, and coronal sonorant consonants, and in Maienfeld it is the set of all front vowels and coronal sonorant consonants.

Table 12.4 summarizes the targets and triggers for those SwG dialects discussed earlier with word-initial velar fronting.

Table 12.4: Targets and triggers for (word-initial) velar fronting in H(st)Almc (<WGmc $^{+}$[k])

Target	Trigger	Place	Source
LL	A	Visperterminen	Wipf (1910)
LL	B	Obersaxen	Brun (1918)
LL	C	Rheintal	Berger (1913)

Again, the three varieties listed here have the same Target Type, and they differ only in terms of the types of segments that trigger the fronting of a (word-initial) velar.

In Chapter 15 I discuss the Trigger Types from additional H(st)Almc velar fronting areas in Switzerland and Austria (Vorarlberg, West Tyrol). In that chapter I also consider data from the linguistic atlases from those regions (SDS, VALTS).

12.3.2 Low Alemannic and Swabian

12.3.2.1 General remarks

In the southwesternmost varieties of LAlmc, velars (/x/) are realized as velars regardless of the nature of the adjacent sound. For example, in the LAlmc dialect spoken in Basel, Heusler (1888: 69) makes it clear that [x] has no palatal variant ("Das χ … ist in jeder Stellung velar, nie der 'ich-Laut'"). A similar statement can be found in descriptions of LAlmc dialects spoken in Germany (Baden-Württemberg) in and around Freiburg im Breisgau, e.g. Ehret (1911: 43) and Eckerle (1936: 50), and in Alsace (Elsass), e.g. Mankel (1886: 8) for Münsterthal and Henry (1900: 61) for Colmar. The reader is referred to Map 7 in Klausmann (1985a,b), which indicates the places in and around Freiburg im Breisgau where velar fronting is and is not active. In ALA a number of maps are given for words with [x] and [ç] in Alsace. An examination of those maps indicates that Colmar (my Map 3.1) is the approximate boundary between velar fronting (to the north) and no velar fronting (to the south). A few places indicating the presence and absence of velar fronting from the maps in ALA are indicated on my Map 3.1. E.M. Hall (1991a,b) investigates the LAlmc/Swb varieties in a broad area to the south of Villingen-Schwenningen. Map 22 in that source shows that velar fronting is active in places to the east and west of Villingen-Schwenningen, but not in the places to the south. Representative examples of two velar fronting places (Tuningen and Urach) and two non-velar fronting places (Titisee-Neustadt and

Donaueschingen) are indicated on my Map 3.1.[4] The conclusions concerning the presence vs. absence of velar fronting in Southwest Germany are also consistent with the maps in SSA. For example, the map for words like *Sichel* 'sickle' in Volume 2 indicates a large region with [x] after a front vowel. That area extends to the south and west of Freiburg im Breisgau and to the south and southeast of Villingen-Schwenningen.

Another area characterized by the absence of velar fronting is the eastern part of the Swb dialect region. Consider first the assessment of Moser (1936: 8), who concerns himself with the dialect spoken in the Staudengebiet (southwest of Augsburg). Moser writes that the palatal articulation does not occur in the dialect, even in the neighborhood of front vowels. ("Die palatale Artikulation findet sich in unserer Mda. nicht, selbst nicht in der Nachbarschaft heller Vokale wie i, e …"). The same observation is made by König (1970: 46) for Graben, ca. 25 south of Augsburg.[5] In fact, the assessment of Moser and König concerning the realization of [x] holds for a much larger expanse. Ibrom (1971) investigates the broad region between Augsburg and Donauwörth and observes that the one dorsal fricative is realized consistently as [x] (p. 252-254). The maps in volume 7.2 of SBS provide similar data for the broad region between Augsburg and Ulm (see my Map 3.1).

As indicated on Map 3.1, the southeast part of the Swb dialect area both velar fronting as well as the absence of velar fronting are attested. For example, SBS Map 173 for *Sichel* 'sickle' indicates the realization [sɪxl̩] (=⟦si̯xl̥⟧) in Ebersbach (near Kaufbeuren). The maps in VALTS also reveal the absence of velar fronting in Wangen im Allgäu. By contrast, the SSA map for *Sichel* 'sickle' alluded to above indicates velar fronting for Niederwangen, and Bausinger & Ruoff (1959) show that velar fronting is attested for Beuren.

[4] One of the first linguists to discuss the distribution of [x] and [ç] in terms of geography was Fischer (1895). In that work, Fischer observes (pp. 68-69) that the dorsal ("guttural") fricative is consistently realized as [x] after any type of vowel in SwG but that north of the Alps ("[n]ördlich der Alb") the same fricative is articulated as velar after back vowels and palatal after front vowels. Fischer similarly observes (pp. 63-64) that postvocalic [g] is pronounced [ç]/[x] according to context ("je nach der Lautumgebung") in the north and northeast (of the Swb dialect region) and that [g] has the palatal articulation ([j]) after front vowels or [r] in the northwest (Rhineland). The latter generalization is depicted on his Map 20. Fischer writes (p. 68) that one of the reasons he was unable to determine a clear isogloss separating velar fronting areas from non-velar fronting ones – to use my terminology – is that north of the Alps dorsal fricatives have more than two places of articulation (recall §1.5).

[5] König's observation holds for the speech of the elderly. He adds that [x] is realized as palatal in unstressed syllables – presumably only after front segments – at faster rates of speech and by younger speakers.

The conservative (non-velar fronting) places described above should not detract from the predominant pattern for LAlmc/Swb, whereby velars like /x/ are realized as the corresponding palatals ([ç]) in the context after front sounds. Velar fronting is not attested in LAlmc/Swb in word-initial position. In all of the sources cited here the sole target for (postsonorant) velar fronting fronting is /x/ (Target Type LL). Recall from earlier discussion that this means /x/ is the sole target for velar fronting because the corresponding lenis sound /ɣ/ is absent. As a general rule, velar fronting applies after all coronal sonorants, although a few varieties are attested with a narrower set of triggers. In particular, some systems possess a low front vowel (/æ/); in one set of dialects that sound serves as a trigger for velar fronting, but in another set it does not.

I make a few brief comments below on some of the LAlmc/Swb varieties with uncommon triggers. Table 12.5 provides a summary of the Trigger Types and Target Types for the LAlmc/Swb sources I have consulted. A complex case of triggers varying within a small area is discussed after Table 12.5.

12.3.2.2 Low Alemannic

Rheinbischofsheim has the full set of velar fronting triggers (Trigger Type E), e.g. [hɛçt] 'pike', [blæç] 'tin', [dmelç] 'the milk' vs. [nɑːxt] 'night'. In Forbach and in a number of communities to the east of Freiburg im Breisgau (Glottertal, Elztal, St. Peter, St. Märgen, Gütenbach) there are no low front vowels and epenthesis prohibits /x/ from occurring next to a consonant (=Trigger Type EE). Examples from Forbach include [liçt] 'light', [gnɛːçt] 'vassal' vs. [hoːx] 'high'.

In Oberschopfheim the set of triggers for fronting consists solely of nonlow front vowels (Trigger Type AA), e.g. [heçt] 'pike' vs. [blæx] 'tin', [nɑːxt] 'night'. For the areas in the Ortenaukreis investigated by Kilian (1935) the facts are essentially the same, e.g. [sɪçl̩] 'sickle', [deːçtər] 'daughter' vs. [dræːxdər] 'funnel', [noːxt] 'night'. Kilian notes that words like [dræːxdər] are realized with [ç] in communities in which [æː] corresponds to [ɛː], i.e. [drɛːçdər].

12.3.2.3 Swabian

One variety with the broadest set of triggers (Trigger Type E) is Erdmannsweiler (§3.2), e.g. [fræç] 'impudent', [knæːçt] 'vassal' [kalç] 'lime' vs. [lɑxə] 'laugh-INF'. Freudenstadt is representative of Trigger Type CC, e.g. [ʃtɛçə] 'sting', [rɛːçt] 'right', [milç] 'milk' vs. [kʰoxə] 'cook-INF', and Memmingen of Trigger Type EE, e.g. [dɛçlə] 'roof-DIM' vs. [nɑxt] 'night'.[6]

[6]The phonetic transcriptions provided in the Swb dialect dictionary (SchwWb) point to Target Type L and Trigger Type CC.

A narrow set of triggers (Target Type AA) is attested in Bavendorf (Schöller 1939: 49). Although he does not provide separate symbols for [ç] and [x], Schöller gives a clear statement concerning the distribution of those sounds. In particular, Schöller (1939: 49) writes that [ç] occurs after front vowels (⟦e, i, ö, ü ei⟧) and [x] after back vowels (⟦ɑ ä o u⟧). The important point to observe in this passage is that [x] surfaces after ⟦ä⟧, which is Schöller's symbol for [ɛ] (p. 9). If [ɛ] is phonologically [+low] – the dialect has no phonetic [æ] – then the set of triggers for velar fronting consists of all nonlow front vowels (Trigger Type AA).

Haag (1898) describes a set of Swb dialects spoken in the vicinity of Villingen-Schwenningen. The following passage (Haag 1898: 82) is significant because it illustrates the way in which the distribution of [x] and [ç] can vary depending on both time and place (as well as religion). In the varieties discussed below, there is no phonetically low vowel (i.e. [æ]), but [ɛ] (/ɛ/) is assumed to be phonologically low and front. Due to the intricacies described below, I do not include it in Table 12.5.

> *Ch* behält in allen Stellungen seine gutturale Artikulation mit Entschiedenheit nur noch im Südwesten: ex, rextə, riix, biixtə, ɛxt, štɛxxə, migləx &; nach l mit Gleitvokal ə: : miləx, khiləxə, khaləx &. Sonst geht es nach palatalen Vokalen in ç über: iç, riçtə, riiç, biiçtə, ɛçt, štɛççə & . Nach Liquiden bleibt es guttural: šnarxlə, khalx, milx, khirxə, štrolx &; mit Entschiedenheit freilich nur noch in der älteren Generation und im Osten; die jüngere, besonderes Protestanten, hat ç übernommen; Tuttlingen-Neuhausen, verschobene ç-Insel, auch noch: štaarç, štɔarç, mɛlçə &. In der Nordwestecke, hinter 25, ausschliesslich ç: šnarçlə, khalç, milç khirç, duiç für durch &, Gleitvokal i leicht angedeutet. Von Westen her dringt die vordere Artikulation mehr und mehr ein. Dass diese auf dem Hauptgebiet neu ist, lehrt die Zwischenstufe zwischen x und ç, die, vor allem im Südosten, für letzteres gilt, und im Munde Aeltere immer wieder mit reinem x wechselt: ix, rixtə, rɛxxtə &, weshalb hier eine feste Grenzlegung schwierig ist; ferner im Osten Heuberg, Bära, IIart bis zum Albrand, wo fast reine gutturale Artikulation herrscht: gleix, feixt, reixbax. – Im Nordosten, in katholischen Gemeinden, bleibt Guttural nach ɛ: ɛxxtə, rɛxxə; protestantische ɛççtə, rɛççə.
>
> "*Ch* retains its guttural articulation in all positions only in the Southwest: ex, rextə, riix, biixtə, ɛxt, štɛxxə, migləx etc.; after *l* with its epenthetic vowel ə: miləx, khiləxə, khaləx etc. Otherwise it [*ch*] changes into ç after a front vowel: iç, riçtə, riiç, biiçtə, ɛçt, štɛççə etc. After liquids it remains guttural: šnarxlə, khalx, milx, khirxə, štrolx etc.; resolutely of course only in the older

Table 12.5: Targets and triggers for (postsonorant) velar fronting in LAlmc and Swb (<WGmc $^{+}$[k x]).

Target	Trigger	Place	Source
LL	E	Reutlingen	Wagner (1889)
		Rheinbischofsheim	Weik (1913)
		Erdmannsweiler	Besch (1961)
LL	AA	Oberschopfheim	Schwend (1900)
		Ortenaukreis	Kilian (1935)
		Bavendorf	Schöller (1939)
LL	CC	Horb am Neckar	Kauffmann (1887, 1890)
		Münsingen	Bopp (1890)
		Oberweier	Wasmer (1915, 1916a,b)
		Herrenberg	Zinser (1933)
		Freudenstadt Stuttgart	Baur (1967)
		Breisgau	Frey (1975)
		Tuningen, Urach	Klausmann (1985a,b)
			E.M. Hall (1991a,b)
LL	EE	Forbach	Heilig (1897)
		Ries	Schmidt (1898)
		Pforzheim	Sexauer (1927)
		Freiburg im Breisgau	Eckerle (1936)
		Dreistammesecke	Nübling (1938)
		Blaesheim	Philipp (1965)
		Memmingen	Hufnagl (1967)
		Kreis Balingen	Bethge & Bonnin (1969)
		Mulhouse	Bethge & Bonnin (1969)
		Metzeral	Zeidler (1978)
		Mittelbaden	Schrambke (1981)

> generation and in the East; the younger generation, especially Protestants, has adopted ç; Tuttlingen-Neuhausen, an advanced ç-island, also has: štaarç, štɔarç, mɛlçə etc. In the Northwest corner [there is] exclusively ç: šnarçlə, khalç, milç khirç, duiç for durch etc., epenthetic vowel i implied. From the West the front articulation is occurring more and more. That this is new in the main area is indicated by the intermediate sound between x and ç which, above all in the Southwest, holds for the latter and alternates in the mouth of the elderly more and more with pure x: ix, rixtə, rɛxxtə & ; for this reason a clear boundary is difficult to determine; furthermore in the East Heuberg, Bära, IIart up to Albrand, where a pure guttural articulation is still retained: gleix, feixt, reixbax. – In the Northeast, in Catholic parishes, the guttural is retained after ɛ: ɛxxtə, rɛxxə; for Protestants: ɛççtə, rɛççə".

On the basis of this passage it is possible to draw the following conclusions: (a) In the southwest there are speakers of conservative non-velar fronting (Stage 1) varieties; (b) there are many speakers (i.e. those belonging to the older generation and those in the east) who have both [ç] and [x]; [ç] occurs for those speakers after front vowels but not after liquids (Trigger Type D or BB); (c) other speakers (e.g. young Protestants) have [ç] and [x], but the former sound occurs after front vowels and liquids (Trigger Type E or CC), and (d) a distinction can be drawn between Protestants ([ɛ] is a trigger for velar fronting) and Catholics ([ɛ] is not a trigger).

12.3.3 Bavarian and East Franconian

12.3.3.1 General remarks

The periphery of the Bav dialect continuum – in particular, SBav in North Tyrol (Austria) and South Tyrol (Italy) – is characterized by the absence of velar fronting; thus, /x/ surfaces consistently as [x]. This point is clear from the many SBav non-velar fronting varieties indicated on Map 3.3. Within the SBav dialect area velar fronting is active in certain places indicated on Map 3.3, including Graz (Moosmüller 1991) and in several isolated mountain valleys of Tyrol (e.g. Egger 1909). I discuss those velar fronting enclaves in greater detail in §15.10.

Non-velar fronting areas are well-attested throughout CBav. This point is clear from Ibrom (1971), who investigates a large area in the northwest of the CBav dialect area between Augsburg and Aichach, including a large part of Northeast Swb (recall §12.3.2). On the basis of his study he concludes that the one dorsal fricative (/x/) is realized either as uvular (p. 256) or velar (p. 257, 259). That assessment is confirmed on the basis of several maps in SBS, which documents non-velar fronting from Aichach to the south along the Lech River through Grafrath and Weilheim (both indicated on Map 3.3).

Outside of the areas discussed in Ibrom (1971) there is little doubt that (post-sonorant) velar fronting predominates in both urban and rural areas in the CBav. The occurrence of velar fronting in the context after sonorants in Southeast Germany can be confirmed by examining the sources cited above, which are indicated on my Map 3.3. That velar fronting is the norm for CBav is also evident from the maps in the linguistic atlases for this region (SNiB for Lower Bavaria, SOB for Upper Bavaria). This point is discussed in greater detail in Chapter 13. It is nevertheless noteworthy that the maps in Volumes 3 and 4 in SNiB and some of the other sources cited below suggest that velar fronting is absent in certain places. Thus, although velar fronting predominates in CBav, there is nothing out of the ordinary for some communities to articulate [x] even after front vowels. Such places can therefore be thought of as NON-VELAR FRONTING ISLANDS – conservative enclaves which have preserved the original (WGmc) system with /x/ and no palatal allophone.[7]

Velar fronting in NBav/EFr has a similar status. The sources cited in this book from those dialect areas (indicated on Map 3.4) as well as the maps in the linguistic atlases for these dialect areas (SUF, SMF, SNOB, SBS) point to a region characterized by velar fronting. However, it is also not unusual to find non-velar fronting enclaves, especially in NBav. A few representative examples from SNOB and SBS are indicated on my Map 3.4.

As in Almc, the typical pattern for NBav/CBav/EFr is that the sole target for postsonorant fronting is the one fricative /x/ because /ɣ/ (< WGmc $^{+}$[ɣ]) is absent (Target Type LL). Velar fronting is typically induced by all front vowels and (if present) coronal sonorant consonants. Since low front vowels are often nonoccurring, Trigger Type CC is the most widely attested. In those varieties with no low front vowels the presence of Schwa Epenthesis (§5.4) means that Trigger Type EE is also well-attested.

The Trigger Types and Target Types of all NBav/SBav/EFr varieties discussed in this book are given in Tables 12.6 and 12.7. I discuss below a few systems from this area that are typical, but I focus primarily on those patterns that are unique for the region.

[7]The absence of velar fronting was also noted by V. M. Schirmunski over ninety years ago in a (NBav) German-language island in Jamburg (Ukraine) (Schirmunski 1931: 255).

12.3.3.2 Central and North Bavarian

Unmarked Target Type LL is represented by all varieties surveyed with the exception of Kallmünz (Target Type M). In that NBav variety, etymological [ɣ] has the palatal allophone [ʝ]; e.g. [gʃiçt] 'history', [næ:ʝɐl] 'nail-DIM' vs. [wox] 'week', [lɑ:ɣɐ] 'situation'. That pattern is shown below to be the unmarked one for most of CG, but it is rare for UG.

Trigger Type CC is represented by Erdmannsdorf/Zillertal, e.g. [kø:ç] 'porridge', [mɪlç] 'milk' vs. [mɔxn̩] 'do-INF' and Trigger Type EE by Marchfeld, [lɑ:ɪçt] 'light', [gŋɛ:çt] 'vassal' vs. [brɑ:uxŋ] 'need-INF'. Bergstetten possesses low front vowels, which serve as triggers (Trigger Type E), e.g. [ʃti:ç] 'sting', [tsæ:ç] 'tough', [mø:lç] 'milk' vs. [tro:x] 'trough'. Bergstetten can be contrasted with Großberghofen, where low front vowels do not induce velar fronting (Trigger Type AA), e.g. [rɪçtn̩] 'judge-INF', [ɛçt] 'genuine' vs. [brɔxt] 'bring-PART', [ɑxt] 'eight', [tsæxɐ] 'tear'. A similar pattern obtains in Kallmüntz (Trigger Type DD).

The variety of CBav described by Maier (1965) deserves special comment because the data in that source reveal that the dialect is unique for its area. Maier investigates a broad CBav-speaking region in Upper Bavaria which is bounded in the south by Austria, to the east by the Inn River, and to the west by the Isar River. In his description of the ch-sound ("ch-Laut"), Maier (1965: 4) observes that the region exhibits variation concerning the realization of the sound(s) depicted by those letters. The generalization is that in one corner of the larger region – defined as Kiefersfelden, Oberaudorf, and Niederaudorf – the only dorsal fricative is velar [x] (=⟦x⟧) even in the context after front vowels, e.g. [tixtə] 'capable', [ʃlɛxt] 'bad', [ɔxt] 'eight'. Hence, those three places can therefore be thought of as non-velar fronting islands. By contrast, in the other areas within the region – e.g. Maier's Isarwinkel, defined in terms of the villages and towns he lists on p. 1 – there are two dorsal fricatives, namely [x] and [ç] (=⟦χ⟧). The data in Maier (1965) reveal that the triggers for postsonorant velar fronting in Isarwinkel (Map 3.3) consist of all and only front vowels (including the low front vowels [æ]), but not the coronal consonants. Thus, Isarwinkel represents Trigger Type D, which is rare among German dialects. Examples from the original source include the following: [tiçtə] 'capable', [ʃlɛçt] 'bad', [ræç] 'smoke' vs. [kru:x] 'smell', [tɒxtɐ] 'daughter', [bɔ:x] 'stream', [lɛrx] 'lark', [milx] 'milk'.

One NBav variety is attested in which only front vowels but not coronal consonants are triggers for velar fronting (Eisendorf; Seemüller 1908c). According to the data from that source (=Trigger Type BB), [ç] surfaces after front vowels (no low front vowel is attested) and [x] after back vowels and liquids ([l r]), e.g. [iç] 'I', [ʃlɛçt] 'bad' vs. [woxɒ] 'week-PL', [dmy:lx] 'the milk', [bɑrx] 'mountain-PL'.

12.3.3.3 East Franconian

Unmarked Target Type LL is represented by all varieties surveyed with the exception of Schmalkalden (Target Type M) and Schefflenz (Target Type L). Representative examples from Schmalkalden are [lɛçt] 'light', [giːɟə] 'violin' vs. [buːx] 'book', [boːɣə] 'bow'. Schefflenz is unusual in that it possesses both /x/ and /ɣ/, and yet only the former serves as a trigger for velar fronting, e.g. [iːç] 'I', [brɛçə] 'break-INF', [mɑnç] 'many' vs. [lɑxə] 'laugh-INF', [fouɣl̩] 'bird', [fɛɣl̩] 'bird-PL', [iːɣl̩] 'hedgehog'. That pattern (Target Type L) is otherwise restricted to LG (Wph), e.g. Soest (§4.3).

Unmarked Trigger Type CC is represented by Bonnland, e.g. [ɛçə] 'oak tree', [lɛrçə] 'lark' vs. [joux] 'yoke'. In a few varieties low front vowels can be shown to induce velar fronting, e.g. Waldau (Trigger Type E) [brɛç] 'break-INF', [væːç] 'soft', [blæç] 'pale', [ɛlç] 'elk' vs. [lɑx] 'laugh-INF'. By contrast, West Central Franconia (Trigger Type C) and Schmalkalden (Trigger Type AA) both possess low front vowels, which do not serve as triggers, e.g. Schmalkalden [knæːxt] 'vassal', [sæɣə] 'blessing' (together with data from that variety given above); West Central Franconia [liçt] 'light', [milç] 'milk' vs. [buːx] 'book', [hɔːx] 'high', [ʃlæxt] 'bad'.

In sum, the material cited above points to a region with a clearly unmarked pattern which is disrupted only by a few outliers described above. However, the reader is referred to Chapter 13, which shows on the basis of data from SNiB that the most uncommon set of velar fronting triggers documented in the present chapter (high front vowels) is the norm in the villages and towns of Upper Bavaria.

12.3.4 West Central German

12.3.4.1 General remarks

In the WCG dialect region a few conservative non-velar fronting places are situated in the northwest of the Rpn/LFr dialect continuum along the Dutch/Belgian border (Map 5.1). One such LFr variety is the one described by Ramisch (1908) for the area south of Geldern. Two non-velar fronting Rpn places in East Belgium are Kreis Eupen (Welter 1929) and Montzen (Welter 1933), e.g. Kreis Eupen [lɪiɣə] 'lie-INF', [lyxt] 'lie-3SG'. Further south, a cluster of non-velar fronting MFr varieties are indicated on Map 5.3, but those places will be shown in §14.6.3 to have lost the once historically active rule of velar fronting. By contrast, in the non-velar fronting varieties described by Ramisch (1908) and Welter (1929, 1933) velar fronting was never active historically.

Table 12.6: Targets and triggers for (postsonorant) velar fronting in SBav, CBav, and NBav (<WGmc $^{+}$[k x])

Target	Trigger	Place	Source
M	DD	Kallmünz	Götz (1987)
LL	BB	Eisendorf	Seemüller (1908c)
LL	DD	Vienna	Moosmüller (1987)
		Salzburg	Moosmüller (1991)
LL	D	Isarwinkel	Maier (1965)
LL	E	Bergstetten	Dozauer (1967)
LL	AA	Großberghofen	Gladiator (1971)
LL	CC	Erdmannsdorf/Zillertal	Siebs (1906)
		Nürnberg	Gebhardt (1907)
		Eggerland	Eichhorn (1908)
		Hausruckviertel	Mindl (1924/1925)
		Untereichenbach	Hain (1936)
		Freutsmoos	Kufner (1957)
		Munich	Kufner (1961)
		Asch	Gütter (1962a)
		Schönbach	Gütter (1962b)
		Lauterbach	Gütter (1963b)
		Rezat-Altmühl	Schödel (1967)
		Kreis Schwabach	Bethge & Bonnin (1969)
		Kreis Wunsiedel	Bethge & Bonnin (1969)
		Windischeschenbach	Denz (1977)
		West Hungary	Manherz (1977)
		Eslarn	Bachmann (2000)
		Ramsau am Dachstein	Noelliste (2017)
LL	EE	West Bohemia	Gradl (1895)
		Vienna	Gartner (1900)
		Loosdorf	Seemüller (1908a)
		St. Georgen an der Gusen	Seemüller (1909d)
		Pilgersham	Seemüller (1909c)
		Marchfeld	Pfalz (1911)
		Neckenmarkt	Bíró (1918)
		Upper Austria	Haasbauer (1924)
		Böhmerwald	Kubitschek (1926)
		Central Bavarian	Kufner (1960)
		Graslitz	Gütter (1963a)
		Munich	Bethge & Bonnin (1969)
		Hallertau	Zehetner (1978)
		Graz	Moosmüller (1991)

Table 12.7: Targets and triggers for (postsonorant) velar fronting in EFr (<WGmc $^+$[k x ɣ])

Target	Trigger	Place	Source
L	CC	Schefflenz	Roedder (1936)
M	AA	Schmalkalden	Kaupert (1914)
LL	C	West Central Franconia	Diegritz (1971)
LL	E	Waldau	Bock (1965)
		Vogtland (Trieb)	Gerbet (1908)
		Kleinschmalkalden	Dellit (1913)
		Suhl	Kober (1962)
LL	CC	Schöneck	Hedrich (1891)
		Pfersdorf	Hertel & Hertel (1902)
		Wachbach	Dietzel (1908)
		Bamberg	Batz (1911)
		Frankenland	Heilig (1912)
		Bonnland	Schmidt (1912b)
		Rot-tal	Knupfer (1912)
		Frankenwald	Werner (1961)
		Gaisbach	Sander (1916)
		East Franconia	Steger (1968)
		Spessart	Hirsch (1971)
		Obermainraum	Trukenbrod (1973)
		Heilbronn	Jakob (1985)
		Weingarts	Schnabel (2000)
LL	EE	Klein-Allmerspann	Blumenstock (1911)
		Fichtelgebirge	Meinel (1932)

The linguistic atlases for WCG give no indication of non-velar fronting places, even along the country borders separating German (WCG) from other languages. In ALLG there are a number of maps for German Lorraine (Deutsch-Lothringen), which includes the area between Thionville and Sarrebourg (see my Map 5.3). Map 7 (*lachen* 'laugh-INF') and Map 116 (*hauch* 'breath') in ALLG indicate consistent realizations with [x] after various back vowels, while Map 160 (*streicheln* 'pet-INF'), Map 200 (*bleich* 'pale'), and Map 269 (*Milch* 'milk') reveal that [ç] appears after any coronal sonorant throughout the region without exception. MRhSA likewise gives no indication that there are conservative enclaves without velar fronting, even among those places along the borders with France, Luxembourg, and Belgium.

Two places in the northeastern part of the Rpn dialect area had not yet phonologized velar fronting in the late nineteenth century: Mülheim an der Ruhr (Maurmann 1889) and Remscheid (Holthausen 1885a,b). It is fairly clear from those descriptions that the ich-Laut is absent. Maurmann (1889: 10) indicates this by placing his velar consonants [k g x ɣ ŋ] in a separate column from his one palatal ([ʝ]), although his description of the phonetics (p. 11) suggests that there is some coarticulatory fronting of velars. Holthausen (1885a) is very clear that velar fronting was not active at that time. He writes (p. 406): "x ist – *ch* in *acht*, vor und nach palatalen vocalen wird seine bildungsstelle – wie auch dies des *k* – ein klein wenig nach vorn verschoben, ohne dass jedoch die palatale articulation des *ch* in *ich* erreicht würde". ("*x* is – *ch* in *acht*, its place of articulation before and after front vowels – like that of k – advanced slightly towards the front without reaching the palatal articulation of the *ch* in *ich*"). That quote and the discussion in that article suggest that there is some coarticulatory fronting of postsonorant and word-initial /x/ but that velar fronting had not yet been phonologized. Both Mülheim an der Ruhr and Remscheid appear to be non-velar fronting islands because they are surrounded by dorsal fronting varieties. For example, Remscheid is located about 5km from Wermelskirchen to the south and 5km from Ronsdorf to the north, but both of those places have velar fronting (see Holthaus 1887 and Hasenclever 1905 on Map 5.1).

Those non-velar fronting varieties aside, the generalization is that postsonorant velar fronting is present throughout the WCG area. In contrast to several of the H(st)Almc and Wph varieties discussed earlier, velar fronting in WCG is not active synchronically in word-initial position. The diachronic change whereby word-initial $^{+}$[ɣ] surfaces as the corresponding palatal ([ʝ]) before any type of sound is a common change throughout CFr (=Rpn/MFr). That topic is postponed until Chapter 14 because it illustrates that velar fronting can apply as a nonassimilatory change.

In postsonorant position the set of targets for WCG consists of /x/ and – if present – /ɣ/ (Target Type M). See Viëtor (1875: 7) for an early description of colloquial speech (Umgangssprache) specifically in RFr where this broad set of targets is presupposed. Many of the varieties below are classified as Target Type LL because /ɣ/ is absent. In only a few rare cases does /x/ but not /ɣ/ undergo velar fronting (Target Type L). This contrasts with the typical pattern for Wpf (§12.3.6). The difference between Target Type M for CG (Rpn) and Target Type L for ELG (Wph) was already recognized in 1915 by Otto Lobbes (Lobbes 1915; Map 5.1). He writes (pp. 17-18) of the difference between Rpn and Wpf (separated by the Uerdingen line):

> Im Rip. haben wir … eine palatale stimmhafte Spirans (j), die auch inlautend nach palatalen Vocalen steht, während nach velarem Vocal die velare stimmhafte Spirans (γ) eintritt. … Dagegen weichen die Mdaa. nördlich und östlich der Ürdinger Linie erheblich von den ripuarischen Mdaa. … An Stelle des stimmhaften palatalen Reibelautes … der rip. Mdaa. haben wir im Inlaut de[n] stimmhafte[n] velare[n] Spirant(en) (γ), der aber auch nach palatalem Vocal seinen velaren Charackter beibehält.
>
> "In Ripuarian we have a palatal voiced fricative (j), which also stands word-internally after front vowels, while the velar voiced fricative (γ) occurs after back vowels ... By contrast, the dialects north and east of the Uerdingen line deviate considerably from the Ripuarian dialects ... In place of the voiced palatal fricative ... of the Ripuarian dialects we have word-internally the voiced velar fricative (γ), which also retains its velar character even after front vowels".

In terms of triggers the clear pattern for WCG dialects is for all coronal sonorants to induce the change from velar to palatal, including low front vowels (if present). Recall that the broadest set of triggers is reflected with Trigger Type E. In a small number of cases identified below, low front vowels are present (/æ/), but they fail to trigger velar fronting (=Trigger Type C, AA, or CC).

The present findings concerning targets and triggers for postsonorant velar fronting are also documented in dialect dictionaries. Three dictionaries for Rpn (KWb and WbKM for Cologne and WbUS for the Lower Sieg region (die untere Sieg) – a large area in and around Bonn – document Trigger Type E and Target Type M. (KWb provides a description on pp. 15-17 of how to pronounce the spelling of *ch* and *g*. KWb and WbUS give phonetic transcriptions for each lexical entry with different symbols for the lenis palatal and velar fricatives). More extensive (multiple volume) dialect dictionaries provide details concerning the pronunciation of words in specific places. One example is SHesWb for South Hesse, which provides phonetic transcriptions with separate symbols for velars and palatals; recall from §9.5 that SHesWb encodes the [x] vs. [ç] contrast. In that source, multiple phonetic transcriptions corresponding to specific places in the broad region are provided for any given word. In SHesWb, [x] regularly occurs after back vowels (e.g. *Loch* 'hole') and [ç] after front vowels and liquids (e.g. *Licht* 'light', *Dolch* 'dagger'); since no low front vowel is present this pattern corresponds to Target Type C. The same source reveals that some places are attested with Target Type M (e.g. *Lager* 'camp' with [ɣ] and *fegen* 'sweep-INF' with [ʝ]) and others with the rare Target Type L (e.g. *Lager* 'camp' and *fegen* 'sweep-INF' with [ʝ]). A second multiple volume dialect dictionary for WCG is RWb for the Rheinland. Like SHesWb, RWb provides phonetically transcribed words in numerous places for any given word. The area defined by RWb includes LFr, Rpn, RFr, and MFr. Segments inducing velar fronting imply that Trigger Type C is typical for the region, although a closer scrutiny of RWb may reveal different Trigger Types. Target Type LL and M are typical for RWb, although it is clear from the occurrence of [ɣ] in a word-internal onset after a front vowel that the same source also recognizes Target Type L.

I discuss first the three Hes dialects (EHes, NHes, CHes) and provide a summary of the targets and triggers in Table 12.8. I then consider LFr, CFr (MFr/Rpn), and RFr and give a summary in Table 12.9.

12.3.4.2 Central Hessian, North Hessian, and East Hessian

According to all sources consulted, velar fronting affects both /x/ and /ɣ/ (Target Type M) or only /x/ if /ɣ/ is not present (Target Type LL). Target Type M is represented by Oberellenbach, e.g. [iʝəl] 'hedgehog', [sæːʝn̩] 'say-INF', [blæç] 'tin', [mɛlç] 'milk', [ærʝər] 'anger' vs. [βoːɣə] 'scale', [kɔx] 'cook'. No Hes variety has been uncovered with /x/ and /ɣ/ in which only /x/ triggers velar fronting (Target Type L).

If a low front vowel is present then that vowel typically induces velar fronting, e.g. (Trigger Type E) Oberellenbach (see above). A second example is Central Vogelsberg [ʃlɛçt] 'bad', [bræçə] 'break-INF', [mɛlç] 'milk' vs. [nox] 'still'. Atzenhain/Grünberg (§9.2) represents a variety in which low front vowels fail to induce velar fronting (Trigger Type AA), e.g. [gəsiçt] 'face', [breːç] 'break-INF' vs. [bux] 'book', [nɔːxt] 'night', [blæx] 'tin'.

Not included in Table 12.8 is the EHes region around Bad Hersfeld (Martin 1957), which nicely illustrates the way in which triggers and targets can differ from place to place. Throughout the area, /x/ surfaces as [ç] after a nonlow front

Table 12.8: Targets and triggers for (postsonorant) velar fronting in EHes, NHes, and CHes (<WGmc $^{+}$[k x ɣ])

Target	Trigger	Place	Source
M	C	Rauschenberg	Bromm (1936)
M	E	Schlierbach	Schaefer (1907)
		Oberellenbach	Hofmann (1926)
M	CC	Bad Salzungen	Hertel (1888)
		Friedberg	Reuß (1907)
		Amtshausen	Hackler (1914)
		Niederhessen	Hofmann (1940)
		Battenberg	Martin (1942)
		Bad Wildungen	Martin (1942)
		Siegerland/Eichsfeld	Möhn (1962)
		Marburg	Spenter (1964)
		Holzhausen	Arend (1991)
M	EE	Frankfurt am Main	Bethge & Bonnin (1969)
LL	E	Bad Hersfeld	Salzmann (1888)
		Hanau	Urff (1926)
		Werra-Fuldaraum	Weber (1959)
		Schlitzerland	Krafft (1969)
		Central Vogelsberg	Hasselbach (1971)
		Central Hesse	Hasselberg (1979)
LL	AA	Atzenhain/Grünberg	Knauss (1906)
LL	CC	Pfahlgraben	Faber (1912)
		Kreis Alsfeld	Heidt (1922)
		Wetterfeld	Schudt (1927)
		Fulda	Noack (1938)
		Hintersteinau	Müller (1958a)
		Kassel	Müller (1958b)
		Fulda	Dingeldein (1995)
LL	DD	Naunheim	Leidolf (1891)
		Rhöntal	Glöckner (1913)
		Fuldaer Land	Wegera (1977)
LL	EE	Weidenhausen	Friebertshäuser (1961)
		Königsstein im Taunus	Schnellbacher (1963)
		Erbstadt	Schudt (1970)
		Bad Salzschlirf	Post (1985)

vowel or consonant (e.g. [liçt] 'light', [mɛlç] 'milk') and [x] after a back vowel (e.g. [ɔːxt] 'eight'). After [æː] the dorsal fricative is realized as [ç] to the east of Bad Hersfeld and as [x] to the west, e.g. [ʃlæːçt] vs. [ʃlæːxt] 'bad', [flæːçt] vs. [flæːxt] 'braid'. The [x] realization is attested in Kirchheim (Reckerode, Rotterode, Gershausen) and Nieraula (Kleba, Niederjossa, Hattenbach), while [ç] occurs in Wölfershausen, Unterneurode, Hillartshausen and Wehrshausen (Martin 1957: 31, 100). Martin's regional variety also elucidates the distinction between Trigger Type M and Trigger Type LL: In the north, /ɣ/ is realized as [ɣ] in a word-internal onset after a back vowel (e.g. [ʃvɔːɣəɐ] 'brother-in-law'), but in the south (where [x] is realized after [æː]), /ɣ/ has restructured to /x/, e.g. [ʃvɔːxəɐ] 'brother-in-law'.

12.3.4.3 Low Franconian

Few descriptions of LFr are available, and hence it is not possible to say what the typical Target Type and Trigger Type are for that dialect area. Two varieties are attested with Target Type L, namely Kalkar (§8.2) and Homberg. The sources for those places also reveal that low front vowels are velar fronting triggers (Trigger Type D), e.g. Kalkar [pleçt] 'duty', [flæçtə] 'braid' vs. [kloxt] 'gap', [ʀɛːɣə] 'rain'. The facts are similar in Kleve (Trigger Type DD).

12.3.4.4 Central Franconian and Rhenish Franconian

Target Type M is the norm for CFr and RFr. A MFr variety illustrating Target Type M (Sörth) was discussed earlier (§5.4). A second MFr variety is Sehlem, e.g. [knɛːçt] 'vassal, [hæːçəl] 'hackle', [ʃpiːʝəl] 'mirror', vs. [vɔx] 'week', [frɑːɣə] 'ask-INF', and a Target Type M from RFr is Zaisenhausen, e.g. [prɛçə] 'break-INF', [iːʝl̩] 'hedgehog' vs. [lɑxə] 'laugh-INF', [froːɣə] 'ask-INF'.

Typical for CFr and RFr is the nonoccurrence of dorsal fricatives after consonants due to Schwa Epenthesis, e.g. (Rpn) Dülken [veːç] 'path', [bøyʝən] 'bend-INF' vs. [frɑxt] 'freight', [drɑːɣə] 'carry-INF' and [foləç] 'consequence' (from /folɣ/). A similar pattern obtains in Wermelskirchen (Rpn), although that dialect allows palatals to surface after liquids in a word-internal onset, e.g. [ʃprɛçən] 'speak-INF', [fɛːʝən] 'sweep-INF', [folʝən] 'follow-INF' vs. [lɔx] 'hole', [fuːɣəl] 'bird'.

Two RFr varieties unique to their area are Mönchzell and Heppenheim because they both exhibit Target Type L, e.g. Mönchzell [blɛç] 'tin', [ʀæçt] 'right', [feʝə] 'sweep-INF', [folʝə] 'follow-INF' vs. [wox] 'week', [kʊɣl̩] 'ball', [flɪɣl̩] 'wing'; Heppenheim [ʃlɛːç] 'bad', [fɛnçl̩] 'fennel', vs. [foɣl̩] 'bird', [ʃtɑiɣə] 'climb-INF', [lɑxə] 'laugh-INF'.

Table 12.9: Targets and triggers for (postsonorant) velar fronting in LFr, MFr, Rpn, and RFr (<WGmc $^+$[k x ɣ])

Target	Trigger	Place	Source
L	E	Mönchzell	Reichert (1914)
L	CC	Heppenheim	Seibt (1930)
L	DD	Homberg	Meynen (1911)
		Kalkar	Hanenberg (1915)
LL	CC	Werden	Koch (1879)
LL	DD	Ober-Flörsheim	Haster (1908)
		Saarhölzbach	Thies (1912)
LL	EE	Kreis Moers	Bethge & Bonnin (1969)
M	E	Kenn	Thomé (1908)
		Beuren	Peetz (1989)
M	CC	Cologne	Wahlenberg (1877)
		Wermelskirchen	Hasenclever (1905)
		Sörth	Hommer (1910)
		Vianden	Engelmann (1910)
		Schelsen	Greferath (1922)
		Speyer	Waibel (1932)
		Gleuel	Heike (1970)
		Krefeld	Bister-Broosen (1989)
M	DD	Sehlem	Ludwig (1906)
M	EE	Handschuhsheim	Lenz (1900)
		Aegidienberg	Müller (1900)
		Erftgebiet	Münch (1904 [1970])
		Zaisenhausen	Wanner (1907, 1908)
		Laubach	Wimmert (1910)
		Dülken	Frings (1913)
		Düsseldorf	Zeck (1921)
		Seelscheid	Mackenbach (1924)
		Plankstadt	Treiber (1931)
		Pfungstadt	Grund (1935)
		Schlebusch	Bubner (1935)
		Kreis Wittlich	Bethge & Bonnin (1969)
		Oftersheim	Liébray (1969)
		Großrosseln	Pützer (1988)
		Horath (Hunsrück)	Reuter (1989)

Target	Trigger	Place	Source
		Lxm	Gilles (1999)
LL	CC	Southeast Palatinate	Heeger (1896)
		Siegerland	Martin (1922)
		Lubeln	Reuter (1903)
		Merzig	Tarral (1903)
		Warmsroth	Fuchs (1903)
		Zell im Mümlingtal	Freiling (1929)
		South Palatinate	Karch (1980)
LL	DD	Arel	Bertrang (1921)
		Echternach	Palgen (1931)
		Kleve	Stiebels (2013)
LL	EE	Niederembt	Grass (1920)
		Saarlouis	Lehnert (1926)
		Saarbrücken	Kuntze (1932)
		Ittersdorf	Pallier (1934)

According to all of the sources for CFr and RFr surveyed, if a low front vowel is present then it serves as a trigger for velar fronting (Trigger Type D, E, DD). In this respect, CFr and RFr differ from Hes ones.

12.3.5 East Central German

12.3.5.1 General remarks

The present survey has failed to discover any references to non-velar fronting enclaves in the ECG dialect region; hence, all places discussed below have some version of postsonorant velar fronting. Word-initial velar fronting occurs in HPr (§11.7) and the two Sln varieties referred to above (§11.4), but that type of system is otherwise unattested in this area. In NUSax-SMk it is common for the modern reflex of WGmc $^{+}$[ɣ] to be realized as the corresponding palatal, but this development is not discussed until Chapter 14.

One nearly exceptionless generalization holding for the sources cited is that if /x ɣ/ are present, then both sounds undergo (postsonorant) velar fronting (Target Type M). One ECG dialect has been found – commented on below – possessing /x ɣ/, in which only /x/ undergoes fronting (Target Type L). Recall from Chapter 11 that two varieties of Sln (Sebnitz and Seifhennersdorf) as well as HPr (Reimerswalde) have a broad set of targets for velar fronting because it includes velar stops and the velar nasal (Target Type N).

As a general rule, the velar fronting triggers subsume all front vowels, including low front vowels (if present), and coronal sonorant consonants (Trigger Type E). A small number of varieties commented on below have been discovered in which low front vowels fail to trigger velar fronting. A pattern that is even more rare is one in which only front vowels but not coronal sonorant consonants induce velar fronting. A few such places (Trigger Type BB) have been identified and are discussed below.

I consider now the individual groupings within ECG, beginning with Thrn, USax, and NUSax-SMk, and then I turn to Sln and HPr. The generalizations concerning targets and triggers are summarized in Tables 12.10–12.13.

12.3.5.2 Thuringian, Upper Saxon, and North Upper Saxon-South Markish

Target Type M is represented by Leinefelde (Thrn), e.g. [zɪçl̩] 'sickle', [tsɛɟn̩] 'goat', [plæç] 'tin', [næːçr̩] 'closer', [pʊrç] 'castle' vs. [lɔx] 'hole', [loːɣr̩] 'camp'. Since historical $^{+}$[ɣ] restructured to [x] (/x/) in most varieties of Thrn/USax, Target Type LL is the predominant pattern, e.g. Sondershausen (Thrn) [brɛçə] 'break-INF', [blæç] 'tin', [forçə] 'furrow' vs. [buːx] 'book'. A rare case of Target Type M for USax is attested in Salzfurtkapelle, e.g. [bleç] 'tin', [iːɟəl] 'hedgehog', [balɟən] 'scuffle-INF', [zorɟə] 'worry' vs. [brauxən] 'need-INF', [krɑːɣən] 'collar'. The one case of Target Type L known to me is Eisenach (Thrn), e.g. [ɛç] 'I' vs. [pɑxt] 'lease', [boːɣn̩] 'bow', [beːɣn̩] 'bow-PL'.

Trigger Type E is illustrated by Zschorlau (USax), e.g. [heç] 'height', [læçt] 'light', [dolç] 'dagger' vs. [rɑːx] 'smoke'. Four sources consulted make it clear that there are low front vowels that fail to induce velar fronting (Trigger Type C). That pattern is reflected in USax (Vorerzgebirge) and Thrn (Buttelstedt, Southwest Thuringian, Eichsfeld), e.g. Vorerzgebirge [knɛçt] 'vassal', [doːrç] 'through' vs. [nuːx] 'still', [nɑxt] 'night', [wæːxŋ] 'because of'. The [æː] in the latter example is described in the original source as low front vowel ("überhelles *a* tiefster Mittelzungenvokal …"); Bergmann (1965: 43).[8]

One unique place in this region where velar fronting fails to apply after [r] (Target Type BB) is Itzgrund, which occupies the southern corner of the Thrn dialect region (Map 7.2). Spangenberg (1989: 128) notes that the entire Thrn region is characterized by (postsonorant) velar fronting. He writes that after a consonant [ç] typically occurs but that in Itzgrund [x] is commonly realized after the rhotic. ("Nach Kons. erscheint wie in der StSpr. ç, doch im Itzgr begegnet nach r wie in der Mda auch häufig x …"). The three examples Spangenberg gives are [dʊrx] 'through', [ʃnɑːrxt] 'snore-3SG', and [kirxŋkoːr] 'church choir'.

[8]According to the transcriptions provided in the dictionary for USax (ObersWb), it is evident that the target for velar fronting is /x/ (Target Type LL) and that the process is induced by coronal sonorants (Trigger Type CC).

Table 12.10: Targets and triggers for (postsonorant) velar fronting in Thrn (<WGmc $^+$[k x ɣ])

Target	Trigger	Place	Source
L	E	Eisenach	Flex (1893)
M	E	North Thuringia	Schultze (1874)
		Stiege	Liesenberg (1890)
		Leinefelde	Hentrich (1905)
		Honsteinisch	Rudolph (1924/1925)
LL	C	Buttelstedt	Kürsten & Bremer (1910)
		Southwest Thuringia	Kürsten (1910, 1911)
		Eichsfeld	Hentrich (1920)
LL	E	Bad Frankenhausen	Frank (1898)
		Sondershausen	Schirmer (1932)
		Unterellen	Spangenberg (1962)
		Dudenrodt, Netra	Guentherodt (1982)
		Barchfeld	Weldner (1991)
LL	BB	Itzgrund	Spangenberg (1989)
LL	CC	Osterland	Trebs (1899)
		Altenburg	Daube (1906)
		Niddawitzhausen	Rasch (1912)
		Weidenhain	Krug (1969)
		Ludwigsstadt	Harnisch (1987)

12.3.5.3 Silesian and High Prussian

Target Type M is represented by Kieslingswalde (Sln), e.g. [lɪçt] 'light', [rɛçtɐ] 'judge', [keːj̩l] 'pin', [mɛlç] 'milk' vs. [hoːɣ̩l] 'hail', [nɔx] 'still', and Target Type LL by Reichenberg (Sln), e.g. [raeç] 'rich', [mɑnçə] 'some-INFL' vs. [vɔxə] 'week'. Sebnitz and Seifhennersdorf (§11.4) deviate from the other Sln dialects because they possess the broadest set of targets for postsonorant fronting (Target Type N).

The generalizations concerning targets and triggers for velar fronting in Sln are for the most part consistent with the maps in SchlSA (although recall the discussion in §9.5 on the occurrence of [ç] after a back vowel). A closer examination of SchlSA's Map 6 reveals that there are parts of the Sln dialect region where the word *Kirche* 'church' is realized with [x] after the coronal consonant [r], e.g. Hohenelbe ([kɛrx]), Grulich ([kɛrxə], [kɑrxə]), and Bärn ([kɪrx]). All three places are

Table 12.11: Targets and triggers for (postsonorant) velar fronting in USax and NUSax-SMk (<WGmc $^+$[k x ɣ])

Target	Trigger	Place	Source
M	CC	Salzfurtkapelle	Schönfeld (1958)
		Friedersdorf	Seibicke (1967)
		Grassau	Stellmacher (1973)
		Berlin	Schönfeld (1986), Bethge & Bonnin (1969)
M	EE	Aken (Elbe)	Bischoff (1935)
LL	C	Vorerzgebirge	Bergmann (1965)
LL	E	Leipzig	Albrecht (1983)
		Zwickau	Philipp (1897)
		Zschorlau	Lang (1906)
		Meißnisch	Große (1955)
		Dresden	Fleischer (1961)
		Erzgebirge	Goepfert (1878)
LL	CC	Greiz	Hertel (1887)
		Brüx	Hausenblas (1898)
		Dubraucke	Goessgen (1902)
		Schokau	Pompé (1907)
		Northwest Bohemia	Hausenblas (1914)
		West Lausitz	Protze (1957)
		South Upper Saxon	Becker (1969)
		Wittenberg	Langner (1977)

indicated on my Map 5.2. SchlSA's Map 26 for *leuchten* 'glow-INF' reveals that velar fronting is active throughout Sln – including the three aforementioned places – because [ç] is present after a front vowel (i.e. [lɛçd̥n̩]).

As noted above, word-initial velar fronting is restricted to two varieties of Sln and one variety of HPr.

In sum, ECG is a region with a consistent pattern whereby /x/ – and /ɣ/ if present – undergo fronting to the respective palatals after any coronal sonorant. That unified picture is disrupted by a few places referred to above which have a broad set of targets as well as several enclaves where fronting is induced by only a subset of coronal sonorants.

Table 12.12: Targets and triggers for (postsonorant) velar fronting in Sln and HPr (<WGmc $^{+}$[k x ɣ ŋ])

Target	Trigger	Place	Source
M	CC	Kieslingswalde	Pautsch (1901)
		Schlesische Mundart	von Unwert (1908)
		Kreis Hirschberg	Graebisch (1912a)
		Alt-Waltersdorf	Graebisch (1912b)
		North Moravia	Weiser (1937)
		Kreis Jauer	Halbsguth (1938)
		Grafschaft Glatz	Blaschke (1966)
M	EE	Kunewald	Giernoth (1917)
N	EE	Seifhennersdorf	Michel (1891)
		Sebnitz	Meiche (1898)
		Reimerswalde	Kuck & Wiesinger (1965)
LL	E	Römerstadt	Rieger (1935)
LL	BB	Hohenelbe, Grulich, Bärn	SchlSA
LL	CC	Lehmwasser	Hoffmann (1906)
		Reichenberg	Kämpf (1920)
		East Bohemia	Festa (1925)
		Kay	Messow (1965)
LL	EE	Groβ-Schönau	Wenzel (1919)

Table 12.13: Targets and triggers for (word-initial) velar fronting in Sln and HPr (<WGmc $^{+}$[k x ɣ ŋ])

Target	Trigger	Place	Source
N	EE	Sebnitz	Meiche (1898)
		Seifhennersdorf	Michel (1891)
		Reimerswalde	Kuck & Wiesinger (1965)

12.3.6 West Low German

12.3.6.1 General remarks

As noted in §4.2, non-velar fronting varieties of WLG (NLG) are attested in the far western part of Lower Saxony, i.e. Lathen, e.g. [zyxtə] 'sigh-INF', [riːɣə] 'row'. Wph varieties with no velar fronting include Grafschaft Bentheim (Rakers 1944: 13) and Ostbevern (Holtmann 1939). A more recent example is discussed by Brandes (2011) for the area between Breckerfeld, Hagen, and Iserlohn. He writes (p. 242): "Das reine palatale [ç] existiert in UG nicht." ("The pure palatal [ç] does not exist in the area under investigation.") In the context after a front vowel, Brandes transcribes the fricative in question as "[ç/x]", which is intended to reflect the fact that it has an articulation between [x] and [ç]. I interpret this to mean that /x/ undergoes phonetic fronting to a prevelar; see §12.9.2. In all of these non-velar fronting places, WGmc $^{+}$[ɣ] is also preserved as a velar fricative in word-initial position regardless of the nature of the following sound, a pattern that is also reflected in Borken (Herdemann 1921 [2006]) and Gütersloh (Wix 1921). Note that velar fronting is active in postsonorant position in both Borken and Gütersloh.[9]

In all other sources consulted for WLG dialects there is some version of postsonorant velar fronting and – in some places – word-initial velar fronting. In contrast to HG, WLG shows much more variation concerning targets and triggers. For example, several places (nearly all Wph) are attested with the rare target Type L. Wph is also important because it exhibits variation in the types of segments that can serve as triggers, i.e. rare Trigger Types A and B are both attested. Wph and Eph also contrast with HG in the sense that some version of word-initial velar fronting can be shown to be synchronically active.

I discuss the three WLG groupings separately, beginning with NLG. The generalizations concerning targets and triggers are summarized in Tables 12.14–12.18.

12.3.6.2 North Low German

Velar fronting is active throughout this region, but only in postsonorant position. Typical for NLG is Target Type LL because historical /ɣ/ has restructured

[9] According to the section on pronunciation (p. 377) in the dictionary for the Wph dialect (WphWb), the StG ich-Laut is absent in most varieties of Wph. This is a peculiar assertion, since it is blatantly contradicted by the studies on Wph cited throughout this book. A more realistic statement can be found in WMlWb. That source states clearly (p. 25) that Westmünsterland – roughly speaking, the area between Bocholt and Vreden (Map 4.2) – is characterized by postsonorant velar fronting of /x/. By contrast, WMlWb notes that the modern reflex of WGmc $^{+}$[ɣ] in word-initial position is a velar fricative even in the context before front vowels (p. 25).

to /g/; recall Altengamme from §4.2. The set of triggers subsumes all front vowels – including low front vowels (if present) and coronal sonorant consonants (if present). In many varieties /g/ spirantizes in coda position, surfacing as [x] or [ç] depending on the nature of the preceding sound.[10]

Target Type LL is attested in Altengamme (§4.2). e.g. [slɛç] 'bad', [fɛlç] 'wheel rim' vs. [ɑx] 'eight'. Diepenau illustrates Target Type M, e.g. [flɛçtn̩] 'braid-INF', [fɔlɟn̩] 'follow-INF' vs. [lɑxn̩] 'laugh-INF', [ʒɔːɣn̩] 'hunt-INF', while Jadebusen is the only NLG example of rare Target Type L, e.g. [zœːʝ] 'sow', [leːiʝt] 'lie-2PL' vs. [ɛçt] 'genuine'.

Oldenburg exemplifies the entire range of triggers (Trigger Type E), e.g. [dɪçt] 'tight', [lɛçt] 'light', [dæːç] 'hard-working' vs. [lʊxt] 'air'.

12.3.6.3 Westphalian

In contrast to NLG, Target Types L and M are both well-attested. Target Type M for the entire range of triggers (Trigger Type E) is represented by Elspe (§7.2), and Borken (§4.3); e.g. Borken [zɛç] 'say-3SG', [fæːʝən] 'sweep-INF', [bɛrç] 'mountain', [zɛɟɟən] 'say-INF' vs. [trɔx] 'trough'. Target Type L is exemplified by four varieties discussed in previous chapters, namely Soest (§4.3), Adorf (§4.3), Schieder-Schwalenberg (§7.2), and Rhoden (§5.2).

The triggers for postsonorant velar fronting can consist of all coronal sonorants (Trigger Type E) or a more restricted subset. One example of the latter is Rhoden (Trigger Type AA), e.g. [lɛçt] 'light' vs. [ʃlæxt] 'bad'.

The Byfang data (within Vest Recklinghausen) discussed in Hellberg (1936) point to a variety with the rare Trigger Type B (and Target Type L). In Byfang there is no low front vowel ([æ]), but front lax [ɛ] patterns phonologically as [+low]. Representative examples include [tɑiçəl] 'brick' (from /tɑixəl/), [tyːç] 'stuff' (from /tyːɣ/) vs. [ɑxtər] 'behind', [kɔɣəl] 'ball', [liɣən] 'lie-INF', [rɛx] 'quite', and [ʃlɛxt] 'bad'. Examples like [pɔːlbœrɣər] 'someone whose family has been living in a community over several generations' and [bɛrx] 'mountain' indicate that the set of triggers does not include coronal sonorant consonants.

Plettenberg displays the rare Trigger Type A. In that dialect, /x/ regularly undergoes fronting to [ç] after [i], e.g. [biçtə] 'confession', [filiçtə] 'maybe'. After back vowels, coronal consonants and nonhigh front vowels, [x] occurs, e.g. [tuxt] 'breeding', [nox] 'still', [æxtr̩] 'behind', [nœxtə] 'vicinity', [lext] 'light', [rɛxt] 'justice', [biɛrx] 'mountain'. The set of segments undergoing fronting consists solely

[10]This description of the distribution of [x]/[ç] and [g] in NLG matches the one for Hamburg as presented in HaWb (Volume 2: 231). The examples cited in the survey of NLG ("Niedersächsisch") in Stellmacher (1981: 37–38) point to an area where postsonorant velar fronting is active.

Table 12.14: Targets and triggers for (postsonorant) velar fronting in NLG (<WGmc ⁺[k x ɣ])

Target	Trigger	Place	Source
L	EE	Hollenstedt	Götze (1922)
		Jade	Götze (1922)
		Jadebusen	Schmidt-Brockhoff (1943)
M	E	Diepenau	Schmeding (1937)
M	EE	Badbergen	Vehslage (1908)
		Bergenhusen	Sievers (1914)
LL	CC	Bleckede	Rabeler (1911)
LL	E	Oldenburg	vor Mohr (1904)
LL	CC	Altengamme	Larsson (1917)
		Finkenwärder	Kloeke (1914)
		Grambkermoor (Bremen)	Bollmann (1942)
LL	EE	Kreis Herzogtum Lauenburg	Heigener (1937)
		Hemmelsdorf	Pühn (1956)
		Harburg	Keller (1961)
		Kreis Kiel	Bethge & Bonnin (1969)
		Oldenburger Ammerland	Mews (1971)
		Nordstrand	Willkommen (1999)

of /x/ because /ɣ/ surfaces as [ɣ] in a word-internal onset, even after [i], e.g. [niɣə] 'new'. The facts involving velar fronting in Plettenberg are discussed and further refined in §12.6.1.

One source not listed in Table 12.15 is Schulte's (1941) survey of the Wph varieties spoken in the Southeast Sauerland.[11] Several generalizations can be made from that source that corroborate the facts from other Wph dialects. Schulte has both [ç] (=⟦χ⟧) and [x] (=⟦x⟧), and – not surprisingly – [ç] but never [x] occurs after high front vowels and [x] but not [ç] after back vowels, regardless of the village, e.g. [nɪç] 'not' vs. [mɑːxn̩] 'do-INF'. By contrast, dorsal fricatives occurring after the front vowels [ɛ œ] can vary according to regions between [x] and [ç]. For example, Schulte (1941: 26) observes that *schlechten* 'bad-INFL' is realized as [ʃlɛçtn̩] in some communities and as [ʃlɛxtn̩] in others (Wenden, Hilmicke,

[11]The work is not cited in Table 12.15 because it is difficult to determine the correct set of targets and triggers for any one community. Nevertheless, as I point out below Schulte's (1941) study represents a microcosm of the Wph region.

Table 12.15: Targets and triggers for (postsonorant) velar fronting in Wph (<WGmc +[k x ɣ])

Target	Trigger	Place	Source
L	A	Plettenberg	Gregory (1934)
L	B	Vest Recklinghausen (Byfang)	Hellberg (1936)
L	AA	Rhoden	Martin (1925)
		Willingen	Martin (1942)
L	CC	Schieder-Schwalenberg	Böger (1906)
		Altenluenne	Borchert (1955)
L	DD	Adorf	Collitz (1899)
L	E	Sudeck	Martin (1942)
		Kreis Tecklenburg	Bethge & Bonnin (1969)
L	EE	Soest	Holthausen (1886)
		Paderborn	Brand (1914)
		Freienhagen	Martin (1942)
		Laer	Niebaum (1974)
		Müschede	Niebaum et al. (1976)
M	E	Elspe	Arens (1908)
		Borken	Herdemann (1921 [2006])
M	EE	Münster	Keller (1961)
M	CC	Lippe	Hoffmann (1887)
		Hiddenhausen	Schwagmeyer (1908)
		Nienberge	Seymour (1970)
		Reelkirchen	Stellmacher (1972)

Altendorf). Other items include [rɛxt] 'right' and [frɛxən] 'impudent-INFL'. Occasional examples in the original source also suggest that there is variation concerning the postconsonantal context, e.g. [ʃtœrçə] 'stork-PL' is realized as [ʃtœrxə] in the northern regions (recall the [rx] sequences from Byfang). Schulte's study is also important because it corroborates the two patterns for targets of postsonorant fronting described above for other varieties of Wph: Communities within the Southeast Sauerland can have either Target Type L or Target Type M; Schulte (1941: 61-62). For example, the words *Brücke* 'bridge' and *Rücken* 'back' can be realized as [bryɣə]/[bryɟə] and [riɣn̩]/[ryɟn̩] respectively. According to Schulte, pronunciation with [ɣ] (=⟦ɣ⟧) is typical for northern regions and [ɟ] (=⟦j⟧) in parts of the west.

Velar fronting in word-initial position in Wph (<WGmc $^{+}$[ɣ]) typically exemplifies Target Type LL because /x/ (<WGmc $^{+}$[ɣ]) is the only dorsal fricative present in that context. (Recall from §4.3 that Wph – represented by Soest – underwent Wd-Initial /ɣ/-Fortition). See Jellinghaus (1877: 66) and Niebaum (1977: 44–46) for general discussion for Wph. A pattern that is uncommon for Wph is attested by Kirchspiel Courl (Target Type MM). In that place, WGmc $^{+}$[ɣ] is retained as /ɣ/ in word-initial position and is not restructured to /x/. /ɣ/ surfaces as [ɣ] before a back vowel and as [ʝ] before a front vowel or coronal consonant, e.g. [ɣɔːən] 'go-INF', [ʝɛet] 'go-3SG', [ʝrɑf] 'grave'. This pattern represents Target Type MM because /ɣ/ is the only velar serving as the target for word-initial velar fronting.

Word-initial velar fronting shows variation concerning triggers. For example, in certain parts of the Plettenberg region (§12.6.1), word-initial fronting of /x/ to [ç] is triggered by high front vowels (Trigger Type A), e.g. [çiətn̩] 'eat-PART' vs. [xelt] 'money'. By contrast, Soest illustrates Trigger Type BB, e.g. Soest [çɪstɑn] 'yesterday', [çɛɔs] 'goose' vs. [xuət] 'good', [xlʏkə] 'fortune'. The same pattern obtains in the text provided (in phonetic transcription) for Laer (Niebaum 1974: 155-177), e.g. [çɪft] 'poison' cs. [xɑːniks] 'nothing at all', [xlɑtiːs] 'black ice'. In Schieder-Schwalenberg (§7.2) the set of triggers for word-initial velar fronting consists of all coronal sonorant consonants (Trigger Type CC), e.g. [çistəʀn] 'yesterday', [çelt] 'money', [çlɑs] 'glas' vs. [xɑfəl] 'fork'. Note that /x/ also surfaces as [x] before the uvular rhotic, e.g. [xʀɑf] 'grave'. Elspe (§7.2) exhibits the entire range of triggers (Trigger Type E), e.g. [çɛlt] 'money', [çæftə] 'give-SUBJ', [çlɔftə] 'believe-PRET' vs. [xɔlt] 'gold'. In contrast to Schieder-Schwalenberg, the rhotic in Elspe is coronal [r], before which the palatal fricative occurs, e.g. [çrɛɔt] 'big'.

Table 12.16: Targets and triggers for (word-initial) velar fronting in Wph (<WGmc $^{+}$[ɣ])

Target	Trigger	Place	Source
LL	A	Plettenberg	Gregory (1934)
LL	E	Elspe	Arens (1908)
LL	BB	Soest	Holthausen (1886)
		Laer	Niebaum (1974)
LL	CC	Schieder-Schwalenberg	Böger (1906)
		Nienberge	Seymour (1970)
MM	CC	Kirchspiel Courl	Beisenherz (1907)

Not reflected in Table 12.16 is postsibilant [x] (<WGmc +[sk]). In general, that [x] surfaces as velar even if a front vowel follows (see Hall 2021 for extensive discussion). This is the pattern attested in Diemelsee, e.g. [ʃxiːp] 'ship', Plettenberg, e.g. [sxiɛp] 'ship', Gütersloh, e.g. [ʃxyt] 'shoot-3sg', and Laer, e.g. [sxøin] 'beautiful'. In Elspe, [x] surfaces as [ç] after word-initial [s] if a front vowel or coronal consonant follows that sound, e.g. [ʃçyt] 'shoot-3sg', [ʃçrɑpn̩] 'scrape-inf' vs. [ʃxʊɣn̩] 'dread-inf'. By contrast, in Borken the /x/ in question surfaces as [ç] before a front vowel and as [x] when followed by a back vowel or coronal consonant, e.g. [sçip] 'ship', [sçæːməl] 'stool' vs. [sxɑp] 'cupboard', [sxrubbm̩] 'scrub-inf'. In the same dialect word-initial [ɣ] does not undergo fronting, e.g. [ɣæːl] 'yellow'. Hence, for Borken we have target Type L and Trigger Type D, but only for /x/ following a word-initial sibilant.

12.3.6.4 Eastphalian

Typical for this region is Target Type M, although Target Type L is also well-represented. Target Type M is attested in four places discussed earlier, namely Magdeburger Börde (§4.4), Eilsdorf (§8.3), Dorste (§4.4), and Dingelstedt am Huy (§8.4). Target Type L is exemplified by Meinersen (§4.3), Börßum (§4.3), and Lesse (§8.3), e.g. Meinersen [dɑxt] 'wick', [slɛçt] 'bad' vs. [vɑːɣn̩] 'car', [geːɣn̩] 'around'; Börßum [lʊxt] 'air', [bɪçtə] 'confession', [mɑrçt] 'market' vs. [zeːɣn̩] 'say-inf'.

In contrast to Wph, the set of triggers for postsonorant velar fronting in all but one of the Eph sources consists of all coronal sonorants (if present). An Eph variety illustrating Trigger Type E is Lesse, e.g. [slɛçt] 'bad', [væːç] 'way', [bɑlç] 'brat' vs. [lɑxn̩] 'laugh-inf', [brʏɣə] 'bridge', [fɔːɣl̩] 'bird'.

The one place in the Eph region characterized by a more restricted set of triggers (and targets) is the area around Celle, documented in ACeM. It is clear from the maps in that source that velar fronting is active in postsonorant position. For example, the map for *wenig* 'few' on p. 133 shows realizations throughout the region with the symbol for a fortis palatal fricative after the front vowel [i]. Other examples discussed in that source reveal the occurrence of [x] after back vowels (e.g. pp. 44-45). Several items ACeM document the occurrence of the lenis velar fricative [ɣ] in the context after back vowels and front vowels (e.g. [ɣ] after [ɑi] and before another vowel in the word *fliegen* 'fly-inf', p. 139); hence the region is characterized by Target Type L. The area in and around Celle is worthy of note because of the context after a coronal sonorant consonant. According to the map for *Berg* 'mountain' (p. 59), the final segment is pronounced as [x] after [r] throughout the entire region, while [..rç..] is restricted to the town of Nordburg (ca. 15km southeast of Celle). The realization of /x/ as [x] after [r] is also attested in the same area for the word *durch* 'through', p, 217, although [ç] (from /x/) also occurs to the north. I conclude that the region around Celle was characterized by Target Type L and the rare Trigger Type BB.

Table 12.17: Targets and triggers for (postsonorant) velar fronting in Eph (<WGmc $^+$[x ɣ])

Target	Trigger	Place	Source
L	E	Lesse	Löfstedt (1933)
L	BB	Celle	ACeM
L	EE	Kreis Hannover	Bethge & Bonnin (1969)
L	CC	Meinersen	Bierwirth (1890)
		Börßum	Heibey (1891)
M	CC	Eilsdorf	Block (1910)
		Dorste	Dahlberg (1937)
		Emmerstedt	Brugge (1944)
		Göddeckenrode/Isingerode	Lange (1963)
M	EE	Magdeburger Börde	Roloff (1902)
		Dingelstedt am Huy	Hille (1939)
LL	CC	Braunschweig	Pahl (1943)
		Mascherode	Bethge & Flechsig (1958)
		Kreis Wolfenbüttel	Bethge & Bonnin (1969)

Word-initial velar fronting is not present in many varieties of Eph because historical /ɣ/ was restructured to /g/ ([g]) by g-Formation-1 (§4.2), e.g. Börßum (§4.3), [gluːɔbm̩] 'believe-INF', [guːɔt] 'good', [gæl] 'yellow'. This generalization also holds for the region around Celle in the maps (pp. 221, 223, 291) provided in ACeM. In those places where WGmc $^+$[ɣ] is retained as /ɣ/ in word-initial position, velar fronting applies (Target Type MM), e.g. Lesse [ʝeːm̩] 'give-INF', [ɣɑf] 'give-PRET'. That pattern is much more prevalent in Eph than in Wph, which prefers Target Type LL. Recall from §8.5 that Dingelstedt am Huy has alternations in word-initial position between [g] (before a back vowel or consonant) and [ʝ] (before a front vowel). Those alternations derive from /ɣ/, which surfaces as [ʝ] by word-initial velar fronting (Target Type MM, Trigger Type B). That same type of example is also attested in Cattenstedt (Eph). Target Type LL is attested in Dorste (Trigger Type BB), e.g. [çɛlt] 'money' vs. [xlɑs] 'glass', [xɔt] 'God'. A similar pattern obtains in Kamschlaken, e.g. [çift] 'poison', [çeːm] 'give-INF' vs. [xɑlə] 'gall bladder', [xlygə] 'fortune'. Reinhausen (§7.2) is also Target Type LL, although that dialect shows that coronal sonorant consonants also induce fronting (Trigger Type C), e.g. [çɛlt] 'money', [çliːk] 'same' vs. [xɔt] 'God'.

Table 12.18: Targets and triggers for (word-initial) velar fronting in Eph (<WGmc $^+$[ɣ])

Target	Trigger	Place	Source
LL	BB	Dorste	Dahlberg (1937)
		Kamschlaken	Göschel (1973)
LL	C	Reinhausen	Jungandreas (1926, 1927)
MM	BB	Magdeburger Börde	Roloff (1902)
		Eilsdorf	Block (1910)
		Cattenstedt	Damköhler (1919)
		Lesse	Löfstedt (1933)
		Dingelstedt am Huy	Hille (1939)
		Braunschweig	Pahl (1943)
		Göddeckenrode/ Isingerode	Lange (1963)

Hassel (1942) offers an overview of the Eph dialect spoken in towns and villages in the area south of Göttingen in the Werra Valley (Werratal). That study is significant because it shows with maps that two different Trigger Types are attested directly next to one another. Hassel observes that WGmc $^+$[ɣ] is realized in word-initial position in the north of the Werratal as [x] before back vowels and as [ç] before front vowels (e.g. [xolt] 'gold' vs. [çistərn] 'yesterday'). In the context before a consonant there are two attested outcomes: In one cluster of towns the realization is [x], and in others it is [ç], e.g. [xliːk]/[çliːk] 'fortune'; see Hassel (1942: 65-67). In terms of the present classification those places with the realization [xliːk] have Trigger Type BB and those with the pronunciation [çliːk] Trigger Type CC.

As indicated in the heading for Table 12.18, the target segment for word-initial velar fronting derives historically from WGmc $^+$[ɣ]. No variety of Eph has been found in which word-initial velar fronting affects the original velar in WGmc $^+$[sk] clusters (Hall 2021).

None of the Eph dialects in the present study are attested which have a word-initial dorsal fricative that always surfaces as velar regardless of the nature of the following sound; recall the Wph dialect once spoken in Gütersloh (Wix 1921).

12.3.7 East Low German

12.3.7.1 General remarks

Velar-fronting is active throughout this region, although previous chapters have documented various places within ELG where that rule is characterized by various quirks. One anomaly not mentioned earlier is the EPo variety described by Stritzel (1937), in the region surrounding the town of Lauenburg (Kreis Lauenburg and Kreis Stolp; Map 11.2). Stritzel's material contains an oddity otherwise unattested in EPo. In particular, Stritzel (1937: 55) documents a small enclave where [x] surfaces consistently as [x] regardless of the nature of the preceding sound. He writes: "Der NW der Landschaft hat die Eigenart, jedes palatale χ der angrenzenden Mda. als gutturales x zu sprechen". ("The northwest of the region has the peculiarity of pronouncing every palatal χ in the bordering dialects as guttural x"). According to Stritzel's Maps 16 and 21, those non-fronting varieties in the northwest occur in a number of communities in Kreis Stolp, while velar fronting areas include Kreis Lauenburg and Kreis Bütow (Map 11.2). Examples include [nɑːxt]/[nɔːxt] 'night', [liːxt] 'light' and [ʃlɛxt] 'bad' (where [x] derives from /x/) as well as [krɪxt] 'get-3sg', [zɛxt] 'say-3sg', where [x] derives from /ɣ/.

This one conservative non-velar fronting island aside, postsonorant velar fronting is active throughout ELG. Recall from Chapter 11 that word-initial velar fronting is also attested in various places in this region. In terms of segments undergoing postsonorant velar fronting, there is a clear preference for Target Type M, but Chapter 11 documented several varieties with a broader set of target segments (Target Type N). One rare pattern for this area is Target Type L, which is only attested in two places in the present survey (see below).

In the sources cited here the triggers for postsonorant velar fronting consist of all front vowels and coronal consonants, but one variety commented on below is attested in which coronal consonants (/r/) fail to induce postsonorant velar fronting.

I consider consider first Brb/MeWPo and summarize the generalizations concerning targets and triggers in Tables 12.20 and 12.19. I conclude this section by summarizing the patterns attested for EPo and LPr.[12]

[12] The one ELG subdivision I do not discuss is CPo. There is general agreement in the literature on German dialectology that CPo is a region not quite the same as the neighboring ones (e.g. Wiesinger 1983b, Schönfeld 1989), but there is sadly a dearth of detailed studies on the structure of CPo (see Wiesinger & Raffin 1982: 379-380). The only sources for CPo indicated on Map 11.1 are Brose (1955) and Prowatke (1973). On the basis of the phonetic transcriptions in both of those works it can be concluded that postsonorant velar fronting is active for the target /x/ and that the triggers are front vowels. The modern reflex of WGmc $^{+}$[ɣ] for Brose's speakers is [g] in word-initial and postsonorant position. Prowatke (1973: 77) observes that WGmc $^{+}$[ɣ] is often realized as [ɟ] in word-initial position.

Table 12.19: Targets and triggers for (word-initial) velar fronting in Brb and MeWPo (<WGmc ⁺[k ɣ])

Target	Trigger	Place	Source
N	EE	West Mecklenburg	Kolz (1914)
MM	BB	Neumark	Teuchert (1907b,c)
		Neu-Golm	Siewert (1912)

12.3.7.2 Brandenburgish and Mecklenburgish-West Pomeranian

Target Type M for postsonorant velar fronting is represented by Neu-Golm (Brb), e.g. [heːçtə] 'height', [bɑlç] 'bellows', [bɛːlʝə] 'bellows-PL' vs. [lɑxn̩] 'laugh-INF', [foːɣl̩] 'bird'. The two attested cases of Target Type L are found in the westernmost region of this dialect area, namely in the Rebenstorf and Lüneburger Wendland, e.g. Lüneburger Wendland [myç] 'mosquito', [rɛçt] 'right' vs. [lɑxn̩] 'laugh-INF', [mɑɣɐ] 'lean', [nɛːɣəl] 'nail'.[13]

Front vowels (including low front vowels if present) induce velar fronting, e.g. South Mecklenburg [vɛç] 'path', [væːç] 'paths' vs. [tʊxt] 'breeding', [oːx] 'eye'. The rare case of Target Type BB is attested in Wolgast, e.g. e.g. [pliːçt] 'duty', [zɛç] 'say-PART', [brøːç] 'bridge' vs. [dox] 'day', [bɑlx] 'brat-DAT.SG'.

Bretschneider's (1951) description of the Brb variety of Hinzdorf (Wittenberge) is significant because her discussion of the velar and palatal fricatives reveals that there is a low front vowel which does not trigger velar fronting (=Trigger Type AA). She writes (p. 97): "Zu beachten ist besonders, daß überoffenes e, mit ä bezeichnet, als gutturaler Laut dem ach-Laut verbunden ist …". ("Attention should be paid to [the fact that] the over-open e, indicated as ä, is connected with the guttural sound, the ach-Laut"). For example, the ⟦ch⟧ in ⟦sächt⟧ 'say-3 SG' is phonetically [x].

In word-initial position WGmc ⁺[ɣ] is realized in some Brb varieties as [ʝ] in the context before front vowels (Target Type BB). The more common change from velar to [ʝ] in word-initial position before all segments (including consonants and back vowels) for Brb and other dialect regions is discussed at length in Chapter 14. Word-initial fronting (Target Type MM, trigger Type BB) is attested in Neu-Golm and Neumark (both Brb); e.g. Neu-Golm [gɑns] 'goose' vs. [ʝenzə]

[13] In the pronunciation guide to TeWb for the Teltow dialect there is a clear description of the realization of velar fricatives as palatal, which corresponds to Target Type M and Trigger Type E (pp. 300–301).

Table 12.20: Targets and triggers for (postsonorant) velar fronting in Brb and MeWPo (<WGmc $^{+}$[x ɣ])

Target	Trigger	Place	Source
L	EE	Lüneburger Wendland	Selmer (1918)
		Rebenstorf (Lübbow)	Götze (1922)
M	E	Jerichower Land	Bathe (1932)
M	AA	Hinzdorf (Wittenberge)	Bretschneider (1951)
M	CC	Neumark	Teuchert (1907b,c)
		Warte	Teuchert (1907a)
		Besten	Siewert (1907)
		Prenden	Seelmann (1908)
		Neu-Golm	Siewert (1912)
		South Stargard	Teuchert (1934)
		Tempelfelde	Schönfeld (1989)
M	EE	Magdeburg	Krause (1895)
		Kaarβen	Dützmann (1932)
N	EE	West Mecklenburg	Kolz (1914)
LL	BB	Wolgast	Warnkross (1912)
LL	CC	Stargard	Blume (1933a,b,c,d)
		Arendsee	Törnqvist (1949)
		Heckelberg	Teuchert (1964)
		Schollene	Schönfeld (1965)
		Kreis Wismar	Bethge & Bonnin (1969)
LL	DD	South Mecklenburg	Jacobs (1925a,b, 1926)
LL	EE	Ivenack-Stavenhagen	Holst (1907)
		Barth	Schmidt (1912a)
		Kreise Arnswalde, Friedeberg	Seelmann (1913)
		Greifswald, Schwerin	Prowatke (1973)

'goose-PL'; Neumark [goːn] 'go-INF' vs. [ɟeːst] 'go-2SG'. The complex pattern of word-initial velar fronting in West Mecklenburg was discussed at length in §11.3.

12.3.7.3 East Pomeranian and Low Prussian

This area is diverse in terms of variation for targets and triggers (§11.5, §11.6). Velar fronting places in this region typically select the target segments from the set of velar consonants in (3b); recall Table 11.3.

Table 12.21: Targets and triggers for (postsonorant) velar fronting in EPo and LPr (<WGmc ⁺[k x ɣ ŋ])

Target	Trigger	Place	Source
M	CC	Königsberg	Mitzka (1919)
		Kreis Schlawe	Mahnke (1931)
		Mandtkeim	Bink (1953)
N	C	Kamnitz	Tita (1921 [1965])
N	E	Kreis Bütow	Mischke (1936)
		Willuhnen	Natau (1937)
N	CC	Kreis Konitz	Semrau (1915a,b)
		Sępóno Krajeńskie	Darski (1973)
N	EE	Lauenburg	Pirk (1928)

Table 12.22: Targets and triggers for (word-initial) velar fronting in EPo and LPr (<WGmc ⁺[k x ɣ ŋ])

Target	Trigger	Place	Source
N	D	Lauenburg	Pirk (1928)
		Kamnitz	Tita (1921 [1965])
		Willuhnen	Natau (1937)
N	BB	Kreis Konitz	Semrau (1915a,b)
		Sępóno Krajeńskie	Darski (1973)
MM	BB	Kreis Bütow	Mischke (1936)
		Kreis Rummelsburg	Mischke (1936)
MM	CC	Königsberg	Mitzka (1919)
		Mandtkeim	Bink (1953)

The dictionary for the Pommern (Pomerania) dialect (PWb) provides a brief statement on the realization of WGmc $^+$[ɣ] in word-initial position (Volume 1: 891) in a broad area defined as the former province of Pomerania (Map B.1). According to that statement, the etymological lenis velar fricative is typically realized as a palatal ([ʝ]) in the context before front vowels (=Trigger Type D or BB). In another area, WGmc $^+$[ɣ] is pronounced palatal before front vowels and [d] before liquids (=Trigger Type C or CC). The change from [ʝ] to [d] before [l r] necessitates a separate rule. No mention is made in PWb of velar noncontinuants serving as targets; hence, Target Type MM (and not target Type N) holds for all areas with word-initial velar fronting.

12.4 Areal distribution of trigger and target types

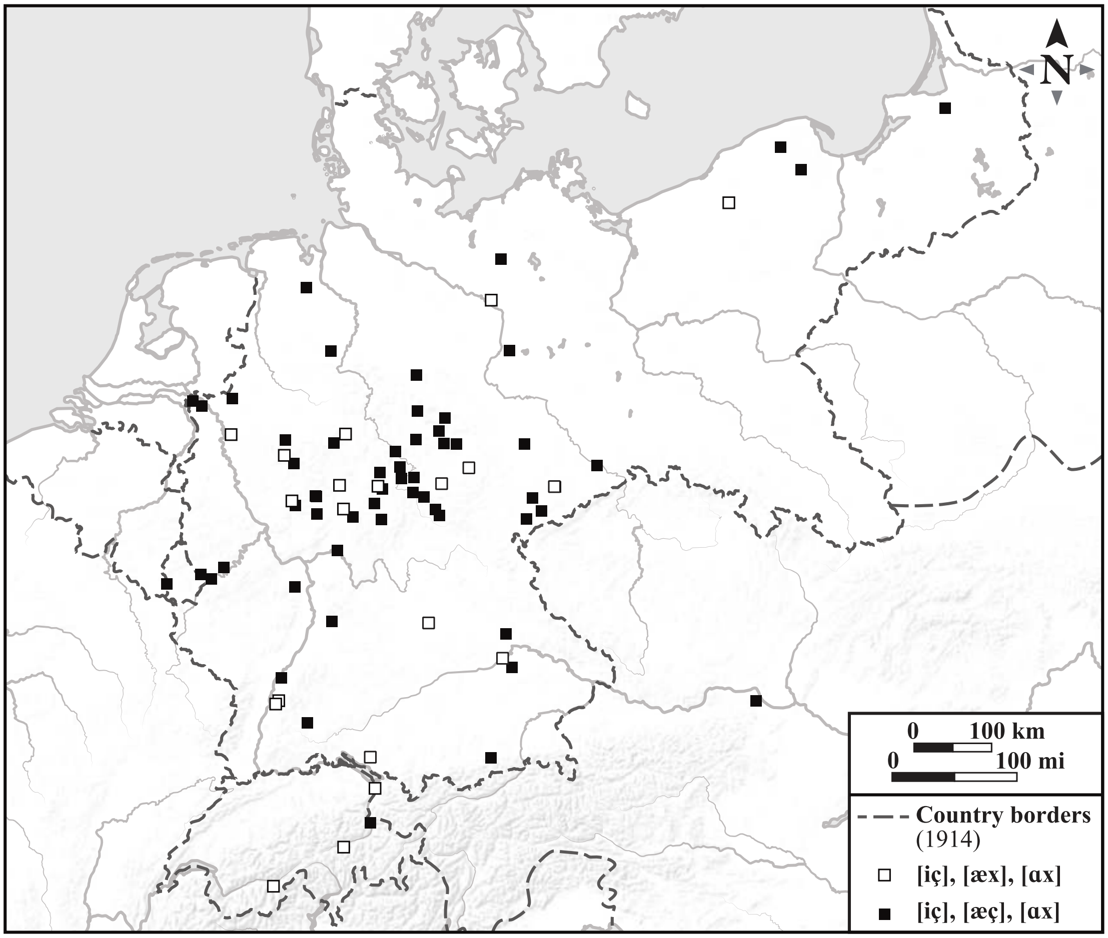
I present four maps below which indicate the distinction between various velar fronting triggers (§12.4.1) and targets (§12.4.2). An examination of those maps should indicate the difficulty of drawing isoglosses separating Trigger/Target Types. In contrast to well-known textbook examples in which targets and triggers for other changes correspond to discreet areas separated by large distances (e.g. High German Consonant Shift), the areal distribution for the various velar fronting patterns does not always give a clean picture. The way in which the German dialects discussed below shed light on where velar fronting was phonologized is delayed until §16.4.

12.4.1 Velar fronting triggers

As indicated in (2), there are three Trigger Types that have not been recognized in the small literature on velar fronting in German dialects (e.g. Herrgen 1986, Robinson 2001), namely the restriction of fronting to the context of either (a) high front vowels, (b) nonlow front vowels, or (c) front vowels to the exclusion of front (coronal) consonants. I consider each in turn in light of the present survey.

The high front vowel context is the rarest of all Trigger Types, since it is attested only two geographically noncontiguous varieties of German (in both word-initial position and postsonorant position), namely Visperterminen (HstAlmc) and Plettenberg (Wph).

Although the set of nonlow front vowels as triggers is robustly attested, that type of dialect is considerably less preferred to those in which all front vowels trigger fronting. Map 12.1 indicates the two types of dialect referred to here for the postsonorant context.



Map 12.1: Areal distribution of low front vowels as velar fronting triggers. Varieties of High German and Low German in which low front vowels do not serve as triggers for postsonorant velar fronting are indicated with white squares. Varieties in which low front vowels serve as triggers are indicated with black squares.

Map 12.1 reveals that those places in which low front vowels do not induce fronting (white squares) are clustered primarily in the west, from as south as Switzerland to as far north as Rhineland and Lower Saxony. Recall from (2b) that this pattern reflects Trigger Types A, B, C, and AA.[14] The more numerous and geographically well-distributed dialects are those in which all front vowels (including low front vowels) serve as triggers (black squares). Those dialects display Trigger Types D, E, and DD.

Chapter 13 assesses the state of velar fronting in Lower Bavaria on the basis of data from 221 villages, towns, and cities drawn from a linguistic atlas (SNiB). It is demonstrated in that chapter that the places within Lower Bavaria can differ according to Trigger Type. In particular, it is shown that the rarest Trigger Type referred to above (high front vowels) is the most common one, while the one with the largest set of triggers (all front vowels) is the rarest.

A dichotomy can be drawn between those dialects in which coronal sonorant consonants (e.g. /l/, /r/) do or do not trigger velar fronting (recall 2c). The type of dialect in which such sounds fail to trigger velar fronting in postsonorant position is rare; the present survey has uncovered fifteen; see Trigger Types A, B, D, and BB in the tables presented earlier.[15] By contrast, the inclusion of coronal sonorant consonants among the triggers for postsonorant velar fronting is clearly the unmarked pattern (attested in 95 varieties of German). Map 12.2 depicts those rare varieties in which coronal sonorant consonants do not serve as triggers.

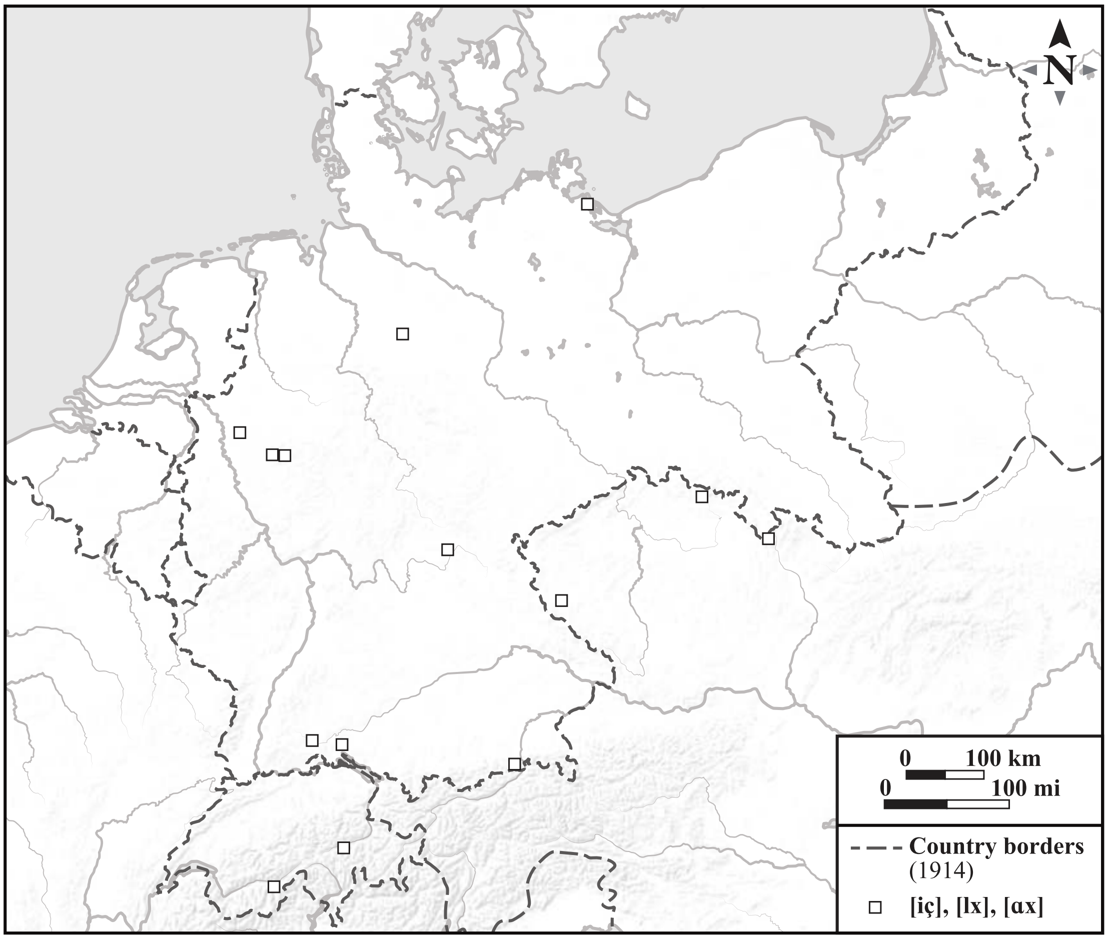
As a general rule, the realization of /x/ as [ç] after coronal consonants is the one documented in dialect dictionaries, regardless of region. The only exception to my knowledge is the dictionary for Dortmund (DoWb), which provides a clear statement (p. XVIII) inferring that [ç] occurs after front vowels and [x] after back vowels or consonants ([l]). Dortmund is indicated on Map 4.2.

For further discussion on the status of consonants like [l] and [r] as triggers for postsonorant velar fronting the reader is referred to §13.5.2 and Chapter 15.

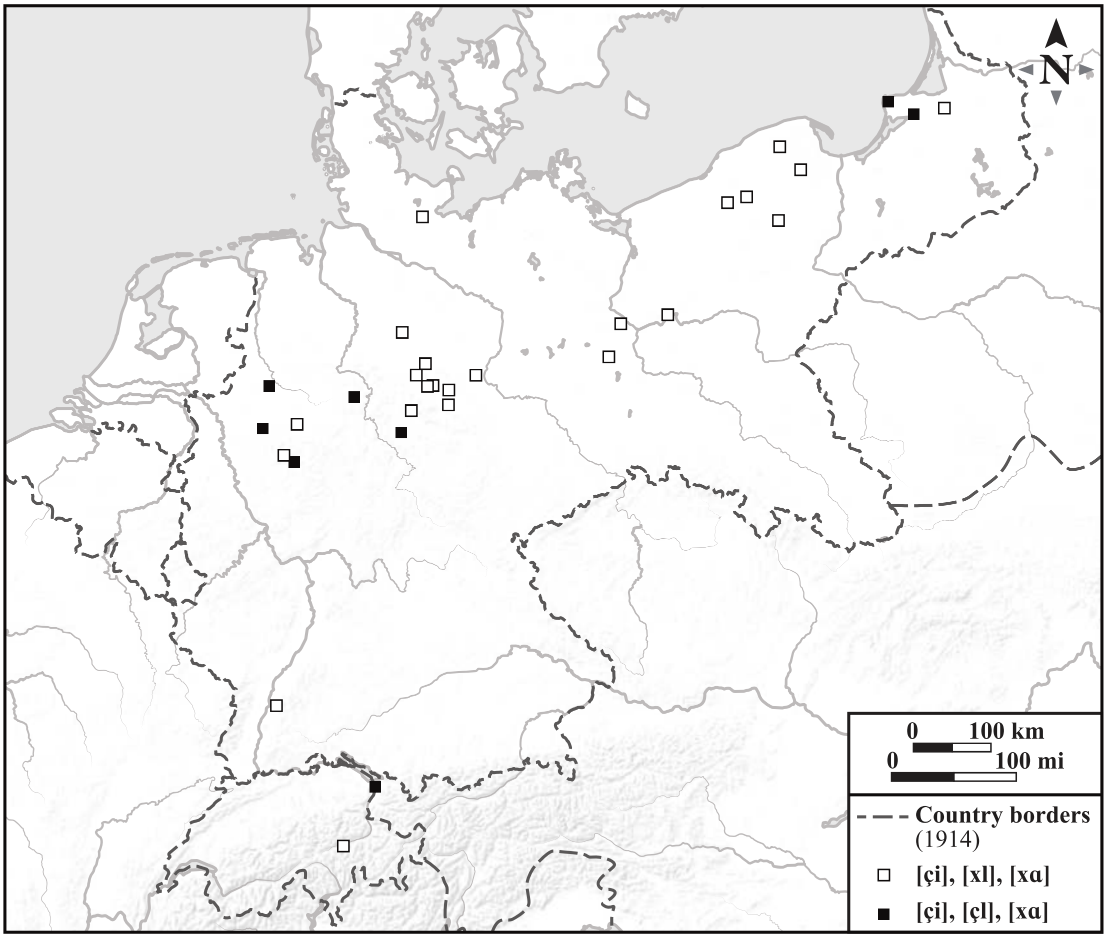
Word-initial position illustrates the opposite distribution: 22 varieties are attested in which velar fronting is not induced by coronal sonorant consonants (=Trigger Types A, B, D, BB), but only eight have been discovered in which those segments do serve as a trigger. The areal distribution of those two types of dialect are indicated on Map 12.3 for word-initial position.

[14] Included among the white squares is one variety (EHes) discussed in §12.3.4 that I did not place in any of the tables, namely the area to the west of Bad Hersfeld (Martin 1957).

[15] Three of those places are not listed in the tables. See the discussion in §12.3.2 on the Swb varieties discussed by Haag (1898) and in §12.3.6 on the Wph ones by Schulte (1941). The third is Mühlingen (Müller 1911). Due to various complexities the data from that Swb variety cannot be discussed until §14.3.2.



Map 12.2: Areal distribution of coronal sonorant consonants as triggers for postsonorant velar fronting. Varieties of High German and Low German in which coronal sonorant consonants (e.g. /l/, /r/) do not serve as triggers are indicated with white squares.



Map 12.3: Areal distribution of coronal sonorant consonants as triggers for word-initial velar fronting. Varieties of High German and Low German in which coronal sonorant consonants (e.g. /l/, /r/) do not serve as triggers are indicated with white squares. Varieties in which coronal sonorant consonants serve as triggers are indicated with black squares.

Map 12.3 reveals that most of the rare varieties where sounds like /l/ are triggers (black squares) are clustered in the west central region of Germany. The more common pattern (white squares) is well-attested in Central/North Germany.

12.4.2 Velar fronting targets

There are systems in which only fortis /x/ but not lenis /ɣ/ undergoes velar fronting (Target Type L) as well as ones in which both /x ɣ/ serve as targets for that process (Target Type M). Map 12.4 indicates the areal distribution of both types of dialect for postsonorant velar fronting. As indicated there, Target Type L is well-attested (twenty-two), although Target Type M is far more common (forty-three).

It can be observed that Target Type L (white squares) is well-represented in the central and northern parts of Germany (WLG) with only a few attestations further south. Target Type M (black squares) reveals a much broader distribution among German dialects (Wph, Eph, Sln, MFr, RFr, EPo, LPr).

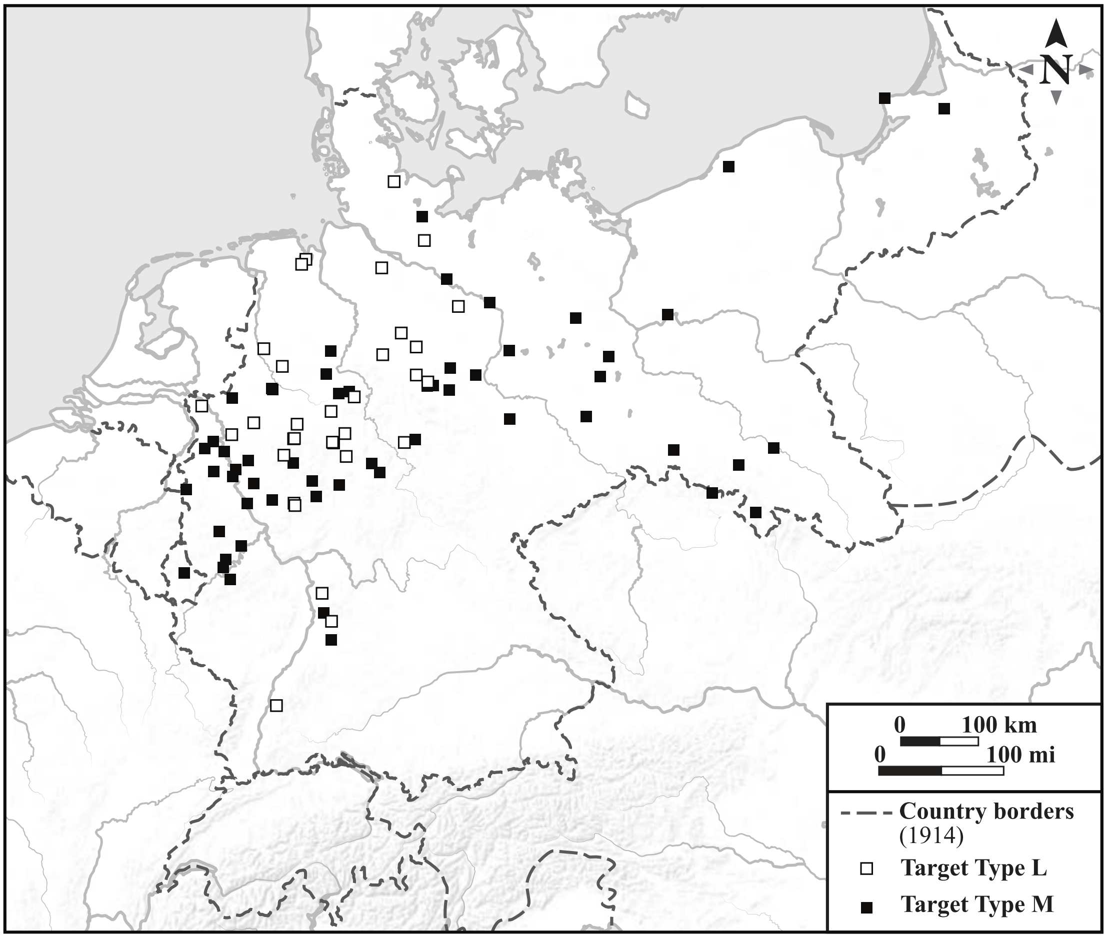
German dialects in which velar fronting affects the entire class of velar consonants (Target Type N) are clustered in the northeast of 1914 Germany. It was noted in Chapter 11 that that type of dialect (Target Type N) can be contrasted with communities in the same region with a more restricted set of segments undergoing velar fronting (Target Type M). Those two types of systems are plotted on Map 11.3.

12.5 Rule generalization

I consider first the way in which the attested Target Types and Trigger Types match up with historical stages (§12.5.1) and then illustrate how those stages are reflected in certain clusters of dialects spoken in the same region (§12.5.2). A more in-depth discussion of how the various Target Types and Trigger Types can shed light on the relative age of velar fronting in certain regions is presented in Chapter 16. Chapter 13 looks at velar fronting throughout Lower Bavaria, showing how the three attested Trigger Types in that region can be interpreted historically in terms of rule generalization.

12.5.1 Triggers, targets, and historical stages

In Table 12.23 I repeat the Trigger Types listed in the first five rows of Table 12.1 and show how they correspond to the historical stages referred to throughout



Map 12.4: Areal distribution of velar fricatives as targets for velar fronting. Varieties of High German and Low German in which /x/ but not /ɣ/ serve as targets for postsonorant velar fronting (Target Type L) are indicated with white squares. Varieties in which both /x/ and /ɣ/ serve as targets (Target Type M) are indicated with black squares.

Table 12.23: Trigger Types and the corresponding historical stages

Type	Trigger	Stage
A	HFV	2a
B	HFV, MFV	2b
C	HFV, MFV, CC	2c
D	HFV, MFV, LFV	2c’
E	HFV, MFV, LFV, CC	2d

the remainder of this book. It is demonstrated here that Stage 2 is subdivided into a series of incremental stages defined according to Trigger Type.

Stages 2a, 2b, 2c, 2d proceed chronologically in that order. Stage 2c' is coterminous with Stage 2c. The reason is that Stage 2b includes only {HFV, MFV} as triggers, at which point there is the option of expanding those triggers to include {CC} (=Trigger Type C=Stage 2c) or {LFV} (=Trigger Type D=Stage 2c').

The Trigger Types in the final five rows of Table 12.1 have in common that each one has at least one segment type not present in the context for velar fronting and hence there is indeterminacy concerning how those Trigger Types fit into the historical stages in Table 12.24. For example, for Trigger Type AA, the coronal consonant trigger ({CC}) is not present in the fronting context; hence, that Trigger Type could be either Stage 2b ({HFV, MFV}) or Stage 2c ({HFV, MFV, CC}). In Table 12.24 the five Trigger Types referred to here are matched to the historical stages from Table 12.23.

Table 12.24: Possible Trigger Types and the corresponding historical stages

Trigger	Stage
AA	2b or 2c
BB	2b or 2c'
CC	2c or 2d
DD	2c' or 2d
EE	2b, 2c, 2c', or 2d

In Table 12.25 I present Target Types L, M, and N from Table 12.3 and the corresponding historical stages. Due to gaps described earlier, the two remaining Target Types (LL/MM) cannot be unambiguously classified into one of the three stages listed in the final column of Table 12.25. The possible historical stages for Target Types LL/MM are listed in Table 12.26.

Table 12.25: Target Types and the corresponding historical stages

Type	Target	Stage
L	/x/	2aa
M	/x/, /ɣ/	2bb
N	/x/, /ɣ/, /k/, /g/, /ŋ/	2cc

Table 12.26: Possible Target Types and the corresponding historical stages

Target	Stage
LL	2aa or 2bb
MM	2bb or 2cc

The historical stages for triggers (Table 12.23) and targets (Table 12.25) are independent of one another. This point is illustrated in Figure 12.1.

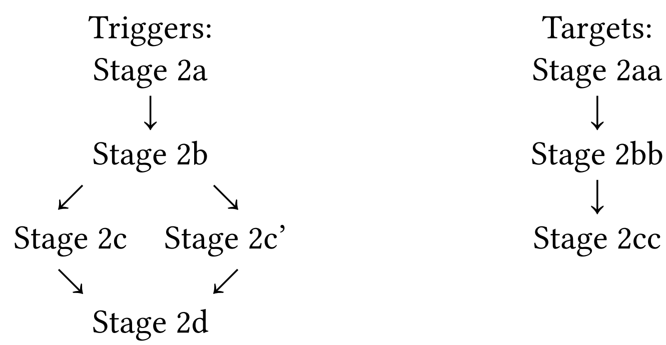


Figure 12.1: Historical stages for triggers and targets

Stage 2aa (/x/ as the sole target) could cooccur with any one of the stages for triggers, as could Stage 2bb (/x ɣ/) and Stage 2cc (/x ɣ k g ŋ/).

12.5.2 Historical stages in selected areas

Velar fronting was phonologized first in the context of high front vowels (Stage 2a), at which point that group of triggers gradually expanded. The same progression occurred in targets from narrow to broad (Stage 2aa > Stage 2bb > Stage 2cc). As demonstrated below certain regions can be identified in which all or some of the historical stages for triggers and targets are reflected in specific communities in relatively close proximity.

Consider first the SwG dialects (§12.3.1), which exemplify the various historical stages corresponding to different Trigger Types for both word-initial and postsonorant position. For word-initial position (Table 12.4) the stages are: Visperterminen (Stage 2a), Obersaxen (Stage 2b), and Rheintal (Stage 2c) and for postsonorant position (Table 12.3) they are Visperterminen (Stage 2a), Obersaxen (Stage 2b), Rheintal (Stage 2c), and Maienfeld (Stage 2d).

For the aforementioned SwG varieties the progression from a narrow set of triggers to a broader one transpired along the time dimension, but not along the place dimension. The reason Stage 2a did not extend to Stage 2b in terms of geography is that the Stage 2 SwG dialects listed above (velar fronting islands) are separated from one another by large distances. Given the distances among the four velar fronting SwG communities the implication is that velar fronting was phonologized independently in each of the four places (polygenesis); hence, there were four distinct focal areas in Switzerland.

A careful scrutiny of certain regions on the locator maps presented in previous chapters reveals places in close proximity representing the various historical stages. I consider two such LG dialect clusters, namely Wph and EPo, in that order.

A reexamination of Map 4.2 for Wph is instructive because it reveals a number of varieties which represent the various Trigger Types. Seven of those Wph varieties are listed in (5). I also include here Grafschaft Bentheim as representative of Stage 1. The significant point is that the velar fronting varieties are all located within an area of about 100km from north to south and 80km from east to west. As illustrated in (5), six of the places indicated on Map 4.2 represent distinct historical stages for (word-initial) velar fronting Trigger Types. (In that context there is no variation in Target Type, since the only sound undergoing velar fronting is /x/). The word-initial velar fricative referred to here derived historically from WGmc $^{+}$[ɣ], although a similar set of stages also involved the reflexes of $^{+}$[k] in WGmc $^{+}$[sk] clusters. In §14.2.2 I expand (5) by adding an additional dialect.

(5) Historical stages for triggers for (word-initial) velar fronting (Wph):

Stage 1:	Grafschaft Bentheim
Stage 2a:	Plettenberg
Stage 2b:	(Soest, Laer)
Stage 2c:	(Nienberge)
Stage 2c’:	(Borken)
Stage 2d:	Elspe

Plettenberg represents the rare high front vowel trigger corresponding to Stage 2a, while Elspe possesses the broadest set of triggers (Stage 2d). There are no clear-cut examples of dialects representing Stage 2b, 2c, or 2c’, although there are several potential ones, four of which are presented above in parentheses. What is clear from (5) is that there is a cluster of Wph dialects in which coronal sonorant consonants ({CC}) do not belong to the set of triggers (Plettenberg, Soest, Laer, Borken), while other varieties fronting is induced by some subset of the front vowels or coronal sonorant consonants (Elspe).

In (6) I list the same Wph varieties for postsonorant velar fronting. I also include Byfang, which represents Stage 2b. Note that the seven velar fronting varieties in (6) represent two distinct historical stages for Target Types.

(6) Historical stages for triggers and targets for (postsonorant) velar fronting (Wph):

Stage 1:	Grafschaft Bentheim	
Stage 2a:	Plettenberg	Stage 2aa: Plettenberg, Byfang, Soest, Laer
Stage 2b:	Byfang	Stage 2bb: Borken, Nienberge, Elspe
Stage 2c:	(Nienberge)	
Stage 2c':	(Soest, Laer)	
Stage 2d:	Elspe, Borken	

A comparison of the places listed in (5) and (6) with Map 4.2 reveals that they are situated in the same region, although it is not possible to say that one particular place is immediately adjacent to another one which represents the immediately following historical stage.

A similar cluster of EPo varieties (§12.3.7, listed in Table 12.21) is depicted in (7) for postsonorant velar fronting. All of the places listed here are located in an area of between approximately 80km from north to south and 80km from east to west on Map 11.2.

(7) Historical stages for triggers and targets for (postsonorant) velar fronting (EPo):

Stage 1:	Kreis Stolp	
Stage 2a:	—	
Stage 2b:	—	Stage 2bb: Kreis Schlawe
Stage 2c:	Kamnitz, (Kreis Schlawe)	Stage 2cc: Kamnitz, Lauenburg, Kreis Bütow
Stage 2c':	Lauenburg	
Stage 2d:	Kreis Bütow	

Recall from §12.3.7 that Kreis Stolp is a rare example of a non-velar fronting island. The stages for Trigger Types are well-represented in this region, although there are two gaps (Stages 2a and 2b). Kreis Schlawe exemplifies Stage 2bb (which is rare for that region), while Kamnitz, Lauenburg, and Kreis Bütow illustrate the more common Stage 2cc.

12.6 Nonheight features as triggers

The data from German dialects presented in Chapters 3–11 provide overwhelming evidence that variation among front vocalic triggers involves the vowel height dimension alone. In this section I discuss those rare cases in which velar fronting is triggered by nonheight features, namely rounding (§12.6.1), tenseness (§12.6.2), and stress (§12.6.3). I speculate below on how these deviant systems fit into the rule generalization model. One nonheight feature I do not discuss is [nasal], which is shown in §15.9 to be relevant in defining velar fronting triggers in a SwG dialect of the Southwest Bernese Oberland.

12.6.1 Rounding

Consider once again the Wph dialect once spoken in the region around Plettenberg (Gregory 1934; Map 4.2). It was noted in §12.3.6 that Plettenberg displays the rare Trigger Type A (=Stage 2a) for both postsonorant velar fronting and word-initial velar fronting. That assessment requires further refinement on the basis of the material presented in the original source. Enough data are provided in Gregory (1934) to safely conclude that the high front vowel [i] serves as a trigger for both postsonorant fronting and word-initial fronting. It can also be deduced from that source that nonhigh front vowels do not serve as triggers. However, within the high front vowel category, Gregory's material includes not only unrounded [i] (=⟦i⟧) but also the rounded vowel [y] (=⟦ü⟧).[16] The complication is that [y] fails to serve as a trigger for velar fronting in both postsonorant and word-initial position. Consider first postsonorant fronting, which applies after [i] in (8a). [x] surfaces after nonhigh front vowels in (8c), back vowels in (8d), and coronal sonorant consonants in (8e). Example (8f) shows that [x] (<WGmc ⁺[sk]) also surfaces after an obstruent. Crucially, [x] and not [ç] occurs after [y] in (8b). The [ç] and [x] in (8) derive historically from velars (WGmc ⁺[ɣ] or ⁺[x]).

(8) Postsonorant dorsal fricatives in Plettenberg (from /x/):

a.	filiχtə	[filiçtə]	vielleicht	'maybe'	22
	biχtə	[biçtə]	Beichte	'confession'	22
	slōpəriχ	[slo:pəriç]	schläfrig	'sleepy'	21
	xəsxiχtə	[xəsxiçtə]	Geschichte	'history'	30

[16] Among high vowels Plettenberg has a length contrast, i.e. [i y u] vs. [i: y: u:] (= ⟦ī ǖ ū⟧), but high lax vowels found in other dialects ([ɪ ʏ ʊ]) are absent. No examples were found in the original source in which long high front vowels surface in the neighborhood of /x/.

b.	füxn̥	[fyxn̩]	Fichten	‘spruce-PL’	37
	ʒəhüxtə	[ɣəhyxtə]	Dickicht	‘thicket’	35
c.	kröxn̥	[krøxn̩]	husten	‘cough-INF’	16
	döxtr̥	[døxtr̩]	Töchter	‘daughter-PL’	16
	nö̧xtə	[nœxtə]	Nähe	‘vicinity’	37
	wiẹ́x	[viɛx]	Weg	‘path’	13
	lẹxn̥	[lɛxn̩]	lagen	‘lie-PRET.PL’	21
	rẹxt	[rɛxt]	Recht	‘justice’	35
	lext	[slext]	Licht	‘light’	29
	knext	[knext]	Knecht	‘vassal’	35
	æxtr̥	[æxtr̩]	hinter	‘behind’	35
d.	tuxt	[tuxt]	Zucht	‘breeding’	37
	doxtr̥	[doxtr̩]	Tochter	‘daughter’	37
e.	biẹrx	[biɛrx]	Berg	‘mountain’	37
f.	tüsxr̥	[tysxr̩]	zwischen	‘between’	15

In word-initial position the same generalization holds: Velar fronting affects /x/ (<WGmc $^{+}$[ɣ]), which surfaces as [ç] before [i] (see 9a), and as [x] before nonhigh front vowels in (9c), consonants in (9d), and most significantly [y] in (9b). The data in (9e) reveal that word-initial [sx] (<WGmc $^{+}$[sk]) surfaces as [sx] even if [i] follows.[17]

(9) Word-initial dorsal fricatives in Plettenberg:

a.	χistr̥n	[çistr̩n]	gestern	‘yesterday’	13
	χiẹ́wn̥	[çiɛvn̩]	geben	‘give-INF’	13
	χiẹ́tn̥	[çiɛtn̩]	gegessen	‘eat-PART’	30
b.	xüt	[xyt]	gieβt	‘water-3SG’	30
	xüö̧tə	[xyœtə]	Grütze	‘groat’	19
c.	xeld	[xelt]	Geld	‘money’	13
d.	xriẹ́p	[xriɛp]	Griff	‘handle’	14
e.	sxiẹ́mn̥	[sxiɛmn̩]	schämen	‘be ashamed-INF’	12
	sxiẹ́p	[sxiɛp]	Schiff	‘ship’	14
	sxiufkār	[sxiufkɑːr]	Schubkarre	‘wheelbarrow’	25

[17] In some varieties of Plettenberg referred to in the original source, WGmc $^{+}$[ɣ] is inherited without change as [ɣ]. That sound fails to undergo fronting even before [i], e.g. [ɣelt] ‘money’, [ɣistr̩n] ‘yesterday’. The contrast between (9a) and (9e) suggests that word-initial velar fronting in Plettenberg must specify that the target segment (/x/) is at the left edge of the word.

The data in (8) and (9) can be expressed by incorporating the feature [−round] in the set of velar fronting triggers:

(10) a. Velar Fronting-11:

$$\begin{array}{cc} \begin{bmatrix}-\textsc{round}\\+\textsc{high}\end{bmatrix} & \begin{bmatrix}-\textsc{son}\\+\textsc{cont}\end{bmatrix} \\ \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

b. Wd-Initial Velar Fronting-7:

$$\begin{array}{lcc} {}_{\text{wd}}[& \begin{bmatrix}-\textsc{son}\\+\textsc{cont}\end{bmatrix} & \begin{bmatrix}-\textsc{round}\\+\textsc{high}\end{bmatrix} \\ \\ & [\textsc{dorsal}] & [\textsc{coronal}] \end{array}$$

The two rules in (10) are unique to Plettenberg; however, the pattern discussed in the case study discussed below derives support from several German dialects.

Diachronically the Plettenberg data suggest that the historical stages for Trigger Types proposed in Table 12.23 need to be further refined. In particular, I claim that Stage 2a can be preceded by a stage in which only high front unrounded vowels (HFUV) but not high front rounded vowels serve as triggers. I refer to that stage as Stage 2a’ (=Trigger Type A’) in Table 12.27.

Table 12.27: Trigger Types and the corresponding historical stages for Plettenberg

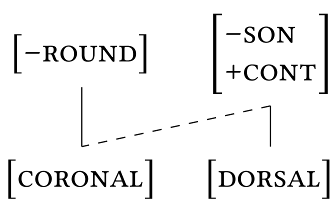
Type	Trigger	Stage
A’	HFUV ([i])	2a’
A	HFV ([i y])	2a
B	HFV, MFV	2b
C	HFV, MFV, CC	2c
D	HFV, MFV, LFV	2c’
E	HFV, MFV, LFV, CC	2d

Data from South Mecklenburg (Jacobs 1925a,b, 1926; §11.3, Map 11.1) lend further support to the claim that dialects can draw a distinction between front rounded and front unrounded vowels as triggers for velar fronting. However, the material presented below from that dialect suggest that there can be an additional stage intervening between Stage 2a’ and Stage 2a. As noted earlier, Jacobs provides a wealth of material collected in a broad region in South Mecklenburg indicating that [x] surfaces after a back vowel and [ç] after any front unrounded vowel. In contrast to Plettenberg, [x] surfaces for many speakers after front rounded vowels regardless of height (=11a). Doublets are provided for many tokens (=11b); according to Jacobs, the ones with [ç] occur in the northwest and the ones with [x] in the south. The [x] and [ç] in (11) derive historically from velars (WGmc $^{+}$[x] or $^{+}$[ɣ]). The formal rule expressing the fact that the set of triggers is restricted to front unrounded vowels is stated in (12).[18]

(11) South Mecklenburg [x] and [ç]:

a.	lü̧xt	[lyxt]	Laterne	‘lantern’	1925b: 121
	žü̧xt	[ʒyxt]	zweifelhafte Flüssigkeit	‘questionable liquid’	1925b: 121
	zœ̄x	[zœːx]	Sau	‘sow’	1925b
	hœ̄x	[hœːx]	Freude	‘joy’	1925b: 111
	brö̧xt	[brøxt]	brachte	‘bring-PRET’	1925b: 133
b.	mö̧xt, mü̧χt	[møxt], [myçt]	mochte	‘like-PRET’	1926: 129
	brüx, brü·χ	[bryx], [bry·ç]	Brücke	‘bridge’	1926: 129
	mü̧x, mü·χ	[myx], [my·ç]	Mücke	‘mosquito’	1926: 129
	rü̧x, rü·χ	[ryx], [ryç]	Rücken	‘back’	1926: 129
	trü̧x, trü·χ	[tryx], [try·ç]	zurück	‘back’	1926: 129

(12) Velar Fronting-12



The data from South Mecklenburg suggests that speakers with [x] after a front vowel preserve an earlier historical stage in which the triggers for velar fronting were high front unrounded vowels (HFUV) and mid front unrounded vowels (MFUV). This means that Stage 2b was preceded by Stage 2a’ (as in Plettenberg), followed by Stage 2a’’ (= Trigger Type A’’, consisting of front unrounded vowels).

Due to the rarity of Trigger Type A’ and A’’, it is not clear whether or not all German dialects begin at Stage 2a’ and proceed to Stage 2a’’, or if dialects have the option of beginning at Stage 2a’ (as in Plettenberg) or Stage 2a.

12.6.2 Tenseness

Recall from §11.5 that the EPo variety once spoken in Kreis Rummelsburg (Mischke 1936; Map 11.2) is unique among German dialects in the sense that the triggers for velar fronting are restricted to front tense vowels (/i e æ/) or coronal sonorant consonants. After front lax vowels (/ɪ ɛ/) and back vowels, underlying velars /x ɣ/ surface as velar.

[18] The distribution of dorsal fricatives in (11) and the formal rule in (12) are shown to be attested in one German-language island (§15.3).

Table 12.28: Trigger Types and the corresponding historical stages for South Mecklenburg

Type	Trigger	Stage
A’	HFUV ([i])	2a’
A’’	HFUV, MFUV ([i e])	2a’’
B	HFV, MFV ([i y e ø]	2b
C	HFV, MFV, CC	2c
D	HFV, MFV, LFV	2c’
E	HFV, MFV, LFV, CC	2d

From the diachronic perspective it is not clear how the set of triggers for velar fronting in Rummelsburg translates into the historical stages proposed above. I describe here a possible scenario: Rummelsburg represents a point (Stage 2d’) whereby high front tense vowels (HFTV), mid front tense vowels (MFTV), low front tense vowels (LFTV) and CC trigger velar fronting. As indicated in Table 12.29, Stage 2d’ preceded Stage 2d. Given the rule generalization model adopted in the present study, one might expect the set of triggers for Rummelsburg to be narrower at an earlier stage. Since the triggers in question refer crucially to [+tense] front vowels, it would be consistent with the present approach to further restrict those triggers along the height dimension; hence, the triggers for velar fronting in pre-Rummelsburg stages might have been more restricted groupings of front [+tense] vowels, three of which are indicated in Table 12.29: Stage 2c’’ (front tense vowels are triggers), Stage 2b’ (nonlow front tense vowels are triggers), and Stage 2a’’’ (high front tense vowels are triggers).

Table 12.29: Trigger Types and the corresponding historical stages for Rummelsburg

Type	Trigger	Stage
A’’’	HFTV ([i])	2a’’’
B’	HFTV, MFTV ([i e])	2b’
C’	HFTV, MFTV, LFTV ([i e æ])	2c’’
D’	HFTV, MFTV, LFTV, CC ([i e æ r])	2d’
E	HFV, MFV, LFV, CC	2d

Since Rummelsburg is unique, the tentative proposal sketched above can only be evaluated once similar case studies from German dialects or other languages become known.

12.6.3 Stress

In the MFr variety of Sörth in Westerwald (Hommer 1910; §5.4; Map 5.3), the reflex of WGmc ⁺[ɣ] in word-initial position (in the *ge-* prefix) is an underlying palatal (/ɟ/) before schwa in (13a), but before other sounds the original word-initial velar is retained as the velar stop [g]. The examples in (13) are representative. Note that [g] occurs before front vowels in (13b), back vowels in (13c) or consonants in (13d).

(13) [ɟ] (from /ɟ/) and [g] (from /g/) in Sörth:

a.	jəlāxt	[ɟəlɑːxt]	gelacht	'laugh-PART'	24
b.	giwəl	[giwəl]	Giebel	'gable'	10
	gę̄lən	[gɛːlən]	gelten	'be valid-INF'	22
c.	gōt	[goːt]	gut	'good'	24
d.	grūs	[gruːs]	groβ	'large'	24

Since the schwa in [ɟə] was originally [i] (cf. OHG, MHG *gi-*) it appears that historical [ɣ] fronted to palatal in word-initial position before that particular vowel. This assumption is consistent with Stage 2a: Velar fronting applied word-initially before high front vowels. The problem is that the change from velar to palatal did not occur in words like [giwəl] 'gable' in (13b). Note that the [i] in that type of example can also be traced back to [i] in earlier stages of German, cf. MHG *gibel*, OHG *gibil*.

There was neither a qualitative nor quantitative difference between the [i] in MHG *gi-* and the [i] in the first syllable of words like MHG *gibel*. The only difference between the two instantiations of [i] is that the one in *gibel* was stressed, while the one in *gi-* was not. The conclusion is that the set of triggers for the first stage of (word-initial) velar fronting in dialects like Sörth was an unstressed high front vowel.

Note that the data from Sörth contrast with the more common pattern whereby all front vowels (or a subset thereof) trigger fronting, regardless of whether or not the front vowels in question are stressed or unstressed (=Trigger Types A-E). One example discussed earlier (§8.4) is the Eph dialect once spoken in Dingelstedt am Huy (Hille 1939; Map 4.3): A word-initial velar (<WGmc ⁺[ɣ]) surfaces as palatal before any original front vowel, e.g. [ɟɛlt] 'money' (cf. OSax *gelt*), [ɟɑːiɟə] 'violin'

(cf. MHG *gīge*), [ɟəzɪçtə] ‘face’ (cf. OHG *gisiht*) vs. [guːt] ‘good’ (cf. OSax *gōd*), [glɑːs] ‘glass’ (cf. OSax *glas*).

Sörth is not an isolated example. According to the phonetically transcribed texts in Cornelissen et al. (1989) there are four towns in the same general area of Westerwald as Sörth which display the same pattern. The data in (14) are from one of those places (Birken). I retain the original transcriptions which indicate that [ɟ] (=⟦J⟧/⟦j⟧) occurs only before schwa (=⟦ę⟧) in (14a) and [g] (=⟦G⟧/⟦g⟧) before front vowels (=14b), full back vowels (=14c), or consonants (=14d). Cornelissen et al. (1989) also indicate that the pattern in (14) is the same in Friesenhagen, Flammersfeld, and Morsbach.

(14) [ɟ] (from /ɟ/) and [g] (from /g/) in Birken:

a.	Jędicht	Gedicht	‘poem’
	Jęschwistęr	Geschwister	‘sibling’
	jęschlacht	geschlachtet	‘slaughter-PART’
b.	ging	ging	‘go-PRET’
	Gänse	Gänse	‘goose-PL’
c.	gǫǫn	gehen	‘go-INF’
	gǫǫre	gute	‘good-INFL’
	gaantsęn	ganzen	‘whole-INFL’
d.	glööf	glaube	‘believe-1SG’

On the basis of the sources discussed above I conclude that there must have been a stage preceding Stage 2a for word-initial position – at least, in parts of Westerwald. At that point (Stage 2a’’’’), WGmc $^{+}$[ɣ] underwent velar fronting in the narrow context before an unstressed [i]. Table 12.30 situates that stage with some of the other ones posited above (HUFV=High unstressed front vowel).

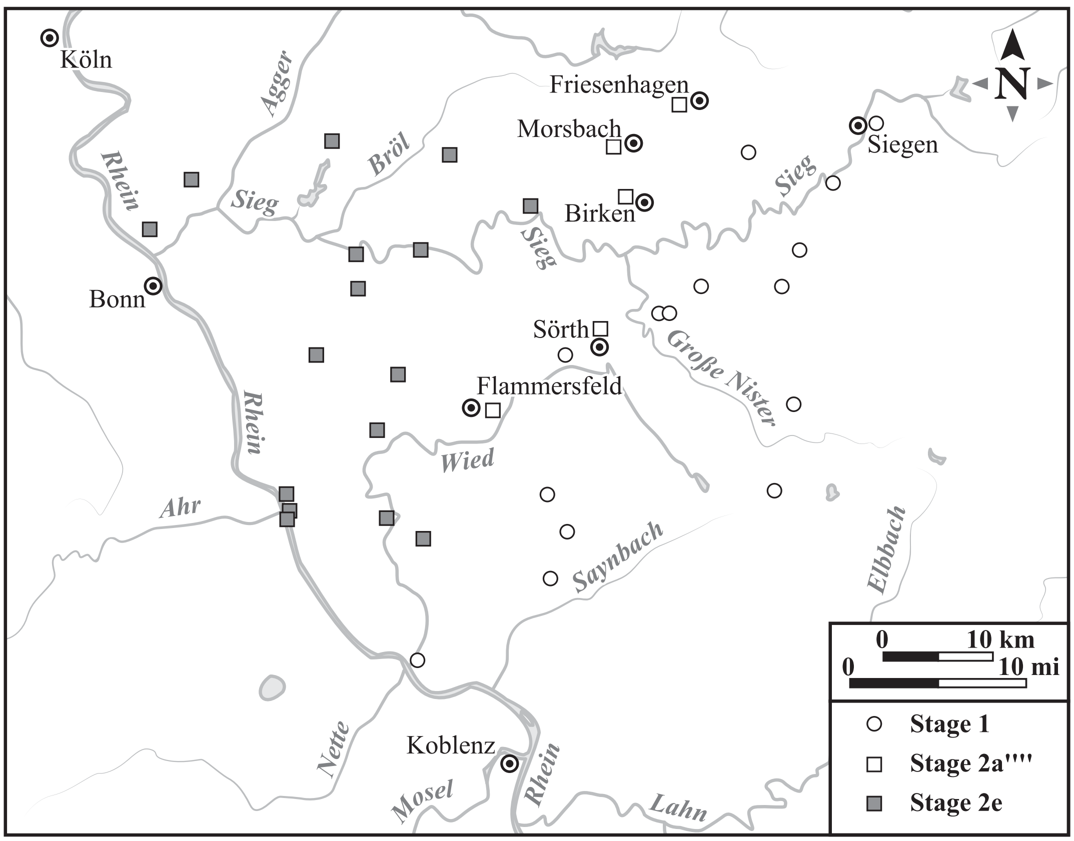
Map 12.5 depicts the five places discussed above representing Stage 2a’’’’ in Westerwald. The map also indicates those places in the same area which represent Stage 1 for word-initial position. Stage 1 means that the place of articulation of the original velar (WGmc $^{+}$[ɣ]) is retained as velar ([g]). For comparison, Map 12.5 also indicates a very common pattern discussed in greater detail in Chapter 14 whereby WGmc $^{+}$[ɣ] is realized as palatal in word-initial position before any type of segment (Stage 2e).

Map 12.5 only documents those places discussed in Cornelissen et al. (1989) that are to the north and east of the Rhine River. It is possible that the aforementioned source might also contain evidence of Stage 2a’’’’ places in other areas.[19]

[19] The areas on Map 12.5 to the south and west of the Rhine River fall within the domain of

Table 12.30: Trigger Types and the corresponding historical stages for word-initial position

Type	Trigger	Stage
A''''	HUFV (unstressed [i])	2a''''
A	HFV	2a
B	HFV, MFV	2b
C	HFV, MFV, CC	2c
D	HFV, MFV, LFV	2c'
E	HFV, MFV, LFV, CC	2d



Map 12.5: Westerwald. Circles represent the absence of velar fronting in word-initial position (WGmc $^{+}$[ɣ] is realized as [g]). White squares indicate the realization of WGmc $^{+}$[ɣ] as [ɟ] in word-initial position before schwa ([ə]) and as velar ([g]) in the context before all other vowels as well as consonants (liquids). Lightly shaded squares indicate the realization of WGmc $^{+}$[ɣ] as a palatal fricative in word-initial position before any type of vowel or consonant (liquid). Sources: Hommer (1910) for Sörth and Cornelissen et al. (1989) for all other places.

An independent source for a very different part of Germany (Kieser 1963) documents Stage 2a''''. Kieser (1963) investigates the modern realizations of word-initial WGmc ⁺[ɣ] in South Brandenburg (Map 7.2). According to that source there is a broad area in which WGmc ⁺[ɣ] is realized as [ʝ] in word-initial position, but only in the context before schwa (see Map 14.2 below).

12.7 Significance of triggers and targets for typology

The present survey of German dialects draws several conclusions concerning triggers and targets, some of which derive support in the cross-linguistic work on Velar Palatalization (§2.3). I consider triggers (§12.7.1) and targets (§12.7.2) in that order.

12.7.1 Velar fronting triggers

12.7.1.1 Vowel height

The most significant finding in the present study is that the front vocalic triggers for velar fronting vary along the height dimension. The generalization is expressed as the implication in (15), which is motivated on the basis of a wide selection of typologically diverse languages (from Bateman 2007: 64), based on earlier studies by Neeld (1973: 37) and Chen (1973: 177). See also Kochetov (2011):

(15) Implicational Universal for Palatalization Triggers:
If lower front vowels trigger Palatalization, then so will higher front vowels.

(15) is exceptionless for the German dialects discussed in this book. No counterexamples from German dialects are known to the present writer.

The Implicational Universal for Palatalization Triggers accounts for the fact that several dialects are attested in which nonlow front vowels serve as triggers

MRhSA. Maps 381 for *Garten* 'garden' and 382 for *grün* 'garden' in that source document the [ʝ] realization consistent with Stage 2d, as well as the [g] realization for Stage 1. MRhSA notes on Map 381 that no comparable map is published for the word *gebissen* 'bite-part' (cf. StG [gəbɪsən]) because the areal distribution for palatal and velar in that word is almost identical with the areal distribution of [ʝ] and [g] in *Garten*. Map 73 in volume 4 of WDU indicates that the initial consonant of *gefallen* 'please someone-inf' (cf. StG [gəfalən]) is realized as a palatal in an area of West Central Germany that includes the Westerwald. One cannot conclude that Map 73 provides independent evidence for Stage 2a'''' because WDU does not provide maps showing the realization of historical velars in word-initial position in other contexts, i.e. before full front and back vowels and consonants (liquids).

but the low front vowels do not, e.g. sequences like [iç] and [eç] (with velar fronting) vs. ones like [æx] (without velar fronting). Significantly, none of the sources cited above have the reverse, i.e. sequences like [æç] (with velar fronting) vs. ones like [ix] and [ex] (without velar fronting). Apparent counterexamples discussed above are those dialects in which a front vowel traditionally described as mid fails to trigger fronting, while other vowels in the mid front range do, e.g. a sequence like [ɛx] (without velar fronting) vs. ones like [eç] and [iç] (with velar fronting). One example discussed earlier involves the fronting of word-initial /kx/ in the HAlmc variety of Rheintal (Berger 1913; §3.4; Map 3.2) before [i y øː eə] but not before [ɛː ɛə]. Recall that this is not a true counterexample to (15) because [ɛː] and the first component of [ɛə] are phonologically [+low], in contrast to [i y øː] and the first part of [eə], which are [−low].

Given the three types of front vowels that can function as triggers ({HFV, MFV, LFV}), the Implicational Universal for Palatalization Triggers accounts for the fact that four logically-possible triggers are unattested:

Table 12.31: Unattested Trigger Types involving vocalic triggers

Type	Trigger	Present in context for fronting
R	MFV	HFV
S	LFV	HFV, MFV
T	HFV, LFV	MFV
U	MFV, LFV	HFV

All four Trigger Types in Table 12.31 violate the Implicational Universal for Palatalization Triggers. For example, velar fronting is triggered by mid front vowels for Trigger Type R, but not for the high front vowels. The fact that (15) derives cross-linguistic support suggests that the four unattested Trigger Types in Table 12.31 are not simply accidental gaps.

12.7.1.2 Nonheight features

The material presented from German dialects also supports the finding from Bateman (2007: 62) that velar fronting is only rarely sensitive to nonheight features. Recall from the earlier discussion that this generalization cannot be a universal without exceptions because the language Fanti (Niger-Congo; Ghana) is attested in which only front oral vowels serve as triggers for velar fronting. Although the German dialects discussed in Chapters 3–11 provide overwhelming support for

Bateman's observation, there is a small number of dialects in which velar fronting triggers are partially defined in terms of nonheight features. I consider the three nonheight features referred to in that earlier section in turn and conclude this section by discussing the status of coronal sonorant consonants as velar fronting triggers.

12.7.1.2.1 Rounding

The data from Plettenberg in (8) and (9) and South Mecklenburg in (11) show that the triggers for velar fronting make a distinction between front rounded and front unrounded vowels. The cross-linguistic studies cited earlier on Palatalization find no correlation between that process (regardless of whether or not the target is a coronal or a velar) and (un)rounding of vocalic triggers (Bhat 1978, Bateman 2007, 2011, Kochetov 2011).

The claim that front unrounded vowels are more favorable triggers for Palatalization than front rounded vowels is discussed at length in Neeld (1973). The example he discusses is the fronting of velar [g] to postalveolar [ʒ] (=⟦ž⟧) before [i] but not before [y] in the history of French, e.g. [reʒim] 'regime' vs. [regylarite] 'regularity', where [ʒ] and [g] both derive from earlier [g].

Bhat (1978: 61) too notes that velar fronting in French apparently failed to take place before front rounded vowels. However, he suggests that the failure of a front rounded vowel to trigger the fronting of a velar may not be because of the roundedness of the trigger but instead because the trigger is not sufficiently front. One might be inclined to apply this proposal to the velar fronting data from Plettenberg and South Mecklenburg, but since no data from those varieties is available corroborating the claim that vowels such as [y] are slightly more retracted than ones like [i], the proposal must remain open for further study.

12.7.1.2.2 Tenseness

The set of vocalic triggers for velar fronting in the now extinct EPo community of Rummelsburg (Mischke 1936; §11.5, Map 11.2) is restricted to [+tense] front vowels. That variety is not only unique for German dialects; it is apparently unprecedented from the cross-linguistic perspective as well. See the literature cited earlier (Bhat 1978, Bateman 2007, 2011, Kochetov 2011), in which no reference is made to languages restricting the set of triggers for Palatalization processes along the tenseness dimension. Although that typological literature suggests that Rummelsburg stands alone in the languages of the world, it is interesting to consider the way in which that dialect corroborates the conclusions drawn by Ćavar (2007) in her analysis of palatalized consonants in Polish. Ćavar argues that there is a direct correlation between tenseness – expressed in her treatment with the feature [ATR] – and Palatalization. In particular, she shows that the positive value of that feature occurs before palatalized consonants (i.e. alveolopalatals like [ɕ]) as well as secondarily palatalized velars (e.g. [kʲ]). For example, most consonants of Polish have secondarily palatalized allophones in the context of [i] and [j], but the vowel [ɨ] never induces that process. In Ćavar's treatment, secondary palatalization is guaranteed by a constraint specifying that the vocalic trigger and the target (e.g. /k/) must share the tenseness feature [+ATR]. Since [i] and [j] are [+ATR] and [ɨ] is [−ATR], the correct prediction is made that [kʲi] but not [kʲɨ] surfaces.[20]

12.7.1.2.3 Stress

Data from several varieties of German in Westerwald were discussed in §12.6.3 indicating that the trigger for velar fronting fronting in word-initial position is restricted to an unstressed high front vowel ([i]). Studies on the typology of Palatalization observe that stress can be a conditioning factor for that process, although the conclusion from that research is that stressed syllables rather than unstressed syllables favor the fronting of velars. For example, Bhat (1978: 55) cites Uzbek (Turkic; Uzbekistan), Eastern Armenian (Indo-European; Armenia), Sindhi (Indo-Aryan; Pakistan), Common Samoyed (Uralic; North Eurasia) and Sirionó (Tupian; Bolivia) as languages in which velars are fronted (palatalized in Bhat's terms) before stressed (front) vowels. No language is cited in Bhat (1978) in which velar fronting is triggered by an unstressed vowel, although Bhat does show that unstressed vowels tend to trigger Palatalization (i.e. raising) of alveolar sounds.

12.7.1.3 Coronal sonorant consonants

The typological literature cited above has little to say on the topic of consonants as triggers. The few languages in which true consonants – as opposed to glides like [j] – trigger Palatalization (regardless of the type of target) involve long distance spreading and are therefore very different from the type of velar fronting under investigation in the present book. That finding from the typological literature suggests that the front segments triggering Palatalization include vowels

[20] One could alternatively argue that [i] and [ɨ] are distinguished not by [ATR], but instead by a frontness feature (e.g. [back]). I do not attempt to evaluate the merits of Ćavar's proposal here and choose to leave that question open for further research.

(e.g. [i]) but not consonants (e.g. [l], [r], [n]). Although that assessment appears to be implicit in much of the cross-linguistic work cited earlier, it is clearly incorrect for German because the predominant pattern for (postsonorant) velar fronting is that the triggers consist of both front vowels or coronal sonorant consonants, in particular /l r n/.

Given that /l r n/ can trigger velar fronting, the present treatment predicts that – in principle – those sounds alone could trigger that process. To see this, consider once again the four front segment types that can function as triggers ({HFV}, {MFV}, {LFV}, {CC}) as well as their logical combinations. Given the three categories for vocalic triggers ({HFV}, {MFV}, {LFV}), there are seven logical combinations, three of which are attested (Trigger Types A, B, D) and four of which are not (Trigger Types R-U from Table 12.31). Eight logically-possible triggers involve {CC} and front vowels ({HFV}, {MFV}, {LFV}). Two of those eight are attested, namely Trigger Type C ({HFV, MFV, CC}) and Trigger Type E ({HFV, MFV, LFV, CC}). The remaining six are listed in the first six rows of Table 12.32. In the final two rows I list the two logical combinations of {CC} and front vowels in the case that {LFV} is absent.

Table 12.32: Trigger Types involving vocalic and consonantal triggers

Type	Trigger	Present in context for fronting	Stage
V	CC	HFV, MFV, LFV	2a’’’’’
W	HFV, CC	MFV, LFV	2a’’’’’’
X	MFV, CC	HFV	---
Y	LFV, CC	HFV, MFV	---
Z	HFV, LFV, CC	MFV	---
ZZ	MFV, LFV, CC	HFV	---
VV	CC	HFV, MFV	2aa’’’’
WW	HFV, CC	MFV	2aa’’’’’

Trigger Types X, Y, Z, and ZZ are correctly predicted to be nonoccurring because they violate the Implicational Universal for Palatalization Triggers in (15). By contrast, there is no reason why Trigger Types V and W (and their equivalents VV and WW without low front vowels) should not occur. In the remainder of this section I demonstrate that this is the correct prediction for Trigger Type VV. Trigger Types V, W, and WW, while not attested, are predicted to be possible in principle.

Two examples are known to me for Trigger Type VV. The first is the RFr variety of Beerfelden (Wenz 1911; Map 5.3). The data from that source indicate that both [ç] and [x] occur in postvocalic position. Wenz transcribes both segments with the same symbol (=⟦χ⟧), but he is clear that they represent palatal [ç] after a front vowel and velar [x] after a back vowel, e.g. [ɪç] 'I' (=⟦ìχ⟧) vs. [bʊx] 'book' (=⟦bùχ⟧). (Beerfelden has no low front vowels). There are no examples of either [ç] or [x] after a consonant because the crucial examples contain an epenthetic vowel, e.g. [mɪlɪç] 'milk' (=⟦mìlìχ⟧). The significance of Beerfelden can be seen in the distribution of [ɣ]/[ʝ], which display a pattern distinct from their fortis counterparts. As indicated below, velar [ɣ] (=⟦ɣ⟧), surfaces after a front vowel and before a vowel in (16a), after a back vowel and before a vowel or syllabic liquid in (16b), and after [i] from /r/ in (16c). By contrast, palatal [ʝ] (=⟦j⟧) occurs after a coronal consonant (always [l]) and before a vowel in (16d).

(16) [ɣ] and [ʝ] in Beerfelden:

a.	bîɣə	[bɪːɣə]	biegen	'bend-INF'	35
	féɣə	[feːɣə]	fegen	'sweep-INF'	35
b.	fòɣl	[fɔɣl̩]	Vogel	'bird'	35
	fróɣə	[froːɣə]	fragen	'ask-INF'	35
	sâɣə	[sɑːɣə]	sagen	'say-INF'	35
c.	bòiɣə	[bɔiɣə]	borgen	'borrow-INF'	35
	gòiɣl	[gɔiɣl̩]	Gurgel	'throat'	35
d.	fòljə	[fɔlʝə]	folgen	'follow-INF'	35
	fèljə	[fɛlʝə]	Radfelge	'wheel rim'	35

From the synchronic perspective, Beerfelden has Target Type M (=Stage 2bb) because both /x/ and /ɣ/ undergo postsonorant fronting; however, the triggers differ for those two targets: For /x/ we have Trigger Type EE, but for /ɣ/ it is Trigger Type VV (Table 12.32).

Synchronically /ɣ/ (<WGmc $^{+}$[ɣ]) undergoes fronting to [ʝ] in the {CC} context (i.e. after [l]). The data in (16) can be accommodated in the rule generalization approach endorsed here given the stages in Table 12.33. The first two stages are the ones unique to Beerfelden (see the final two rows of Table 12.32), while the final three are the same as ones proposed earlier.

The second variety known to me for Trigger Type VV is the Hes dialect described by Gommermann (1975). That dissertation provides a detailed description of the historical phonology and morphology for speakers living in Milwaukee, Wisconsin (USA), whose ancestors came originally from an area south of Fulda

(Map 7.1). From there, the progenitors of this presumably EHes variety emigrated to the town of Mucsi (Hungary) and then later to the United States. Gommermann (1975: 105–106; 108–109) shows that velar and palatal fricatives (both fortis and lenis) surface. Both /x/ and /ɣ/ serve as targets for postsonorant velar fronting (=Target Type M), but – as in Beerfelden – /ɣ/ undergoes fronting only in the context after liquids, while an epenthetic vowel intervenes between a liquid and /x/, e.g. ⟦moːɣə⟧ 'stomach', ⟦gədsoːuɣə⟧ 'pull-PART', ⟦viːɣə⟧ 'scale', ⟦ẹːɣə⟧ 'harrow', ⟦gnaːiçd⟧ 'vassal', ⟦ɪç⟧ 'I', ⟦buːx⟧ 'book', ⟦kʰʊxə⟧ 'cake', ⟦gɒljə⟧ 'gallows', ⟦ẹorjṛ⟧ 'anger', ⟦mɛlɪç⟧ 'milk' (cf. StG [mɪlç]), ⟦ʃdʊrɪç⟧ 'stork' (cf. StG [ʃtɔʀç]).

Table 12.33: Alternate Trigger Types and historical stages for Beerfelden /ɣ/

Type	Trigger	Stage
VV	CC	2aa''''
WW	HFV, CC	2aa'''''
B	HFV, MFV, CC	2b
D	HFV, MFV, LFV	2c'
E	HFV, MFV, LFV, CC	2d

The proposal in Table 12.33 is consistent with the approach to rule generalization described above where there is a progression of triggers from specific to general.

12.7.2 Velar fronting targets

A significant finding in the present study is that the targets for velar fronting in German dialects obey the implication in (17) without exception. Recall from §2.3 that (17) derives strong support from both phonetics and typology in a wide variety of languages. No counterexamples are known.

(17) Implicational Universal for Velar Fronting Targets-2:
If a lenis sound undergoes velar fronting then the corresponding fortis sound does as well.

(17) accounts for the fact that there are dialects in which the targets for velar fronting are fortis (/x/) and lenis (/ɣ/) sounds (Target Type M), or fortis (/x/) but not lenis (Target Type L). Significantly, there is no dialect in which a lenis velar (/ɣ/) undergoes fronting but the corresponding fortis sound (/x/) does not. Target Types L and M are restated in Table 12.34 in a slightly simplified form as well as nonoccurring Target Type M'.

Table 12.34: Unattested and attested Target Types

Type	Target	Present in fronting context
L	/x/	/ɣ/
M	/x ɣ/	-----
M'	/ɣ/	/x/

Bateman (2007: 56ff.) observes that the most common targets for Palatalizations are obstruents (stops, fricatives) as opposed to sonorants (e.g. /ŋ/). The generalization also holds for velar fronting in German dialects, although the only sonorant target for velar fronting in the material discussed above is [ŋ]. Only a small number of dialects exhibit the fronting of a velar nasal (Chapter 11); however, of those dialects with that change, velar stops and velar fricatives also undergo fronting. It is possible to posit an exceptionless implication ("If a velar sonorant undergoes fronting then so does a velar obstruent"); however, that statement is not particularly meaningful given the small number of dialects where [ŋ] undergoes fronting.

Bateman also observes that languages with stops as targets outnumber those with fricatives, although she concedes that there are also many languages in which fricatives but not stops serve as targets. The present study demonstrates that the latter situation is the norm for German dialects (recall the Implicational Universal for Velar Palatalization Targets-1 from §2.3.2). Thus, there are many dialects in which only fricatives (/x/) but not stops (/k/) undergo velar fronting (Target Types L and M), and there is also a small but not insignificant group of dialects in which both stops and fricatives undergo fronting (Target Type N). However, no dialect has been found in which only velar stops but not velar fricatives undergo fronting. Recall from §11.8 that a historical explanation was offered to account for the strong preference of velar fricatives over velar stops as targets for velar fronting in German dialects.

12.8 Additional properties of velar fronting

12.8.1 Adjacency of targets and triggers

In almost all case studies discussed in Chapters 3–12 the velar fronting target either immediately follows the trigger (postsonorant velar fronting) or immediately precedes it (word-initial velar fronting). In a small number of systems, the trigger and target are separated by another sound (referred to below as Q). In the present section I provide a synopsis of those dialects and the patterns they represent.

Table 12.35 lists four patterns expressed in earlier chapters with the corresponding rules. Those patterns involve either the spreading of [coronal] from the trigger in the third column to the target (Q) in the second column by a version of schwa fronting, or by the merger of the [coronal] feature of a front vowel with the [coronal] feature of an adjacent consonant (Q) by one of two processes of coalescence.[21] The segments in bold in the fourth column share the same [coronal] feature. The four patterns are classified as one of the types listed in the first column. Note that the three rules listed for Types PP, QQ, and RR feed velar fronting in the postsonorant context, while the coalescence indicated for Type SS feeds word-initial velar fronting. In the penultimate column of Table 12.35 I list the places discussed in earlier chapters with the four patterns. I comment on the target segment /v/ for Type SS below.

The one dialect listed above exemplifying Type PP is Rheintal. Recall from §3.4 that the front vowel trigger and the target schwa together form a diphthong. Type PP can be contrasted with the pattern whereby a velar surfaces as velar after a diphthong consisting of a front vowel plus schwa, e.g. Ramsau am Dachstein (§3.5). Some of the dialects discussed in this chapter in passing also reflect Type PP, although no data were presented. Two Wph examples are Laer (Niebaum 1974; §12.3.6) and Müschede (Niebaum et al. 1976). The original sources are clear concerning the facts involving the distribution of [x] and [ç] after diphthongs ending in schwa, e.g. Laer [dri·əç] 'wear-PRET' vs. [vu·əx] 'weigh-PRET'. Niebaum (1974: 62-63) writes: "Dies zeigt, dass bei diesen Diphthongen für die Auswahl der Reibelautvariante jeweils die erste Diphthong-komponente entscheidend ist". ("This shows that for the selection of the fricative variant [i.e. [x] or [ç], T.A.H.] the first component of the diphthong is crucial").

For Type QQ, schwa is epenthesized and then undergoes Schwa Fronting-2. The two varieties of German discussed above exemplifying schwa epenthesis-cum-schwa fronting are Sörth and Schlebusch, although it was also noted in the context of the former dialect that that type of system is quite common among HG dialects.

Types RR and SS are interesting from the point of dialectology and historical phonology because they are attested in areas that are not geographically contiguous. Thus, Type RR can be observed in Switzerland, Mecklenburg-Vorpommern

[21] In contrast to the two schwa fronting processes, neither rule of coalescence has a target or a trigger. The front vowel referred to in the third column of Table 12.35 represents the trigger for velar fronting, and the adjacent consonant in the second column corresponds to Q.

Table 12.35: Processes feeding velar fronting. IS: Intervening sound.

Type	IS (Q)	Trigger	Pattern	Rule	Place	Dialect	Sec.
PP	schwa	nonlow front vowel	/iəx/ ⟶ |i**ə̟**x| ⟶ [**iə̟ç**] /uəx/ ⟶ [uəx]	Schwa Fronting-1	Rheintal	HAlmc	§3.4
QQ	schwa	liquid	/Vlx/ ⟶ |Vləx| ⟶ |V**lə̟**x| ⟶ [V**lə̟ç**]	Schwa Fronting-2	Many places	HG	§5.4, §10.3.1
RR	liquid	front vowel	/ilx/ ⟶ |**il**x| ⟶ [**ilç**] /ɑlx/ ⟶ [ɑlx]	Coalescence-1	Visperterminen	HAlmc	§6.2
					Obersaxen	HAlmc	§6.3
					West Mecklenburg	MeWPo	§11.3
					Wolgast	MeWPo	§11.3
					Sebnitz	Sln	§11.4
					Reimerswalde	HPr	§11.7
SS	liquid or /v/	front vowel	/gli/ ⟶ |g**li**| ⟶ [**ɟli**] /glɑ/ ⟶ [glɑ]	Coalescence-2	West Mecklenburg	MeWPo	§11.3
					Sebnitz	Sln	§11.4
					Seifhennersdorf	Sln	§11.4
					Kreis Konitz	EPo	§11.5

and East Prussia, and Type SS in Mecklenburg-Vorpommern, West Prussia, and East Prussia (but not in Switzerland). It is also important to stress that not all varieties of German described in Mecklenburg-Vorpommern, East Prussia, West Prussia, and Switzerland represent Type RR and/or Type SS. For example, West Mecklenburg and Wolgast represent Type RR, but South Mecklenburg does not (because /x/ is realized as [x] after a liquid, even if the liquid is preceded by a front vowel). The conclusion is that the two coalescence processes – like velar fronting – can arise independently in noncontiguous areas (polygenesis).

The leftmost segment (Q) of Coalescence-2 is a (coronal) liquid, as indicated in Table 12.35. However, Q can also be /v/, e.g. West Mecklenburg [cveə] 'across' (from /kveə/). Words like [cveə] pose a potential problem for the present treatment because /v/ is not a coronal consonant and therefore does not fit the structural description of Coalescence-2, as formalized in §11.3. West Mecklenburg is not an isolated example because the same generalization involving [v] holds for the other dialects exemplifying Type SS. One possible alternative analysis is to reject Coalescence-2 and to posit that the trigger and target for velar fronting in Type SS systems need not be adjacent. Velar fronting can then spread across a liquid if liquids are not specified for coronality, and spreading can likewise occur across a labial (/v/) without incurring a violation of the line-crossing constraint in nonlinear phonology. However, that reanalysis may pose a problem for various cross-linguistic generalizations involving adjacency (Odden 1994 as well as work by later authors). A more attractive option in my view is to analyze the /v/ referred to above not as an obstruent, but instead as a sonorant, i.e. as the glide-like (approximant) sound /ʋ/. See Appendix H and Hall (2014c) for a discussion of similar data from Wph.

Given the processes of schwa fronting for Types PP and QQ it can be said that the trigger and target for velar fronting are adjacent on the surface. The reason is that the fronted schwa is a (derived) front vowel, and front vowels are triggers for velar fronting. For Type RR and SS the situation is different because the trigger for velar fronting (front vowel) is not adjacent to the target velar even after coalescence merges the [coronal] feature of Q with [coronal] of the trigger. The same point holds if Q is /v/. Future work may want to consider Type RR and SS dialects in light of Bateman's conclusion that the trigger and target for Velar Palatalization are always adjacent (Bateman 2007: 77-82).

12.8.2 Domain of velar fronting

In every case study discussed in this book the trigger and target for velar fronting belong to the same word. There is no evidence from any dialect that those two sounds can span a word boundary as in the rule of Flapping for American English (§2.2.1); hence, nothing suggests that velar fronting has the status of a phrase level (postlexical) rule in any German dialect. In the models referred to in §2.2.1, i.e. Lexical Phonology and Morphology (e.g. Kiparsky 1982b, Kaisse & Shaw 1985, Mohanan 1986, Hargus & Kaisse 1993) and Stratal Optimality Theory (Kaisse & McMahon 2011, Bermúdez-Otero 2015) velar fronting must be classified a word level (lexical) rule.

It is possible to test whether or not velar fronting applies across words (postlexically): One needs to consider a sequence of two lexical items ("Word A" and "Word B"), where Word A ends in a segment that serves as a trigger for velar fronting (e.g. /i/), and Word B begins with a target for velar fronting (e.g. /x/). If velar fronting is active with /i/ as a trigger and /x/ as a target, then the rule would be expected to apply to the sequence described above if velar fronting is a phrase level rule. In most of the dialects investigated in the present book there are no sequences such as /i/ plus /x/ in connected speech because the target velar segment (/x/) does not occur word-initially. In those velar fronting dialects with a word-initial target velar (/x/), that sound systematically fails to undergo velar fronting even after an appropriate trigger at the end of a preceding word. As a representative example, consider Rheintal (§3.4). In that dialect, /x/ and /kx/ regularly undergo fronting after a nonlow front vowel or a coronal sonorant consonant. The same velars also undergo fronting in word-initial position if the same triggers follow. One can test whether or not postsonorant velar fronting is a phrasal rule in Rheintal by considering a sequence of Word A and Word B, where Word A ends in a velar fronting trigger and Word B begins with [k] or [kx]. Fortuitously, several examples of that structure are present in the texts provided by Berger (1913: 188-191). One example from the Rheintal variety is the phrase [i kxɑmmər] 'in the room' (=⟦i kxɑmmər⟧), with a velar after a front vowel trigger. On the basis of that type of example one can conclude that velar fronting in Rheintal is a word level (lexical) rule (i.e. target and trigger belong to the same word) and not a phrase level (postlexical) rule (i.e. target and trigger can span a word-boundary).[22]

Velar fronting is a word level rule in those dialects like Rheintal for which evidence is available, although I do not provide additional examples here.

[22] In the hypothetical example described above, the postlexical rule of velar fronting applies from left-to-right (progressively). Since no German dialect is attested in which postsonorant velar fronting applies regressively from a trigger to a target belonging to the same word (§2.3.5, §6.5.2, §16.5) it should come as no surprise that regressive spreading across a word boundary is also not attested; cf. StG [buːxɪst] 'book is' vs. *[buːçɪst].

The conclusion is that velar fronting is word-bounded, but it also needs to be stressed that the trigger and target for velar fronting never span a morpheme boundary, a generalization that is true without exception for all German dialects with that rule. Put differently, the trigger and target for velar fronting (word-initial and postsonorant) always belong to the same morpheme. As a representative example, consider the MStGm words [lɑxən] 'laugh-INF' (from /lɑx-ən/) and [ʀiːçən] 'smell-INF' (from /ʀiːx-ən/), in which the morpheme boundary is situated after the dorsal fricative of the stem and before the schwa-initial suffix. In those examples the vocalic trigger is tautomorphemic with the velar target. By contrast, there are no suffixes beginning with a velar fronting target (/x/) that could potentially undergo the rule and surface as palatal after a stem ending in a front vowel trigger, e.g. hypothetical morphologically-complex items like /liː-xə/ and /nɑ-xə/, which would presumably surface as [liːçə] and [nɑxə] respectively. The famous example involving the occurrence of *-chen* ([çən]) even after a stem ending in a back vowel is not a counterexample because the initial sound of that suffix is an underlying palatal (/ç/) and not an underlying velar (/x/); see §17.3.2 for discussion.

Since the trigger and target for velar fronting never span a morpheme boundary there is no German dialect in which the fronting of velars displays the kind of opaque effects typical of lexical rules discussed in the literature on Lexical Phonology and Morphology and Stratal Optimality Theory. For example, there is no German dialect in which certain suffixes trigger velar fronting but others do not, cf. *national* vs. *nationhood*, in which Trisyllabic Laxing is induced by the presence of *-al*, but not by *-hood*. Recall the discussion on stem level rules and word level rules from §2.2.1.

A recent model couched in the theory of Stratal Optimality Theory postulates a mechanism of historical change called domain narrowing (§5.5.1), which proposes that rules are phonologized at the end of the grammar and then gradually work their way up into smaller domains, e.g. the change from (a) phrasal level rule to a word level rule, and (b) word level rule to a stem level rule (Bermúdez-Otero 2007, 2015, Ramsammy 2015). Since phrase level velar frontings are not attested, this book offers no evidence for (a). And since there is no evidence for the distinction between word level suffixes and stem level suffixes (cf. English *-hood* vs. *-al*), no dialect supporting (b) either.

12.8.3 Status of irregular forms

The sources cited in this book rarely state explicitly that velar fronting (synchronic or diachronic) is regular. However, it can be said that the descriptions for HG give no indication at all that the distribution of velars and palatals has idiosyncrasies modern linguists call lexical exceptions. That generalization holds not only for those HG regions in which velar fronting has the status of an allophonic rule, but also for those HG localities identified in Chapters 7–10 in which that process is a neutralization (or quasi-neutralization). The present section considers first the aberrant items in the Wph variety of Rhoden that were characterized earlier as irregular forms (§5.2) and then takes a closer look at them in the context of other varieties with similar data. I show below that the anomalous forms do not fit the profile of lexical exceptions as that term is usually understood.

Given the regularity of velar fronting in HG it is interesting to recall that there are several lexical items in the LG (Wph) variety of Rhoden (Martin 1925), which unexpectedly contain [x] after a front vowel trigger. In Rhoden, velar fronting converts the target /x/ to palatal [ç] after a nonlow front vowel, but a small number of word were transcribed in the original source with [x] after high front vowels, e.g. [gəʃxɪxtə] 'history', [fʏxtə] 'humidity'. Items like these are clearly surprising because a segment that belongs to the targets for velar fronting ([x]) stands after a segment that belongs to the triggers ([ɪ ʏ]).

Rhoden is not unique: A number of descriptive grammars for LG present enough data to safely conclude that velar fronting is active, but those sources also note that [x] can occur unexpectedly in the context of front vowels; those vowels are typically lax ([ɪ ʏ ɛ œ]). The occurrence of [x] after front (lax) vowels is documented in the following quotes from original sources. The first one (Martin 1925) was already given in §5.2, but the others were not mentioned earlier:

Martin (1925: 14) on the Wph variety in Rhoden (Map 4.2):

> …hört man sehr oft *x* … nach palatalen Vocalen
>
> " …one hears very often [x] after a front vowel"

Kloeke (1914: 23) on the NLG variety of Finkenwärder (Map 4.1):

> Es ist mir öfter aufgefallen, dass in schneller und schlaff artikulierter Rede das [χ] (=[ç]) wie [x] gesprochen wird, so sagt man [vɛx] weg, fort, [zɛx] gesagt statt [vɛχ] und [zɛχ]. Diese Aussprache scheint nur auf nachlässiger Artikulation zu beruhen, denn wenn ich das Wort noch einmal auszusprechen bat, wurde immer [χ] gesprochen.
>
> "I have often observed that [χ] (=[ç]) is pronounced as [x] in fast and sloppily articulated speech; for example, [vɛx] 'away, gone', [zɛx] 'say-PRET' are

> uttered instead of [vεχ] and [zεχ]. This pronunciation appears to be based solely on careless articulation, because [χ] was always uttered when I requested that the word be repeated".

Seelmann (1908: 24) on the Brb variety of Prenden (Map 8.1):[23]

> Mnd. Ch erscheint nach palatalen Vokalen und nach Liquiden als χ, nach gutturalen Vokalen als x … In gleicher Weise scheiden die meisten nd. Dialekte beide Laute, jedoch nicht alle. In mecklenburgischen Dörfern kann man sehr oft nixt, rext u.ä sprechen hören.
>
> "Middle Low German *Ch* occurs after palatal vowels and liquids as *χ*, and after guttural vowels as *x* … Most Low German dialects divide the sounds the same way, however not all [dialects]. In Mecklenburgian villages one can quite often hear nixt, rext being uttered".

Holst (1907: 156) on the MeWPo variety of Ivenack-Stavenhagen (Map 8.1):

> Im ursprünglichen Auslaut ist *g* stimmloser Reibelaut geworden, und zwar gewöhnlich *ich*- oder ach-Laut (χ – x), je nach dem vorhergehenden Vokal (dax = Tag, (ik) sēχ. = ich sah. … Doch kommt auch öfter … ach-Laut für zu erwartenden ich-Laut vor (vex = Weg, nix = nicht).
>
> "In an original coda position *g* has become a voiceless fricative, that is, the usual *ich*- or *ach*-sound depending on the preceding vowel (dax = Tag, (ik) sēχ. = I saw. … However, the *ach*-sound often occurs in place of the expected *ich*-sound (vex = Weg, nix = nicht)".

More recently, Lauf (1996: 208) observes that [x] often occurs in Wph colloquial speech ("westphälische Umgangssprache") after mid front vowels ([møːxlɪç] 'possible') and [l] (e.g. [mɪlx] 'milk').

It is clear from other sources that [x] can occur unexpectedly after the front rounded lax vowel [œ], although those data are often presented without comment. One example is the description of the Wph variety of Gütersloh (Wix 1921; Map 4.2). According to the material given in that source (pp. 80-81) it can be concluded that [x] (=⟦x⟧) occurs after a back vowel and [ç] (=⟦χ⟧) after a front vowel. While [ç] is consistently transcribed after high front vowels and mid front unrounded vowels and [x] after back vowels, Wix is not consistent in the way

[23]In the transcription system of Seelmann and Holst (see below), the front vowels ⟦i⟧ and ⟦e⟧ in the irregular items are lax ([ɪ ε]).

he transcribes dorsal fricatives in the context after [œ]. Thus, he has [brœçtə] 'bring-OPT' with his symbol for the palatal after his symbol for [œ] on p. 98, but the same word is given as [brœxtə] on p. 40. A second example of a word with [x] after [œ] is [kœxən] 'cough-INF' (p. 31).

The irregularity of velar fronting in the context after [œ] is also documented in the Wph variety of Lüdenscheid (Frebel 1957; Map 4.2). The author provides a clear description of the distribution of dorsal fricatives on p. 34 suggesting that [x] (=⟦x⟧) surfaces after back vowels and [ç] (=⟦χ⟧) after front vowels. Among the words with [ç] is [lœçtə] 'lamp', illustrating the occurrence of [ç] after [œ], but on the same page he gives [kœxən] 'cough-INF', with [x] after the same vowel.

In Table 12.36 I provide a list of the LG varieties cited above together with representative examples of irregular forms. I also include examples from LG dialects not mentioned earlier. The data from most of the sources below come from phonetically transcribed texts of individual speakers. This type of source is advantageous because it eliminates the possibility that data from different speakers are being intermingled. As indicated on Map 12.6, all of the places listed in the first column of Table 12.36 are in the same general region in North Germany.

The items presented in the final column of Table 12.36 are referred to here as "irregularities" and not as "lexical exceptions" because they do not behave as the kind of lexical exceptions discussed in the literature on phonology. Consider my own informal definition: A word (W_a) is a lexical exception to rule R if there is a string of segments (XYZ) in W_a which satisfies the structural description of R, but R does not apply. That definition succeeds in characterizing a textbook case of exceptionality, namely the word *obesity* (cf. *obese*), which fails to undergo the English rule of Trisyllabic Laxing (§2.2.1, §12.8.2), cf. *sincerity* (cf. *sincere*).[24] Note crucially that the definition posited here presupposes that R consistently fails to affect XYZ in every occurrence of W_a. Thus, the word *obesity* consistently fails to undergo Trisyllabic Laxing for any given speaker in any given utterance.

Given this definition it is doubtful if any of the irregular forms from Table 12.36 is a true lexical exception. The reason is that in the sources cited the /x/ in the word in question (W_a) fails to undergo velar fronting (=R) in some instances in a given text but in other instances (i.e. a few pages later in the same text for the same speaker), R correctly applies to the /x/ in W_a. As a representative example, it was noted above that the irregular realization of the word [brœxtə] 'bring-OPT' in Gütersloh is also realized with the expected pronunciation [brœçtə] (Wix 1921).

[24] There is a large body of research investigating the status of exceptions in phonology as well as other components of grammar (e.g. Zonneveld 1978, Wolf 2011, Simon & Wiese 2011). The question of how to define what is meant by exception is dealt with in works such as these.

Table 12.36: Selection of LG velar fronting varieties with irregularities (word-initial and/or postsonorant)

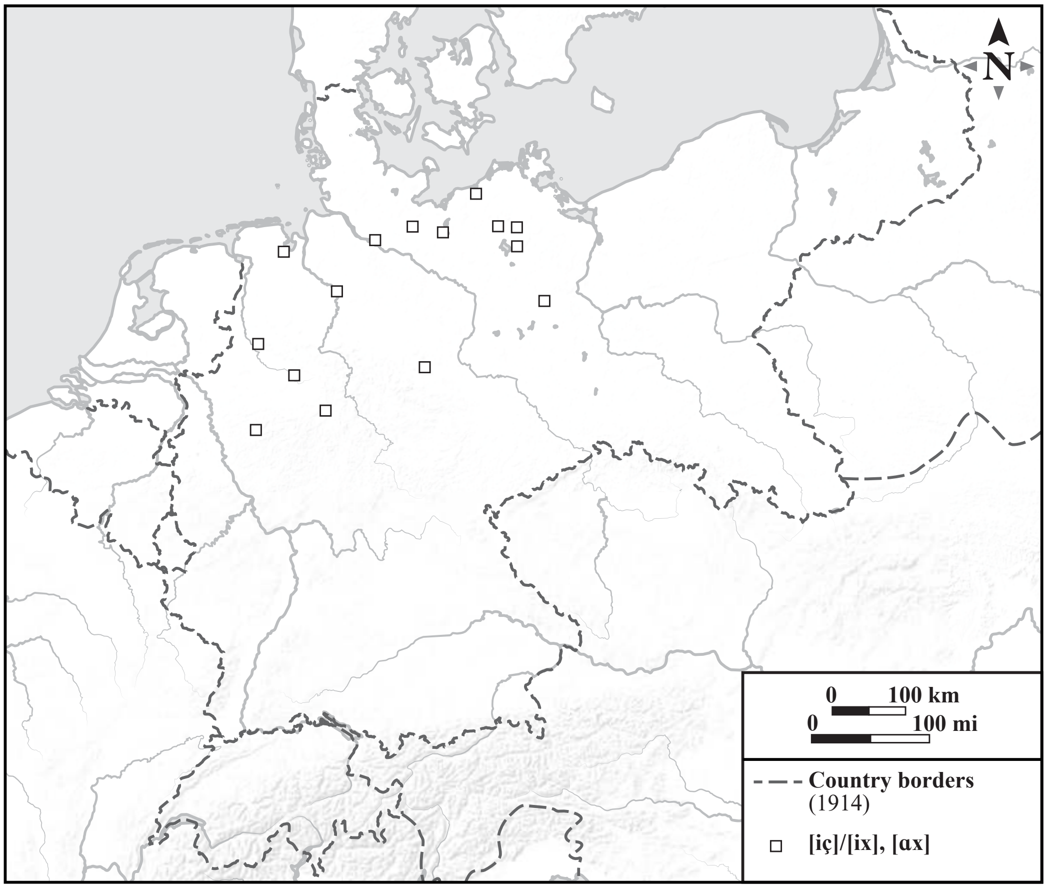
Place/Region:	Dialect	Source:	Irregularities:
Finkenwärder	NLG	Kloeke (1914)	[vɛx] ‘away’, p.23
Borgstede	NLG	Feyer (1939)	[lɪx] ‘lie-3SG’ p. 39, [nɪx] ‘not’ p. 31
Baden	NLG	Feyer (1941)	[lɪx] ‘lie-3SG’, p. 89
Gütersloh	Wph	Wix (1921)	[kœxən] ‘cough-INF’, p. 31
Rhoden	Wph	Martin (1925)	[gəʃxɪxtə] ‘history’, p. 188; [fʏxtə] ‘humidity’, p. 36
Lüdenscheid	Wph	Frebel (1957)	[kœxən] ‘cough-INF’
Riesenbeck	Wph	Bethge (1970)	[xrɑɔdə] ‘straight’, p. 50; [xøŋ] ‘go-PRET’, p. 30
Laer	Wph	Niebaum (1974)	[sɛxs] ‘six’, p. 163
Prenden	Brb	Seelmann (1908)	[nɪxt] ‘not’, p. 24
Ivenack-Stavenhagen	MeWPo	Holst (1907)	[vɛx] ‘path’, p. 156
Schwerin	MeWPo	Teuchert (1927)	[dœrx] ‘trough’, p. 9
Ratzeburg	MeWPo	T&S (1933)[a]	[brœxt] ‘bring-PART’, p. 10
Rostock	MeWPo	T&S (1933)	[mɪtbrœxt] ‘bring along-PART’, p. 9
Lank	MeWPo	T&S (1933)	[zɛx] ‘say-IMP.SG’, p. 18
South Stargard	MeWPo	Teuchert (1934)	[brœxt] ‘bring-PART’, [ʃlɪxt] ‘bad’, p. 13
Bristow	MeWPo	Schönfeld (1989)	[bəzœxt] ‘visit-PART’, p. 99

[a](Teuchert & Schmitt 1933)

The quote given above from Kloeke (1914: 23) for the NLG variety of Finkenwärder likewise implies that a speaker who utters an irregular form (e.g. [vɛx] ‘away’) might also pronounce the same word with the expected pronunciation (i.e. [vɛç]).

Three questions can be posed: (A) Why do all of these examples in Table 12.36 involve LG varieties in the same area of North Germany?; (B): If [x] is adjacent to a front vowel then why is that vowel typically lax?; (C) If the irregularities given in Table 12.36 do not fit the standard profile of lexical exception, then what are they?

Concerning (A): It is important not to lose sight of the fact that speakers with the items listed in Table 12.36 lived in an area (North Germany) at a time (first part of the twentieth century) when the triggers (and targets) for velar fronting still differed from place to place. Recall from §12.3.6 that the dialects spoken



Map 12.6: Areal distribution of velar fronting varieties of LG with irregularities involving the fluctuation between regular [ç] and unexpected [x] after coronal triggers.

in that area (WLG) displayed considerably more variation with respect to velar fronting triggers than HG. This means that both during and after the acquisition of velar fronting the speakers referred to in Table 12.36 – in contrast to speakers of the typical variety of HG – must have been exposed to speakers with different versions of velar fronting (Appendix D).

Concerning (C): Given the diversity of velar fronting triggers in North Germany I contend that the irregularities listed above simply reflect the fact that many speakers in that area are influenced by the speech of individuals with alternate realizations of dorsal fricatives. For example, a speaker (P_1) who acquires a broad set of triggers (after all front vowels) might have contact with a speaker (P_2) with a restricted set (e.g. after all front unrounded vowels). P_1 pronounces sequences like [iç], [œç], [ɑx] in their own speech, but P_2 has the pronunciation [iç], [œx], [ɑx]. When P_1 utters an occasional word with [œx] this is simply an indication that their speech has been influenced by the speech of P_2.[25]

Concerning (B): As described in §11.5 one LG (EPo) variety (Kreis Rummelsburg) had a set of triggers restricted to front lax vowels. In §12.7.2 I suggested that the triggers for Kreis Rummelsburg occupies a unique historical stage, namely Stage 2d'. I summarize the final three Trigger Types and historical stages from Table 12.29 in (18):

(18) Three Trigger Types/Historical Stages:

C'	HFTV, MFTV, LFTV ([i e æ])	2c''
D'	HFTV, MFTV, LFTV, CC ([i e æ r])	2d'
E	HFV, MFV, LFV, CC	2d

The occurrence of [x] after front lax vowels for a speaker with a broad set of triggers (P_1) indicates that their speech has been influenced by a speaker (P_2) with a narrow one (Trigger Types C' and D').

A potential weakness with the present proposal is that Kreis Rummelsburg is the only dialect uncovered in this book with a set of velar fronting triggers defined according to tenseness. What is more, Kreis Rummelsburg is geographically further to the east that even the easternmost marker on Map 12.5. This may be true, but it is also conceivable that in an earlier time frame Trigger Types C' and D' were much more widespread in Northwest Germany and that those restricted sets of triggers were simply not recorded in the descriptive literature for WLG dialects.

A final question is whether or not it is correct to say that irregularities like the ones identified for LG are absent from HG. I would not make that claim. However, I do contend that it is difficult to find HG dialects akin to the LG ones discussed above because velar fronting is older in HG than in LG (Chapter 16). Given its age, velar fronting has had more time to diffuse itself in HG regions by adopting the full set of triggers (Trigger Type E). Seen in that light, there may have once been many HG varieties with irregular forms, but those aberrant items were eventually eliminated through time. In fact, I demonstrate below (Chapter 13) that Lower Bavaria has many velar fronting places with irregular forms. Not surprisingly, the villages and towns of Lower Bavaria differ in terms of what types of front vowels serve as triggers.

[25]The fact that the irregularities listed above consist of a only small set of words is a consequence of the relatively short length of the phonetically transcribed texts in the sources cited. The prediction is that speakers with irregular forms in all likelihood have more irregular forms that were not documented in the sources cited.

12.9 The fate of velars that do not undergo velar fronting

12.9.1 General remarks

The topic of this book is the categorical change from velar to palatal (or alveolopalatal), which is what I refer to as velar fronting. The goal of the present section is to discuss velars such as /x/ which do not undergo some version of that phonological process. The velars referred to here are present in dialects with or without velar fronting. In dialects with velar fronting, /x/ remains a simplex [dorsal] in the back vowel context. In dialects without velar fronting, /x/ is phonologically [dorsal] regardless of context. However, from the point of view of phonetics, all simplex [dorsal] segments can be pronounced in more than one way.

In §12.9.2 I discuss dialects in which velars (/x/) show phonetic fronting. In §12.9.3 I turn to systems in which velars surface either as velars or in which they are retracted to uvulars. The discussion focuses on the dorsal fricative /x/, although similar generalizations can be made concerning other velars (e.g. /k/, /g/); recall §11.2.

In the first column of Table 12.37 I give the categories for dorsal fricatives employed in the present book and the corresponding phonetic symbols for fortis fricatives. In the second column I give the analysis of those four articulations in terms of the features posited earlier.

Table 12.37: Realization of /x/ in phonetics and phonology

Phonetic realization	Phonological features
Palatal ([ç])	[coronal, dorsal]
Prevelar ([x̟])	[dorsal]
Velar ([x])	[dorsal]
Uvular ([χ])	[dorsal]

The realization of simplex [dorsal] sounds as fronted (prevelar) or retracted (uvular) is not expressed in phonological features because it is a function of phonetic rules.

Evidence for the phonetics of /x/ I summarize below is based on statements made in descriptive grammars of German dialects. Future work may want to conduct phonetic studies in order to (dis)confirm some of those claims.

12.9.2 Phonetic fronting

The phonetic fronting of velars to the sound I refer to as prevelar is well-attested in the literature on German dialects. The examples I discuss below are drawn from non-velar fronting (UG) varieties in Switzerland, Austria, and Northeast Italy.

A number of sources provide a description of the pronunciation of velars which suggest that they are fronted in the context of front vowels by coarticulation. Consider the following examples:

Kurath (1965) describes the SBav dialect spoken in St. Ruprecht bei Villach (Map 3.3) in the Austria state of Carinthia (Kärnten). In the following passage Kurath (1965: 32) discusses the complementary distribution of [h] and [x], which he considers to be allophones, as well as the phonetics of [x]:

> Im Anlaut, wo er [=x] nur vor Vokal vorkommt, wird er als [h] ausgesprochen, in anderen Stellungen als ein velarer Reibelaut [x]. Nach hintervokalen und nach dem velaren r … ist [x] ausgesprochen hintergaumig, nach Vordervokalen und nach n, l mittelgaumig (nicht vordergaumig wie im Bühnenhochdeutschen) ….
>
> “In a [word-initial] onset, where it only occurs before vowels, [x] is pronounced as [h]; in other positions [it is pronounced] as a velar fricative. After back vowels and after the velar r it is a markedly back-palate sound, after front vowels it is a mid-palate sound (not a front-palate sound as in Standard German) …”

The point is that the velar fricative [x] in St. Ruprecht has a gradiently fronted variant – Kurath’s mid-palate sound, which is the equivalent of my prevelar – in the context after coronal sonorants. Significantly, the prevelar is not articulated as palatal [ç] (“front-palate sound” in Kurath’s terms).

Rowley (1986) is a detailed description of the phonetics and phonology of the German-language (UG) island of Fersental in Northeast Italy (Map 3.3 and Map 15.3 below). The dorsal obstruents in Fersentalerisch (Mòcheno) are classified as velar (p. 65). Rowley (1986: 143) provides the following remark on the pronunciation of velar fricatives [ɣ] and [x]):[26]

> Nach vorderen Vokalen /i/, /e/, /ɛ/ usw. wird das [x] bzw. [ɣ] etwas weiter nach vorne gebildet als nach hinteren Vokalen /o/, /u/ usw. Manchmal nähert sich die Aussprache dem hdt. [ç]: [mïlx+] …*Milch*.

[26]The fricative [x] is analyzed as an allophone of /h/ and [ɣ] as an allophone of /g/.

> "After front vowels /i/, /e/, /ɛ/ etc., [x] and [ɣ] are produced somewhat more front than after back vowels /o/, /u/ etc. Sometimes the pronunciation approaches standard German [ç]: [mı̈lx+] …Milch".

As in St. Ruprecht, [x] undergoes coarticulatory fronting (to prevelar) in Fersentalerisch, but neither variety has the phonological process of velar fronting.

The coarticulatory fronting of velars has been documented for other German-language (UG) islands as well. Two examples are Gottschee (Bav) in modern-day Slovenia (Tschinkel 1908: 26) and the Cimbrian variety of the Sieben Gemeinden ("Seven Communities") in and around Asiago in Northeast Italy (Kranzmayer 1956: 50). Both places are indicated on Map 3.3, Map 15.3, and Map 15.4.

Similar examples from SwG dialects can be found in the descriptive literature as well. One case known to me is implied in the statement made by Baumgartner (1922: 11) on the realization of /x/ in the HAlmc variety spoken in the area around Bern. On that page he notes that his dialect only has velar [x], which can be slightly fronted in the context of front sounds. ("Unsere Mundarten kennen nur das velare x … In palataler Umgebung setzt der Laut ganz wenig vorn ein … ").

The SBav variety of Laurein (Kollmann 2007; Map 3.3) possesses a single fortis dorsal fricative (< WGmc $^+$[k x]) as well as the corresponding affricate. According to Kollmann (2007: 175) those sounds surface as prevelar ("prävelar"), which is very close (but not identical) to the palatal articulation (ich-Laut) of StG. The reason Laurein is different from the other UG varieties discussed above is that it does not involve coarticulatory fronting. The reason is that /x/ and /kx/ are realized as prevelar in the context of any type of sound, including front vowels.

The requirement that Laurein /x/ and /kx/ be articulated as phonetically fronted velars (prevelars) – but not as palatals – is due to a dialect-specific rule of phonetic implementation. Recall from §2.2.1 that phonetic implementation is necessary to specify fine-grained place and manner distinctions for consonants that are not necessary in the phonology. For example, a rule of phonetic implementation is required to indicate the exact place of articulation of [coronal] stops (/t d/) as alveolar or dental. A similar rule is present in Laurein; namely that the one requiring that /x/ surfaces as a prevelar (but not as a palatal, velar, or uvular).

Laurein is the clearest case to my knowledge of a variety of German in which /x/ undergoes small-scale (phonetic) fronting even in the neighborhood of back sounds. Based on the terse statement regarding the realization of /x/ in the LAlmc dialect spoken in northwest Switzerland (Map 3.1), Schläpfer (1956: 30) implies that the same kind of phonetic implementation is attested in that variety as well. ("χ (=[x]) wird normalerweise palatal … gebildet"). However, Schläpfer points out in a footnote on the same page that the fronted articulation is not as front as StG [ç].

12.9.3 Phonetic retraction

An underlying segment like /x/ can surface as velar ([x]) or it can have a retracted realization as uvular ([χ]); recall §1.5 and Table 12.37. I discuss below examples from the descriptive literature on German dialects for those two articulations ([x] and [χ]).

Even in a well-researched language like StG the term "velar" is often misused. Anyone knowledgeable about StG knows that the ach-Laut after a low back vowel (e.g. in words like *Bach* 'stream' and *machen* 'do-INF') is uvular and not velar (Kohler 1990a,b), but there is nevertheless a tradition of referring to the sound as "velar" and transcribing it as [x].[27] One example of a work that follows this tradition is the most well-known pronouncing dictionary for StG (Mangold 2005: 44, 46, 52).

It is conceivable that there is a system in which [x] and [χ] are both present and that the two are contextually determined. If there were such a German dialect, then the uvular realization would be a consequence of coarticulation. To the best of my knowledge, no German dialect has been described in this manner, although the reader is referred to the discussion in §1.5 on the contextually-determined distribution of [x] and [χ] in StG.

In the descriptive literature referred to throughout this book, the ach-Laut ([x]) is usually classified as a phonetic velar. By contrast, other authors observe that /x/ is pronounced as uvular ([χ]) regardless of the neighboring sounds. Sometimes [x] and [χ] are assumed to be free variants; in other cases the difference between [x] and [χ] is shown to be a function of geography. In all such studies /x/ is not a product of coarticulation, but instead of phonetic implementation. One study mentioned earlier (§12.3) is Ibrom (1971), who notes that /x/ is pronounced as velar ([x]) in the Swb variety between Augsburg and Donauwörth (Map 3.1) but as either velar ([x]) or uvular ([χ]) in the CBav varieties between Augsburg and Aichach (Map 3.3). According to Stein-Meintker (2000), the uvular [χ] pronunciation is the most common realization of /x/ in Garmisch-Partenkirchen (CBav; Map 3.3). In Zürich German (HAlmc; Map 3.2), Fleischer & Schmid (2006: 244) observe that /x/ (and its lenis counterpart) are in free variation with the corresponding uvulars. The final example mentioned here is Hove (2002: 100-101), who demonstrates that there are three ways of realizing /x/ in SwG, namely velar, velar with a slightly lowered tongue body, or uvular.

[27] The realization of the ach-Laut after the vowel [ɑ] as uvular is particularly clear in the x-ray tracing (Tafel 11) in Wängler (1981). Wängler refers to that realization of the ach-Laut as "velar-postdorsal".

12.10 Conclusion

The aim of this chapter has been to summarize the attested targets and triggers for velar fronting – in both word-initial and postsonorant position – in a large selection of German dialects representing all subdivisions of German dialects from Appendix A. The study has determined that dialects can be classified according to the generality of targets and triggers; hence, some varieties have a very specific set of triggers and/or targets, while others have a much broader set. The findings have been argued to support the model of rule generalization, according to which language change (velar fronting) began with a small set of targets and triggers and then expanded through time and space to include more and more target segments and more and more triggers.

In the following chapter I consider data drawn from a linguistic atlas (SNiB) which provides evidence that velar fronting is active throughout Lower Bavaria. I demonstrate in Chapter 13 that three of the historical stages posited in the present chapter on the basis of velar fronting triggers are attested in Lower Bavaria, namely Stage 2a (after high front vowels), Stage 2b (after nonlow front vowels, and Stage 2c' (after all front vowels).

13 Velar fronting in Lower Bavaria

13.1 Introduction

The triggers for the synchronic rule of velar fronting were shown in Chapter 12 to mirror a series of historical stages, as in Table 13.1. Recall that HFV=high front vowel, MFV=mid front vowel, LFV=low front vowel, and CC=coronal sonorant consonant (/r l n/). The final column gives phonetic transcriptions for sequences corresponding to the various triggers for postsonorant velar fronting.

Table 13.1: Six velar fronting stages

Stage	Triggers	Example (postsonorant context)						
1	—	[ix]	[ɪx]	[ex]	[ɛx]	[rx]	[æx]	[ɑx]
2a	HFV	[iç]	[ɪç]	[ex]	[ɛx]	[rx]	[æx]	[ɑx]
2b	HFV, MFV	[iç]	[ɪç]	[eç]	[ɛç]	[rx]	[æx]	[ɑx]
2c	HFV, MFV, CC	[iç]	[ɪç]	[eç]	[ɛç]	[rç]	[æx]	[ɑx]
2c’	HFV, MFV, LFV	[iç]	[ɪç]	[eç]	[ɛç]	[rx]	[æç]	[ɑx]
2d	HFV, MFV, LFV, CC	[iç]	[ɪç]	[eç]	[ɛç]	[rç]	[æç]	[ɑx]

Stage 1 represents the point where velar fronting was absent; hence, velar sounds like /x/ surface as [x] regardless of the nature of the preceding sound. At Stage 2a only high front vowels induced velar fronting, and each subsequent stage incorporates more segments into the set of velar fronting triggers. Recall that Stage 2c and Stage 2c’ are coterminous. Thus, Stage 2b has the choice of adding coronal sonorant consonants to the set of triggers at a later stage (Stage 2c) or low front vowels (Stage 2c’).

Of the five velar fronting stages listed above, Stage 2a is the least inclusive because it reflects the narrowest natural class (high front vowels), while Stage 2d is the most inclusive because it captures the broadest natural class (coronal sonorants). Recall that Stage 2d represents the default pattern for German dialects. By contrast, Stage 2a was shown to be extremely rare, being only attested in two places, namely Visperterminen (HstAlmc) in Switzerland (Upper Valais) and Plettenberg (Wph) in Germany (North Rhine-Westphalia).

What is lacking is a study of velar fronting in a particular area which documents cities, towns, and villages representing more than one of the postulated historical stages. The purpose of the present chapter is to eliminate this gap by discussing the synchronic state of velar fronting in Lower Bavaria (Niederbayern). The case study undertaken below demonstrates that velar fronting is the norm throughout Lower Bavaria, but a closer scrutiny of the data reveals that those velar fronting places exemplify four of the historical stages in Table 13.1, namely Stage 1, Stage 2a, Stage 2b, and Stage 2c'. A surprising – but welcome – result of the present investigation is that the rarest one of all, namely Stage 2a, is by far the most common one throughout Lower Bavaria.

The data are drawn exclusively from Part 5 of the six part *Bayerischer Sprachatlas*, namely the *Sprachatlas von Niederbayern* (SNiB). SNiB consists of seven volumes containing maps and narrow phonetic representations for the examples depicted on those maps. The reason this atlas is particularly suitable for this investigation is that Volume 3 on vowels, Volume 4 on consonants, and Volume 7 on the morphology of nouns contain phonetic representations for all of the two hundred twenty-one places in Lower Bavaria which were the sources for data (Belegorte).

Drawing data from a single source for a large number of places in a single area is advantageous because the result can be thought of as a snapshot of a particular area at a particular point in time. This snapshot is important because it gives clues as to how the original rule was originally phonologized and spread temporally and spatially.

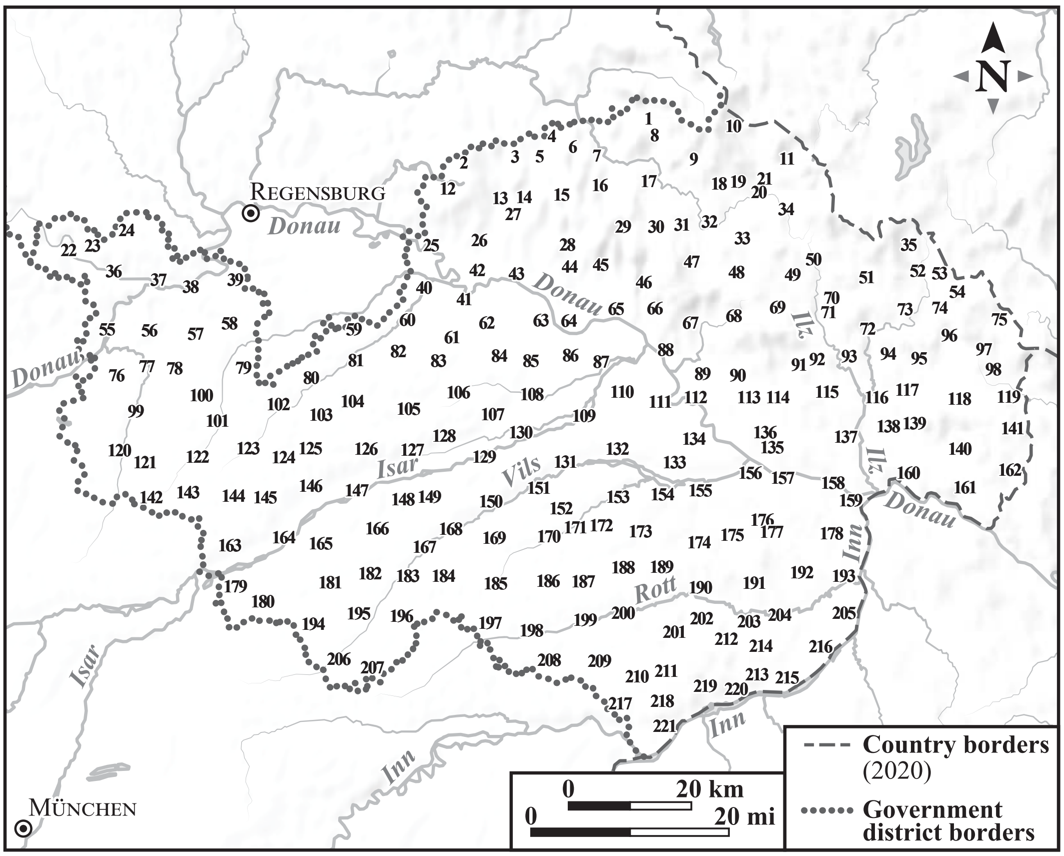
The remainder of this chapter is organized as follows: §13.2 provides some important background information, and §13.3 gives data from SNiB representing Stage 1, Stage 2a, Stage 2b, and Stage 2c'. §13.4 discusses the areal distribution of those four stages in Lower Bavaria and provides a map illustrating that distribution. In §13.5 I discuss several issues that arise in the course of this chapter. §13.6 concludes.

13.2 Background

Before presenting the data from SNiB it is essential that some information be provided on the geography of Lower Bavaria (§13.2.1), the state of velar fronting in Bavarian phonology on the basis of the descriptions of that dialect area cited in previous chapters (§13.2.2), and the SNiB transcription system (§13.2.3).

13.2.1 Geography of Lower Bavaria

Bavaria is divided into seven large administrative divisions called government districts (Regierungsbezirke), one of which is Lower Bavaria (Map 13.1). It is bounded by the government districts of Upper Bavaria (Oberbayern) to the south and west and Upper Palatinate (Oberpfalz) to the north. To the northeast is the Czech Republic (South Bohemia), and to the southeast is Austria (Upper Austria). The numbers depicted on Map 13.1 represent the cites, towns, and villages which constitutes the Belegorte for SNiB. The names of those places are provided in Appendix J.



Map 13.1: Lower Bavaria

In contrast to Upper Bavaria and Upper Palatinate, there are no large urban centers in Lower Bavaria. The largest three cities (with the approximate population in parentheses) are the capital Landshut (ca. 73,000), Passau (ca. 52,000), and Straubing (ca. 47,000).

Almost all of Lower Bavaria is situated within the CBav dialect area (Map 3.3), although some of the places in the north are classified as NBav (Map 3.4). Four places in Lower Bavaria are depicted on those two maps, namely Heining (=[58]) on Map 3.3 and Zinzenzell (=[2]), Herrnsaal (=[38]), and Atting (=[40]) on Map 3.3.

13.2.2 Velar fronting in Bavarian phonology

Most of the studies cited in this book on CBav and NBav have shown that [x] and [ç] stand in an allophonic relationship which is expressed by some version of velar fronting. In this section I discuss briefly the segments that induce that process (triggers) as well as the sounds that undergo it (targets) with particular reference to Bav. I refer to the triggers as "potential" velar fronting triggers because the data discussed in this chapter reveal that those triggers are not the same in every place in Lower Bavaria.

Potential velar fronting triggers consist of some subset of the coronal sonorants – coronal sonorant consonants and front vocoids (vowels and glides). Consider first the vocoids. In a number of case studies discussed earlier it has been demonstrated that the system of vowels – both monophthongs and diphthongs – can differ from place to place, even within the same dialect area. The same is true for Bav; hence, it needs to be stressed that the inventory of monophthongs I posit in Table 13.2 might not be the same in all Bav varieties. The system in Table 13.2 is very similar to the ones posited by other authors of Bav dialects, e.g. Keller (1963: 207) for Upper Austrian (CBav), Rowley (1989: 422) for NBav, Wiesinger (1989: 485–486) for the variety of CBav spoken in and around Munich (München), Bachmann (2000: 17) for the NBav variety of Eslarn (Upper Palatinate), and Bolter (2022) for Austrian German varieties spoken in Styria. There is general agreement that front rounded vowels (e.g. /y ø/) are absent from the set of contrastive vowels (Wiesinger 1989: 452).[1]

Table 13.2: Distinctive vowels of Bavarian

high	i	u
mid	e	o
	ɛ	ɔ
low	æ	ɑ

[1]The differences between the vowels in Table 13.2 and the ones posited in the aforementioned studies is immaterial. For example, Keller assumes that front rounded vowels are phonemic in some varieties in Upper Austria, Keller and Bachmann also have nasalized vowels, Bachmann posits schwa (/ə/), and Keller, Rowley and Bolter have /a/ instead of /æ/.

The important takeaway from Table 13.2 is that there are four segments that are potential velar fronting triggers, namely /i e ɛ æ/. Those four segments are distinguished along the height dimension; hence, /i/ is high, /e ɛ/ are mid, and /æ/ is low. In this book I have not committed myself to a particular phonetic property distinguishing the two mid front vowels, /e/ and /ɛ/; in previous chapters I simply assume the cover feature [±tense], e.g. /e/ is [+tense] and /ɛ/ is [−tense]. It will be useful in the remainder of this chapter to think of those two vowels in terms of degrees of openness in the IPA tradition. Hence, /e/ is more close than /ɛ/; or – put differently – /e/ occupies a higher level than /ɛ/, which is implicit in the way those two vowels are displayed in Table 13.2. Some authors similarly posit two (phonemic) levels of high front vowels for Bav, e.g. Noelliste (2017) has both /i/ and /ɪ/ for Ramsau am Dachstein in Styria (CBav).

In addition to the monophthongs in Table 13.2 Bav has a number of phonemic diphthongs. Six of the diphthongs Rowley (1989) lists for NBav are /ei/, /oi/, /ai/, /ou/, /ɔu/, /ɑu/. Of those diphthongs only the former three can potentially induce velar fronting because they end in a front vocoid. All diphthongs in Bav are falling in the sense that the second component and not the first is nonsyllabic, i.e. a glide (e.g. [ei̯] in a narrow transcription).

The set of potential velar fronting triggers also consists of the three sonorant consonants /r l n/. In Bav those sounds are either dental or alveolar and hence phonologically [coronal]. See for example the consonant phonemes in Rowley (1989: 423) as well as the other studies cited above. Both Rowley (1989) and Wiesinger (1989) note that the two liquids /l r/ are typically vocalized in coda position (recall §3.5). Since the vocalized /l/ surfaces as a front vocoid, it is a potential velar fronting trigger, e.g. the pronunciation [zɔidz] (from (/zɔldz/) for *Salz* 'salt' (Wiesinger 1989: 459, 486).

The works cited in this book on Bav dialects agree that [x] and [ç] are the only two dorsal fricatives and that those two sounds stand in complementary distribution in postsonorant position, e.g. Kranzmayer (1956: 71), Kufner (1960: 12–13) for Upper Bavaria; Dozauer (1967: 81–83; 103–104) for Bergstetten (Upper Palatinate); Bachmann (2000: 43) for Eslarn (Upper Palatinate), Noelliste (2017) for Ramsau am Dachstein (Styria). The relationship between the ich-Laut and the ach-Laut in Bav phonology presupposed by those authors is depicted in (1):

(1) /x/

[x] [ç]

Some of the authors referred to above observe that velar and palatal allophones also occur as geminates (e.g. Bachmann 2000 for Eslarn, Dozauer 1967 for Bergstetten). In some Bav varieties with the affricate /kx/ that sound can likewise occur as the equivalent palatal ([kç]) in the context of front sounds (Chapter 15). As is typical for UG, the diminutive suffix *-chen* is absent in Bav; hence, there are no cases of [x] and [ç] occurring after back vowels, as in StG [tauxən] 'dive-INF' vs. [tauçən] 'rope-DIM'.

The literature cited throughout this book on Bav indicates that velar fronting in that dialect region is characterized by the broadest set of triggers (=coronal sonorants). This assessment is made explicit in Table 12.6, which lists sources for thirty-eight varieties of Bav and classifies them in terms of the targets and triggers for postsonorant velar fronting. Only three of those thirty-eight sources show that a subset of the coronal sonorants induce velar fronting, namely (NBav) Eisendorf (Seemüller 1908c), and (CBav) Isarwinkel (Maier 1965), where velar fronting fails to be induced by a coronal consonant (/r/), and (CBav) Großberghofen (Gladiator 1971), where only nonlow front vowels trigger the change. In the remainder of this chapter I demonstrate that those three examples are more the rule than the exception in Lower Bavaria.

13.2.3 SNiB transcription system

SNiB follows the tradition adopted in some linguistic atlases of providing extremely narrow phonetic transcriptions which express very subtle articulations that are usually ignored in the descriptive grammars cited throughout this book, including the ones mentioned in the previous section. It is not always clear how the symbols and diacritics in SNiB match up with the ones adopted in the previous section, nor is it evident what segments are phonemic. For these reasons I present data from SNiB throughout this chapter using that source's transcription system and make no attempt to translate those transcriptions into the symbols employed in the first twelve chapters of this book. It is therefore imperative to clarify the SNiB system of symbols and diacritics for velar fronting triggers and targets.

Consider first vowels. SNiB adopts the five basic phonetic symbols ⟦i e u o ɑ⟧, which represent the cross-linguistically common five vowel system. There are no front rounded vowels in the material discussed below, although SNiB also includes the symbols ⟦ü ö⟧.

The vowel symbols ⟦i e u o ɑ⟧ are enhanced with diacritics which capture the degree of openness. Table 13.3 indicates that there are five such levels. I refer to the vowels in the first and second columns below as I-VOWELS and E-VOWELS throughout the remainder of this chapter. I only consider i-vowels and e-vowels because those are the front vowels which are potential velar fronting triggers. The back vowels ⟦u o ɑ⟧ can likewise be referred to as U-VOWELS, O-VOWELS, and ɑ-VOWELS.

Table 13.3: SNiB symbols for front vowels

i-vowels	e-vowels	Description
⟦i̤⟧	⟦e̤⟧	very close
⟦ị⟧	⟦ẹ⟧	close
⟦i⟧	⟦e⟧	neutral
⟦i̧⟧	⟦ȩ⟧	open
⟦i͈⟧	⟦e͈⟧	very open

It should be clear that the five levels for i-vowels and e-vowels are considerably more fine-grained that the one in Table 13.2. What is not expressed in Table 13.3 is that the transcriptions are even more narrow than what the diacritics suggest because SNiB occasionally encloses the diacritics expressing the five degrees of openness in parentheses. I do not include the parenthesis in the phonetic transcriptions given below.[2]

Two additional vocalic sounds that play an important role below are ⟦ə⟧ and ⟦α⟧. It is clear from the way in which the symbols ⟦ə⟧ and ⟦α⟧ are employed in transcriptions that they represent two variant pronunciations of the sound referred to throughout this book as the vocalized-r, cf. StG [ɐ] in [uːɐ] ‘clock’ and [fɑːtɐ] ‘father’.

The vocalized pronunciation of coda /l/ is transcribed in SNiB as one of the i-vowels or e-vowels depending on the place in Lower Bavaria.

In addition to front vowels, coronal sonorant consonants (/r l n/) are potential velar fronting triggers. SNiB has a number of symbols for those three sounds, but the most important ones are ⟦r l n⟧. The pronunciation guide for all three volumes consulted does not discuss the place of articulation for those three sounds, although it is reasonable to assume on the basis of what is known about the phonetics and phonology of consonants in other varieties of Bav (see §13.2.3) that

[2]Some works cited earlier for Bav depart from Table 13.2 by adopting more than two levels for i-vowels and/or e-vowels, but the maximum number of levels in those studies is three, e.g. Kranzmayer (1956: X) has three levels for e-vowels and Wiesinger (1970a: 1) has three levels for i-vowels and e-vowels. Neither of those studies has demonstrated that the vowels posited are actually contrastive (phonemic).

⟦l n⟧ are denti-alveolar and that they are therefore phonologically marked for the frontness feature ([coronal]). SNiB notes that ⟦r⟧ is an apical trilled sound ("Zungenspitzen-r (gerollt)"), which implies that ⟦r⟧ is phonologically [coronal]. SNiB also includes a symbol for an apical rhotic with a different manner of articulation (⟦ɹ⟧), which is referred to as "rubbed" ("gerieben"), as well as two symbols for uvular rhotics (⟦ʀ ʁ⟧). None of the data discussed below include the rhotics transcribed as ⟦ɹ ʀ ʁ⟧.

SNiB follows the tradition described in §1.5 of assigning three distinct places of articulation to dorsal fricatives. Since SNiB also postulates fortis and lenis obstruents, there are consequently six separate categories with unique symbols, which are given in Table 13.4:

Table 13.4: SNiB symbols for dorsal fricatives

SNiB term	lenis	fortis
Palatal (ich-Laut)	χ	χ̥
Between ich and ach	ꭓ	ꭓ̥
Velar (ach-Laut)	x	x̥

It has been made abundantly clear throughout this book that I follow the alternative tradition which posits two places of articulation for dorsal fricatives, namely front dorsals (palatals) and back dorsals (velars). This is also the position adopted by all of the authors cited in §13.2.2. As indicated in Table 13.5, I treat SNiB palatal sounds as front dorsals (palatals), but I collapse the SNiB velar sounds and the sounds belonging to the intermediate category as back dorsals. See also Chapter 15 for a similar interpretation of the three-way place distinction for dorsal fricatives presupposed in two other linguistic atlases, namely SDS and VALTS. The fortis and lenis articulations in Table 13.4 are grouped together in Table 13.5 because none of the data considered below suggest that the front and back dorsals belonging to those two categories behave differently.

In the second column of Table 13.5 I provide the place features for the three SNiB places of articulation, and in the final column I give what I consider to be the most likely phonetic realization of the corresponding sounds. Thus, the palatal place of articulation (front dorsal) is pronounced as [ç], but the simplex [dorsal] articulation can either be realized as velar or as uvular.

Recall from §12.9.3 and Table 12.37 that the distinction between velar and uvular is not relevant for the phonology of German dialects. Hence, the two simplex [dorsal] articulations from SNiB are realized as velar or uvular by phonetic rules.

Table 13.5: SNiB symbols for dorsal fricatives and their probable interpretation

SNiB symbols	Phonological features	Probable phonetic realization
Palatal ⟦χ⟧/⟦ꭔ⟧	[coronal, dorsal] (front dorsal)	Palatal [ç]
Intermediate ⟦ꭗ⟧/⟦ꭘ⟧	[dorsal] (back dorsal)	Velar [x]
Velar ⟦x⟧/⟦ꭖ⟧	[dorsal] (back dorsal)	Uvular [χ]

The clearest argument for grouping SNiB's intermediate category (⟦ꭗ⟧/⟦ꭘ⟧) together with the velar category (⟦x⟧/⟦ꭖ⟧) is that those two sets of sounds behave phonologically the same way, namely as back dorsals. This point can be made clear by considering the phonetic transcriptions in SNiB for the dorsal fricative in the context after a back vowel. A typical example is the word *Joch* 'yoke' from Map 94, Volume 4. The data accompanying that map reveal that there are sixty-nine places in Lower Bavaria in which the dorsal fricative is transcribed after an o-vowel with the symbols for the intermediate category (=⟦ꭗ ꭘ⟧), thirty-eight places where that fricative is transcribed with a symbol for the velar category (=⟦x ꭖ⟧), and five places with transcriptions with symbols for the palatal category (=⟦χ ꭔ⟧). Although palatals can regularly occur after all or some back vowels in the areas discussed in Chapter 14 and Chapter 15, none of those places are in Lower Bavaria. This suggests that the five places with a palatal after the back vowel in *Joch* are simply anomalies; this assessment derives further support from the fact that dorsal fricatives in those five places are not realized as palatal after back vowels in other words. What is more significant is that the velar category (⟦x ꭖ⟧) and the intermediate category (⟦ꭗ ꭘ⟧) both predominate in *Joch* (i.e. after an o-vowel), which is not surprising given that back vowels (such as o-vowels) are the prototypical context for the ach-Laut in StG and in all of the velar fronting varieties discussed in previous chapters. Similar statistics can be obtained from the data accompanying SNiB maps for other words which contain a back vowel followed by a dorsal fricative.

As noted earlier, I provide all data below in the original transcriptions from SNiB. I make extensive reference to the five levels of i-vowels and e-vowels and show how those sounds can be understood given the featural system adopted in previous chapters. I refer to dorsal fricatives in terms of two place categories, namely front dorsals (palatals) and back dorsals (velars).

13.3 Data representing four historical stages

The distribution of front dorsals and back dorsals in the data accompanying the SNiB maps reveal that the places indicated on Map 13.1 exhibit one of the four stages from Table 13.1, namely Stage 1 (§13.3.1), Stage 2 (§13.3.2), Stage 2b (§13.3.3), or Stage 2c' (§13.3.4).

13.3.1 Stage 1

As is demonstrated below, velar fronting is the norm throughout Lower Bavaria. Nevertheless, conservative enclaves are attested without velar fronting. This statement is based on the maps in SNiB for the modern reflexes of MHG /x/ in the context after a vowel. Nonvelar fronting places are characterized by realizations of that sound with back dorsals (⟦x̗ x̗̥ x x̥⟧) after front and back vowels alike. Needless to say, front dorsals (⟦χ χ̥⟧) are absent in Stage 1 varieties.

In (2) I present data from one particular place representing Stage 1, namely Rinchnach (=[33]). In the first column I give the phonetic transcriptions from SNiB, and in the final column I list the volume and map number of the corresponding map and list of data. In many of the phonetic transcriptions from SNiB the original fricative (/x/) is now realized either as [h] or as a manner of articulation somewhere between that of a fricative and that of an approximant. I only consider data in which MHG /x/ is realized as a dorsal fricative and therefore do not take reduced variants into consideration. Some of the examples in (2) and below are the transcriptions for words embedded in a longer phrase, which I do not include. The data are arranged according to the degree of openness of the vowel preceding /x/, namely i-vowels in (2a–2c), e-vowels in (2d–2f), and back vowels in (2g–2m). The dataset in (2) shows that palatals (⟦χ χ̥⟧) are absent entirely and that MHG /x/ surfaces as a back dorsal [x] (=⟦x x⟧) regardless of the nature of the preceding vowel.[3]

(2) Stage 1 for Rinchnach (=[33])

a.	ş̌ḍī̩x̗̣	Stiche	'sting-PL'	7: 139
b.	šdĭx̗	Stich	'sting'	3: 4
	we̩̩ix̗α	weihen	'sanctify-INF'	4: 122

[3]The SNiB transcription system incorporates a number of diacritics which express various articulations not directly relevant to velar fronting. Examples include lip rounding (e.g. ⟦ë⟧), nasalization (e.g. ⟦ẽ⟧), length (e.g. ⟦ē⟧), half-length (e.g. ⟦ê⟧), unexpected conspicuous shortening (e.g. ⟦ĕ⟧), aspiration (e.g. ⟦th⟧/⟦tʰ⟧), strengthened lenis sounds (e.g. ⟦b̥⟧), and weakened fortis sounds (e.g. ⟦t̬⟧).

c.	id̩lα̣įꭓ	(in die) Leich	‘(to the) burial’	4: 28
	khọ̄įꭓ	Kalk	‘lime’	4: 80
	bα̣įꭓ	Bäuche	‘stomach-PL’	7: 82
d.	b̩ẹꭓ	Pech	‘misfortune’	4: 39
	ǫẹꭓα	Eiche	‘oak tree’	7: 57
	lẹ̆ꭓα	Löcher	‘hole-PL’	7: 105
e.	reꭓα	Rechen	‘rake’	3: 30
f.	we͈ꭓα	weihen	‘sanctify-INF’	4: 122
g.	rα̣o̤xα	rauchen	‘smoke-INF’	4: 127
h.	jọ̆x	Joch	‘yoke’	4: 94
i.	dox	Dach	‘roof’	4: 131
	moxα	machen	‘do-INF’	3: 78
	woxαn	Wochen	‘week-PL’	7: 61
	brα̣oxα	brauchen	‘need-INF’	4: 128
j.	nǫxt͓ʰ	Nacht	‘night’	7: 75
k.	dα̣xα	Dächer	‘roof-PL’	7: 113
	nα̣xd͈ʰ	Nächte	‘night-PL’	7: 76
l.	buαxα	Buche	‘beech tree’	3: 130
	duαx	durch	‘through’	3: 29
m.	s̩g̩v̩iəꭓαd	das Vieh (Gefiechert)	‘the cattle’	3: 5

The items *Kalk* in (2c) and *durch* (2l) illustrate Liquid Vocalization, which was already shown to be active in Austrian varieties of CG in §3.5. The generalization is that /l/ vocalizes to a front vowel and /r/ to a back vowel.[4]

Stage 1 also includes places with the general pattern as in (2) but with one word with an unexpected palatal after an i-vowel. One example is Pocking-Hartkirchen (=[205]), which has data comparable to the ones in (2) with the symbols for [x] (=⟦ꭓ x⟧) after all vowels, e.g. ⟦nǫxd⟧ ‘night’, ⟦v̩α̣e̤ꭓn̥⟧ ‘spruce’ (4: 125), ⟦khọįꭓ⟧ ‘lime’, ⟦vīꭓ⟧ ‘cattle’ with the exception of the word ⟦deiχdα⟧ ‘daughters’ (=7: 123) with a palatal after the i-vowel ⟦i⟧.

[4]The presence of the underlying /r/ and /l/ in these items can be inferred from German orthography, as indicated in the second column of (2). One could take the alternative position that the ⟦į⟧ in *Kalk* and the ⟦α⟧ in *durch* are present in the underlying representation, in which case Liquid Vocalization is not a synchronic rule, although it was uncontroversially active diachronically. In the remainder of this section I assume that Liquid Vocalization operates synchronically, although my treatment of velar fronting is also compatible with the alternative approach.

13.3.2 Stage 2a

In the SNiB transcription system Stage 2a dialects can be identified if ⟦χ χ̥⟧ (=[ç]) occur after i-vowels and ⟦x x̥ x x̥⟧ (=[x]) after e-vowels and back vowels.

Stage 2a is attested in Wurmsham (=[207]), which possesses the four front vowels ⟦i ẹ̤ ẹ e⟧. The dataset in (3) shows that ⟦χ⟧ (=[ç]) surfaces after ⟦i⟧ in (3a) and ⟦x x⟧ (=[x]) after ⟦ẹ̤⟧ in (3b), ⟦ẹ⟧ in (3c), ⟦e⟧ in (3d), and back vowels in (3e–3h).

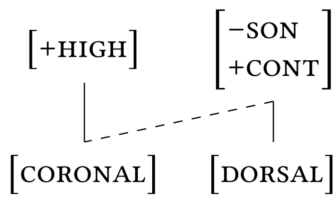
(3) Stage 2a for Wurmsham (=[207])

a.	šdiχ	Stich	'sting'	3: 4
	šdiχ	Stiche	'sting-PL'	7: 139
	vīχ	Vieh	'cattle'	3: 5
	khọiχ	Kalk	'lime'	4: 80
b.	ɑ̣d̩lɑ̣ẹ̤xgẹ̄	(auf die) Leich	'(to the) burial'	4: 28
	v̩ɑ̣ẹ̤xn̥	Fichte	'spruce'	4: 125
c.	b͈ẹx	Pech	'misfortune'	4: 39
	bɑ̣ẹ̤x	Bäuche	'stomach-PL'	7: 82
d.	d̩ëxdα	Töchter	'daughter-PL'	7: 123
	gŋexth	Knecht	'vassal'	4: 124
e.	lọx	Loch	'hole'	7: 104
	d̩ọxdα	Tochter	'daughter'	7: 122
	bɑọx	Bauch	'stomach'	7: 81
f.	dǫx	Dach	'roof'	7: 112
	nǫxth	Nacht	'night'	7: 75
g.	nɑ̣x̩th	Nächte	'night-PL'	7: 76
	dɑ̣xα	Dächer	'roof-PL'	7: 113
h.	ọαx̩	Eiche	'oak tree'	7: 57
	bụαx̩	Buche	'beech tree'	3: 130
	dûαx	durch	'through'	3: 29

The word ⟦khọiχ⟧ in (3a) reveals that the vowel produced by Liquid Vocalization for a target /l/ is a high front vowel that serves as a trigger for velar fronting. Thus, the i-vowels that induce velar fronting include not only phonemic i-vowels, but also synchronically-derived i-vowels. As shown below in §13.5.2, the feeding order between Liquid Vocalization (for /l/) and velar fronting is not only true for Wurmsham (=[207]), but it represents the unmarked pattern for velar fronting in Lower Bavaria.

The five i-vowels ⟦i̤ ị i ï̭ i̯⟧ are phonologically [+high] throughout Lower Bavaria. In that type of Stage 2a system, velars ([x]) and palatals ([ç]) are allophones of underlying velars (/x/), and velar fronting is restricted to the context after [+high] vowels. The rule of Velar Fronting-6 – posited earlier in §6.2.2 for Visperterminen – is way of expressing formally the restricted set of triggers characterized by Stage 2a. Recall that back vowels are analyzed in Visperterminen as [peripheral], which I replace with [dorsal] in (4).

(4) Velar Fronting-6:



Most of the Stage 2a varieties identified below display a very regular system like the one in (3). However, several Stage 2a places display one of two types of irregularity. In the first, [ç] regularly occurs after i-vowels and elsewhere [x], but there is a very small number of words (one or two) with an unexpected [x] after an i-vowel. In the second, [ç] and [x] have the expected distribution for a Stage 2a system, but there is an unexpected instance of [ç] after a non-i-vowel.

The first type of dialect is represented by Zinzenzell (=[2]). The maps in SNiB reveal that this is a clear case of Stage 2a with palatals after two levels of i-vowels (⟦i i̯⟧), and elsewhere velars, e.g. ⟦šḍ̤îχ⟧ 'sting', ⟦γ̩ei̯χα⟧ 'cattle-PL', ⟦khôi̯χ⟧ 'lime', ⟦wɑ̣i̯χα⟧ 'sanctify-INF', ⟦bɑ̣i̯χ⟧ 'stomach-PL', ⟦dəṣ̤i̯χ⟧ '(the) colter' (4: 132) vs. ⟦blẹχ⟧ 'tin' (4: 130). The important point is that this Stage 2a system also possesses the aberrant item ⟦i̤nḍlɑ̣î̯χḍ̤⟧ '(to the) burial' with ⟦χ⟧ (=[x]) after an i-vowel.

Neukirchen am Inn (=[178]) exemplifies the second type of Stage 2a system. The maps in SNiB indicate a clear Stage 2a pattern in which [ç] surfaces after i-vowels (⟦i i̯⟧) and [x] after e-vowels (⟦ẹ ę⟧) and back vowels, e.g. ⟦šdiχ⟧ 'sting', ⟦vɑ̣iχn⟧ 'spruce', ⟦vî̯χα⟧ 'cattle-PL', ⟦ɑvḍlɑ̣î̯χ⟧ '(to the) burial', ⟦khoi̯χ⟧ 'lime' vs. ⟦b̤lẹχ⟧ 'tin', ⟦ręχα⟧ 'rake', and ⟦ḍɑ̣xə⟧ 'roof-PL' The surprising item is the word ⟦ḍęχḍ̤α⟧ 'daughter-PL' with an unexpected palatal after an e-vowel.

Sandbach (=[157]) is similar to Neukirchen am Inn ([178]) with the one difference being that the unexpected palatal occurs after a back vowel, i.e. ⟦joχ⟧ 'yoke'. The occurrence of a palatal in the context after a back vowel is well-attested in various places outside of Lower Bavaria discussed in Chapter 14, but this is not a common feature in Lower Bavaria. Thus, phonetic transcriptions like ⟦joχ⟧ are sporadic and therefore do not reflect a significant pattern; recall the discussion in §13.2.3.

13.3.3 Stage 2b

Stage 2b dialects are defined as places where [ç] occurs after i-vowels and [x] after back vowels. Within the class of e-vowels there is a threshold below which [x] occurs. The e-vowels after which [ç] surfaces are phonologically mid, while the e-vowels after which [x] occurs are phonologically low. The exact cut-off point between mid e-vowels and low e-vowels can differ from place to place.

I illustrate Stage 2b with three different places. The first is Voglarn (=[201]), which has one i-vowel ⟦i⟧ and four e-vowels ⟦e̤ ẹ e ę⟧. In that town, [ç] surfaces after the nonlow front vowels ⟦i e̤ ẹ e⟧ (=5a–5d) and [x] after the low front vowel ⟦ę⟧ (5e) and after back vowels (=5f–5j).

(5) Data for Stage 2b in Voglarn (=[201])

a.	šdīχ	Stich	‘sting’	3: 4
	šdïχ	Stiche	‘sting-PL’	7: 139
	vî̈χ	Vieh	‘cattle’	3: 5
b.	ɑ̣d̥lɑ̣e̤χ	(auf die) Leich	‘(to the) burial’	4: 28
	bɑ̣e̤χ	Bäuche	‘stomach-PL’	7: 82
c.	γ̩ɑ̣ẹχd̆n̥	Fichte	‘spruce’	4: 125
	khǫẹχ̩	Kalk	‘lime’	4: 80
	b̩ẹχ	Pech	‘misfortune’	4: 39
d.	bleχ	Blech	‘tin’	4: 130
e.	gŋęxt͓ʰ	Knecht	‘vassal’	4: 124
	dę̈xdα	Töchter	‘daughter-PL’	7: 123
f.	jọx	Joch	‘yoke’	4: 94
	lọx	Loch	‘hole’	7: 104
g.	doxdα	Tochter	‘daughter’	7: 122
h.	dǫx̩	Dach	‘hole’	7: 112
	bǫx	Bach	‘stream’	4: 33
	nǫxth	Nacht	‘night’	7: 75
i.	nɑ̣xt̆n̥	Nächte	‘night-PL’	7: 76
j.	oαx̩	Eiche	‘oak tree’	7: 57

The featural system for the vowels of Voglarn is posited in Table 13.6. Recall from previous chapters that other dialects are attested in which certain e-vowels

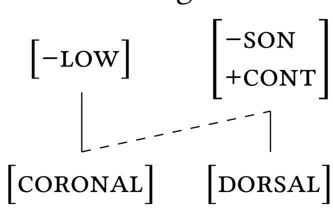
– typically [ɛ] in the symbols given in Table 13.2 – are phonologically low vowels, while other e-vowels (i.e. [e]) are phonologically mid. The nature of the features distinguishing two or more vowels in the same column is not important and is therefore not discussed.

Table 13.6: Distinctive features for vowels (Voglarn)

	⟦i⟧	⟦e̤ ẹ e⟧	⟦ę⟧	⟦ọ o ǫ⟧	⟦ɑ̣ ɑ⟧
[coronal]	✓	✓	✓		
[dorsal]				✓	✓
[low]	−	−	+	−	+
[high]	+	−			

Given the features in Table 13.6 the rule for all Stage 2b dialects (=6) spreads the frontness feature ([coronal]) to the right from any [coronal, −low] vowel onto a dorsal fricative (/x/), thereby deriving [ç]. Recall that Velar Fronting-2 was shown to be active synchronically in a number of German dialects outside of Lower Bavaria, e.g. in Rheintal (Switzerland) in §3.4.

(6) Velar Fronting-2



The second Stage 2b system is Reicheneibach (=[185]), which possesses one i-vowel ⟦i⟧ and three e-vowels ⟦ẹ e ę⟧. In that town, [ç] surfaces after the nonlow front vowels ⟦i ẹ⟧ (=7a, 7b) and [x] after the low front vowels ⟦e ę⟧ (=7c, 7d) and after back vowels (=7e−7i).

(7) Data for Stage 2b in Reicheneibach (=[185])

a.	šdîχ	Stich	‘sting’	3: 4
	šd̩ïχ	Stiche	‘sting-PL’	7: 139
	v̩īχ	Vieh	‘cattle’	3: 5
b.	ɑ̣d̤lɑ̣ẹχ	(in die) Leich	‘(to the) burial’	4: 28
	v̩ɑ̣ẹχt̀n̥	Fichte	‘spruce’	4: 125
	bɑ̣ẹχ	Bäuche	‘stomach-PL’	7: 82

	khoẹχ	Kalk	‘lime’	4: 80
	ḅẹχ	Pech	‘misfortune’	4: 39
c.	ḅleꭓ	Blech	‘tin’	4: 130
d.	gnęꭓt^{h}	Knecht	‘vassal’	4: 124
	ṭ̽ë̜ꭓḍα	Töchter	‘daughter-PL’	7: 123
e.	lọꭓ	Loch	‘hole’	7: 104
	ḍọxḍα	Tochter	‘daughter’	7: 122
f.	dox	Dach	‘roof’	7: 112
	joꭓ	Joch	‘yoke’	4: 94
	bɑ̜ọx	Bauch	‘stomach’	7: 81
g.	nǫꭓṭ̽h	Nacht	‘night’	7: 75
h.	nɑ̣ꭓṭ̽h	Nächte	‘night-PL’	7: 76
i.	dûαx	durch	‘through’	3: 29

The Reicheneibach system has the featural specifications in Table 13.7. The crucial difference between Table 13.7 and Table 13.6 is that ⟦ẹ e⟧ are both mid vowels in Table 13.6, but in Table 13.7 only ⟦ẹ⟧ is mid, while ⟦e⟧ is low.

Table 13.7: Distinctive features for vowels (Reicheneibach)

	⟦i⟧	⟦ẹ⟧	⟦e ę⟧	⟦ọ o ǫ⟧	⟦ɑ̣⟧
[coronal]	✓	✓	✓		
[dorsal]				✓	✓
[low]	−	−	+	−	+
[high]	+	−			

The third Stage 2b system is Martinshaun (=[125]), which has the two i-vowels ⟦i į⟧ and the four e-vowels ⟦ẹ̣ ẹ e ę⟧. In that dialect, [ç] occurs after the nonlow front vowels ⟦i į ẹ̣⟧ (=8a–8c), while [x] surfaces after the low front vowels ⟦ẹ e ę⟧ (=8d–8f) and back vowels (=8g–8l).

(8) Data for Stage 2b in Martinshaun (=[125])

a.	šdîχ	Stich	‘sting’	3:
	ṿīχ	Vieh	‘cattle’	3: 5
b.	šdįχ̩	Stich	‘sting’	3: 4
	mų̜įχ̩	Milch	‘milk’	3: 10
	khǫįχ	Kalk	‘lime’	4: 80
	šdįχ̩	Stiche	‘sting-PL’	7: 139

c.	î̩dlɑ̣e̤χ	(in die) Leich	'(to the) burial'	4: 28
	vɑ̣e̤χtn	Fichte	'spruce'	4: 124
	b̩ɑ̣e̤χ	Bäuche	'stomach-PL'	7: 82
d.	bẹχ	Pech	'misfortune'	4: 39
	blẹχ	Blech	'tin'	4: 130
e.	gŋex̩d̩	Knecht	'vassal'	4: 124
f.	rę̄xα	Rechen	'rake'	3: 30
	dęxdα	Töchter	'daughter-PL'	7: 123
g.	jọχ	Joch	'yoke'	4: 94
	b̩ɑọx	Bauch	'stomach'	4: 129
h.	lōx	Loch	'hole'	7: 104
i.	dǫx̩dα	Tochter	'daughter'	7: 122
	bǫx	Bach	'stream'	4: 33
j.	nɑ̣x̩d	Nacht	'night'	7: 75
	nɑ̣x̩d	Nächte	'night-PL'	7: 76
k.	dɑ̩x	Dach	'roof'	7: 112
l.	dûαx	durch	'through'	3: 29

The featural system for the vowels in Martinshaun ([125]) is given in Table 13.8. These features differ crucially from the ones in Table 13.6 and Table 13.7 in terms of the cut-off point between mid front and low front vowels. Thus, Table 13.6 treats the two e-vowels ⟦ẹ e⟧ as mid ([−low, −high]), Table 13.7 analyzes ⟦ẹ⟧ as mid ([−low, −high]) and ⟦e⟧ as low ([+low]), and Table 13.8 analyzes both of those e-vowels as low ([+low]).

Table 13.8: Distinctive features for vowels (Martinshaun)

	⟦i i̯⟧	⟦e̤⟧	⟦ẹ e ę⟧	⟦ọ o ǫ⟧	⟦ɑ̣ ɑ̩⟧
[coronal]	✓	✓	✓		
[dorsal]				✓	✓
[low]	−	−	+	−	+
[high]	+	−			

Although the featural systems proposed for Voglarn ([201]), Reicheneibach ([185]), and Martinshaun ([125]) are not the same, all of those possess precisely the same version of velar fronting, stated in (6).

A number of other places in Lower Bavaria have Stage 2b as defined above, but those systems also possess irregularities where [x] surfaces after the e-vowels that are expected to always be the context for [ç]. Consider Malgersdorf (=[170]), where [ç] surfaces after i-vowels and [x] after ⟦e⟧, e.g. ⟦štīχ⟧ 'sting', ⟦svī˙χ⟧ '(the) cattle' vs. ⟦k̽ʰǫex̣⟧ 'lime', ⟦dex̣d̩α⟧ 'daughter-PL'. No example is attested in this place with a dorsal fricative after e-vowel lower than ⟦e⟧, i.e. ⟦ȩ⟧ or ⟦e̤⟧. After the e-vowel one level above ⟦e⟧ palatals occur in examples like ⟦v̩ɑ̤ẹχtn̥⟧ 'spruce'⟦bɑ̣ẹχ⟧ 'stomach-PL', but Malgersdorf also has the two irregular forms ⟦dlɑ̣ẹx̣⟧ '(to the) burial' and ⟦p̽ẹx̣⟧ 'misfortune'.

13.3.4 Stage 2c'

Stage 2c' is defined as any dialect in which front dorsals ([ç]) occur after all i-vowels and after all e-vowels, while back dorsals ([x]) surface after back vowels.

Stage 2c' is exemplified by Herrnsaal (=[38]), which possesses two i-vowels (⟦i i̹⟧) and three e-vowels (⟦ẹ e ȩ⟧). The dataset in (9) shows that palatals occur after every one of those front vowels in (9a–9e), while velars (=⟦x x̣̥ x x̥⟧) surface after back vowels (=9f–9j).

(9) Stage 2c' for Herrnsaal (=[38]):

a.	hȩ̂iχα	höher	'higher'	4: 123
	mȩ̂iχ	Milch	'milk'	3: 10
	ɑ̣ov̩d̩ɑ̣lȩ̂iχ	(auf die) Leich	'(to the) burial '	4: 28
b.	b̤v̩ī̹χα	Vieh	'cattle'	3: 5
c.	lẹχα	Löcher	'hole-PL'	7: 105
	blẹχ	Blech	'tin'	4: 130
	b̤ʰẹχ	Pech	'misfortune'	4: 39
d.	v̩ɑ̣eχt̀n̥	Fichte	'spruce'	4: 125
	bɑ̣eχ	Bäuche	'stomach-PL'	7: 82
	lɑ̣eχα	leihen	'lend-INF'	4: 120
	ọeχα	Eiche	'oak tree'	7: 57
	ọeχαn	Eichen	'oak tree-PL'	7: 58
e.	gnȩχt̽	Knecht	'vassal'	4: 124
	rȩχα	Rechen	'rake'	3: 5
f.	khụx̣l̥	Küche	'kitchen'	4: 165
g.	rɑox̣α	rauchen	'smoke-INF'	4: 127
	bɑ̣ox	Bauch	'stomach'	7: 81
	b̩rɑ̣oxα	brauchen	'need-INF'	4: 128

h.	lǫx	Loch	‘hole’	7: 104
	wǫxα	Wochen	‘week-PL’	7: 61
	b̩ǫx	Bach	‘stream’	4: 33
	d̩ǫx	Dach	‘roof’	4: 131
i.	nɑ̣xṭ͓	Nacht	‘night’	7: 75
	nɑ̣xṭ͓	Nächte	‘night-PL’	7: 76
	d̩ɑ̣xα	Dächer	‘roof-PL’	7: 113
j.	mɑ̩xα	machen	‘do-INF’	3: 78

The Stage 2’ rule of velar fronting needs to capture the fact that all and only front vowels – the conjunction of i-vowels and e-vowels – serve as triggers. This can be accomplished by positing that the trigger is a front ([coronal]) vowel ([−consonantal]), as expressed in (10):

(10) Velar Fronting-13

$$\begin{array}{cc} [-\textsc{cons}] & \begin{bmatrix}-\textsc{son}\\ +\textsc{cont}\end{bmatrix} \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

Velar Fronting-13 spreads the frontness feature from any front vowel ([−consonantal, coronal]) to a /x/ target. The featural system for Stage 2’ dialects does not crucially require a particular analysis of e-vowels; hence, any of the matrices posited above work.

One might argue that the correct triggers for Herrnsaal (and presumably for any Stage 2c’ dialect) is the class of front sonorants ([+sonorant, coronal]). Although that broader version of velar fronting works technically for the data in (9) there is good reason for questioning it. See §13.5.2 for discussion.

The Stage 2c’ system for Herrnsaal is very regular in the sense that back dorsals (⟦χ χ̥ x x̥⟧) are absent after both i-vowels and e-vowels. In other Stage 2c’ systems it is possible to find an occasional example of a back dorsal in the front vowel context. This is precisely the case in Ruppertskirchen (=[152]), e.g. words like ⟦eḍ͈lɑ̣i̜χ⟧ ‘(to the) burial’, ⟦š̩d͈i̜χ⟧ ‘sting’, ⟦bleχ̣⟧ ‘tin’, ⟦beχ⟧ ‘misfortune’, ⟦gnę̣χd͈ʰ⟧ ‘vassal’ display the regular pattern as in (9), but there is the irregular form ⟦vi̜x⟧ ‘cattle’.

The regular Stage 2c’ system in for Herrnsaal ([38]) also has an irregularity, namely there is one word with a palatal after the back vowel [u], i.e. ⟦bǫuχα⟧

'beech tree'. Recall from §13.3.2 that one occasionally finds velar fronting varieties with a palatal in the context after a back vowel but – because of their rarity – that no significance can be attributed to this type of anomaly.

13.4 Areal distribution of velar fronting stages in Lower Bavaria

Dialects representing the four stages described in the preceding section do not have an equal areal distribution in Lower Bavaria. As indicated in Table 13.9, Stage 2a represents by far the most common one. While Stage 2b is attested in a sizable number of places, Stage 2c' is extremely rare. It is interesting to observe that the most common stage in the dialects discussed in Chapters 3–12 – Stage 2d from Table 13.1 – is not attested at all in Lower Bavaria.[5]

Thirty places in Lower Bavaria are categorized as Stage 2. That type of system has palatals after i-vowels, but there are two reasons why those thirty places cannot be unambiguously placed into any of the three velar fronting stages (2a, 2b, 2c'): (a) There are not enough examples to determine which of the three velar fronting stages is correct, or (b) there is too much fluctuation between front dorsals and back dorsals after e-vowels to distinguish between Stage 2b and 2c'. Haidlfing (=[108]) illustrates (a). That place has front dorsals in ⟦γ̩ī̯χɑ⟧ 'cattle' and ⟦vɑ̣e̤χtn̥⟧ 'spruce' and back dorsals after back vowels, but since there are no examples with dorsal fricatives after other e-vowels it is not possible to know whether or not Haidlfing represents Stage 2a, Stage 2b, or Stage 2c'. Peising (=[39]) illustrates (b). In that place palatals occur after i-vowels and after the fourth level of e-vowel (⟦ę⟧) and velars after back vowels. Those generalizations suggest that Peising represents Stage 2c'. The problem is that after e-vowels higher than ⟦ę⟧ velars occur in some words and palatals in others, e.g. some items have a front dorsal after ⟦ẹ⟧/⟦e⟧ while other ones have a back dorsal. It could be that the words with a back dorsal after e-vowels higher than ⟦ę⟧ are irregular, in which

[5]Table 13.9 only lists two hundred thirteen places and not the two hundred twenty-one places depicted on Map 13.1. The eight places which have not been taken into consideration ae Zell (=[5]), Teichnach (=[17]), Bischofsmais (=[47]), Ringelai (=[72]), Rottenmann (=[86]), Altreichenau (=[97]), Eging am See (=[114]), and Wegscheid (=[162]). The reason I ignore those places is that there are too few phonetic transcriptions with dorsal fricatives on the SNiB maps to know for certain whether or not velar fronting is active. For example, Wegscheid (=[162]) has several words with back dorsals after e-vowels, but no words are given for that place with dorsal fricatives after i-vowels. Wegscheid (=[162]) could therefore either represent velar fronting (Stage 2a) or non-velar fronting (Stage 1).

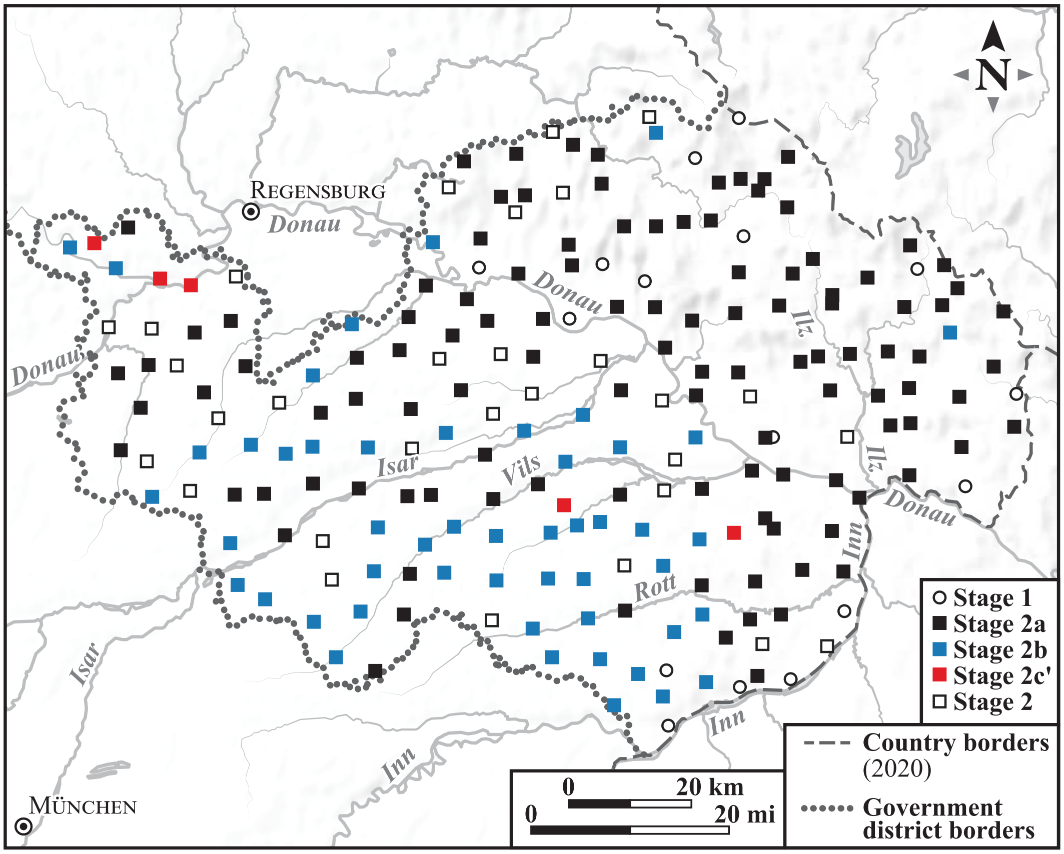
Table 13.9: Velar fronting and non-velar fronting places in Lower Bavaria. n=number of places for the corresponding stage.

Stage	*n*	Places in Lower Bavaria
1	16	9, 10, 33, 42, 45, 46, 52, 64, 119, 135, 161, 205, 211, 215, 220, 221
2a	112	2, 3, 6, 7, 11, 13, 14, 16, 18, 19, 20, 21, 24, 26, 28, 29, 30, 31, 32, 34, 35, 40, 41, 43, 44, 48, 49, 50, 51, 53, 54, 57, 58, 60, 61, 62, 63, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 79, 81, 82, 85, 88, 89, 90, 91, 92, 93, 94, 95, 98, 99, 100, 103, 104, 105, 106, 110, 112, 115, 116, 117, 118, 120, 129, 136, 138, 139, 140, 141, 144, 145, 146, 147, 148, 149, 150, 151, 153, 155, 156, 157, 158, 159, 160, 164, 176, 177, 178, 183, 190, 191, 192, 193, 196, 200, 203, 204, 207, 212, 213
2b	50	8, 22, 25, 36, 59, 80, 96, 109, 122, 123, 124, 125, 126, 128, 130, 131, 132, 134, 142, 163, 166, 167, 168, 169, 170, 171, 172, 173, 174, 179, 180, 182, 184, 185, 186, 187, 189, 194, 195, 198, 199, 201, 202, 206, 208, 209, 210, 217, 218, 219
2c’	5	23, 37, 38, 152, 175
2	30	1, 4, 12, 15, 27, 39, 55, 56, 78, 83, 84, 87, 101, 102, 107, 108, 111, 113, 121, 127, 133, 137, 143, 154, 165, 181, 188, 197, 214, 216

case Peising would represent Stage 2c’. On the other hand, it could be that Peising is a Stage 2b dialect and the two items with a palatal after ⟦ę⟧ are additional anomalies.

All of the places listed in Table 13.9 are indicated on Map 13.2. As noted above, there are five places representing the broadest set of velar fronting triggers (Stage 2c’), namely Baiersdorf (=[23]), Kelheim (=[37]), Herrnsaal (=[38]), Ruppertskirchen (=[152]), and Sachsenham (=[175]). The first three are in close proximity in the northwest, while the latter two are about 30km apart in the south central region. Most places representing Stage 2b can be found in the area south of the Danube River. Stage 2a places are most visible in the northeast, although they are also attested in the south and west. Non-velar fronting places are found in two areas: (a) In the south along the Inn River and (b) in the area between the Danube River and the border with Upper Palatinate and the Czech Republic. Outside of those two areas Stage 1 varieties are not attested in Lower Bavaria.

In the remainder of this section I interpret the places on Map 13.2 representing Stages 2a, 2b, and 2c’ historically in the rule generalization approach (§2.4.1). In the course of that discussion I refer only to the markers in Lower Bavaria,



Map 13.2: Areal distribution of velar fronting stages in Lower Bavaria. Circles indicate the absence of (postsonorant) velar fronting. Black squares show velar fronting after high front vowels, blue squares after nonlow front vowels, and red squares after high front vowels, mid front vowels, and low front vowels.

although a complete treatment would also have to take neighboring places in Upper Bavaria, Upper Palatinate, and Upper Austria into consideration. Since the data from those places are lacking I do not discuss them.

Stage 2c' has the broadest set of triggers; hence, the five places Baiersdorf (=[23]), Kelheim (=[37]), Herrnsaal (=[38]), Ruppertskirchen (=[152]), and Sachsenham (=[175]) can be thought of as focal areas for velar fronting. Baiersdorf (=[23]), Kelheim (=[37]), Herrnsaal (=[38]) are in close proximity; hence, I see them as a single focal area, which I refer to as F_1. Ruppertskirchen (=[152]) and Sachsenham (=[175]) could represent two separate focal areas or possibly a single one. I assume the latter for simplicity, which I call F_2. The focal areas are those places where velar fronting was originally phonologized. I refer to the point in time when phonologization occurred in F_1 and F_2 henceforth as T_1. Phonologization began in F_1 and F_2 at T_1 with the narrowest set of triggers; hence, F_1 and F_2 were Stage 2a at T_1. By contrast, all other places in Lower Bavaria – that is, the blue and black markers depicted on Map 13.2 – had no velar fronting (Stage 1) at T_1.

Velar fronting then spread both temporally and spatially; recall that the two types of spreading are represented on Figure 2.1. Temporal spreading means that the places I call F_1 and F_2 which represented Stage 2a at T_1 added mid front vowels to the set of velar fronting triggers (at time T_2), thereby becoming Stage 2b. Later on (at time T_3), low front vowels were added to the set of velar fronting triggers in F_1 and F_2, which is precisely the state of affairs represented by the red markers on Map 13.2.

At a point in time after F_1 and F_2 had phonologized velar fronting (T_2) the rule started to spread spatially. This means that communities near F_1 and F_2 phonologized the rule with the high front vowels as triggers (Stage 2a); these are the black markers depicted in the present day (T_3) on Map 13.1. Some of the Stage 2a places at T_2 eventually added mid front vowels to the set of velar fronting triggers and thereby became Stage 2b places; these are the blue markers at T_3 on Map 13.2.

Why is Stage 2a so well-attested in Lower Bavaria but so rare elsewhere? Before addressing this question it is important to bear in mind is that the areas representing Stage 2a probably include regions outside of Lower Bavaria. For example, the linguistic atlas for Upper Bavaria (SOB) provides some evidence that the most common velar fronting variety in Lower Bavaria (Stage 2a) is also the norm in Upper Bavaria. Map 36 in Volume 2 for the word *Vieh* 'cattle' shows the symbol for a palatal fricative in the context after a high front vowel throughout most of Upper Bavaria. By contrast, Map 2 in Volume 2 for *Blech* 'tin' illustrates that the mid front vowel is followed by symbols for the back dorsal. (SOB has a three-way place distinction for dorsal fricatives as in Table 13.4). If these examples are representative, then they suggest that Stage 2a is even more widespread than suggested in this chapter.

The prevalence of Stage 2a throughout Lower Bavaria (and probably Upper Bavaria) and its rarity elsewhere make sense when one considers when velar fronting might have been phonologized. As stressed throughout this book, velar fronting must have had more than one point of origin (focal area). Polygenesis is the only sensible explanation for the existence of velar fronting islands, which by definition phonologized velar fronting independently (Chapter 15). In Chapter 16 I argue on the basis of linguistic evidence that velar fronting must have been phonologized in WCG and WLG as early as OHG/OSax. Given the extreme age of velar fronting in LG and CG it makes sense that Stage 2a varieties would be rare in those areas because the original rule would have had many centuries to diffuse itself spatially and temporally. This meant that there was ample time to acquire the full set of triggers characterized by Stage 2d.

The reason Stage 2a is so common throughout Lower Bavaria and probably also Upper Bavaria is that velar fronting must have been phonologized in Southeast Germany much more recently than in CG and LG areas. Although it is not possible to give a precise century for the phonologization of velar fronting in Bavaria, it must have been recent because of the prevalence of places which still represent Stage 2a.

13.5 Discussion

This section addresses three issues. First, a number of velar fronting dialects listed in Table 13.9 only apply the rule after an i-vowel that is a monophthong but not after an i-vowel that is the second component of a diphthong (§13.5.1). Second, nothing has been said in this chapter about the status of consonants (e.g. /l/ and /r/) that serve as triggers for velar fronting in areas outside of Lower Bavaria. In §13.5.2 I assess whether or not there is evidence from SNiB that bears on this question. Third, reference was made above to irregular forms (recall §12.8.3 on LG). In §13.5.3 I address the nature of irregularities with respect to velar fronting in Lower Bavaria.

13.5.1 Velar fronting in monophthongs and diphthongs

The velar fronting places listed in Table 13.9 have in common that the rule is always triggered by i-vowels. As indicated in the datasets presented in §13.3 those i-vowels can be either monophthongs or the second component of a diphthong. A typical example is Stage 2a Zinzenzell (=[2]). In the data presented above for that place, velar fronting applies after i-vowels (⟦i i̯⟧) in monophthongs (e.g. ⟦š̩d̤îχ⟧ 'sting', ⟦dəs̤i̯χ⟧ '(the) colter') and diphthongs (e.g. ⟦ɣ̩ei̯χα⟧ 'cattle-PL', ⟦khôi̯χ⟧ 'lime', ⟦wɑ̣i̯χα⟧ 'sanctify-INF', ⟦bɑ̣i̯χ⟧ 'stomach-PL'). That speakers in Zinzenzell do not draw a distinction between i-vowels in monophthongs and i-vowels in diphthongs makes sense if speakers treat the i-vowel in diphthongs phonologically the same way as the i-vowel in monophthongs. This is illustrated in (11):

(11) a. /i x/

$$\begin{bmatrix} -\text{CONS} \\ +\text{HIGH} \\ \text{CORONAL} \end{bmatrix} \quad \begin{bmatrix} +\text{CONS} \\ -\text{SON} \\ +\text{CONT} \\ \text{DORSAL} \end{bmatrix}$$

b. /ɑ i x/

$$\begin{bmatrix}-\textsc{cons}\\+\textsc{low}\end{bmatrix} \quad \begin{bmatrix}-\textsc{cons}\\+\textsc{high}\\\textsc{coronal}\end{bmatrix} \quad \begin{bmatrix}+\textsc{cons}\\-\textsc{son}\\+\textsc{cont}\\\textsc{dorsal}\end{bmatrix}$$

Since the i-vowel in (11a) as well as the i-vowel in (11b) are [+high] they both trigger velar fronting.

The pattern represented by Zinzenzell can be contrasted with another one. In particular, a number of velar fronting varieties included among the ones listed in Table 13.9 are places where only i-vowels in monophthongs trigger velar fronting but not the i-vowels in diphthongs. A typical example is Schöllnach (=[90]). As indicated below, front dorsals occur after the i-vowels in monophthongs in (12a) but back dorsals are found after the i-vowels in diphthongs in (12b). Note that velar fronting is not sensitive to vowel length because palatals occur in (12a) after vowels that are short, long, or extra short.

(12) Data for Stage 2a Schöllnach (=[90])

a.	š̩d̩îχ	Stich	‘sting’	3: 4
	š̩d̩îχ	Stiche	‘sting-PL’	7: 139
	viχd̩̄n̥	Fichte	‘spruce’	4: 125
	vīχ	Vieh	‘cattle’	3: 5
	vīχ	Vieh	‘cattle-PL’	3: 5
b.	ẹd̩lạix	(in die) Leich	‘(to the) burial’	4: 28
	kǫix	Kalk	‘lime’	4: 80
	wạixα	weihen	‘sanctify-INF’	4: 122

Places in Lower Bavaria which display a pattern akin to the one in (12) are centered primarily in the north-central region bounded by the Danube (Donau), the border to the government district of Upper Palatinate, and the Czech Republic, namely Rattiszell (=[13]), Brandten (=[18]), Rabenstein (=[19]), Zwiesel (=[20]), Lindberg (=[21]), Perasdorf (=[28]), Achslach (=[29]), Zachenberg (=[30]), Schwarzach (=[44]), Kirchberg im Wald (=[48]). The other five places are isolates situated along the Isar River (Aholming=[110], Mamming=[129]), the Ilz River (Büchlberg=[138]), the Inn River (Malching=[213]), and ca. 20km south of Regensburg (Aholming=[58]).

From the formal perspective, speakers from Schöllnach ([90]) treat i-vowels in monophthongs as phonologically [+high], but i-vowels in diphthongs as unmarked for that feature. The two types of i-vowels are depicted in (13).

(13) a.

$$\begin{array}{cc} /\text{i} & \text{x}/ \\ \begin{bmatrix} -\textsc{cons} \\ +\textsc{high} \\ \textsc{coronal} \end{bmatrix} & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \\ \textsc{dorsal} \end{bmatrix} \end{array}$$

b.

$$\begin{array}{ccc} /\text{ɑ} & \text{i} & \text{x}/ \\ \begin{bmatrix} -\textsc{cons} \\ +\textsc{low} \end{bmatrix} & \begin{bmatrix} -\textsc{cons} \\ \textsc{coronal} \end{bmatrix} & \begin{bmatrix} +\textsc{cons} \\ -\textsc{son} \\ +\textsc{cont} \\ \textsc{dorsal} \end{bmatrix} \end{array}$$

Given that treatment, velar fronting correctly produces a palatal from /x/ in (13a) but not in (13b).

The reason why i-vowels in monophthongs are treated differently from the i-vowels in diphthongs is that speakers of these dialects are cognizant of the fact that the feature [high] is not distinctive for the second component of diphthongs. In the system of monophthongs for every German dialect without exception an i-vowel like /i/ must be [+high] to distinguish it from /e/, which is [−high]. But in diphthongs like /ɑi/ the /i/ is not distinctively [+high] because /ɑi/ does not contrast with /ɑe/, which is non-occurring in this variety. The approach described here therefore makes the prediction that the pattern displayed in (13) could not obtain in a dialect with both /ɑi/ and /ɑe/.[6]

Independent evidence for the treatment proposed in (13b) comes from StG. According to one pronouncing dictionary (Mangold 2005) the second component of the three native diphthongs of StG is transcribed with the phonetic symbol for high vowels, i.e. /ai/, /au/, /ɔy/ (together with the bottom ligature). By contrast, another pronouncing dictionary (Krech 1982) transcribes the second component of the same diphthongs with the phonetic symbols for mid vowels, i.e. /ae/, /ao/, /ɔø/ (together with the bottom ligature). The reason those two sources differ in their transcriptions is precisely because vowel height is not distinctive – or, to be colloquial, it does not matter – for the second component of diphthongs. By contrast, Mangold (2005) and Krech (1982) both transcribe high monophthongs like /iː/ (but never as /eː/) because vowel height is distinctive for monophthongs, cf. [ziː] 'they' vs. [zeː] 'lake'.[7]

[6]The featural approach for diphthongs in (13b) is consistent with the contrastive hierarchy of Dresher (2009), which has been presupposed throughout this book. A complete analysis of Schöllnach (=[90]) and the other places mentioned above would need to take all of the contrastive diphthongs into consideration. That type of analysis is not possible because SNiB does not provide enough data to know for certain which diphthongs are contrastive in which place in Lower Bavaria.

[7]The approach to distinctive features in diphthongs described here is defended in Noelliste (2017) for Ramsau am Dachstein. See also the treatment of diphthongs like /ɑi/ in StG in §16.2.

13.5.2 The status of velar fronting after consonants

Recall that the default set of triggers for velar fronting in German dialects consists of all front vowels and coronal sonorant consonants (/r l n/), which is precisely the pattern attested in StG (Chapter 17). The datasets from SNiB in §13.3 all have in common that the segments inducing velar fronting consist solely of front vowels. The question I explore below is whether or not there is material available from SNiB that can shed light on whether or not consonants might also be velar fronting triggers, as in Stage 2c and Stage 2d in Table 13.1.

It is difficult to test whether or not there are Stage 2c/2d places in Lower Bavaria for two reasons. First, none of the maps in SNiB has a word with /n/ followed by /x/, e.g. *manchmal* 'sometimes' (cf. StG [mɑnçmɑl]). Second, in those maps in SNiB with liquids followed by /x/ the liquid stands in coda position and therefore undergoes Liquid Vocalization, at least in the unmarked case.

SNiB provides extensive discussion of the places in Lower Bavaria where coda liquids do and do not vocalize, e.g. Map 140 in Volume 4. What is important for present purposes are words with a coda liquid followed by a dorsal fricative. A careful examination of the data accompanying those SNiB maps reveals that there are a few places in Lower Bavaria where coda liquids surface but do not undergo Liquid Vocalization. In those places the dorsal fricative following [l] and [r] is realized as either a front dorsal (=⟦χ χ̥⟧) or a back dorsal (=⟦x̞ x̞̥ x x̥⟧). In Table 13.10 I list the places in Lower Bavaria with the four attestations [lx], [lç], [rx], [rç].

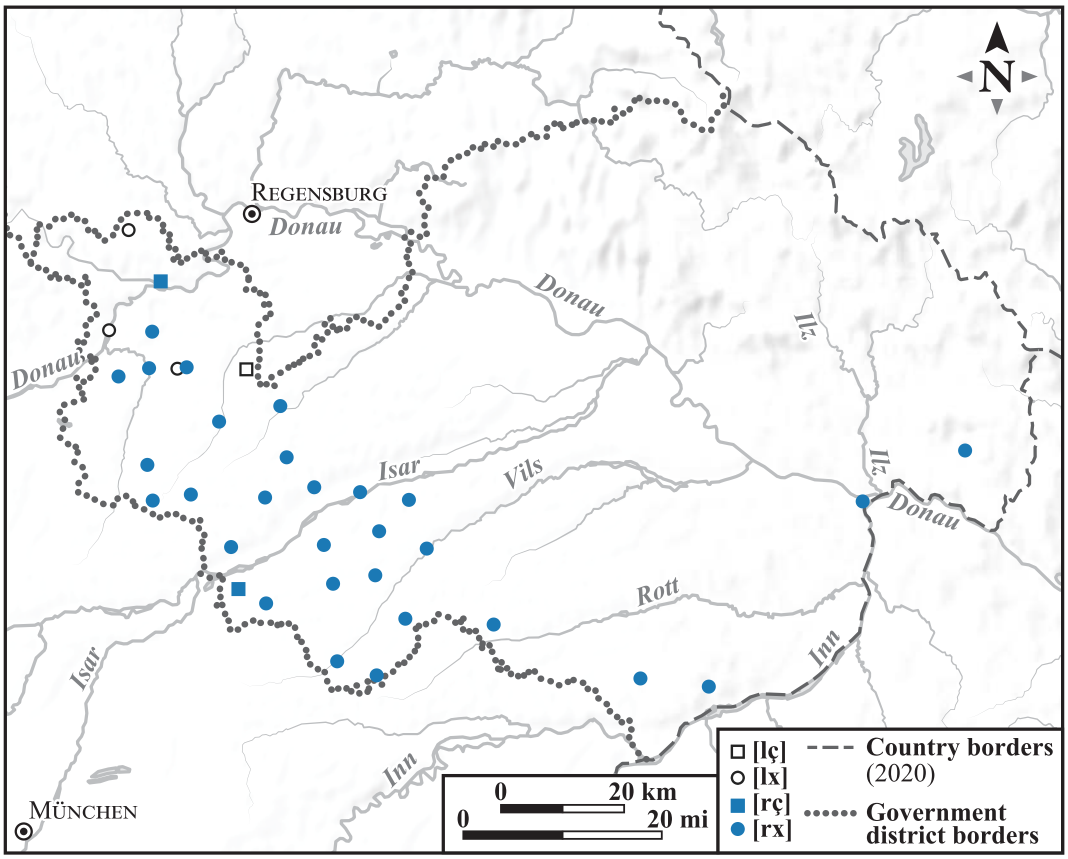
Table 13.10: Realization of /x/ as [x] or [ç] after [l]/[r]

Pattern	Places in Lower Bavaria	Example	Map
/lx/⟶[lç]	79	⟦muïlχ⟧ 'milk'	3: 10
/lx/⟶[lx]	24, 55, 78	⟦mïl̥x⟧ 'milk'	3: 10
/rx/⟶[rç]	37, 179	⟦ṿụrχn̥⟧ 'furrow-PL'	3: 24
/rx/⟶[rx]	56, 76, 77, 78, 101, 102, 121, 124, 140, 142, 143, 145, 146, 147, 148, 159, 163, 165, 166, 167, 180, 181, 182, 196, 197, 206, 207, 210, 219	⟦šnɑ̣rxα⟧ 'snore-INF'	3: 86

Consider the first two rows of Table 13.10. The predominance of Liquid Vocalization with /l/ as the target segment is reflected in the fact that only four places have realizations of words like *Milch* 'milk' (or *Kalk* 'lime') with a consonantal [l] followed by a dorsal fricative. Three of those places have a back dorsal ([x]) following that [l], while only one place has a palatal.

The maps in SNiB with [r] followed by a dorsal fricative point to a similar conclusion. The first observation is that there are only two words (*schnarchen* 'snore-INF' and *Furchen* 'furrow-PL') in which /r/ is realized as [r] followed by a dorsal fricative. The second observation is that the occurrence of a palatal after [r] is restricted to two places, but the pronunciation [rx] is robustly attested in twenty-nine places.

The areal distribution of the four types of liquid plus dorsal fricative sequence in Table 13.10 is depicted on Map 13.3.



Map 13.3: Areal distribution of [rx], [lx], [rç], [lç] sequences in Lower Bavaria. All of the places depicted above have some version of velar fronting after front vowels.

Map 13.3 shows that places with [rx] are clustered in the southwest with a small number of isolates to the east. The few places with [lx] are attested in the northwest. It is interesting to observe that there are more places in Lower Bavaria with [rx] than on Map 12.2, which depicts those sequences throughout German-speaking countries.

The most significant generalization from Table 13.10 is that if speakers do not vocalize /r/ in the context before /x/ then the default pattern is for the latter segment to be realized as a back dorsal ([x]) and not as a front dorsal ([ç]). This means that the set of triggers for velar fronting in those areas with [rx] must not include coronal sonorant consonants (specifically /r/). Those places include Stage 2a, Stage 2b, and Stage 2. The absence of places representing Stage 2c' from this list can be attributed to the rarity of Stage 2c'.

The occurrence of [l]/[r] followed by a palatal in Table 13.10 suggest that the version of velar fronting presupposed for those places may in fact be broader than what was assumed. The case of Kelheim (=[37]) – classified in Table 13.9 as Stage 2c' – is an interesting one. Assuming that the occurrence of [rç] in Kelheim is a regularity and not one of the irregular articulations referred above and assuming that [ç] also surfaces for those speakers after [l] and [n], then Kelheim represents the broadest set of triggers, namely Stage 2d. The case of Stage 2a Herrngiersdorf (=[79]) is intriguing as well. If the occurrence of [ç] after [l] (and [r], [n]) is regular in that place then the set of velar fronting triggers would consist of high front vowels or coronal sonorant consonants. Although that historical stage is absent from Table 13.10, it was discussed in §12.7.1. That section investigated the status of several unattested velar fronting Trigger Types, including one consisting of high front vowels and coronal sonorant consonants (Trigger Type W in Table 12.32). Significantly, it was argued in that section that nothing in the present analysis speaks against that type of conjunction; hence, Herrngiersdorf potentially fills an accidental gap.[8]

A final issue to consider is the realization of dorsal fricatives after vocalized liquids. The datasets from §13.3 for words containing coda /l/ and coda /r/ reveal the predominant pattern discussed above: Liquid Vocalization produces a front vowel from /l/, and those derived front vowels count as velar fronting triggers. This pattern is reflected in a pronunciation such as [kɑiç] for *Kalk*. By contrast, if /r/ undergoes Liquid Vocalization then the following /x/ is realized as [x] because the vocalized-r is not a front sound. This generalization can be seen in a pronunciation such as [duɑx] for *durch*. Put differently, realizations like [kɑiç] and [duɑx] illustrate transparent outputs without any trace of opacity. In the former word Liquid Vocalization feeds velar fronting and in the latter velar fronting and Liquid Vocalization do not interact, i.e. they are unordered in a rule-based model.

[8]The third place listed in Table 13.10 with a liquid followed by a palatal is Haunwang (=[179]). Since that place is classified in Table 13.10 as the indeterminate Stage 2 one should not even attempt to speculate on what the realization of /rx/ as [rç] means for the reinterpretation of Haunwang's historical stage.

The data accompanying the SNiB maps for words with a vocalized-r followed by dorsal fricatives reveal two patterns: One with a back dorsal (=⟦x̗ x̗̥ x x̥⟧) and the other with a front dorsal (=⟦χ χ̥⟧). Representative examples are given in (14a–14d) for the word *Kirche* ‘church’ from the data accompanying Map 13 in Volume 3. The back dorsal realizations in (14a, 14b) can be compared with the front dorsal pronunciation in (14c, 14d). As noted earlier in §13.2.3, the narrow phonetic transcriptions in SNiB express the vocalized-r either as ⟦ə⟧ or ⟦α⟧. All four of the places indicated below possess some version of velar fronting.

(14)
a. k͓hįαx̗α Hofendorf (=[102])
b. khīəx̗α Schwarzach ([44])
c. k͓hîαχα Kelheim (=[37])
d. kʰiəχα Schöllnach (=[90])

Of the realizations in (14) the ones with the back dorsals in (14a, 14b) are much more common than the ones with front dorsals in (14c, 14d). For example, the data for Map 13 in Volume 3 indicate sixty-nine places with ⟦α⟧ realizations followed by a back dorsal as in (14a), eighteen realizations with schwa (⟦ə⟧) followed by a back dorsal as in (14b) but only ten with palatal realizations after schwa as in (14d) and 7 with the palatal pronunciation after ⟦α⟧ as in (14c).

Although not particularly common, the palatals in (14c, 14d) nevertheless deserve comment. Consider first the pronunciation in (14d) in which the vocalized-r surfaces as schwa. I argue that the palatal in that context is synchronically derived from the i-vowel preceding schwa. The treatment endorsed here derives support from other varieties of German discussed in previous chapters. For example, in §3.4 it was demonstrated that dorsal fricatives surface in Rheintal as palatal after a nonlow front vowel even if a schwa intervenes between that sound and the target. Thus, /iəx/ surfaces as [iəç], but /x/ after a schwa preceded by either a low front vowel or a back vowel surfaces as velar, i.e. [uəx].

To account for (14d), I argue that schwa inherits the frontness feature ([coronal]) from a preceding front vowel, which then spreads to /x/ and creates [ç]. The rule referred to here (from §3.4) is stated in (15):

(15) Schwa Fronting-1:

$$\begin{array}{ll} [-\textsc{cons}] & \begin{bmatrix} -\textsc{cons} \\ +\textsc{son} \end{bmatrix} \\ \quad | \; \text{- - - - - - -} & \\ [\textsc{coronal}] & \end{array}$$

According to the treatment proposed here r-Vocalization feeds Schwa Fronting-1, which in turn feeds velar fronting. This can be expressed with a diacritic indicating frontness: /irx/⟶|iəx|⟶|iə̟x|⟶[iə̟ç̟t]. Since back vowels like /u/ do not bear the frontness feature they do not undergo Schwa Fronting-1; the /x/ in an underlying representation like /urx/ surfaces without change: /urx/ ⟶ |uəx| ⟶ [uəx].[9]

The analysis proposed here derives support from additional maps in SNiB which depict the modern realization of historical /x/ after schwa. Of particular relevance are words containing a back vowel plus the schwa realization of /r/ followed by /x/, e.g. in Map 24 in Volume 3 for *Furchen* 'furrow-PL'. The data accompanying that map reveal no realization at all with a palatal preceded by [u] plus schwa ([uəç]), while three places are attested with the back dorsal ([uəx]). (The most common realization for *Furchen* contains the sequence [uɑx]).

The treatment proposed above presupposes that the Lower Bavarian rule of r-Vocalization differs from the same process in other dialects (and in StG) in the sense that the output is a placeless segment (schwa). It was assumed in preceding chapters that r-Vocalization for an input [dorsal] rhotic (i.e. /ʀ/) simply changes [+consonantal] into [−consonantal]; thus, the [dorsal] input /ʀ/ is [dorsal] in the output ([ɐ]). If the input is [coronal] (i.e. /r/) then r-Vocalization creates a [dorsal] output (i.e. [ɐ]); hence, r-Vocalization changes [+consonantal, coronal] into [−consonantal, dorsal]. In dialects like the one in Lower Bavaria with a more general process of Liquid Vocalization, a target /l/ surfaces as [−consonantal, coronal].[10]

Since Liquid Vocalization in Lower Bavaria can produce schwa ([ə]) for a target /r/, that rule changes [+consonantal] into [−consonantal] and deletes all place features. Thus, if /r/ is [coronal], that feature is deleted in coda position, thereby producing placeless schwa. This is an important assumption because only placeless sounds constitute the input to Schwa Fronting-1.

Consider now the occurrence of the palatal after the ⟦α⟧ realization of /r/, as in (14c). As noted above, of the four patterns in (14), the one with ⟦α⟧ in (14c) is the least common. The same generalization obtains when one considers other maps. For example, Map 3: 24 for *Furchen* 'furrow-PL' has no attestations at all of a palatal followed by the ⟦α⟧ realization of the vocalized-r.

[9] As stated in (15) the frontness feature spreads from any front vowel. It was noted earlier in §3.4 that it may be necessary to restrict those segments further, e.g. only nonlow front vowels or high front vowels.

[10] To express the fact that /l/ surfaces as an i-vowel in many places in Lower Bavaria, Liquid Vocalization must ensure that /l/ surfaces as [+high]. I do not pursue this analysis further because it is not directly relevant to the question discussed above.

I argue that the sound transcribed as ⟦ɑ⟧ (for the coda realization of /r/) is simply a low-level variant of ⟦ə⟧. This means that the Lower Bavarian version of Liquid Vocalization changes a target /r/ sound into a [−consonantal] sound that lacks place features. That treatment implies that the palatal in (14c) is an underlying velar (/x/), which inherits the frontness feature ([coronal]) from the preceding vowel ⟦ɑ⟧, which in turn receives that frontness feature from the preceding i-vowel by Schwa Fronting-1. The difference between the two low-level variants of the vocalized-r – ⟦ɑ⟧ and ⟦ə⟧ – lies outside the domain of phonology and can therefore only be understood by taking phonetics into consideration.[11]

13.5.3 Irregularities

Reference was made throughout this chapter to irregular forms. For example, in a Stage 2a system an irregularity would be either (A) an unexpected [x] after an i-vowel, or (B) an unexpected [ç] after anything other than an i-vowel. Both cases need to be assessed, especially in light of the claim I have made throughout this book that the historical rule of velar fronting was a classic Neogrammarian change that regularly affected every target velar and that the synchronic reflex of velar fronting operates as an exceptionless rule.

In §12.8.3 I discussed the status of irregularities like the ones in (A) and (B) for a different set of dialects (LG) in a very different area (North Germany). One takeaway from that section is that irregularities do not fit the textbook example of lexical exceptions. Recall that the English word *obesity* is a true lexical exception to the rule of Trisyllabic Laxing, which applies in words like *sincerity*. The reason the LG irregularities are very different from an English word like *obesity* is that LG speakers fluctuate between the irregular (unexpected) pronunciation and the regular (expected) pronunciation of the same word. It is possible to draw this conclusion from observations of several different linguists describing those LG dialects as well as from phonetically transcribed texts from a single speaker. In §12.8.3 I conjectured that the irregular forms in LG are tokens from neighboring dialects that are adopted by speakers having contact with speakers of those other dialects.

[11] In StG and in many of the dialects discussed in earlier chapters palatals occur in the context after the vocalized-r, e.g. [fʏɐ̯çtən] 'fear-INF'; see Chapter 17. In Chapter 7 it was shown that the palatals in this context are underlying palatals in the synchronic phonology (/ç/) because they cannot be derived by any version of velar fronting. Pronunciations like [fʏɐ̯çtən] are historically opaque because the trigger for the once allophonic rule of velar fronting (i.e. /r/) is no longer present in the phonetic representation. One cannot argue that the palatal in (14c) is an underlying palatal as in StG because this would imply that the /r/ was once a trigger for velar fronting.

I claim that the same explanation holds for the irregularities present in Lower Bavaria belonging to both category (A) and category (B). The data from Lower Bavaria discussed in this section have been drawn from a linguistic atlas; hence, it is difficult to observe the kind of fluctuation referred to in the preceding paragraph between the irregular and the regular pronunciation of any given word. However, it is important to stress that not a single variety of German has been discovered in this book with true lexical exceptions to velar fronting. Given this finding it would be surprising to find true lexical exceptions to velar fronting in the material discussed in the present chapter.

13.6 Conclusion

The aim of this chapter has been to assess the state of velar fronting in Lower Bavaria on the basis of data drawn from a linguistic atlas (SNiB). It has been shown that over 200 places in Lower Bavaria reflect three of the historical stages for velar fronting defined according to Trigger Types which were posited in Chapter 12: Velar fronting after high front vowels (Stage 2a), after nonlow front vowels (Stage 2b), and after all front vowels (Stage 2c'). The data discussed above demonstrate that Stage 2a places constitute the majority pattern while Stage 2c' places reflect the rarest one. The areal distribution of towns belonging to the three velar fronting stages was interpreted historically on the basis of the rule generalization model.

The discussion of targets and triggers for velar fronting is continued in Chapter 14: In that chapter I discuss a number of dialects where the triggers for velar fronting include not only front (coronal) segments, but also back sounds, such as back vowels.

14 The nonassimilatory fronting of velars

14.1 Introduction

The synchronic and diachronic processes fronting velar segments in word-initial and postsonorant position investigated in previous chapters are uncontroversially assimilatory. As documented above, the generalization is that velar fronting is induced by front (coronal) sonorants or some subset thereof. Regardless of how one captures the fronting of velars in a formal model, that process spreads the fronting feature from the triggers to the appropriate targets in an assimilatory fashion, thereby creating palatals.

Considerable evidence from the literature on German dialects points to the nonassimilatory fronting of historical velars to palatals. An example is the change from an etymological velar (WGmc $^{+}$[ɣ]) to palatal in word-initial position before back vowels, e.g. [ʝɑbəl] 'fork' (cf. StG [gɑbəl]). The change in question was not an assimilation because it occurred before all or some back vowels, in addition to coronal sonorants, e.g. [ʝiːsən] 'water-INF' (cf. StG [giːsən]). The nonassimilatory change referred to here affected historical velar fricatives in word-initial position in many varieties of CG and in some varieties of LG. The analogous nonassimilatory change in postsonorant position likewise shifted historical velar fricatives to palatals and is attested primarily in WCG.

Some earlier studies have discussed the motivation for nonassimilatory velar fronting in word-initial position. For example, Scheutz (2005: 1707) and more recently Hinskens (2021: 10) both note that the change from an original velar to palatal in words like [ʝɑbəl] 'fork' mentioned above was the extension of the assimilatory change from velar to palatal only in the context before a front vowel in items like [ʝiːsən] 'water-INF'. In present terms, the change from velar to palatal before back vowels involved rule generalization, as defined earlier.

In this chapter I adopt the rule generalization approach endorsed by Scheutz and Hinskens, but I propose a much more fine-grained treatment. For example, I consider the change from velar to palatal in word-initial position before coronal sonorant consonants, e.g. [ʝroːs] 'large' (cf. StG [groːs]) as well as the same change in postsonorant position after all types of segments, namely front vowels, coronal sonorant consonants, and back vowels. The main idea of the present chapter is that the nonassimilatory change in question is the final historical stage defined in terms of velar fronting triggers.

In §14.2 I discuss the nonassimilatory fronting of historical velars in word-initial position. §14.3 considers dialects in which velars fronted to palatals after only a subset of back vowels, and §14.4 examines those varieties in which the same fronting processes transpired after all back vowels. §14.5 looks at the state of nonassimilatory velar fronting in a cluster of MFr dialects in the area of Nordösling (North Luxembourg). §14.6 investigates several questions related to the nonassimilatory fronting of etymological velars that arise in the course of the chapter, and §14.7 considers various issues relating to the connection between velar fronting in word-initial and postsonorant position. The chapter concludes in §14.8.

14.2 Word-initial velar fronting

14.2.1 Introduction

The nonassimilatory change from velar to palatal in word-initial position to be documented below is depicted in (4). The velar referred to here could be WGmc $^{+}$[ɣ] or the $^{+}$[x], which developed out of the $^{+}$[k] in WGmc $^{+}$[sk] clusters.[1] The fronting process in (4) is not an assimilation because it occurred regardless of the nature of the following sound; in particular, it transpired before front vowels (FV), coronal consonants (CC), and (crucially) back vowels (BV). In all dialects investigated in previous chapters with velar fronting in word-initial position that change is assimilatory, as in (2–3).

(1) Velar fronting (word-initial):

(2) velar > palatal / $_{\text{wd}}$ [(C) ___ FV

(3) velar > palatal / $_{\text{wd}}$ [(C) ___ FV, CC

(4) velar > palatal / $_{\text{wd}}$ [(C) ___ FV, CC, BV

(2) and (3) were expressed formally in previous chapters as the spreading of [coronal] to a target. The nonassimilatory change in (4) cannot be captured in the

[1]Recall from earlier chapters that a small number of dialects fronted WGmc $^{+}$[k] in word-initial position (e.g. HAlmc and ELG). That type of fronting is assimilatory in all varieties investigated earlier. No dialect is known which exhibits the nonassimilatory fronting of word-initial WGmc $^{+}$[k].

same way because back vowels are not [coronal]. I do not provide a formal rule for (4), although that process would have to be stated as one which adds (but does not spread) the frontness feature [coronal]. Since the formal rule applies before any segment it would be sufficient to state the change with the word-initial context without reference to any segmental triggers at all. Seen in that light, it is not true that the change in (4) is "triggered" by all back vowels. I continue to refer to the back vowels in (4) as triggers for the sake of comparison with (2) and (3).

I assume that (4) – as well as the mirror-image development in postsonorant position discussed in §14.3 and §14.4 – affected underlying representations, e.g. WGmc $^{+}$/ɣ/ shifted to /ʝ/. Alternatively, one could argue that nonassimilatory changes like the one in (4) did not alter underlying representations, but instead remain in the respective dialects as synchronic rules, e.g. WGmc $^{+}$/ɣ/ was inherited without change as /ɣ/, which then surfaced at that later stage as [ʝ] by the synchronic reflex of (4) in word-initial position; see §14.6.2.

I contend that (4) represented the final stage in the rule generalization scenario described in Chapter 12 for word-initial position. Trigger Types A-E and the corresponding historical stages proposed earlier are listed in Table 14.1. In the final row (Trigger Type F=Stage 2e) I include the change from velar to palatal in the elsewhere case, i.e. before back vowels, which represents (4).

Table 14.1: Trigger Types and the corresponding historical stages

Type	Trigger	Stage
A	HFV	2a
B	HFV, MFV	2b
C	HFV, MFV, CC	2c
D	HFV, MFV, LFV	2c'
E	HFV, MFV, LFV, CC	2d
F	HFV, MFV, LFV, CC, BV	2e

One could argue that Stage 2e – like the changes from Stage 2a to 2b etc. – should be broken down into a series of substages defined according to the height of the vocalic trigger: On that view, the first nonassimilatory change – call it Stage 2e' – occurs before a high back vowel, later (Stage 2e'') before a high back vowel or a mid back vowel, and finally (Stage 2e''') before all back vowels. No evidence from is known to me which supports the decomposition of Stage 2e in that manner for word-initial position. However, I demonstrate in §14.3 and §14.4

that the nonassimilatory change from velar to palatal after a sonorant proceeded in an incremental fashion according to vowel height.

The change from velar to palatal in word-initial position at Stage 2e occurred before all back vowels in every example meeting its structural description. None of the studies described below for Stage 2e dialects provides evidence for lexical exceptions. For example, if an original velar shifted to palatal before [u o ɑ], then the change occurred in every item with those three vowels; there were no aberrant items beginning with an unshifted velar followed by any one of [u o ɑ]. The nonassimilatory change in (4) can therefore be thought of as a Neogrammarian-style development. It is conceivable that the across-the-board change referred to here began its life as a lexical diffusion type change that applied sporadically, on a word-by-word basis, but as yet no evidence is available to my knowledge for that claim.

In (5) I state the four diachronic stages affecting WGmc +[ɣ] in word-initial position. In the headings for (5a–5d) I list four of the historical stages given in Table 14.1. The initial segment in the three sequences listed in phonetic representation for each of the stages corresponds to the attested realization of that original velar fricative +[ɣ]. The symbols "[i]", "[l]" and "[ɑ]" represent the natural classes of front vowels, coronal sonorant consonants and back vowels respectively. The initial sound in some of the three sequences in (5a–5d) underwent Wd-Initial ɣ-Fortition (§4.3).

(5) Modern reflexes of WGmc +[ɣ] in word-initial position:

a. Stage 1:	b. Stage 2b/2c':	c. Stage 2c/d:	d. Stage 2e:
[ɣi ɣl ɣɑ]	[ʝi ɣl ɣɑ]	[ʝi ʝl ɣɑ]	[ʝi ʝl ʝɑ]
[xi xl xɑ]	[çi xl xɑ]	[çi çl xɑ]	[çi çl çɑ]
	[ʝi çl ʝɑ]		

At Stage 1 (=5a) the original velar +[ɣ] is retained as a velar. Not taken into consideration in (5a) is the default pattern – represented in StG and UG – whereby word-initial +[ɣ] is realized as a stop ([g]) regardless of the nature of the following sound (by g-Formation-1 from §4.2). (5b) is the point where the change to palatal is induced by front vowels but not by coronal consonants (=2). (5c) shows the assimilatory change whereby +[ɣ] undergoes fronting before a front vowel or a coronal sonorant consonant (=3). The assimilatory changes in (5b, 5c) were examined from the point of view of rule generalization in Chapter 12. Stage 2e (=5d) reflects the most advanced fronting stage – the nonassimilatory one – because original +[ɣ] is realized as palatal before front vowels, coronal consonants and back vowels.

The reflexes of WGmc +[sk] clusters in word-initial position as described in late-nineteenth and early twentieth century sources are summarized in (6); see also Hall (2021). The symbols "[i]", "[r]" and "[ɑ]" are cover symbols representing front vowels, the coronal rhotic consonant, and back vowels respectively. The symbol "[s]" is similarly a cover symbol for a sibilant fricative ([s] or [ʃ]).[2] (6e) represents the final stage (reflected in StG); it is not directly relevant to the present chapter, but it is included for completeness.

(6) Reflexes of WGmc +[sk] clusters in word-initial position:

a.	[sxi sxr sxɑ]	(=Stage 1)
b.	[sçi sxr sxɑ]	(=Stage 2c')
c.	[sçi sçr sxɑ]	(=Stage 2c or 2d)
d.	[sçi sçr sçɑ]	(=Stage 2e)
e.	[ʃi ʃr ʃɑ]	

The patterns depicted in (6a) and especially the assimilatory ones in (6b, 6c) were discussed in Chapter 12. Pattern (6d) exhibits the historical stage involving the nonassimilatory change from [sx] to [sç] before any type of sound.

14.2.2 Data and discussion

In (7–15) I present data from nine varieties of German reflecting the four stages depicted in (5). The respective heading provides information concerning place, dialect classification, source, and respective stages. For each data set I provide one or two representative examples for the reflex of WGmc +[ɣ] in the three contexts (a) before front vowels, (b) before sonorant consonants, and (c) before back vowels. For comparison, I also include one word possessing the modern reflex of WGmc +[j], which underwent Glide Hardening to [ɟ] in all varieties discussed below. The most important examples for purposes of this chapter are given in (13–15), which illustrate the nonassimilatory change from velar to palatal in word-initial position in (4).

(7) Kalkar (LFr; Hanenberg 1915; §8.2; Map 5.1, Stage 1):

a.	gę̄rn	[ɣɛːrn]	gern	'gladly'	192
b.	grōnd	[ɣʀoːnt]	Grund	'reason'	195
c.	gūt	[ɣuːt]	gut	'good'	216
d.	jɑxt	[ɟɑxt]	Jagd	'hunt'	209

[2]The developments depicted in (6a–6d) only hold for word-initial position because the reflexes of WGmc +[sk] in word-internal and word-final position in the dialects discussed below were either [sk], [s], or [ʃ], but never [sx]/[sç]; Hall (2021).

(8) Gütersloh (Wph; Wix 1921; §4.3; Map 4.2, Stage 1):

a.	xeln	[xeln̩]	gelten	‘be valid-INF’	88
b.	xlɑs	[xlɑs]	Glas	‘glass’	12
c.	xolt	[xɔlt]	Gold	‘gold’	27
d.	jǫuɒ	[ɟɔuɐ]	Jahr	‘year’	77

(9) Eilsdorf (Eph; Block 1910; §8.3; Map 4.3, Stage 2b/2c’):

a.	jęlt	[ɟɛlt]	Geld	‘money’	342
b.	ʒlɑs	[ɣlɑs]	Glas	‘glass’	340
c.	ʒuut	[ɣuːt]	gut	‘good’	342
d.	jɑ̊ɑ̊	[ɟɑː]	ja	‘yes’	338

(10) Soest (Wph; Holthausen 1886; §4.3; Map 4.2, Stage 2b/2c’):

a.	cist*ɑ*n	[çɪstɐn]	gestern	‘yesterday’	44
b.	xlykə	[xlʏkə]	Glück	‘fortune’	84
c.	xuət	[xuət]	gut	‘good’	88
d.	jɑ̨	[ɟɔː]	ja	‘yes’	43

(11) Kirchspiel Courl (Wph; Beisenherz 1907; Map 4.2, Stage 2c/2d):

a.	ʒĭɛl	[ɟɪɛl]	gelb	‘yellow’	28
	ʒɛẹ̆t	[ɟɛet]	geht	‘go-3SG’	15
b.	ʒrɑf	[ɟrɑf]	Grab	‘grave’	40
	ʒlīən	[ɟliːən]	glitten	‘slide-PRET.PL’	40
c.	gɑrvə	[ɣɑrvə]	Garbe	‘sheaf’	16
d.	(im) jɔ̄ərə	[ɟɔːərə]	(im) Jahre	‘(in the) year’	24

(12) Elspe (Wph; Arens 1908; §7.2; Map 4.2, Stage 2c/2d):

a.	χelt	[çɛlt]	Geld	‘money’	31
b.	χreŏt	[çrɛɔt]	groβ	‘large’	89
c.	xolt	[xɔlt]	Gold	‘gold’	66
d.	jōa	[ɟoːɐ]	Jahr	‘year’	28

(13) Schlebusch (Rpn; Bubner 1935; §10.3.1; Map 5.1, Stage 2e):

a.	jęl	[ɟɛl]	gelb	‘yellow’	72
	jī:hǿ:zəš	[ɟiːhøːzəʃ]	jähzornig	‘irascible’	72
b.	jlɑt	[ɟlɑt]	glatt	‘smooth’	72
	jrɑs	[ɟrɑs]	Gras	‘grass’	72

c.	jɑs	[ɟɑs]	Gast	‘guest’	72
	jəpȩk	[ɟəpɛk]	Gepäck	‘luggage’	72
d.	jǭ	[ɟɔː]	ja	‘yes’	88
	jets	[ɟets]	jetzt	‘now’	88

(14) Kreis Lippe (Wph; Hoffmann 1887; §7.2; Map 4.2, Stage 2e):

a.	χæust	[çæust]	Geist	‘intellect’	23
b.	χnɑidiχ	[çnɑidiç]	gnädig	‘merciful’	32
	χlet	[çlet]	Glied	‘member’	17
	χrunt	[çʀunt]	Grund	‘reason’	20
c.	χɑus	[çɑus]	Gans	‘goose’	3
	χəwolt	[çəvolt]	Gewalt	‘violence’	14
d.	juŋk	[ɟuŋk]	jung	‘young’	20

(15) Mansfeld (Thrn; Hennemann 1901; Map 7.2, Stage 2e):

a.	jǣl	[ɟæːl]	gelb	‘yellow’	20
b.	χrās	[çʀɑːs]	Gras	‘grass’	40
	χlɑs	[çlɑt]	Glas	‘glass’	40
c.	jōrtn̩	[ɟoːʀtn̩]	Garten	‘garden’	17
	jənɑuə	[ɟənɑuə]	genau	‘exactly’	35
d.	joxn̩	[ɟoxn̩]	jagen	‘hunt-INF’	39

In (16–19) I present data from four Wph varieties illustrating the stages depicted in (6a–6d) for WGmc +[sk] in word-initial position (Hall 2021). The LG dialect in (20) represents a stage postdating Stage 2e, whereby WGmc +[sk] is consistently realized as [ʃ] (=6e). Note that the dorsal (uvular) rhotic in (16b) and (17b) shows the effects of r-Retraction (§3.5) from [r] to [ʀ].

(16) Adorf (Wph; Collitz 1899; Map 4.2, Stage 1):

a.	šɧīp	[ʃxiːp]	Schiff	‘ship’	45
b.	šɧrå	[ʃxʀɑ]	mager	‘lean’	79
c.	šɧou	[ʃxou]	Schuh	‘shoe’	29

(17) Soest (Wph; Holthausen 1886; §4.3; Map 4.2, Stage 2c’):

a.	scylic	[sçʏlɪç]	schuldig	‘guilty’	43
	scèpm	[sçɛpm̩]	schöpfen	‘ladle-INF’	43
b.	sxʀuĭvə	[sxʀuivə]	schreibe	‘write-1SG’	43
	sxʀiʒ̯n	[sxʀɪɣn̩]	schreien	‘scream-INF’	62

	c.	sxult	[sxʊlt]	Schuld	‘fault’	15
		sxǭp	[sxɔːp]	Schaf	‘sheep’	43
(18)	Elspe (Wph; Arens 1908; §7.2; Map 4.2, Stage 2d):					
	a.	šχyt	[ʃçyt]	schieβt	‘shoot-3SG’	97
		šχelə	[ʃçɛlə]	Schale	‘bowl’	33
	b.	šχrɑpn	[ʃçrɑpn̩]	schaben	‘scrape-INF’	27
	c.	šxugn	[ʃxʊɣn̩]	scheuen	‘dread-INF’	96
		šxāp	[ʃxɑːp]	Schrank	‘cabinet’	23
(19)	Kreis Lippe (Wph; Hoffmann 1887; §7.2; Map 4.2, Stage 2e):					
	a.	sχoin	[sçoin]	schön	‘beautiful’	3
	b.	šrị̄ƀən	[ʃʀiːβən]	geschrieben	‘write-PART’	17
	c.	sχẹ̄u	[sçeːu]	Schuh	‘shoe’	3
(20)	Diepenau (NLG; Schmeding 1937; Map 4.1):					
	a.	šulαn	[ʃulɐn]	Schulter	‘shoulder’	14
	b.	šāp	[ʃɑːp]	scharf	‘sharp’	19

The closest variety found for stage 2e is Kreis Lippe in (19). Hoffmann (1887: 3) notes that in the year 1887 the realization [sç] was rapidly being replaced with [ʃ] and that one hears [sç] only in the speech of the elderly. In that dialect there are apparently no [sç] sequences before the rhotic consonant – even in the speech of the elderly – because WGmc ⁺[sk] underwent coalescence to [ʃ] in that context, as in (19b).

In contrast to WGmc ⁺[sk] clusters, many varieties of German are attested which exhibit the change from ⁺[ɣ] in word-initial position before any sound, as in (13)-(15). A list of those varieties from the original sources cited in this book is given in Table 14.2. The final column indicates the palatal realization before a front vowel (“[i]”), coronal sonorant consonant (“[l]”), or back vowel (“[ɑ]”); recall (5).[3] Many Brb and NUSax-SMk varieties exemplify Stage 2e, several of which are listed in Table 14.2. The location of those places can be found on Map 7.2 and Map 11.1.

[3]According to the source for Friedersdorf (Seibicke 1967: 37) the palatal in the context before a consonant exhibits a strong tendency to surface as [ʝ] and not as [ç]. Speakers who have that realization therefore display pattern (5a) and not (5c). The same point holds for Weidenhain (Krug 1969: 39).

Table 14.2: Velar fronting (word-initial) of WGmc ⁺[ɣ] (=Stage 2e)

Place	Source	Pattern
Rpn		
Krefeld	Röttsches (1877), Bister-Broosen (1989)	[ʝi ʝl ʝɑ]
Aachen	Jardon (1891)	[ʝi ʝl ʝɑ]
Aegidienberg	Müller (1900)	[ʝi ʝl ʝɑ]
Erftgebiet	Münch 1904 [1970]	[ʝi ʝl ʝɑ]
Wermelskirchen	Hasenclever (1905)	[ʝi ʝl ʝɑ]
Cologne	Müller (1912)	[ʝi ʝl ʝɑ]
Dülken	Frings (1913)	[ʝi ʝl ʝɑ]
Niederembt	Grass (1920)	[ʝi ʝl ʝɑ]
Düsseldorf	Zeck (1921)	[ʝi ʝl ʝɑ]
Schelsen	Greferath (1922)	[ʝi ʝl ʝɑ]
Seelscheid	Mackenbach (1924)	[ʝi ʝl ʝɑ]
Eckenhagen, Berghausen	Branscheid (1927)	[ʝi ʝl ʝɑ]
Schlebusch	Bubner (1935)	[ʝi ʝl ʝɑ]
Aachen	Welter (1938)	[ʝi ʝl ʝɑ]
Burscheid	Heinrichs (1978)	[ʝi ʝl ʝɑ]
Rimburg	Hinskens (1992)	[ʝi ʝl ʝɑ]
Gleuel	Heike (1970)	[ʝi ʝl ʝɑ]
Moresnet	Jongen (1972)	[ʝi ʝl ʝɑ]
Burg-Reuland	Hecker (1972)	[ʝi ʝl ʝɑ]
Niederbachem, Oberbachem	Fuss (2001)	[ʝi ʝl ʝɑ]
MFr		
Prüm	Büsch (1888)	[ʝi ʝl ʝɑ]
Ihren, Sellerich, Weinsheim	Meyers (1913a,b)	[ʝi ʝl ʝɑ]
Elsenborn	Hecker (1972), Cajot & Beckers (1979)	[ʝi ʝl ʝɑ]
NUSax-SMk		
Aken (Elbe)	Bischoff (1935)	[ʝi ʝl ʝɑ]
Grassau	Stellmacher (1973)	[ʝi ʝl ʝɑ]
South Brandenburg	Kieser (1963)	[ʝi ʝl ʝɑ]
Friedersdorf	Seibicke (1967)	[ʝi çl ʝɑ]
Weidenhain	Krug (1969)	[ʝi çl ʝɑ]

Place	Source	Pattern
Wittenberg	Langner (1977)	[ʝi ʝl ʝɑ]
Berlin	Schönfeld (1986)	[ʝi ʝl ʝɑ]
USax		
Saalkreis	Bremer (1909)	[ʝi ʝl ʝɑ]
Salzfurtkapelle	Schönfeld (1958)	[ʝi ʝl ʝɑ]
Thrn		
Stiege	Liesenberg (1890)	[ʝi ʝl ʝɑ]
Mansfeld	Hennemann (1901)	[ʝi çl ʝɑ]
Südharz	Rudolph (1924/1925)	[ʝi ʝl ʝɑ]
Brb		
Magdeburg	Krause (1895)	[ʝi ʝl ʝɑ]
Kreis Jerichow I	Krause (1896)	[ʝi ʝl ʝɑ]
Besten	Siewert (1907)	[ʝi ʝl ʝɑ]
Prenden	Seelmann (1908)	[ʝi ʝl ʝɑ]
Strodehne (Havelaue)	Hildebrand (1913)	[ʝi ʝl ʝɑ]
Jerichower Land	Bathe (1932)	[ʝi ʝl ʝɑ]
Kleinwusterwitz	Bathe (1937)	[ʝi ʝl ʝɑ]
Heckelberg	Teuchert (1964)	[ʝi ʝl ʝɑ]
Schollene	Gebhardt (1965), Schönfeld (1965)	[ʝi ʝl ʝɑ]
Wph		
Kreis Lippe	Hoffmann (1887)	[çi çl çɑ]
Hiddenhausen	Schwagmeyer (1908)	[çi çl çɑ]

The earliest attestation of Stage 2e among my sources is Rovenhagen (1860) for Aachen. He writes (p. 8): "The breathing sound j (engl. y) … [is] … in most cases a substitute for g; thus at the beginning of words g has always this sound … this pronunciation is common in the Berlin etc. vulgar speaking …"

In §12.5.2 I presented a cluster of Wph dialects which represent several historical stages involving the trigger for the fronting of word-initial WGmc $^{+}$[ɣ]. In (21) I reproduce those dialects and include Kreis Lippe from (19) and Table 14.2 for Stage 2e.

(21) Historical stages for triggers for (word-initial) velar fronting (Wph) for WGmc ⁺[ɣ]:
Stage 1: Grafschaft Bentheim
Stage 2a: Plettenberg
Stage 2b: (Soest, Laer)
Stage 2c: (Nienberge)
Stage 2c’: (Borken)
Stage 2d: Elspe
Stage 2e: Kreis Lippe

Recall that parentheses in (21) indicate that the dialect in question cannot be unambiguously classified as a particular Target Type, e.g. Soest could be either Stage 2b or Stage 2’.

14.2.3 Areal distribution of the reflexes of WGmc ⁺[ɣ] in word-initial position

Stage 2e dialects for word-initial position have been discussed at length in the literature on German dialectology, although to the best of my knowledge no one has proposed the historical stages in Table 14.1. Before presenting my own map, I consider briefly some of the findings in dialectology on the fronting of historical ⁺[ɣ] in word-initial position.

An inspection of the earlier literature on the modern realizations of WGmc ⁺[ɣ] reveals that the change from that sound to palatal in word-initial position (=Stage 2e) has an areal distribution akin to the one suggested in by the works listed in Table 14.2. One such work is Diederichs (1884), who provides a list of places in Germany and indicates how WGmc ⁺[ɣ] is realized in those places word-initially, word-medially, and word-finally. Among those places are several in North and Central Germany with [ʝ] in initial position (=Stage 2e), but also a few with a velar before a back vowel and a palatal before a front vowel (recall the Eph dialects discussed in §8.3, §8.4). A second work is KDSA. In particular, Map 80 (for *Gänse* ‘goose-PL’), Map 81 (for *Garten* ‘garden’), and Map 95 (for *glaube* ‘believe-1SG’) indicate the areas in pre-1914 Germany where the initial sound (an etymological velar) is realized as *j* (=[ʝ]). The dialect regions on those maps correspond to the ones reflected in the second column of Table 14.2.

Stage 2e for word-initial position has been discussed in works focusing on a specific region. One dialect area particularly well-known for the change in question is CFr (=Rpn and MFr). The extent of that change in MFr is evident from Maps 381 and 382 in volume 4 of MRhSA, which depicts the realization of the original velar as palatal or alveolopalatal in the words *Garten* 'garden' and *grün* 'green'. The (alvelo)palatal realization is the dominant pronunciation to the west of Koblenz and north of the Mosel River (see MFr region on Map 5.3). According to Cornelissen (2000: 397–398) the change from original lenis velar to palatal fricative in word-initial position (=Stage 2e) is typical for the Rpn variety in and around Cologne extending north to the Uerdinger Line, the approximate boundary between Rpn and LFr (Map 5.1). van de Wijngaard (2007: 49–50) likewise documents that change in the Rpn areas in the Netherlands (Limburg), especially around Kerkrade. The phonetic transcriptions of various dialogues from informants throughout the Rpn/MFr region presented in Cornelissen et al. (1989) similarly reveal the extent of Stage 2e. Several places from that source in the Rpn dialect region are indicated on Map 5.1.

The change from word-initial WGmc ⁺[ɣ] to a palatal fricative is also well-documented in the literature on ECG (Thrn, NUSax-SMk) and ELG (Brb). Three detailed case studies documenting that change are Hankel (1913), Kieser (1963), and Bathe (1965). The former author discusses data collected in a number of communities (Thrn) in the northeastern part of the state of Thuringia (Map 7.2). Kieser (1963) focuses on the realization of WGmc ⁺[ɣ] as palatal in a number of NUSax-SMk-speaking towns in South Brandenburg (Map 7.2). Bathe (1965) likewise documents the same change, concentrating on Brb varieties in a broad area in western Brandenburg (Map 11.1). All three authors demonstrate that the contexts for the change from velar to palatal can differ from village to village within a small area. A closer examination of that small-scale variation confirms the stages posited above; thus, WGmc ⁺[ɣ] shifts to palatal before front vowels in some towns and villages (=5a), before front vowels and coronal consonants in others (=5b), and before any type of segments in other places (=5c).

Stage 2e for word-initial position (< WGmc ⁺[ɣ]) is also well-attested in a number of dialect dictionaries for the dialect areas in Table 14.2. For Rpn, two dictionaries for the Cologne dialect (NKSS, WbKM) provide a brief statement in the pronunciation guide (NKSS Volume 1: 265; WbKM: 17) that word-initial *g* is articulated as *j* (=[ʝ]). KWb gives phonetic transcriptions for all lexical entries beginning with *g* as [ʝ]. Also for Rpn, the dictionaries for Neunkirchen-Seelscheid (NSSS), the Lower Sieg (WbUS), Aachen (AaWb) and Dremmen (DrWb) list all words beginning with [g] in StG as j-initial, e.g. *Jeld* 'money' (cf. StG [gɛlt]), *Jlaas* 'glass' (cf. StG [glɑs]), and *Jold* 'gold' (cf. StG [gɔlt]). For Rpn and MFr, RWb includes among words with initial *g* such as *gut* 'good', *gießen* 'water-INF', and *Glück* 'fortune' the realization ⟦j⟧ (=[ʝ]). Finally, for Brb, the dictionary for Teltow (TeWb), provides a clear statement to the effect that historical ⁺[ɣ] is realized in word-initial position as a lenis palatal fricative [ʝ] before vowels and consonants alike (p. 300).

Map 14.1 depicts the modern realization of WGmc $^{+}$[ɣ] in word-initial position representing three historical stages: No velar fronting (=Stage 1), velar fronting as an assimilatory change (Stage 2a-d), and velar fronting as a nonassimilatory change (=Stage 2e). For Stage 1 I only include those dialects mentioned earlier (§12.3) in which WGmc $^{+}$[ɣ] is realized as a velar fricative ([ɣ] or [x]); hence, I ignore the prevalent pattern reflected in UG whereby that original sound is now realized as a velar stop ([g]). For Stage 2e I list all of the places listed in Table 14.2. For those localities where velar fronting applies as an assimilatory change I do not attempt to distinguish the five incremental steps discussed in Chapter 12 (summarized in Table 14.1). Those varieties are listed in Tables 12.13, 12.16, 12.18, 12.19, and 12.22 in §12.3.

It can be seen on Map 14.1 that Stage 1 varieties are restricted to the far western regions of modern-day Germany, including German-speaking parts of Belgium. The numerous Stage 2e varieties belong overwhelmingly to CG. By contrast, velar fronting as an assimilation word-initially is a common pattern for LG.

It is difficult – although not impossible – to project isoglosses onto Map 14.1 separating those areas where velar fronting applies as an assimilation (white square) vs. those places where the change is nonassimilatory (black square). I hypothesize that many centuries ago – but some time after velar fronting had been phonologized in word-initial position – the white square areas were much more prominent and black square areas were rare. At that earlier point in time I claim that it would have been possible to discern isoglosses separating the four assimilatory stems (Stage 2a-Stage 2d) from Table 14.1.

14.2.4 Word-initial velar fronting before all vowels

The treatment proposed in this chapter asserts that the assimilatory process of velar fronting (=22a, 22b) applies historically before the corresponding nonassimilatory process (=22c). Nothing has been said up to this point about the change in (22d), which applies before front vowels and back vowels but not before coronal consonants. That development poses a potential problem because it includes a nonassimilatory change (velar > palatal before a back vowel) but not an assimilatory one (velar > palatal before a sonorant coronal consonant).

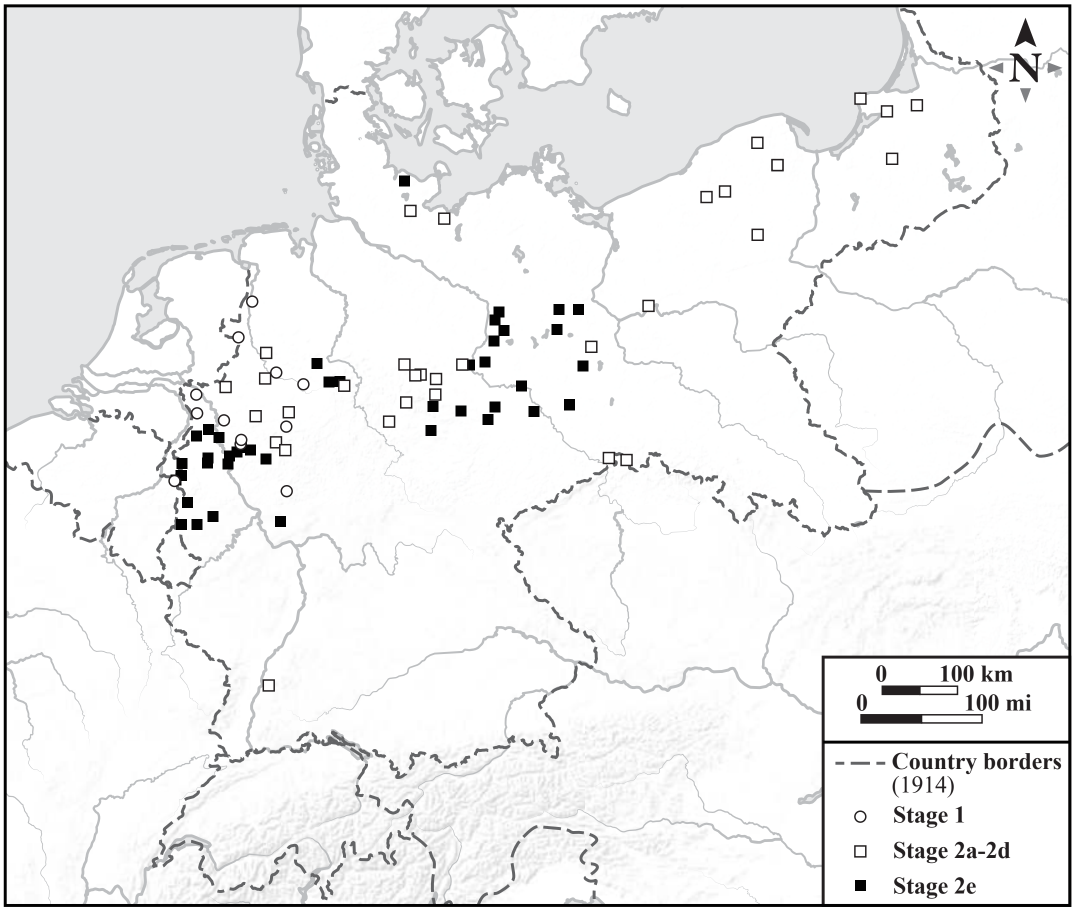
(22) Velar fronting (word-initial):

a. velar > palatal / $_{\text{wd}}$[___ FV

b. velar > palatal / $_{\text{wd}}$[___ FV, CC

c. velar > palatal / $_{\text{wd}}$[___ FV, CC, BV

d. velar > palatal / $_{\text{wd}}$[___ FV, BV



Map 14.1: Areal distribution of the realization of WGmc ⁺[ɣ] in word-initial position. Circles are varieties of High German and Low German with no word-initial velar fronting (Stage 1), white squares are varieties with word-initial velar fronting as an assimilatory change (Stage 2a-d), and dark squares are varieties with word-initial velar fronting as a nonassimilatory change (Stage 2e). The velars and palatals referred to for Stages 2a-e can be either fortis ([x ç]) or lenis ([ɣ ʝ]).

The historical change in (22d) is attested in more than one region; hence, the goal of this section is to explain why it is compatible with the present treatment of velar fronting.

As a representative example of (22d), consider Kieser's (1963) study of the pronunciation of word-initial *g* in South Brandenburg (NUSax-SMk; Map 7.2). Kieser shows that that broad region displays more than one pattern (=Trigger Types or historical stages in the present framework). Most significant is the area between Marxdorf and Rothstein and further to the east in the area around Deutsch Sorno. Those areas are characterized by the change from WGmc ⁺[ɣ] in word-initial position to palatal (⟦j⟧=[ɟ]) in the context before front vowels (=23a) or back vowels (=23b), but not before coronal sonorant consonants, where the original velar is retained as a velar stop (=23c). I retain Kieser's original transcriptions because it is not clear how some of his phonetic symbols and diacritics match up with the ones adopted in this book.

(23) Nonassimilatory velar fronting:

a.	jįḅ'	gib	'give-IMP.SG'
	jęrnə	gerne	'gladly'
b.	jɑns	Gans	'goose'
	jūḍ'	gut	'good'
c.	glɑi	sogleich	'immediately'
	ġrīnəs glås	grünes Glas	'green-INFL glass'

The data in (23) can be accommodated in the present framework by taking phonotactics into consideration. I argue that the pattern in (23) obtains because its speakers have adopted a condition governing the type of complex onset that is (not) allowed. In (24) I give a list of the complex (two-member) onset clusters attested in StG (e.g. Hall 1992, Wiese 1996b). It is not possible to present the onset clusters for the dialect in (23) because the source cited does not give them. However, the data presented in Kieser (1963) suggest that the basic generalization is the same in StG and in (24): A complex onset can consist of an obstruent plus liquid (=24a), an obstruent plus nasal (=24b), an obstruent plus [v] (=24c), or a sibilant plus stop (=24d).

(24)

a.	pl	bl			kl	gl	fl	ʃl
	pʀ	bʀ	tʀ	dʀ	kʀ	gʀ	fʀ	ʃʀ
	pfl							
	pfʀ							
b.					kn	gn		
c.	tsv	kv	ʃv					
d.	ʃp	ʃt	sk					

All of the clusters in (24) have in common that the individual members are simplex segments in the sense that they bear only one of the place features [labial], [coronal], [dorsal]. For example, /pl/ in (24a) consists of /p/, which is [labial], and /l/, which is [coronal], and /tsv/ in (24c) is made up of the affricate /ts/, which is [coronal], and the fricative /v/, which is [labial].

By contrast, there are no complex onsets containing a featurally complex consonant which bears more than one of the three features [labial], [coronal], [dorsal]. In the featural approach described in Chapter 2 the only complex segments in this sense of the word are palatals, which are both [dorsal] and [coronal]. The following condition holds for the dialect in (23) on the type of complex onset allowed:

(25) Condition on Complex Onsets:
Segments with more than one of the features [labial], [coronal], [dorsal] are not allowed in a complex onset.

Speakers of the dialect in (23) have adopted the Condition on Complex Onsets in (25) on the basis of the occurring onset clusters in (24). Given that condition, there cannot be clusters which contain a palatal because palatals are both [coronal] and [dorsal]. This means that speakers who incorporated (25) into their grammar could not have applied velar fronting to the initial velar (=WGmc +[ɣ]) in (24c), otherwise a cluster would be created like [ʝl ʝr ʝn çr çl çn], which violates (25).[4]

Given that the change in (22d) is attested, I assign it a unique Trigger Type (=E') and a unique historical Stage (=2d'), which I list in Table 14.3 together with four other stages for word-initial position.

Stage 2d' is coterminous with Stage 2d. Thus, there are two possible developments: (i) Stage 2c' > Stage 2d by the addition of coronal sonorant consonants (CC) to the set of triggers, or (ii) Stage 2c' > Stage 2d' by incorporating back vowels (BV) among the segments inducing the change.

[4]The historical rule of velar fronting referred to here is shown in Chapter 16 to have applied in OHG/OSax. The basic generalizations concerning the onset clusters of StG in (24) also held for earlier stages of German. See in particular Moulton (1972: 167), who lists obstruent plus liquid/nasal clusters for PGmc which were similar to the ones in (24a, 24b) in the sense that each member was either [labial], [coronal], or [dorsal]. At that early stage in the language there were also clusters containing +/w/, which was presumably [labial] and [dorsal]. However, the +/w/ in +/wr wl/ onset clusters of PGmc was deleted in the earliest stages of OHG (Braune 2004: 108). OHG also possessed onset clusters consisting of an obstruent plus +/w/ which were the historical precursors of the clusters in (24c), e.g. +/tw dw/. It is possible that at this early stage the +/w/ in such clusters was [−consonantal], which would then escape (25) if that condition only held for onset clusters that were [+consonantal].

Table 14.3: Trigger Types and the corresponding historical stages for word-initial position

Type	Trigger	Stage
A''''	HUFV (unstressed [i])	2a''''
D	HFV, MFV, LFV	2c'
E	HFV, MFV, LFV, CC	2d
E'	HFV, MFV, LFV, BV	2d'
F	HFV, MFV, LFV, CC, BV	2e

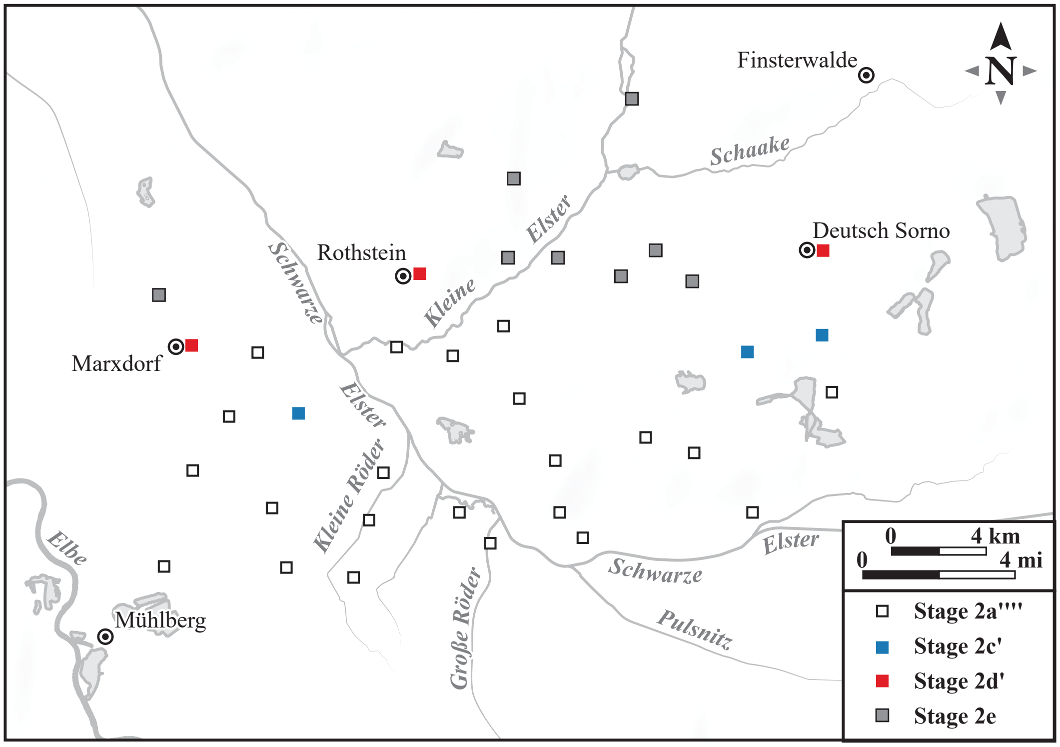
Map 14.2 depicts the three places mentioned above in South Brandenburg (Marxdorf, Rothstein, Deutsch Sorno) which illustrate Stage 2d'. The same map also includes those places listed in Kieser (1963) characterized by Stage 2a'''' (recall §12.6.3 and Map 12.5), Stage 2c', and Stage 2e.[5]

I mention here two other places in Germany where (22d) occurred. The first can be observed in a number of the phonetically transcribed texts in Cornelissen et al. (1989). In their discussion of the dialect features of that broad area of West Central Germany those authors note that some places in Westerwald are characterized by the following pattern (p. 39). I retain here the original transcriptions, whereby [j̥] corresponds to ⟦J⟧/⟦j⟧.

(26) a. Jęd̥icht Gedicht 'poem'
 jęṣoot gesagt 'say-PART'
 b. joof gab 'give-PRET'
 c. klööv̥ęn glaubten 'believe-1/3PL.PART'
 kruęs groß 'large'

Recall that Map 12.5 depicts places in Westerwald which represent three of the historical stages posited in this book with special reference to word-initial

[5]Kieser (1963) discusses six areas (Grenzzonen), four of which (I-IV) match up with the historical stages on Map 14.2: I (=Stage 2e), II (=Stage 2d'), III (=Stage 2c'), and IV (=Stage 2a''''). I do not include on Map 14.2 those places further to the south (Grenzzone V), where WGmc ⁺[ɣ] surfaces as a palatal fricative (⟦j⟧ or ⟦χ⟧) in word-initial position before schwa (<[i]), but only if the consonant following schwa is velar ([g]). If the post-schwa consonant is anything other than a velar then WGmc ⁺[ɣ] is realized in those places as velar ([g]), e.g. ⟦ġə-mɑxd'⟧ 'do-PART' vs. ⟦χə-ġōfd'⟧ 'buy-PART'. I also do not include on Map 14.2 those areas even further to the south (in Saxony) illustrating the retention of the original velar place of articulation (WGmc ⁺[ɣ]) as velar ([g]), i.e. Stage 1 (=Grenzzone VI).



Map 14.2: South Brandenburg. Velar fronting of WGmc $^+$[ɣ] in word-initial position illustrates four historical stages: Stage 2e (before any type of segment), Stage 2c' (before all front vowels), Stage 2d' (before front vowels and back vowels), and Stage 2'''' (before [ə] < unstressed $^+$[i]). Data have been drawn from Kieser (1963).

position. The data in (26) suggest that there are other places in that same area not depicted on Map 12.5 which represent Trigger Type E' (=Stage 2d').

A second example of (22d) is a small area to the west of the Elbe River (in the Eph/Brb dialect area), which is indicated on a map in the dialect dictionary for that region (MiElWb: 1087–1090). In particular, that map depicts the places where the reflex of word-initial $^+$[ɣ] is palatal ([ʝ]) before front and back vowels but is retained as velar before a consonant.

14.3 Velar fronting after a subset of back vowels

14.3.1 Introduction

The nonassimilatory fronting of historical velars also occurred in the context after a sonorant. In contrast to word-initial position, the developments depicted in (27) are attested in the context of high back vowels (HBV), mid back vowels (MBV), and low back vowels (LBV). The velar undergoing (27) could be WGmc ⁺[k], ⁺[x] or ⁺[ɣ], depending on the dialect.

(27) Nonassimilatory velar fronting:
  a. velar > palatal / HBV ___
  b. velar > palatal / HBV, MBV ___
  c. velar > palatal / HBV, MBV, LBV ___

The changes depicted in (27) represent the final phases in the rule generalization scenario described in Chapter 12 for postsonorant position. The first five rows of Table 14.4 list Trigger Types A-E and the corresponding historical stages. In the final three rows, Trigger Type F/Stage 2e from Table 14.1 is decomposed into three separate stages defined according to vowel height. Those three stages applied in the chronological order given below.

Table 14.4: Trigger Types for front and back segments and the corresponding historical stages

Type	Trigger	Stage
A	HFV	2a
B	HFV, MFV	2b
C	HFV, MFV, CC	2c
D	HFV, MFV, LFV	2c’
E	HFV, MFV, LFV, CC	2d
F’	HBV	2e’
F’’	HBV, MBV	2e’’
F’’’	HBV, MBV, LBV	2e’’’

In the remainder of this section I focus on Swb, Eph, and CHes varieties which document the changes in (27a, 27b). In §14.4 I discuss dialects that support the general development in (27c).[6]

[6]The reflex of WGmc ⁺[ɣ] in a word-internal onset is a palatal glide ([j]) in many varieties, especially UG. In the present section I restrict my discussion to sources in which that etymological velar is a fricative. An example of a source I do not consider (LAlmc) is Ottenheim (Heimburger 1887; Map 3.1). Heimburger states that [x] occurs after front vowels and [ç] after back vowels and that the palatal glide [j] (< WGmc ⁺[ɣ]) surfaces in a word-internal onset in the context after front vowels, liquids, and back vowels. The essential facts are the same in the RFr dialect of Spessart (Lauinger 1929; Map 5.3), which I likewise do not consider below.

14.3.2 Data and discussion

Strohmaier (1930) describes the Swb dialect spoken in and around Blaubeuren (Map 3.1). The author is clear that the dialect possesses [ç] and [x], which he transcribes with the same symbol (⟦x⟧). Of interest is Strohmaier's (1930: 94–95) description of the distribution of those two dorsal sounds, which I cite below. The important part of this passage is the final sentence, which I have italicized.

> Die Unterscheidung zwischen gutturaler und palataler Spirans erfolgt nach denselben Gesichtspunkten wie sie schon bei Bopp (S. 16) und bei Keinath (S. 86) aufgeführt worden sind. Nach den dunklen Vokalen *a* und *o* und den unechten Diphthongen *ūə* und *īə* ist die Spirans guttural … Gutturales *x* tritt auch auf in *miləx*, *dswiləx* Zwilch, soweit es nicht geschwunden ist. *Nach* i, u, ẹ, əi, əu *erscheint MHD* ch *dagegen als palatale Spirans.*
>
> "The difference between guttural and palatal fricative is a consequence of the same factors already discussed by Bopp (p. 16) and Keinath (p. 86). After the back vowels *a* and *o* and the pseudo-diphthongs *ūə* and *īə* the fricative is guttural. Guttural *x* also occurs in *miləx*, *dswiləx* Zwilch, unless it was elided. *By contrast, after* i, u, ẹ, əi, əu *MHG* ch *occurs as a palatal fricative*".

What is surprising is that [ç] surfaces after both the back vowel [u] and the diphthong [əu]. Aside from that one quirk, the distribution of [x] and [ç] is precisely what one would expect: The velar occurs after a back vowel – or a diphthong whose second element is back – and the palatal after a front vowel.

One way of coming to grips with Strohmaier's surprising description of dorsal fricatives in Blaubeuren is to either deny the facts or question the reliability of the source. As simple and tempting as that strategy might be, it is weak because – as I make clear below – several other varieties of German are described in which [ç] patterns with front vowels and high back vowels like [u].

Müller (1911) is a historical description of the sounds in the Swb dialect spoken in Mühlingen (Map 3.1). In contrast to Strohmaier (1930), Müller (1911) does not provide a clear statement concerning the distribution of [ç] and [x], the only two dorsal fricatives in the dialect. However, the correct generalizations concerning the distribution of those sounds can be inferred from Müller's data because he has two distinct symbols distinguishing velar [x] (his ⟦x⟧) and palatal [ç] (his bold ⟦**x**⟧). The dialect has four front monophthongs (/i ɪ e ɛ/), seven back monophthongs (/u ʊ o ɔ ɑ ɑː ə/), diphthongs ending in a front vowel (/iɛ ɛɪ/), several diphthongs ending in schwa (/iːə uːə ɔə ɛːə/), and the diphthong /ɑu/.

The data in (28a) reveal that [x] occurs after the four back monophthongs [o ɔ ɑ ɑː] and after all of the diphthongs ending in schwa, and the items in (28c) show that [x] occurs after a coronal consonant ([l]). The examples in (28b) exemplify the distribution of [ç], which surfaces after all of the front monophthongs and diphthongs ending in a front vowel. The [x] and [ç] in all examples derive from WGmc $^{+}$[k] or $^{+}$[x].

(28) Dorsal fricatives in Mühlingen:

a.	lox	[lox]	Loch	‘hole’	25
	dōxt	[doːxt]	Docht	‘wick’	56
	mɑxt	[mɑxt]	Macht	‘power’	56
	šnɑ̄xlə	[ʃnɑːxlə]	schnarchen	‘snore-INF’	56
	ɑ̄əx	[ɑːəx]	Arche	‘ark’	58
	līəxə	[liːəxə]	Heu aus dem Heustock rupfen		
			‘pick-INF hay from hayrick’		55
	būəx	[buːəx]	Buch	‘book’	50
	wɔ̄əx	[vɔəx]	weich	‘soft	45
	wɛ̄əxə	[vɛːəxə]	angestrengt arbeiten		
			‘work-INF intensely’		58
b.	fi**x**t	[fiçt]	feucht	‘damp’	56
	wɪ**x**tɪk	[vɪçtɪk]	wichtig	‘important’	56
	še**x**lɪ	[ʃeçlɪ]	kleiner Heuhaufen		
			‘small-INFL haystack’		55
	fɛ**x**də	[fɛçdə]	fechten	‘fence-INF’	56
	bl^{i}ɛ**x**	[bliɛç]	Blech	‘tin’	14
	rɛɪ**x**	[rɛɪç]	reich	‘rich’	37
c.	kʿɑlx	[kʰɑlx]	Kalk	‘lime’	54
	dmɪlx	[dmɪlx]	die Milch	‘the milk’	63

Mühlingen differs from all dialects discussed up to this point – with the exception of Strohmaier’s variety of Blaubeuren – in the sense that palatal [ç] surfaces after a high back vowel, namely [ʊ] in (29a), [u] in (29b) and [au] in (29c). As in (28), the [x] and [ç] in (29) derive from WGmc $^{+}$[k] or $^{+}$[x].

(29) Dorsal fricatives in Mühlingen:

a.	fʊ**x**dlə	[fʊçdlə]	fuchteln	‘wave about-INF’	56
	sʊ**x**t	[sʊçt]	Art von Krankheit		
			‘type of sickness’		27
	grʊ**x**	[grʊç]	Geruch	‘smell	62
	kʿʊ**x**ɪ	[kʰʊçɪ]	Küche	‘kitchen’	55
	fʊ**x**dsɛ̄ə	[fʊçdsɛːə]	fünfzehn	‘fifteen’	59
	fʊ**x**dsk	[fʊçdsk]	fünfzig	‘fifty’	59

b.	fru**x**bɑr	[fruçbɑr]	fruchtbar	‘fertile’	66
c.	bau**x**	[bɑuç]	Bauch	‘stomach’	41
	bau**x**we	[bɑuçve]	Bauchweh	‘stomach ache’	41
	brau**x**ə	[brɑuçe]	brauchen	‘need-INF’	41
	hau**x**ə	[hɑuçe]	hauchen	‘aspirate-INF’	41
	šlau**x**	[ʃlɑuç]	Schlauch	‘hose’	41
	rau**x**	[rɑuç]	Rauch	‘smoke’	47

In sum, [x] and [ç] in Mühlingen stand in complementary distribution: [ç] after front vowels or coronal consonants and high back vowels and [x] after all other back vowels. From the historical perspective, the nonassimilatory change in (27a) was active.

Dreher (1919) describes the Swb variety spoken in and around Liggersdorf (Map 3.1). The dialect possesses four front monophthongs (/iː ɪ ɛː ɛ/), seven back monophthongs (/uː ʊ ɔː o ɑː ɑ ə/), two diphthongs ending in a front vowel (/ei ɛi/), several diphthongs ending in schwa (e.g. /ɔːə ɛə/), and the diphthong /əu/. The only two dorsal fricatives are [x] and [ç].

The data presented in the original source reveal the following generalizations: (a) Palatal [ç] (=⟦χ⟧) occurs after the front monophthongs or diphthongs ending in a front vowel in (30a), a coronal sonorant consonant in (30b), or a high back monophthong, i.e. either [uː] in (30c) or [ʊ] in (30d).

(30) Dorsal fricatives in Liggersdorf:

a.	bīχdə	[biːçdə]	Beichte	‘confession’	38
	kwĭχd	[kvɪçd]	Gewicht	‘weight’	23
	sę̄χə	[sɛːçə]	verstohlen schauen ‘look-INF sneakily’		35
	hę̆χl̥	[hɛçl̥]	Hechel	‘hatchel’	20
	leiχt	[leiçt]	leicht	‘easy’	37
	rẹ̆iχ	[rɛiç]	reich	‘rich’	37
b.	khĭərχə	[kʰɪərçə]	Kirche	‘church’	25
	milχ	[milç]	Milch	‘milk’	52
c.	bfūχə	[bfuːçə]	fauchen	‘hiss-INF’	75
	būχ	[buːç]	Bauch	‘stomach’	39
	khūχə	[kʰuːçə]	hauchen	‘aspirate-INF’	39
d.	tsŭχd	[tsʊçd]	Zucht	‘breeding’	74
	sŭχd	[sʊçd]	Sucht	‘addiction’	28
	trŭχə	[trʊçə]	Truhe	‘chest’	28
	khŭχi	[kʰʊçi]	Küche	‘kitchen’	30

The author is consistent in transcribing her symbol for [ç] in each of the four contexts in (30), even after high back vowels in (30c, 30d). Dreher (1919: 74) herself realizes that there is a significant generalization concerning the context for [ç], which she describes as after front ("hell") vowels. Apparently Dreher considers ⟦ŭ ū⟧ to be front.[7]

In (31) I provide data with dorsal fricatives in the remaining contexts listed above, namely after the one diphthong ending in a high back vowel ([əu]) in (31a), diphthongs ending in schwa in (31b, 31c), mid back vowels [ɔː ɔ] in (31d), and the low back vowel [ɑ] in (31e). Note that for each of the first five categories some words are attested with [x] (=⟦x⟧) and others with [ç]. One token was found with [ç] after a low back vowel, i.e. [lɑçə] 'laugh-INF' (=⟦lɑχə⟧). I assume that [x] is the unmarked pronunciation for the dorsal fricative after [ɑ] and comment on that one exceptional item below.

(31) Dorsal fricatives in Liggersdorf:

a.	šləux	[ʃləux]	Schlauch	'hose'	39
	rəuχ	[rəuç]	Rauch	'smoke'	41
b.	blǭəx	[blɔːəx]	bleich	'pale'	75
	ǭəxr̥	[ɔːəxr̥]	Eichhorn	'squirrel'	44
	tsǭəxə	[tsɔːəxə]	Zeichen	'sign'	45
	sǭəχ	[sɔːəç]	Harn	'urine'	45
	glǭəχ	[glɔːəç]	Gelenk	'joint'	44
c.	šdę̆əxə	[ʃdɛəxə]	stechen	'sting-INF'	96
	bę̆əx	[bɛəx]	Pech	'misfortune'	75
	fę̆əχdə	[fɛəçdə]	betteln	'beg-INF'	21
	sę̆əχtsę̄ə	[sɛəçtsɛːə]	sechzehn	'sixteen'	21
d.	šǭxə	[ʃɔːxə]	Heuhaufen	'haystack'	75
	fəlǫ̆χərə	[fəlɔçərə]	in die Erde vergraben 'bury-INF in the ground'		26
	brǭχət	[brɔːçət]	Brachmonat	'fallow month'	33
	fədǭχt	[fədɔːçt]	Verdacht	'suspicion'	33
e.	bɑx	[bɑx]	Bach	'stream'	16

[7] The type of vowel described here appears to have been recognized in the literature on German dialectology. See in particular the chart for vowels in Wiesinger (1970a: 1), which is based on the one proposed by Schmitt & Wiesinger (1964). In that system there are two categories of sounds I call "back", namely velar rounded ("velar gerundet") and palato-velar ("palato-velar"); significantly, vowels in the latter category are considered to be centralized ("zentralisiert"). In the system proposed by Wiesinger, there are two distinct sets of symbols, e.g. ⟦u⟧ is velar rounded and ⟦**u**⟧ is palato-velar. Several of the case studies in Wiesinger (1970a) dealing with LAlmc have the centralized back vowel.

I hypothesize that the [x] pronunciation in (31a–31d) represents one group of speakers (Variety A) and that the [ç] realization characterizes a separate set of speakers (Variety B). The generalizations are the following: For Variety A, [ç] only surfaces after a coronal sonorant (=30a, 30b) or a high back monophthong (=30c, 30d) and [x] after any other back vowel (=[x] realization in 31). For Variety B, [ç] surfaces after a coronal sonorant (=30a, 30b) or any nonlow back vowel, including diphthongs ending in a nonlow vowel (=30c, 30d and the [ç] realization in 31a–31d), while [x] occurs after a low back vowel (=31e). This suggests that (27a) was the version of velar fronting that was active for Variety A – with the added provision that the high back vowel be a monophthong – and that the more general context in (27b) was the one that held for Variety B. It is difficult to interpret the item [lɑçə] 'laugh-INF' referred to above. That token might be a mistranscription, or it could indicate that for some speakers the more general change in (27c) has transpired (or was in the process of transpiring in 1919).[8]

Jarfe (1929) describes the Eph dialect once spoken in Ramlingen (Map 4.3), which has front vowels (/i iː y yː e eː ɛː ø øː/), back vowels (/u uː o oː ɑ ɑː ə/) and three diphthongs (/ɑi ɑu oi/), as well as the two dorsal fricatives [x] and [ç].

The following data indicate that [ç] (=⟦χ⟧) surfaces after front vowels in (32a–32g) or coronal sonorant consonants in (32h). There are copious examples of words like these, which are consistently transcribed with Jarfe's symbol for [ç] and never with the symbol for [x] (=⟦x⟧).

(32) Dorsal fricatives in Ramlingen:

a.	twīχ	[tviːç]	Zweig	'branch'	25
b.	liχtə	[liçtə]	leicht	'light'	26
	tjiχt	[tjiçt]	Gicht	'gout'	18
	liχt	[liçt]	liegt	'lie-3SG'	19
c.	tȳχ	[tyːç]	Zeug	'stuff'	30
d.	dyχdiχ	[dyçdiç]	tüchtig	'capable'	22

[8]An alternative interpretation is that Variety A and Variety B are present in the grammar of a single individual. It is not possible to know for sure whether or not this is true for Liggersdorf, but this is clearly the correct interpretation for the Swb speakers of Beuren investigated by Bausinger & Ruoff (1959); see Map 3.3. Bausinger & Ruoff provide phonetically transcribed texts for four speakers of Beuren. All four have palatal [ç] after front segments and [x] after back vowels, but the first three speakers also have several instances of [ç] in the context after back vowels (e.g. [brəuçɐ] 'need-INF', [nɔçər] 'afterward'). These speakers have internalized both assimilatory velar fronting, whereby /x/ surfaces as palatal after any coronal sonorant, as well as some version of nonassimilatory velar fronting from (27). Since the assimilatory pattern corresponds to the one for StG (Chapter 17), the Beuren speakers appear to be diglossic.

e.	weχ	[veç]	Weg	‘path’	17
	sleχt	[sleçt]	schlecht	‘bad’	17
f.	høχtə	[høçtə]	Höhe	‘height’	30
	krøχəln	[krøçəln]	husten	‘cough-INF’	21
g.	nø̄χtə	[nøːçtə]	Nähe	‘vicinity’	24
h.	dolχ	[dolç]	Dolch	‘dagger’	11

The data in (32) are consistent with Jarfe’s (1929: 11) assertion that the palatal occurs after front vowels and consonants (“nach hellen Vokalen und Konsonanten”). However, the data in Jarfe (1929) containing back monophthongs or diphthongs ending in a back vowel indicate that [ç] is not limited to the coronal sonorant environment. In fact, in the overwhelming number of items with nonlow back vowels followed by a dorsal fricative, that fricative is represented with Jarfe’s symbol for [ç]. That being said, some items can be found in which nonlow back vowels are followed by [x]. In (33a–33e) I provide representative examples for words with five nonlow back vowels (including the diphthong [ɑu]) followed by a dorsal fricative. Data like the ones in (33f) indicate that [x] surfaces after low back vowels, although I found one token with [ç] in that context, namely [dinzədɑç] ‘Tuesday’ (=⟦dinzədɑχ⟧).

(33) Dorsal fricatives in Ramlingen:

a.	tjūχən	[tjuːçən]	kreischen	‘screech-INF’	27
b.	plɑuχ	[plɑuç]	Pflug	‘plow’	26
	gənɑuχ, gənɑux	[gənɑuç], [gənɑux]	genug	‘enough’	26
c.	slōχ	[sloːç]	schlug	‘strike-PRET’	26
	lōχ	[loːç]	log	‘lie-PRET’	29
	tōχ, tōx	[toːç] [toːx]	zog	‘pull-PRET’	11
d.	nox	[nox]	noch	‘still’	19
	trox	[trox]	Trog	‘trough’	20
	soχt	[soçt]	sucht	‘search-3SG’	26
	hoχtīt	[hoçtiːt]	Hochzeit	‘wedding’	29
e.	tǭx	[tɔːx]	zähe	‘tough’	23
	waidǭχ	[vaidɔːç]	Schmerzen	‘pain-PL’	28
f.	ɑxt	[ɑxt]	acht	‘eight’	14
	dɑxt	[dɑxt]	Docht	‘wick’	23
	slɑx	[slɑx]	Schlag	‘blow’	14
	bɑ̄x	[bɑːx]	Berg	‘mountain’	17

I posit that there are two groups of speakers: Variety A and Variety B. For Variety A, [ç] only occurs after coronal sonorants (=32) and [x] only after back vowels (=[x] realization in 33), but for Variety B, [ç] surfaces after coronal sonorants (=32) or nonlow back vowels (=[ç] realization in 33a–33e), and [x] after low back vowels (=33f). Thus, nonassimilatory fronting has not yet affected Variety A, but for Variety B, (27b) obtains. Since the [dinzədɑç] 'Tuesday' example mentioned above appears to be an isolated example it is difficult to know whether or not this item was simply mistranscribed or if there is a third group of speakers for which (27c) occurred or was in the process of occurring in 1929.[9]

Recall from §9.2 the CHes variety spoken in Wissenbach (Kroh 1915; Map 7.1), which has the phonemic front oral vowels /i e ɛ/ and back oral vowels /u o ɔ ɑ ə/; most of those vowels can surface as short or long. As described earlier, in that dialect WGmc ⁺[k] and ⁺[x] regularly neutralized to [ç] after a coronal sonorant, although Monophthongization (/ei/ > /ɑː/) later led to the development of the palatal phoneme /ç/. Wissenbach is significant in the context of this chapter because of the development of WGmc ⁺[ɣ]. That sound regularly shifted to [ʝ] after a coronal sonorant in (34b, 34c) and was retained as [ɣ] after a low back vowel in (34a). However, in the context after a nonlow back vowel, WGmc ⁺[ɣ] shifted to [ʝ] by (27b); see (34d). Examples like the one in (34d) illustrate that WGmc ⁺[ɣ] failed to undergo (27b) after [ɔː] which derived historically from a low back vowel (cf. MHG [ɑ]). Note the contrast between [ɣ] and [ʝ] after [ɔː] and before schwa.

(34) Dorsal fricatives in Wissenbach:

a.	āɣ	[ɑːɣ]	Auge	'eye'	120
	āɣə	[ɑːɣə]	Augen	'eye-PL'	120
b.	blę̄jə	[plɛːʝə]	pflegen	'care for-INF'	76
	rējəl	[reːʝəl]	Regel	'rule'	77
	ēj	[eːʝ]	Egge	'harrow'	120
c.	foljə	[folːʝə]	folgen	'follow-INF'	81
	bǭjə	[bɔːʝə]	Bogen	'bow'	82
	gəflǭjə	[gəflɔːʝə]	geflogen	'fly-PART'	120
d.	mǭɣə	[mɔːɣə]	Magen	'stomach'	71

[9]It is also conceivable that both Variety A and Variety B are present in the grammar of a single individual. Since Variety A corresponds to the StG pattern, this alternative interpretation points to diglossia: Variety A is the StG rule of velar fronting, and Variety B is a nonassimilatory version, which is the local dialect.

There are no examples listed in Kroh (1915) in which [ɣ] surfaces after a high back vowel like [u] or after mid back vowels other than [ɔː]. The reason for those gaps is that the original MHG vowels neutralized to other sounds or deleted.

14.4 Velar fronting after all sonorants

14.4.1 Introduction

The nonassimilatory change examined below involves the fronting of a WGmc velar sound in postsonorant position after any type of vowel (=27c). The velar under discussion can be WGmc $^{+}$[ɣ], $^{+}$[k], and/or $^{+}$[x], depending on the dialect.

The reflexes attested in the material cited below for WGmc $^{+}$[ɣ] and $^{+}$[x]/$^{+}$[k] in postsonorant position are summarized in (35). I comment on those stages in greater detail below. The dorsal fricative in the three sequences given in phonetic representation in each row correspond to the attested realization of that original velar. The symbols "[i]", "[l]" and "[ɑ]" represent the natural classes of front vowels, coronal sonorant consonants and back vowels respectively. As noted earlier, the coronal sonorant consonants referred to here are [l] and/or [r] depending on dialect. [n] is also attested, although the number of those examples is relatively small, and many of the sources do not include those examples. As indicated below, the four categories in (35a) and (35b) are argued to correspond to four distinct historical stages.

(35)	a. Postsonorant $^{+}$[ɣ]:	b. Postsonorant $^{+}$[x], $^{+}$[k]:	
	i. [iɣə lɣə ɑɣə]	i. [ixə lxə ɑxə]	(=Stage 1)
	ii. [iʝə lɣə ɑɣə]	ii. [içə lxə ɑxə]	(=Stage 2c')
	iii. [iʝə lʝə ɑɣə]	iii. [içə lçə ɑxə]	(=Stage 2c/2d)
	iv. [iʝə lʝə ɑʝə]	iv. [içə lçə ɑçə]	(=Stage 2e''')

At Stage 1 (=35ai and 35bi) historical velars are retained as velar. When velar fronting is phonologized it does so first in the context after high vowels (Stage 2a) and then after high vowels and mid vowels (Stage 2b), two changes not depicted above. The next incremental change is Stage 2c' (=35aii and 35bii), whereby historical velars are realized as palatal after a front vowel but not after a coronal sonorant consonant, and elsewhere as velar. At Stage 2c/2d (=35aiii and 35biii) the velar changes to palatal after a front vowel (or a nonlow front vowel) or coronal consonant but is retained as velar after a back vowel. Those assimilatory changes were examined from the point of view of rule generalization in Chapter 12. Stage 2e''' (=35aiv and 35biv) reflects the most advanced fronting stage

– the nonassimilatory one – because original velars are realized as palatal after front vowels, sonorant consonants and (crucially) back vowels. As indicted earlier in Table 14.4, Stage 2e’’’ is the third and final nonassimilatory change after Stage 2e’ and 2e’’, which are not depicted in (35).

There are solid descriptions for a number of varieties exhibiting Stage 2e’’’ (=35aiv and 35biv) to varying degrees. In several of those varieties, the lenis velar fricative regularly shows nonassimilatory velar fronting (=35aiv), while the fortis fricative only shows that change to a limited extent (=35biv). The neighboring MFr varieties in Luxembourg, Belgium, and Germany discussed in §14.5 display the nonassimilatory shift from any velar fricative to palatal, regardless of the historical source (=35aiv and 35biv).

Most of the dialects discussed below exhibit the historical merger of various back vowels as well as the deletion of etymological [ɣ] in intervocalic position. A consequence of those developments is that there are gaps involving [ʝ], which is attested only after a subset of the phonemic back vowels. For example, [ʝ] surfaces in some dialects only after long nonhigh back vowels like [oː ɑː], but there are no examples with [ʝ] after the corresponding short vowels ([ɔ ɑ]) or high back vowels like [u uː]. In the type of dialect described here I assume that WGmc $^{+}$[ɣ] underwent fronting after all back vowels (=27c), although a weaker position is that the change only occurred after a subset of the back vowels (=27a, 27b).

14.4.2 Data and discussion

The data in (36a–36c) from the Wph variety once spoken in Soest (§4.3) illustrate Stage 1 for WGmc $^{+}$[ɣ] (=35ai) and the data in (36d, 36e) the assimilatory change (Stage 2c/2c’/2d) for WGmc $^{+}$[x] (=35bii or 35biii).

(36) Dorsal fricatives in Soest:

a.	liʒə	[lɪɣə]	liege	‘lie-1SG’	44
	lèʒə	[lɛɣə]	lege	‘place-1SG’	44
b.	bɑlʒə	[bɑlɣə]	Balge	‘brat-DAT.SG’	44
c.	vɑ̄ʒn	[vɑːɣn̩]	Wagen	‘car’	45
	ròʒə	[ʀɔɣə]	Roggen	‘rye’	44
d.	trèct*a*	[tʀɛçtɐ]	Trichter	‘funnel’	14
e.	dɑxtə	[dɑxtə]	dachte	‘think-PRET’	44

By contrast, the Eph dialect of Eilsdorf (§8.3) in (37) represents Stage 2c/2d for WGmc $^{+}$[ɣ] (=35aiii) and Stage 2c/2d for WGmc $^{+}$[x] (=35biii). The examples in (36) and (37) were discussed earlier and therefore require no comment.

(37) Dorsal fricatives in Eilsdorf:

a.	lı̜jən	[lɪɟən]	liegen	'lie-INF'	342
	fę̄ęjən	[fɛːɟən]	fegen	'sweep-INF'	342
b.	mǫrjən	[mɔrɟən]	morgen	'tomorrow'	342
	feljə	[felɟə]	Radfelge	'wheel rim'	342
c.	fǫʒəl	[fɔɣəl]	Vogel	'bird'	342
	swå̊ʒər	[swɑːɣər]	Schwager	'brother-in-law'	342
d.	bı̜ct	[bɪçt]	Beichte	'confession'	341
e.	fru̜xt	[frʊxt]	Frucht	'fruit'	341

The remaining datasets display the nonassimilatory developments in (27). Consider first material from the two (NHes) places in (38–39). The words listed in (38) from Loshausen-Zella (Schoof 1913a,b,c; Map 7.1) exhibit the change from WGmc $^{+}$[ɣ] to [ɟ] after a front vowel (=38a), coronal sonorant consonant (=38b), or back vowel (=38c). The items provided in (38d–38f) show the modern reflexes of WGmc $^{+}$[k x] in postsonorant position: [ç] surfaces after a front vowel (=38d) or a coronal sonorant consonant (=38e) and [x] after a back vowel (=38f). In the context after [u] the original source (Schoof 1913c: 209) provides several examples like the ones in (38g), which show that [u] can be followed by either the velar or (surprisingly) the palatal. The phonemic front vowels in this variety are /i ɪ e ɛ ø æ/ and the phonemic full back vowels /u o ɔ ɑ/; most of those vowels can surface as short or long.[10]

(38) Dorsal fricatives in Loshausen-Zella:

a.	laijə	[lɑiɟə]	liegen	'lie-INF'	207
	ööjə	[øːɟə]	Augen	'eye-PL'	207
	sääjə	[sæːɟə]	Segen	'blessing'	207
b.	šwäljə	[ʃvælɟə]	schwelgen	'wallow-INF'	207
	mǫrjə	[mɔrɟə]	morgen	'tomorrow'	207
c.	gəfloojə	[gəfloːɟə]	geflogen	'fly-PART'	207
	frå̊j	[frɑːɟ]	fragen	'ask-INF'	207
d.	ricə	[riçə]	riechen	'smell-INF'	209
	rööcərn	[røːçərn]	rauchen	'smoke-INF'	209
	šläăct	[ʃlæːçt]	schlecht	'bad'	209

[10] I do not include /ə/ among the back vowels of Loshausen-Zella or in any of the dialects listed below because that vowel fails to occurs in the context before dorsal fricatives. I likewise do not include diphthongs among the phonemic vocalic sounds.

e.	šilcə	[ʃilçə]	schielen	‘squint-INF’	210
f.	hoox	[hoːx]	hoch	‘high’	209
	šbrååx	[ʃprɑːx]	Sprache	‘language’	209
g.	bux, buc	[bux], [buç]	Bauch	‘stomach’	209

Schoof does not say much about the items in (38g), other than the fact that this optionality sometimes (“zuweilen”) exists. Three points are in need of clarification: First, Schoof’s examples all involve words with [u], but he does not state explicitly that the optionality only holds after that one vowel. Second, it is not clear whether or not the same optionality holds for [x]/[ç] after [u] in all words with that vowel. Third, we cannot know for sure how to interpret the optionality itself. Recall that I accounted for examples in Liggersdorf in (31a–31d) and Ramlingen in (33b–33e) where the velar and palatal occur after the same back vowel by postulating that the two pronunciations reflect two different sets of speakers (varieties). I hypothesize that the two realizations in (38g) are likewise speaker-dependent; hence, some speakers have [bux], while others have [buç].

The data in (38) point to two different stages depending on the target velar fricative: Stage 2e’’’ (=27c) for [ɣ] (<MHG $^+$[ɣ]) and Stage 2e’ (=27a) for [x] (<MHG $^+$[x k]), but only for those speakers with the pronunciation [buç] ‘stomach’.

In the NHes dialect of Blankenheim (Dittmar 1891; Map 7.1) WGmc $^+$[ɣ] is realized as palatal [ʝ] after a front vowel (=39a), coronal sonorant consonant (=39b), or back vowel (=39c). By contrast, [x] (<WGmc $^+$[k x]) undergoes assimilatory velar fronting in the context after a coronal sonorant (=35biii), as in (39d, 39e), and otherwise surfaces as velar after a back vowel, as in (39f). The dialect possesses the phonemic front vowels /i ɪ y e ɛ/ and the phonemic back vowels /u o ɔ ɑ/. Most of those sounds can surface as short or long. Due to historical neutralizations of various vowels referred to above no examples involve [ʝ] in the context after high and low back vowels like [u ɑ].

(39) Dorsal fricatives in Blankenheim:

a.	îjəl	[iːʝəl]	Igel	‘hedgehog’	42
	sê·jəl	[seːʝəl]	Segel	‘sail’	42
b.	gɑljən	[gɑlʝən]	Galgen	‘gallows’	42
	mórjən	[mɔʀʝə]	morgen	‘tomorrow’	42
c.	fôjəl	[foːʝəl]	Vogel	‘bird’	42
	frô·j	[fʀoːʝ]	fragen	‘ask-INF’	43
d.	síçəl	[sɪçəl]	Sichel	‘sickle’	44
	slêç.d	[sleːçt]	schlecht	‘bad’	44

e.	ke·rç	[kerç]	Kirche	'church'	44
f.	bûc	[buːx]	Buch	'book'	29
	no.cd	[nɔxt]	Nacht	'night'	44
	šɑcdəl	[ʃɑxtəl]	Schachtel	'box'	44

The data in (39) exemplify Stage 2e''' (=27c) for [ɣ] (<MHG $^+$[ɣ]) and Stage 2c/2d (=35biii) for [x] (<MHG $^+$[x k]).

Kirchspiel Courl (Beisenherz 1907; Map 4.2) illustrates the nonassimilatory velar fronting of WGmc $^+$[ɣ]. Recall from (11) that WGmc $^+$[ɣ] underwent fronting to [ʝ] in word-initial position before a front vowel or coronal sonorant consonant. In postsonorant position, WGmc $^+$[ɣ] shifted to [ʝ] after a front vowel or a sequence of front vowel plus schwa (=40a), coronal sonorant consonant (=40b), or back vowel (=40c). The examples in (40d–40f) illustrate the assimilatory fronting of WGmc $^+$[x] in postsonorant position. The phonemic front vowels are /i ɪ y e ɛ ø æ/, and the phonemic back vowels are /u o ɔ ɑ/. Due to dialect-specific processes of Diphthongization there do not appear to be examples of back monophthongs in the context before [ʝ]. The data in (40) show that Stage 2e''' (=35aiv) holds for [ɣ] (<MHG $^+$[ɣ]) and Stage 2c' (=35bii) for [x] (<MHG $^+$[x]).

(40) Dorsal fricatives in Kirchspiel Courl:

a.	ĭʓl	[ɪʝl̩]	Igel	'hedgehog'	39
	nīəʓn	[niːəʝn̩]	neun	'nine'	39
b.	mĭɛrʓl	[mɪɛrʝl̩]	Mergel	'marl'	34
c.	būɒʓn	[buːɒʝn̩]	Bogen	'bow'	65
	dȳəʓn	[dyːəʝn̩]	taugen	'be good for sth-INF'	70
d.	bictə	[biçtə]	Beichte	'confession'	56
	rɛct	[rɛçt]	Recht	'justice'	2
e.	bŭɒrx	[buɐrx]	geschnittenes Schwein	'sliced-INFL pig'	62
f.	fuxt	[fuxt]	(no gloss)		61
	doxt	[doxt]	Docht	'wick'	23
	dɑx	[dɑx]	dachte	'think-PRET'	23

Aachen (Welter 1938: 13; Map 5.1) appears to be a dialect in transition from Stage 2c/2d to Stage 2e''' for WGmc $^+$[ɣ]. Recall from Table 14.2 that WGmc $^+$[ɣ] undergoes the nonassimilatory change to palatal in word-initial position. The dialect possesses phonemic front vowels (/i y e ɛ ø/) and phonemic full back vowels (/u o ɔ ɑ/), which Welter transcribes with tone as well as more than one degree of length.

In postsonorant position the reflex of WGmc $^{+}$[ɣ] is palatal [ʝ] after a front vowel (or a front vowel plus schwa) and before a vowel (=41a) or after an original coronal consonant and before a vowel (=41b). (The pre-rhotic schwa in 41b is epenthetic; recall §5.4). As in Schlebusch (§10.3.1), WGmc $^{+}$[k x] assimilate to a sibilant fricative (alveolopalatal [ɕ]) after a front vowel (=41e) and otherwise surface as [x] (=41f). Welter writes that WGmc $^{+}$[ɣ] is normally ("normalerweise") realized as [ɣ] after a back vowel and before a vowel but that after [ɑː] it is occasionally ("gelegentlich") replaced with the palatal in (41c). The example in (41d) reveals that WGmc $^{+}$[ɣ] after other back vowels and before a vowel is optionally replaced with the glide [u̯]. Significantly, there do not appear to be words listed in the original source containing back vowels other than [ɑː] or [oə] after which [ɣ] could potentially occur. This suggests that [ɣ] only occurs in the context after [ɑː] or [oə] and before another vowel and that [ɣ] is replaced with [ʝ] after any back vowel and before another vowel because it deletes after the only other back vowel. Thus, Stage 2c/2d is replaced with Stage 2e''' for WGmc $^{+}$[ɣ]. By contrast, WGmc $^{+}$[k x] exhibit Stage 2c/2d (=35biii).

(41) Dorsal fricatives in Aachen:

a.	lý·j.ə	[lyʝə]	lügen	'lie-INF'	13
	vẹ́·ə.jə	[veəʝə]	fegen	'sweep-INF'	13
b.	ę́·r.əjər	[ɛrəʝər]	Ärger	'anger'	13
c.	drā:ɣə, drā:jə	[drɑːɣə], [drɑːʝə]	tragen	'carry-INF'	13
	zā:ɣə, zā:jə	[zɑːɣə], [zɑːʝə]	sagen	'say-INF'	13
d.	vrọ́·ə.ɣə, vrǭ:u̯ə	[vroəɣə], [vrɔːu̯ə]	fragen	'ask-INF'	13
e.	rî:š	[riːɕ]	reich	'rich'	13
	vø.š(t)	[vøɕt]	feucht	'damp'	15
f.	štrû:x	[ʃtruːx]	Strauch	'shrub'	13
	lɑ·xt.ə	[ʃlɑxtə]	schlachten	'slaughter-INF'	15

Braun (1906) discusses a number of places (EFr) in the general vicinity of Heilbronn (Map 3.4). The author observes that the distinction between [x] and [ç] is not nearly as well-defined as in the standard language ("nicht stark ausgeprägt") and consequently transcribes the fortis dorsal fricatives in his material with [ç]. Some representative examples illustrating the occurrence of palatal [ç] can be observed in (42). What these examples suggest is that [ç] can have any historical source, i.e. WGmc $^{+}$[k x] in (42a, 42b) or WGmc $^{+}$[ɣ] in (42c–42g).

(42) Dorsal fricatives in Heilbronn:

a.	gsiçd	[gsiçt]	Gesicht	‘face’	12
	rɛçd	[rɛçt]	recht	‘right’	12
b.	buuç	[buːç]	Buch	‘book’	12
	doç	[doç]	doch	‘however’	12
c.	fliiʒə, fliiçə	[fliːɣə], [fliːçə]	Fliege	‘fly’	13
d.	fooʒəl, flooçəl	[foːɣəl], [foːçəl]	Vogel	‘bird’	13
	maaʒər, maaçər	[mɑːɣər], [mɑːçər]	mager	‘lean’	13
e.	seçd	[seçt]	sagt	‘say-3sg’	13
f.	taaç	[tɑːç]	Tag	‘day’	13
g.	bɛrç	[bɛrç]	Berg	‘mountain’	14

I interpret the optionality in (42c, 42d) as speaker-dependent; hence, some speakers have the pronunciation with [ɣ] and others with [ç]. Significantly, the change from WGmc $^{+}$[ɣ] or $^{+}$[k x] to [ç] occurred after any type of sound. Note in particular the occurrence of [ç] after back vowels (=42b, 42d, 42f). The phonemic front vowels in this dialect are /i e ɛ/ and the phonemic full back vowels /u o ɑ/, which surface as short or long as well as nasalized or oral.

One could take the data in (42) at face value and conclude that the dialect has fronted WGmc $^{+}$[ɣ k x] to [ç] after any type of sound (=Stage 2e’’’). Alternatively, one might interpret Braun’s comments concerning the distinction between [x] and [ç] not as a complete merger to [ç], but instead as a near-merger. If correct, that would mean that the two fricatives are still phonetically distinct, even though Braun decided to transcribe them with the same phonetic symbols. If the latter interpretation is on the right track then Heilbronn represents a transitional dialect on its way to becoming fully-fledged Stage 2e’’’.

14.4.3 Areal distribution of nonassimilatory velar fronting after a sonorant

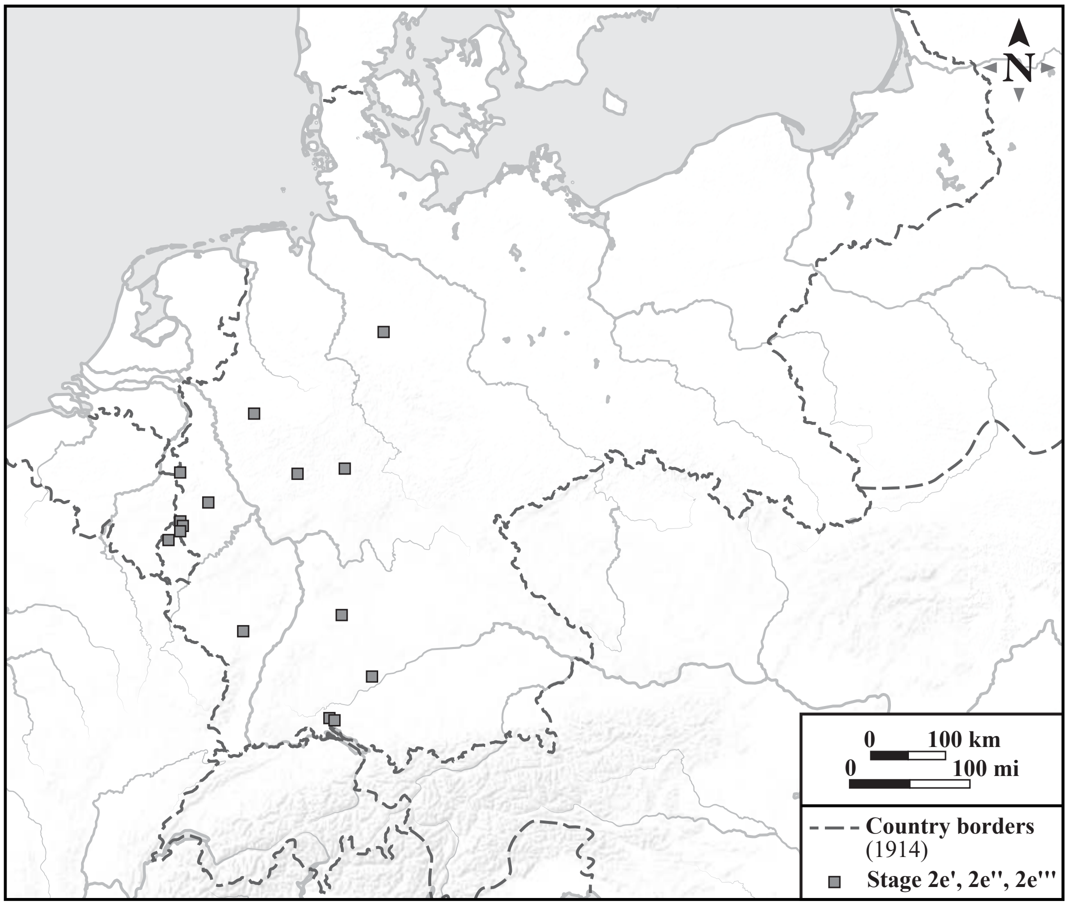
Table 14.5 provides a list of all dialects discussed in this chapter involving some version of nonassimilatory velar fronting in (27) for the postsonorant context. All of those varieties are indicated in Map 14.3. I also include the places discussed in §14.5 below. In Table 14.5 I do not indicate the velar fronting targets for the stages indicated in the final column.

In Chapter 15 I discuss data from linguistic atlases for various places in Vorarlberg and Tyrol which have palatal [ç] but no velar [x] (=Stage 2e’’’). I do not list those places in Table 14.5, nor do I include them on Map 14.3. Discussion of those areas is delayed until Chapter 15, which considers their status as velar fronting islands.

All of the places indicated on Map 14.3 are situated in the western part of Germany (and Luxembourg/Belgium). Those varieties occupy various points along a broad vertical column extending from the area just north of Switzerland to a point to the northwest of Hannover in Lower Saxony. Although the twelve varieties are found in the same broad region, there is considerable space separating most of them.

Table 14.5: Nonassimilatory velar fronting of WGmc velars in postsonorant position (=22a–22c)

Place	Dialect	Source	Stage
Mühlingen	Swb	Müller (1911)	2e’
Blaubeuren	Swb	Strohmaier (1930)	2e’
Liggersdorf	Swb	Dreher (1919)	2e’/2e’’
Ramlingen	Eph	Jarfe (1929)	2d/2e’’
Wissenbach	CHes	Kroh (1915)	2e’’
Nordösling	MFr	Bruch (1952)	2e’’’
Burg-Reuland	MFr	Hecker (1972)	2e’’’
Lützkampen, Dahnen	MFr	MRhSA	2e’’’
Aachen	Rpn	Welter (1938)	2e’’’
Loshausen-Zella	NHes	Schoof (1913a,b,c)	2e’’’
Blankenheim	NHes	Dittmar (1891)	2e’’’
Kirchspiel Courl	Wph	Beisenherz (1907)	2e’’’
Heilbronn	EFr	Braun (1906)	2e’’’



Map 14.3: Areal distribution of nonassimilatory velar fronting in postsonorant position. Varieties of High German and Low German in which postsonorant velar fronting is a nonassimilatory change (Stage 2e’, 2e’’, 2e’’’) are indicated with squares.

14.5 Nonassimilatory velar fronting in Nordösling

The case studies discussed in §14.4 have in common that some velar fricatives undergo fronting to palatals, but other velar fricatives remain and therefore surface as such. In the present section I discuss a set of dialects in the northwest corner of the MFr region (Map 5.3) which have in common that they do not possess velar fricatives because those sounds underwent nonassimilatory velar fronting (or underwent g-Formation-1 to [g]). I discuss first the variety of North Lxm spoken in Nordösling (Bruch 1952) followed by the MFr variety of Burg-Reuland in the southeastern tip of Belgium (Hecker 1972). I conclude by showing that the same pattern is attested in data from MRhSA for two German villages in the same area.

The data in (43) from North Lxm (Nordösling) can be contrasted with the material analyzed earlier in §10.3.2 from Central, South, and East Lxm discussed by Gilles (1999). Nordösling is a region in North Luxembourg in the canton of Clerf. The words listed in (43) reveal that WGmc ⁺[ɣ] shifted to palatal [ʝ] between vowels if the first vowel is front (=43a) or back (=43b). No examples were found in Bruch (1952) illustrating the environment after a consonant. WGmc ⁺[ɣ] in coda position shifted to palatal ([ç]) after a front vowel (=43c) or back vowel (=43d). WGmc ⁺[k x] are similarly realized as [ç] (/ç/) after a front vowel (=43e) or back vowel (=43f). The change to palatal can even be observed for historical sources other than the ones mentioned above, e.g. an original glide (=43g). [11] In sum, the words listed below illustrate that Nordösling exhibits Stage 2e''' for WGmc ⁺[ɣ x k]. No velar fricatives occur word-initially because WGmc ⁺[ɣ] underwent g-Formation-1 and therefore surfaces as [g]. There were no independent sound changes introducing velar fricatives in word-initial position. That velars changed to palatals even after back vowels is stated clearly in the original source (Bruch 1952: 35, 36: "nach velaren wie nach palatalen Vokalen").

(43) Palatal fricatives in Nordösling:

a.	lɛːjən	legen	'place-INF'	35
	fleijən	fliegen	'fly-INF'	35
b.	tujənt	Tugend	'virtue'	35
	fujəl	Vogel	'bird'	24
	mɔːjər	mager	'lean'	35

[11] The phonemic front vowels in this dialect are /i e ɛ/ and the phonemic back vowels /u o ɔ ɑ/; most of those vowels surface as short or long. Since there is no significant difference between the phonetic symbols in the original source and the ones I employ in the present book, I simply give the former in the first column of (43). Two minor differences are that Bruch's ⟦j⟧ depicts the palatal fricative [ʝ] and that ⟦aː⟧ is the low back vowel [ɑ].

c.	fleiç	Fliege	‘fly’	35
	lɛ·ç	Lage	‘situation’	35
	vɛːç	Weg	‘path’	35
d.	tsuç	Zug	‘train’	35
	vɔːç	Waage	‘scale’	35
	taːç	Tag	‘day’	35
	fouç	Fuge	‘seam’	35
e.	zeçər	sicher	‘certainly’	23
	ʃpɛːçt	Specht	‘woodpecker’	22
f.	koːçən	kochen	‘cook-INF’	12
	lɔːç	Loch	‘hole’	23
	ʃwaːç	schwach	‘weak’	21
	aːçt	acht	‘eight’	21
	baːçən	backen	‘bake-INF’	36
	kouç	Kuchen	‘cake’	36
	hɑːuçən	hauchen	‘aspirate-INF’	28
g.	blɔːç	blau	‘blue’	32
	grɔːç	grau	‘gray’	32

The pattern depicted in dataset (43) is confirmed by independent sources. First, according to LSA, palatal fricatives are attested after front and back vowels throughout North Luxembourg. Some examples of words containing [ç] after a back vowel from that source are [nɑːçt] ‘night’ (Map 25), [voçən] ‘week-PL’ (Map 61), [kɑçən] ‘cook-INF’ (Map 64), and [luːçt] ‘air’ (Map 82). Second, Gilles (1999) collected data throughout Luxembourg, including the area in and around Nordösling. He concludes that the palatal fricative [ç] now surfaces for his informants as alveolopalatal [ɕ] after front and back vowels alike. Examples of words in his survey from Nordösling include [nɑːɕt] ‘night’ and [brɑːɕt] ‘bring-PART’.[12]

As in Nordösling, etymological velar fricatives (WGmc $^{+}$[ɣ x]) in the region in and around Burg-Reuland in East Belgium in the province of Liège (Lüttich) have been consistently replaced with their fronted counterparts.

The data in (44) from Hecker (1972) are representative for the area around Burg-Reuland; see also Cajot & Beckers (1979: 197). As shown in (44a), historical $^{+}$[ɣ] underwent nonassimilatory velar fronting to [ʝ] (=⟦j⟧) in word-initial position (Stage 2e). In the context between sonorants, original $^{+}$[ɣ] likewise shifted to [ʝ] after a front vowel in (44b), but – more significantly – the same change took place

[12]Some of the maps in LSA suggest that nonassimilatory velar fronting is attested outside of Nordösling. For example, Map 25 for *Nacht* ‘night’ indicates that the realization as [nuəçt] occurs throughout Central Lxm.

after any back vowel in (44c). The same generalization holds for historical ⁺[x], which now surfaces as the corresponding alveolopalatal fricative [ɕ] (=⟦š⟧). The change from ⁺[x] to [ɕ] occurred in the context after a front vowel in (44d), but also after any back vowel in (44e). The data in (44f) show that an original ⁺[ɣ] in the context after a back vowel and before another vowel is alveolopalatal [ɕ] and not [ɟ], and the items in (44g) indicate that an original fortis velar stop is now [ɕ] even though a back vowel precedes that sound. The words in (44h) contain a historical ⁺[ʃ], which merged together with historical [ɣ x] to alveolopalatal [ɕ].[13]

(44) Alveolopalatal/palatal fricatives in Burg-Reuland:

a.	juː́t	[ɟuːt]	gut	‘good’	65
	jeː́l	[ɟeːl]	gelb	‘yellow’	97
	jraːs	[ɟrɑːs]	Gras	‘grass’	65
b.	fliː́je	[fliːɟə]	fliegen	‘fly-INF’	65
c.	plǫːje	[plɔːɟə]	plagen	‘afflict-INF’	65
	kla::je	[klɑːɟə]	klagen	‘complain-INF’	106
d.	bräːše	[bræːɕə]	brechen	‘break-INF’	62
	reš	[reɕ]	reich	‘rich’	62
e.	fluː́še	[fluɕə]	fluchen	‘curse-INF’	60
	kǫːše	[kɔɕə]	kochen	‘cook-INF’	62
	štrǫše	[ɕtrɔɕə]	streichen	‘paint-INF’	118
	oš	[oɕ]	auch	‘also’	62
	baːš	[bɑːɕ]	Bach	‘stream’	62
f.	doːše	[doːɕə]	taugen	‘be good for sth-INF’	132
g.	dreše	[dreɕə]	trocken	‘dry’	117
	baːše	[bɑːɕə]	backen	‘bake-INF’	104
h.	šlaŋ	[ɕlɑŋ]	Schlange	‘snake’	39
	fläš	[flæɕ]	Flasche	‘bottle’	62
	biːšt	[biːɕt]	Bürste	‘brush’	82
	touše	[touɕə]	tauschen	‘exchange-INF’	115

[13] The data in Hecker (1972) reveal that many instances of historical velar fricatives deleted, but I do not consider those examples here. The diacritic ⟦´⟧ in some of the items listed in the first column of (44) represents a distinct tonal contour which I ignore in my transcriptions in the second column. The phonemic front vowels of Burg-Reuland are /i e ɛ æ/ and the phonemic back vowels /u o ɔ ɑ/. Those eight vowels surface as short or long. There are a few gaps (e.g. no example was found with [ɟ] between a nonhigh front vowel and another vowel), but they are not deemed significant.

Unlike the alveolopalatalizing dialects discussed in Chapter 10 there are no alternations between [x] and [ɕ] in Burg-Reuland which would motivate a synchronic rule neutralizing the contrast between /x/ and /ɕ/. The reason for this gap is that Burg-Reuland has no /x/.

The pattern for the MFr variety of Burg-Reuland depicted in (44) stands in contrast with the system of velars and (alveolo)palatals in neighboring Rpn varieties of East Belgium discussed in Hecker (1972), e.g. Elsenborn, Wallerode, Recht, St. Vith, Manderfeld (=Hecker 1972 on Map 5.1). Consider the data in (45) from Elsenborn, ca. 20 km north of Burg-Reuland:

(45) Alveolopalatal/palatal and velar fricatives in Elsenborn:

a.	brä:še	[bræːɕə]	brechen	'break-INF'	62
	riš	[riɕ]	reich	'rich'	62
b.	fluxe	[fluxə]	fluchen	'curse-INF'	60
	kǫ:xe	[kɔxə]	kochen	'cook-INF'	62
	ba:x	[bɑːx]	Bach	'stream'	62
c.	maxen	[mɑxə]	machen	'do-INF'	61
	mešt	[meɕt]	macht	'do-3SG'	61

These data reveal that Elsenborn retains historical velars after back vowels. Hecker (1972) points out that the areas of East Belgium north of Burg-Reuland now have alternations involving [x] and [ɕ] as in (45c) which motivate a synchronic process of velar fronting (as in Schlebusch; §10.3.1).

An examination of the maps in the fourth volume of MRhSA indicates that the two German villages Lützkampen and Dahnen in Rhineland-Palatinate exhibit a pattern that is essentially the same as the one in (44) for Burg-Reuland. Both of those villages fall into the broad alveolopalatalizing region; hence, historical [ç] is now [ɕ]. That change occurred after coronal sonorants – evident in the maps for *ich* 'I' and *Kirche* 'church' – but most significantly after historically back vowels. Etymological $^{+}$[ɣ] likewise underwent velar fronting to palatal [ʝ] after a sonorant and before a vowel or to alveolopalatal [ɕ] in the coda even after back vowels. The data in (46) have been drawn from MRhSA. They have in common that the change from $^{+}$[ɣ] to [ʝ]/[ɕ] occurred after back vowels.[14] As in Nordösling, the modern reflex of WGmc $^{+}$[ɣ] in Lützkampen and Dahnen is [g].

(46) Alveolopalatal/palatal fricatives in Lützkampen (in a) and Dahnen (in b):

[14] I have simplified the phonetic representations in (46) from the original source by ignoring diacritics capturing low-level phonetic detail (half-length in vowels, slight aspiration in fortis stops) and tone contours. The sound [ʃ] is the alveolopalatal sibilant I transcribe as [ɕ].

a.	[βɔʃ]	Waage	‘scale’	Map 384
	[kʊɟəl]	Kugel	‘ball’	Map 387
b.	[b̥lʊʃ]	Pflug	‘plow’	Map 392
	[nɑːʃd̥]	Nacht	‘night’	Map 338
	[lʊːʃd̥]	Luft	‘air’	Map 399

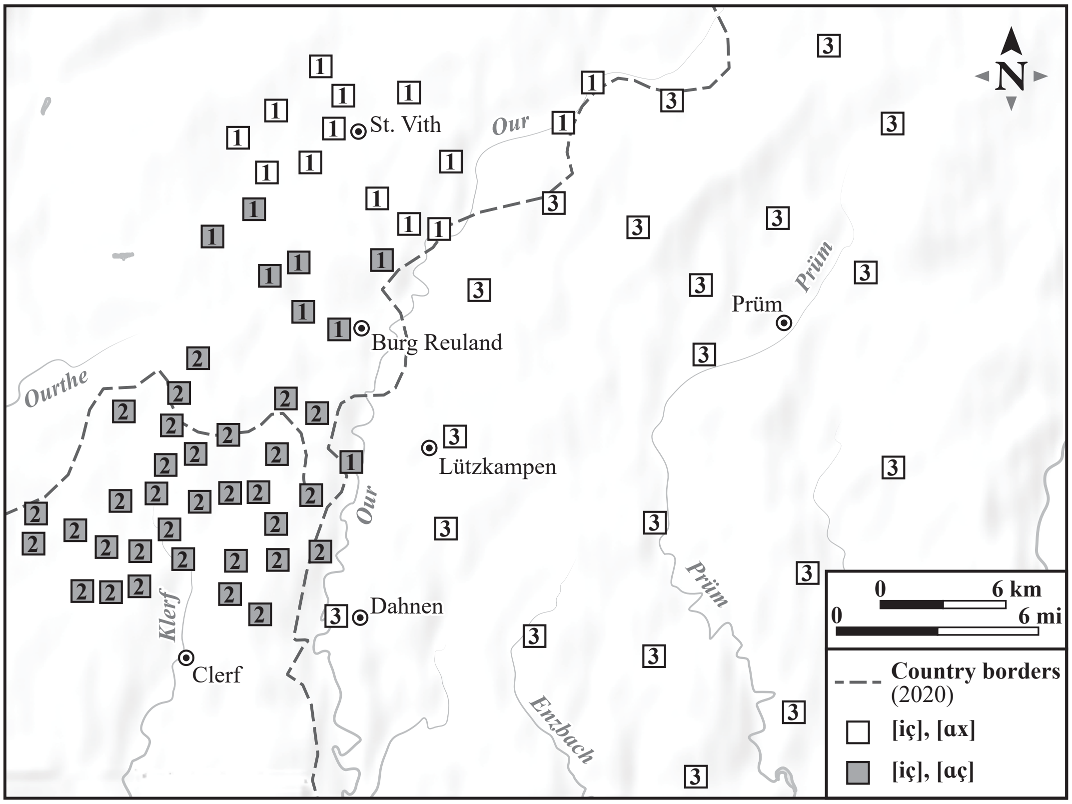
The risk of drawing conclusions solely on the basis of a sparse set of examples drawn from a linguistic atlas is that the maps might not reflect deeper generalizations concerning the dialect as a whole. Nevertheless, on the basis of the data in MRhSA and the close proximity of Lützkampen and Dahnen to Nordösling and Burg-Reuland, I assume – unless evidence can be adduced to the contrary – that the two German villages in question have no velar fricatives.

Map 14.4 contrasts assimilatory vs. nonassimilatory velar fronting in the places discussed in the present section. The markers in Belgium correspond to the towns and villages indicated on the map in Hecker (1972: 146) showing the realization of /x/ as /x/ or /ç/ (=⟦š⟧) in *machen* ‘do-INF’, and the ones in Luxembourg are the locations of the informants for LSA (Belegorte) which are in the Nordösling region described by Bruch (1952). The markers in Germany are the ones indicated in MRhSA (Belegorte).

The detailed descriptions cited above for Nordösling and Burg-Reuland are the only ones uncovered up to this point in the present survey possessing (alveolo)palatal fricatives but no corresponding velars. (For examples attested outside of this area see Chapter 15). The data from MRhSA for Lützkampen/Dahnen suggests that the same generalization is also true for those places. What is more, since closely related varieties of German spoken in the same area display the unmarked assimilatory pattern of (alveolo)palatals after front vowels and velars after back vowels (=Stage 2c/2d), the inescapable conclusion is that Nordösling, Burg-Reuland, and Lützkampen/Dahnen – indicated on Map 14.4 with lightly shaded squares – exhibited the loss of velar fronting (§14.6.3).

14.6 Discussion

I turn to several unresolved issues. First, I consider and reject a possible alternative treatment to the one presupposed in the present chapter (§14.6.1). Second, I discuss the status of the nonassimilatory changes in (4) and (22) as synchronic rules (§14.6.2). Third, I discuss the topic of rule loss in light of the Nordösling/Burg-Reuland/Lützkampen/Dahnen data presented above (§14.6.3). Finally, I provide further remarks on accounting for unattested Trigger Types (§14.6.4).



Map 14.4: Luxembourg (Nordösling), East Belgium, and West Central Germany (Rhineland-Palatinate). Shaded squares indicate nonassimilatory velar fronting and white squares assimilatory velar fronting (alveolopalatalization). 1=Hecker (1972), 2=LSA, 3=MRhSA.

14.6.1 Alternative approach

This chapter asserts that the fronting of velars in the neighborhood of one or more back vowel by (4) and (27) is nonassimilatory because back vowels do not bear the frontness feature ([coronal]). One could alternatively argue that the basic premise is incorrect and that the back vowels inducing fronting are marked phonologically for the frontness feature, in which case velars would be expected to surface as palatals in the neighborhood of those vowels. It is demonstrated below that an alternative analysis along these lines is flawed.

I apply the alternative analysis to Schlebusch (=13), which is exemplifies the change from an original velar to palatal in word-initial position before any kind of sound (=4). I focus on Schlebusch, although the same argument can be extended to any of the other dialects listed in Table 14.2.

The alternative analysis for Schlebusch is depicted in (47) and (48). To the right of the wedge in (47) I give the phonetic representation for three words from (13).

To the left of the wedge I give the reconstructed example with [ɣ] or [ʝ] at the point before WGmc ⁺[ɣ] shifted to palatal [ʝ] before a back vowel (=Stage 2d). Front vowels like /ɛ/ and liquids like /l/ are simplex [coronal] sounds, as indicated below. Since a velar fronts to palatal before any back vowel, all back vowels must be analyzed as phonologically coronal. This treatment might be plausible if back vowels are phonetically (and phonologically) central, which might translate into a treatment whereby vowels like /ɑ/ are complex (=[coronal, dorsal]), as in (47c). Given the features in (47), rule (48) is triggered by all coronal sonorants; hence, that rule is assimilatory and (4) never occurred at all.

(47)	a.	⁺[ʝɛl]	>	[ʝɛl]	/ɛ/	= [coronal]	'yellow'
	b.	⁺[ʝlɑt]	>	[ʝlɑt]	/l/	= [coronal]	'smooth'
	c.	⁺[ɣɑs]	>	[ʝɑs]	/ɑ/	= [coronal, dorsal]	'guest'

(48) velar > palatal / $_{\text{wd}}$[___ [coronal, +sonorant]

The problem with analyzing all back vowels (/u uː o oː ɔ ɔː ɑ ɑː/) phonologically as coronal is that those same back vowels do not trigger the fronting of a following velar. For example, as noted earlier in §10.3.1, Schlebusch /x ɣ/ both undergo assimilatory fronting after front vowels (Velar Fronting-1), thereby accounting for alternating forms like [ruxə]~[ryç] 'smell-INF~smell-3SG'. Velar Fronting-1 affects /x/ after any coronal sonorant; hence, the /x/ in the word [ruxə] (/ruxə/) fails to undergo it because the vowel /u/ is back and hence not [coronal]. If the vowels /u uː o oː ɔ ɔː ɑ ɑː/ are phonologically [coronal] to account for the fronting of a velar preceding that sound, then one would incorrectly expect a velar after that sound to be fronted as well.

The upshot is that the alternative analysis described above cannot work for the dialects in Table 14.2. I do not discuss any of the dialects illustrating the changes depicted in (27) for postsonorant position, but potential problems arise in those varieties where ⁺[ɣ] and ⁺[x]/ ⁺[k] do not behave in a consistent manner in the context after back vowels.

14.6.2 Status of nonassimilatory velar fronting in the synchronic phonology

Stress in this chapter has been placed on the historical nonassimilatory process of fronting, both word-initially and after a sonorant. One question not discussed earlier is the status of the nonassimilatory fronting of velars in the synchronic grammar. Two positions suggest themselves here, which I refer to below as Analysis A and Analysis B. For Analysis A, the nonassimilatory fronting of velars restructured underlying representations and hence that change is no longer present in the synchronic grammar. By contrast, for Analysis B the nonassimilatory change in question did not alter underlying representations but instead remains active in the grammar as a synchronic process.

As I point out below, Analysis B in its strongest form cannot be correct for the change from an assimilatory process fronting velars to one of the nonassimilatory changes in (4) or (27). However, there is good reason for believing that a variant of Analysis B holds for the initial (assimilatory) stages of velar fronting. To illustrate that point I consider as a representative example data in (49) for velar fronting in word-initial position in the Wph variety of Elspe described by Arens (1908); recall §7.2. The example discussed here concerns a change in the set of triggers, but the same point holds for a change in the set of target segments.

(49)	a.	[çɛlt] /xɛlt/	<	+[çɛlt] /xɛlt/	‘money’
	b.	[çrɛɔt] /xrɛɔt/	<	+[xrɛɔt] /xrɛɔt/	‘large’
	c.	[xɔlt] /xɔlt/	<	+[xɔlt] /xɔlt/	‘gold’

The phonetic representations in the first column of (49) are the ones representing Elspe in 1908. Since there was no contrast between [ç] in [x] in word-initial position at that stage, those two sounds derive from /x/. The set of triggers for velar fronting (word-initial) in 1908 subsumed high, mid and low front vowels as well as coronal sonorant consonants (=Stage 2d). The immediately preceding stage could be either Stage 2c (high front vowels, mid front vowels or coronal consonants) or Stage 2c’ (high, mid or low front vowels). I assume the latter, although the choice between the two is not crucial. The phonetic representations for the three examples are reconstructed for Stage 2c’. The crucial example is the one in (49b): At Stage 2c’ the set of triggers for word-initial velar fronting consisted of all front vowels, but not the consonants. The important point is that the change from Stage 2c’ to Stage 2d did not involve a change in underlying representations. In (49a), (49b) – and crucially (49c) – /x/ is simply inherited without change. Rule generalization therefore describes the relationship between a synchronic process at one stage with the same synchronic process at the next stage.

A treatment like the one in (49) for nonassimilatory velar fronting fails in those places where velars and palatals contrast, e.g. in the CHes variety spoken in Wissenbach (Kroh 1915) from (34). In that dataset it was demonstrated that WGmc +[ɣ] shifted to [ʝ] after nonlow back vowels deriving historically from nonlow back vowels (=27b), e.g. [bɔːʝə] ‘bow’ (< pre-CHes +[bɔːɣə]; cf. MHG *boge*). According to Analysis B, (27b) did not alter underlying representations; hence, a pre-CHes underlying representation like /bɔːɣə/ was also present in the dialect as it was described in 1915 as /bɔːɣə/, in which case (27b) applied as a synchronic process. Analysis B fails for the Wissenbach variety because (27b) incorrectly applies to the /ɣ/ after [ɔː] (< [ɑ]), e.g. [mɔːɣə] (/mɔːɣə/) 'stomach' (=34d).

In some of those varieties where velars and palatals never contrast, Analysis B can be shown to be highly questionable at best. Consider as a representative example the Stage 2e''' variety of Nordösling from (43). In that dataset it was shown that WGmc velars (⁺[x ɣ k]) are realized as palatal in postsonorant position (=27c). The phonetic representation in the first column of (50a) is the pronunciation described in the original source (Bruch 1952). Given the rule generalization approach described above, the nonassimilatory stages (Stage 2e''' < Stage 2e'' < Stage 2e') were preceded by a stage in which velars front in an assimilatory manner after coronal sonorants (=Stage 2d). The examples in the first column of (50a) are reconstructed to the right of the wedge as a Stage 2d dialect. Since the set of triggers subsume front sounds, the synchronic rule referred to here is an assimilation spreading the frontness feature [coronal] (Velar Fronting-1). According to Analysis A, Velar Fronting-1 was active until (27c) altered /x ɣ/ in postsonorant position to /ç ʝ/. Significantly, Alternative A implies that the restructuring of underlying representations to palatals led to the loss of the earlier rule of Velar Fronting-1. Consider now Alternative B, which is sketched in (50b). According to that treatment, (22c) did not alter underlying representations; hence, /x ɣ/ are inherited into the dialect as it was described in 1952 with /x ɣ/. Alternative B does not necessitate rule loss; instead, it involves the reanalysis of a rule of assimilation triggered by coronal sonorants (Velar Fronting-1) to a nonassimilatory change which applies synchronically after any type of segment (=27c).

(50)	a.	Analysis A for Nordösling:			
		[aːçt] /aːçt/	<	⁺[aːxt] /aːxt/	'eight'
		[ʃpɛːçt] /ʃpɛːçt/	<	⁺[ʃpɛːçt] /ʃpɛːxt/	'woodpecker'
		[fuʝəl] /fuʝəl/	<	⁺[fuɣəl] /fuɣəl/	'bird'
		[lɛːʝən] /lɛːʝən/	<	⁺[lɛːʝən] /lɛːɣən/	'place-INF'
	b.	Analysis B for Nordösling:			
		[aːçt] /aːxt/	<	⁺[aːxt] /aːxt/	'eight'
		[ʃpɛːçt] /ʃpɛːxt/	<	⁺[ʃpɛːçt] /ʃpɛːxt/	'woodpecker'
		[fuʝəl] /fuɣəl/	<	⁺[fuɣəl] /fuɣəl/	'bird'
		[lɛːʝən] /lɛːɣən/	<	⁺[lɛːʝən] /lɛːɣən/	'place-INF'

It is important to stress that Nordösling possesses neither [x] nor [ɣ]. If Analysis B were adopted then the question is why speakers would continue to analyze the palatal in words like [aːçt] 'eight' as a sound they do not have, i.e. /x/. Put differently: How are language learners not knowledgeable about the history of the

Nordösling variety able to deduce that an underlying representation for words like [aːçt] is /aːxt/ (as per Analysis B) and not /aːçt/?

The weakness described above for Analysis B holds for those dialects which no longer possess the surface velars in question, but it is not clear what the status is of the nonassimilatory changes in (4) and (27) in those varieties which do possess the corresponding velars. Consider as a representative example the Wph variety Kreis Lippe (=14). One could make a case that word-initial [ç] in the items like [çɑus] 'goose' is underlyingly /x/ – as per Analysis B – and that (4) is active synchronically, thereby deriving [ç]. That type of treatment is not subject to the criticisms described in the preceding paragraph for Nordösling because Kreis Lippe does possess the velar in question (i.e. [x] /x/) in postsonorant position, e.g. [dɑxt] 'wick' (§7.2).

The assumption made in the present book is that the nonassimilatory changes in (4) and (27) altered underlying representations, as in Analysis A. I contend that this is the correct treatment even for dialects like Kreis Lippe, although I concede that an Analysis B-type treatment for that type of dialect may work technically.

14.6.3 Rule loss

As indicated in (50a), the present-day Nordösling system in (43) possesses two phonemic palatals (/ç ʝ/) and since the corresponding velars – underlying /x ɣ/ and surface [x ɣ] – are absent, the dialect cannot have a synchronic process of velar fronting. However, related varieties of Lxm (Gilles 1999) possess an assimilatory version of that rule (Velar Fronting-1; §10.3.2). The implication is that Nordösling once had the same system as Lxm, as illustrated to the right of the wedge in (50a). The nonassimilatory change in (27c) affected underlying representations in Nordösling, in which case the originally synchronic rule of fronting which continues to be active in Lxm (Velar Fronting-1) was lost. I consider briefly the way in which the Nordösling variety bears the issue of rule loss in historical phonology. Recall that the facts of Nordösling are mirrored in the closely related MFr variety of Burg-Reuland spoken in the southeastern tip of Belgium and Lützkampen/Dahnen in West Central Germany.

The change in (50a) involves the replacement of every /ɣ/ with /ʝ/ and every /x/ with /ç/ – changes accomplished by (27c), which restructured underlying representations. I interpret this change as a generational one: The earlier generation of speakers had underlying representations like /lɛːɣən/ 'place-INF' and /fuɣəl/ 'bird', which were then restructured by a later generation as /lɛːʝən/ and /fuʝəl/. That new generation of innovative speakers represents the informants in Bruch (1952).

Rule loss has been discussed for a number of years in the framework of generative grammar (e.g. King 1969, Hock 1986, Ringe & Eska 2013). One topic investigated in that earlier literature concerns the location of rule loss as a stage in the life cycle of a rule (§2.5). A number of linguists cited in that section argued that rule loss is the endpoint in a long series of stages, whereby loss only occurs after a rule has become morphologized and then lexicalized. In a synthesis of much of the previous work on the life cycle of a rule, Hyman (2013) gives the following stages:[15]

(51) phonetic > phonologized > phonemicized > morphologized > lexicalized > loss

However, there is no evidence from Nordösling – or Burg-Reuland/Lützkampen/Dahnen – for a phonemicized stage (i.e. one with phonemic palatals) or a lexicalized version of velar fronting. Instead, the facts point to a situation in which an allophonic rule (Velar Fronting-1) – presumably Hyman's phonologized stage in (51) – is simply lost without any intermediate stage. What is more, the nonassimilatory change in (27c) appears to have been abrupt in the sense that every velar was replaced with the corresponding palatal at the same time. No evidence can be found in the original source for lexical diffusion. The interpretation of rule loss as an abrupt change is consistent with the treatment of the loss of schwa apocope in Yiddish proposed by Ringe & Eska (2013) but is not compatible with the analysis of the loss of Final Devoicing in Yiddish as lexically gradual endorsed by Hock (1986: 268–269). The present treatment of rule loss is likewise very different from the lexically gradual approach to rule loss in West Frisian discussed by Tiersma (1980).

14.6.4 Accounting for unattested trigger types

The approach to rule generalization adopted here presupposes that the nonassimilatory changes in (4) and (27) can only become active after velars have been fronted assimilatorily by the stages in Table 14.1. That assumption – a nonassimilatory change follows an assimilation – accounts for the two unattested Trigger Types listed in Table 14.6.

The reason Trigger Type G represents an unattested system is that fronting cannot begin as a nonassimilatory change by being conditioned solely by back

[15] Hyman defines "morphologization" as the loss of a phonological condition on an alternation, while "lexicalization" means that specific morphemes have to be marked as undergoing or not undergoing an alternation. It is not clear how morphologization translates into the present model, and hence I eschew that term below. To the best of my knowledge there is no variety of German in which velar fronting has been lexicalized.

Table 14.6: Unattested Trigger Types for the fronting of velars

Type	Trigger	Present in context for fronting
G	BV	FV, CC
H	BV, CC	FV

vowels. Instead, the change begins as an assimilation in a specific context conducive to fronting (FV). The change from velar to palatal could therefore not have begun applying before back vowels because that context does not involve an assimilation. A similar explanation holds for the absence of Trigger Type H, in which the context most conducive to velar fronting (FV) is absent, while the one least conducive to fronting (BV) is.

No dialect of German has been discovered in the present survey which has any of the four Trigger Types listed in Table 14.7.

Table 14.7: Unattested Trigger Types involving vocalic triggers

Type	Trigger	Present in context for fronting
R’	MBV	HBV
S’	LBV	HBV, MBV
T’	HBV, LBV	MBV
U’	MBV, LBV	HBV

In a hypothetical dialect with Trigger Type R’, a velar fronts to palatal in the context of a mid back vowel, but not before a high back vowel. Trigger Type S’ represents a system involving the shift from velar to palatal in the context of a low back vowel, but fronting is not induced by mid or high back vowels. Trigger Type T’ and U’ only include a subset of back vowels as triggers.[16]

[16]There are dialects known to me which apparently represent Trigger Type R’ and Trigger Type S’. One source (Weber 1959; Map 7.1) for an EHes variety provides a large selection of data pointing to Trigger Type S’. Krafft (1969) and Post (1985: 29) make the same observation for the related EHes varieties of Schlitzerland and Bad Salzschlirf. The facts (from Weber 1959) are drawn from a number of cities and towns in a broad region (Werra-Fuldaraum): [ç] surfaces after all front vowels, coronal consonants, and the diphthong [ɔɑ] and [x] after all back sounds with the exception of [ɔɑ], e.g. [lɪçt] ‘light’, [tsoɪçt] ‘breeding’, [nɔɑçt] ‘night’ vs. [hoːx] ‘high’, [kɔxə] ‘cake’, [gəruːx]/[gərʊx]/[gərɔx] ‘smell’. The diphthong in examples like [nɔɑçt] derives from etymological [ɑ]. In §5.2 I discussed similar examples from Weidenhausen (CFr) and argued that the original back vowel underwent a change to a diphthong ending in a front vowel, which then triggered the change from velar to palatal. I hold that the same explanation holds for the data in Weber (1959), and probably Krafft (1969) and Post (1985) as well.

Significantly, the nonoccurring Trigger Types listed in Table 14.7 are parallel to the ones discussed in Table 12.31. For example, no dialect is attested in which mid front vowels but not high front vowels trigger fronting, nor are dialects attested in which only low front vowels but not high or mid front vowels condition the rule. Those earlier gaps were accounted for by appealing to the Implicational Universal for Palatalization Triggers, which is repeated in (52). If (52) is rephrased as in (53), the gaps in Table 14.8 can be accounted for.

(52) Implicational Universal for Palatalization Triggers:
If lower front vowels trigger Palatalization, then so will higher front vowels.

(53) Implicational Universal for Palatalization Triggers (revised):
If lower vowels trigger Palatalization, then so will higher vowels.

The status of (53) for non-Gmc languages is unclear because the typological studies cited earlier (Chen 1973, Bhat 1978, Bateman 2007, 2011, 2007, Kochetov 2011) do not discuss nonassimilatory Velar Palatalization (velar fronting).[17]

14.7 Connection between word-initial and postsonorant velar fronting

In many dialects investigated above velar fronting is active after a sonorant and word-initially. However, the two rules are not always mirror-images of one another because they can differ in terms of the factors identified earlier (targets, triggers, opacity). That the triggers and targets for word-initial velar fronting and postsonorant velar fronting for any one dialect are not always the same can be ascertained by comparing those targets and triggers in some of the tables presented in Chapter 12. Likewise the presence vs. absence of opacity need not be identical in word-initial and postsonorant position. To cite one example, in Dorste (§4.4) the palatal quasi-phoneme /ʝ/ occurs word-initially before schwa, but [ʝ] in postsonorant position (from /ɣ) is an allophone which only surfaces after a coronal sonorant. Finally, there is the case of Neuendorf (§8.5), in which

[17]Bateman (2007: 64) recognizes the existence of Palatalizations triggered by high back vowels (/u/), but languages with that change raise an alveolar (e.g. /s/) to a postalveolar ([ʃ]) in the context of high vowels only (i.e. /i/ and /u/). That type of change therefore entails the assimilation of a height feature, which is very different from velar fronting as discussed in the present chapter. Bateman (2007) has no examples involving the fronting of a velar in the context of all back vowels.

an underlying palatal undergoes retraction to velar in the context of back vowels in word-initial position, while an underlying velar surfaces as a palatal after coronal sonorants. What all of these examples suggest is that the rules relating velars and palatals word-initially and after a sonorant in any given dialect are independent of one another and can therefore have a life of their own.

A question not discussed above is whether or not a correlation holds between the presence or absence of velar fronting word-initially and after a sonorant. Given the two variables "word-initially" and "after a sonorant" four logical types of dialect obtain (Table 14.8). As indicated there, Type AAA are those varieties with some version of velar fronting in word-initial position but not in postsonorant position, while Type BBB indicates the mirror-image. Type CCC represents dialects alluded to in the preceding paragraph with some version of velar fronting in both contexts, and Type DDD are those dialects with no version of velar fronting.

Table 14.8: Four types of dialect

Type	Description	Dialects attested
AAA	Word-initially only	0
BBB	After a sonorant only	many
CCC	Word-initially and after a sonorant	many
DDD	----------	many

The present survey shows that Types BBB and CCC are robustly attested. The same can be said for Type DDD, although I have only made sporadic reference to those non-velar fronting varieties without attempting to compile a more exhaustive list. The most significant finding in the present study is that Type AAA is not attested.[18]

Two interpretations for the absence of Type AAA suggest themselves: First, one could argue that Type AAA represents a systematic gap, in which case such dialects would be considered impossible. Second, the gap could be accidental, meaning that Type AAA – although clearly dispreferred in German – could in principle occur. I adopt the second interpretation.

[18]The careful reader may have observed that two varieties were referred to in §12.3 with word-initial velar fronting, but those same varieties were not discussed in the postsonorant context, namely Kirchspiel Courl (Wph) and Reinhausen (Eph). However, the sources for those dialects (Beisenherz 1907 and Jungandreas 1926, 1927 respectively) are clear that velar fronting is also active in postsonorant position.

The analysis adopted here is consistent with the fact that there is no phonetic and/or phonological reason why a dialect could not have velar fronting in word-initial position but lack that process in postsonorant position. In languages other than German that type of example should be attested, and in fact this is precisely the case in Afrikaans (Appendix I). I see unattested Type AAA German dialects as a consequence of the history of velar fronting in German: I argue in Chapter 16 that velar fronting was first phonologized in the postsonorant context and was later extended to the word-initial environment in some dialects (Type CCC) but not others (Type BBB). Phonologization of velar fronting in the postsonorant consonant occurred throughout a very large area (virtually all of Germany and most of Austria), while word-initial velar fronting occurred in that broad region only in North and Central Germany. Significantly, those areas of North and Central Germany that developed word-initial velar fronting already had velar fronting in postsonorant position. Given that historical progression the absence of Type AAA dialects can be thought of as a historical accident. However, the present book has uncovered a number of dialects that exhibit highly marked patterns, e.g. nonheight features as triggers (§12.7); hence, it would not be inconceivable that there is a marked variety yet undiscovered in which velar fronting is not active at all for many speakers (Type DDD), although some innovative speakers in that same area phonologized velar fronting in word-initial position only (Type AAA).

14.8 Conclusion

In the present chapter I investigated processes of velar fronting in word-initial position and in postsonorant position which are not assimilatory. The claim defended above is that the nonassimilatory fronting of velars can only occur from the historical perspective after the assimilatory fronting of velars. Support for my hypothesis can be found not only in the patterning of dorsal fricatives one finds in German dialects, but also in the unattested patterns.

The survey of velar fronting in German dialects is nearly complete. In the following chapter I consider the status of velar fronting in German-language islands.

15 Velar fronting islands

15.1 Introduction

By definition, a velar fronting island is a velar fronting place surrounded by areas in which velar fronting is absent. Two types can be distinguished. First, a velar fronting dialect of German might be attested in a German-language island. German-language islands originate when speakers of German emigrate to a new area where they are encircled by speakers of a different language (Wiesinger 1980, Wiesinger 1983a, Boas 2009: 76–83, and Putnam 2011). The reader is referred to the two case studies (Plautdietsch and Transylvania Saxon) discussed in §9.5.2 and to Table C.30 in Appendix C for a list of German-language islands discussed in this book. Second, a (German) velar fronting island may be observable in a country where German is the dominant language. This is the case when the velar fronting variety of German is bounded by other varieties of German without velar fronting.

The purpose of this chapter is to document velar fronting islands known to me. For the first type I focus on some of those German-language islands in the areas to the east and south of modern-day German-speaking countries, namely the Czech Republic, Slovenia, and Northeast Italy. For the second type I consider specific places in Switzerland and Austria (Tyrol, Vorarlberg).

The velar fronting islands I discuss below can vary greatly in terms of size and robustness. On the one hand, certain islands are very small and might simply comprise a single village or town. On the other hand, some velar fronting islands are embedded in a large area with multiple villages and towns. Some of the dialects discussed below are either extinct or on the verge of extinction, while others are spoken by large numbers of speakers and show no signs at all of endangerment.

Velar fronting islands are important to document for more than one reason. First, they illustrate variation among some of the parameters discussed in previous chapters. Of those parameters, the one involving velar fronting triggers plays the most significant role below. A closer examination of those triggers reveals that they can consist of either all coronal sonorants – referred to earlier as the default pattern – or of some subset of the coronal sonorants. Since the enclaves discussed below phonologized velar fronting independently, it is precisely this type of variation that lends support to the historical stages proposed in Chapter 12. A surprising finding is that velar fronting is nonassimilatory (=Trigger Type F from Chapter 14) in several geographically distinct areas. Recall that that type of system, i.e. one with only palatals but no velars, is otherwise most robustly attested in Nordösling (Luxembourg) and in neighboring places in Germany and East Belgium (§14.5). A second reason for documenting velar fronting islands is to demonstrate that certain places possess patterns that are either rare or otherwise unattested. In the course of this chapter, I show that those patterns are compatible with the models adopted in this book.

It is important to clarify the nature of the data and sources I cite below. Some of those works give a large selection of data involving the distribution of velars and palatals that make it possible to precisely pinpoint the set of sounds that do and do not trigger the process. By contrast, other sources might give a prose statement indicating that velar fronting is present in a particular context and might (or might not) include only a small selection of data. Other sources – in particular, linguistic atlases – may give detailed maps indicating the geographic distribution of words with velars and palatals without giving any concrete examples.

It is not uncommon for two or more sources to describe the state of velar fronting in conflicting ways for the same place. For example, one source might state that a place (Town A) has no velar fronting at all, while another source might assert – either directly in a prose statement or indirectly with data – that (assimilatory) velar fronting is active for Town A, but another source might be clear that Town A has nonassimilatory velar fronting. These conflicting claims should not be surprising because it is not the case that any one place always has a single version of velar fronting for all speakers. A more realistic view is that the inconsistency among speakers indicates that in any given place – Town A in the hypothetical example given above – there are non-velar fronting speakers and two types of velar fronting speakers (assimilatory and nonassimilatory).[1]

The case studies investigated below are organized geographically. The first four sections concern themselves with velar fronting islands within German-language islands, namely Iglau and Libinsdorf in the Czech Republic (§15.2), Schönhengst in the Czech Republic (§15.3), Giazza/Dreizehn Gemeinden in Northeast Italy (§15.4), and Gottschee in Slovenia (§15.5). §15.6 concerns itself

[1]The situation I am describing is also documented in linguistic atlases. To cite one example, the informants for SSA for the town of Wangen im Allgäu had (assimilatory) velar fronting but the informants for that same place for VALTS did not (see Map 3.3).

with two velar fronting islands spoken in the Swiss canton of Grisons, namely Obersaxen and Vals. Since this chapter draws on data from the linguistic atlas of Switzerland (SDS). I devote §15.7 to a discussion and interpretation of the symbols for dorsal fricatives in that source. §15.8 evaluates the state of velar fronting in the German-speaking region of the Swiss canton of Valais (Upper Valais) as well as in the neighboring German-language enclaves in Northwest Italy and the Swiss canton of Tessin. §15.9 documents velar fronting in the Southwest Bernese Oberland, §15.10 investigates the velar fronting islands in the isolated mountain valleys of Tyrol, and §15.11 concerns itself with velar fronting varieties in a large region consisting of East Switzerland, Liechtenstein, and Vorarlberg (Austria). In §15.12 I provide a summary of velar fronting islands and discuss the way in which they differ in terms of segments inducing the change.

15.2 Iglau and Libinsdorf

Libinsdorf (Czech: Karlov) is a small village in the Czech Republic situated about 116km southeast of Prague. The town was once a German-language island which was settled in 1789 by families from four North Bohemian villages. The German dialect of Libinsdorf is classified as USax-North Bohemian (Wiesinger 1983a: 915). According to the census of 1 December 1930, 20–50% of the populace of Libinsdorf were ethnic Germans (SDA: Blatt 4).

The sound structure of the Libinsdorf dialect is described by Weinelt (1940). The data in that source indicate that palatal [ç] (=⟦χ⟧) occurs after any front vowel (=1a) or coronal sonorant consonant (=1c-1e) and velar [x] (=⟦x⟧) after any back vowel (=1b). Czech has [x] (/x/) but no corresponding palatal (Šimáčková et al. 2012). That source makes no reference to a process fronting /x/ to [ç] in the Czech language. [2]

(1) Dorsal fricatives in Libinsdorf:

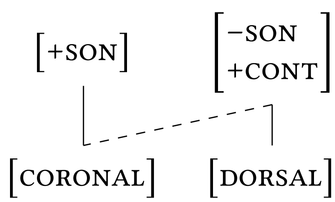
a.	fiχtə	[fiçtə]	Fichte	'spruce'	40
	lẹ̄χt	[leːçt]	liegt	'lie-3SG'	38
	kẹχin	[kɛçin]	Köchin	'cook-FEM'	41
	trẹχtə	[trɛçtə]	Trichter	'funnel'	44

[2]Some of the examples in (1) indicate that the surface dorsal fricative corresponds to an orthographic *g*, e.g. [tswɑiç] in (1a). No examples were found in Weinelt (1940) in which those examples are followed by a vowel-initial suffix (cf. StG [tsvɑik] 'branch' vs. [tsvɑigə] 'branch-PL'); hence, it cannot be known whether or not the underlying representations of such words contain /x/ or a lenis sound (e.g. /g/). The same comment holds for several other dialects posited in this chapter.

	laiχt	[lɑiçt]	leicht	‘easy’	39
	tswaiχ	[tswɑiç]	Zweig	‘branch’	43
b.	pūxə	[pu:xə]	Buche	‘beech tree’	40
	tōx	[to:x]	Dach	‘roof’	37
	haxt	[hɑxt]	Hecht	‘pike’	41
	knāxt	[knɑ:xt]	Knecht	‘vassal’	37
	pauxwī	[pauxwi:]	Bauchweh	‘stomach ache’	39
c.	khirχə	[kʰirçə]	Kirche	‘church’	38
	mụrχl	[mʊrçl̩]	Morchel	‘morel’	38
	štarχ	[ʃtɑrç]	Storch	‘stork’	38
	harχn	[hɑrçn̩]	horchen	‘hark-INF’	38
d.	šelχ	[ʃelç]	schuldig	‘guilty’	44
e.	tsaumkhēnχ	[tsaumkʰe:nç]	Zaunkönig	‘wren’	44

The patterning of velars and palatals in (1) is the default one described in previous chapters. Thus, velar fronting applies to any /x/ after a coronal sonorant:

(2) Velar Fronting-1:



The orthographic forms in (1d, 1e) indicate that the final vowel was elided by the historical process of Syncope (Chapter 7). No examples were found in Weinelt (1940) in which a dorsal fricative occurs after [l] or [n] without a historically syncopated vowel, e.g. StG [zɔlç] ‘such’, [mɑnçmɑ:l] ‘sometimes’.

Iglau (Czech: Jihlava) is a medium-sized Czech city about 114km southeast of Prague and 36km southwest of Libinsdorf; see Map 3.3. The area in and around Iglau once formed a sizable German-language island (Iglauer Sprachinsel), the largest city of which was Iglau. According to the census of 1 December 1930, 80–90% of the population of a large portion of the Iglauer Sprachinsel consisted of ethnic Germans (SDA: Blatt 4). The area was settled many centuries ago (between 1240 and 1260) by NBav speakers from the Upper Palatinate (Oberpfalz) and from ECG speakers from the Erzgebirge region (Wiesinger 1983a: 909).

To the best of my knowledge, the most comprehensive source for the sound structure of the dialects once spoken in the towns of the Iglauer Sprachinsel is Stolle (1969). That work is a description of the historical changes affecting vowels in thirty-nine villages and towns in the Iglauer Sprachinsel. Although the author does not explicitly discuss the distribution of the ich-Laut and the ach-Laut, it is clear from Stolle's phonetic transcriptions that those two sounds occur in all of the thirty-nine places in his study (Belegorte). The basic generalization for the entire area is that [ç] (=⟦χ⟧) occurs after any front vowel (=3a) and [x] (=⟦x⟧) after any back vowel (=3b). A number of words can be found in Stolle (1969) with dorsal fricatives in the context after liquids (=3c, 3d), which I discuss in greater detail below. The generalizations concerning the distribution of [ç] and [x] do not differ from place to place within the Iglauer Sprachinsel; hence, the data in (3) do not represent any one particular town. In the following discussion I therefore refer to all of the places in Stolle's study collectively as Iglau.[3]

(3) Dorsal fricatives in Iglau:

a.	iχ	[ɪç]	ich	'I'	92
	giχt	[giçt]	Gicht	'gout'	46
	hēχt	[heːçt]	Hecht	'pike'	77
	štęχ	[ʃtɛç]	stechen	'sting-INF'	45
	štę̄χ	[ʃtɛːç]	Steg	'footbridge'	45
	tāeχ	[tɑːeç]	Teich	'pond'	133
b.	nǫxt	[nɔxt]	Nacht	'night'	46
	pǫx	[pɔːx]	Bach	'stream'	45
	woxɒn	[woxɒn]	Wochen	'week-PL'	46
	nōx	[noːx]	noch	'still'	79
	wāx	[wɑːx]	weich	'soft'	153
	pāǫx	[pɑːɔx]	Bauch	'stomach'	136
c.	pęɒrx	[pɛɒrx]	Berg	'mountain'	48
	dųɒrx	[dʊɒrx]	durch	'through'	48
	tswęɒrx	[tswɛɒrx]	Zwerg	'dwarf'	71
	lęɒrxŋ	[lɛɒrxŋ̍]	Lärche	'larch'	63
	kįɒrxŋ	[kʰɪɒrxŋ̍]	Kirche	'church'	97
	fįɒrxt	[fɪɒrxt]	fürchte	'fear-1SG'	105
d.	pîłχ	[piːlʲç]	Bild	'picture'	96

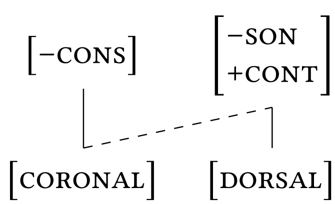
[3]Iglau is also worthy of note because the etymological diphthong [ei] underwent Monophthongization to [ɑː], as in [wɑːx] 'soft' in (3b), (cf. MHG *weich*). Iglau therefore illustrates the completely transparent distribution of [ç] and [x], in contrast to the CG varieties discussed in Chapter 9, in which opaque [ç] surfaces in the same environment, e.g. Wissenbach [vɑːç] 'soft'; recall §9.2.

I consider now the realization of /x/ after the rhotic (=3c) and the lateral (=3d) in that order.

The data in (3c) indicate that [x] consistently occurs after [r]. That realization is made explicit in his description of vocalic changes before /r/. For example, on p. 101 Stolle states that MHG /u/ surfaces throughout the entire dialect area as ⟦ų̯ɒrx⟧. That realization [rx] is significant because of its rarity among German dialects. Although a large part of Lower Bavaria is attested with [rx] sequences (Map 13.3), the unmarked realization of /x/ after [r] in velar fronting areas is undoubtedly [ç]; see Map 12.2, which shows the rarity of [rx]/[lx] sequences.

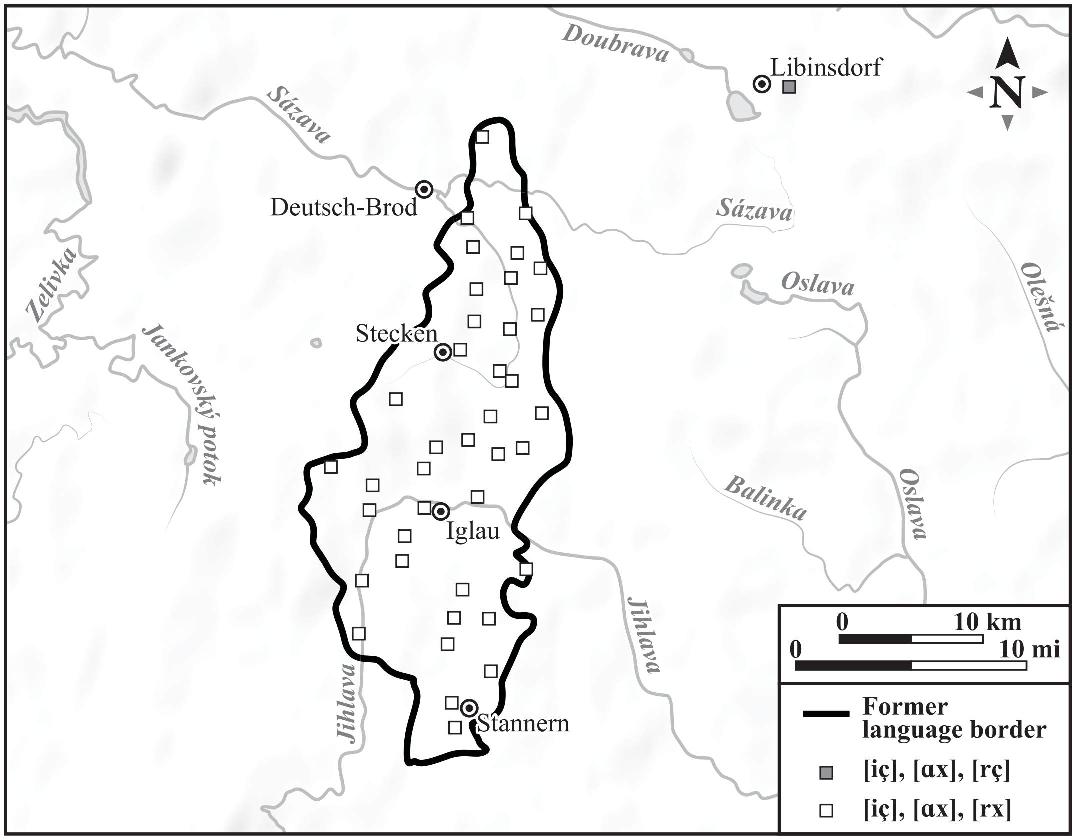
Words with a dorsal fricative preceded by the consonant [l] are rare in Iglau because that sound typically merges together with the preceding vowel by Liquid Vocalization (§3.5, §13.5.2), e.g. the item in (3d) surfaces elsewhere in Iglau as [pyːç]. The realization given in (3d) with the secondarily palatalized lateral (=⟦ł⟧) represents two of the places in the north, namely Sehlenz and Langendorf. The occurrence of [x] after the rhotic and [ç] after the lateral suggests that the triggers for velar fronting must only include the latter but not the former. If so, the patterning of the ich-Laut and the ach-Laut in Iglau would be without precedent. I argue alternatively that the set of triggers for velar fronting throughout Iglau consists solely of front vocoids ([−consonantal, coronal]), as in (4):

(4) Velar Fronting-13



Given the context expressed in (4), /x/ surfaces as palatal after /l/ in (3d) because the lateral is palatalized to [lʲ] in coda position (l-Palatalization). As suggested by the phonetic transcription, [lʲ] consists of a lateral component ([l]) and a vocalic component ([ʲ]). Since the latter is featurally [−consonantal, coronal], any /x/ following that sound must therefore undergo velar fronting. Put differently, l-Palatalization feeds velar fronting.

The realization of /x/ in the context after [r] in Libinsdorf and Iglau are depicted on Map 15.1. That map indicates the contrast between the unmarked pattern (represented by Libinsdorf) and the marked pattern (represented by thirty-nine small places in Iglau). Those two contrastive patterns are expressed directly in Velar Fronting-1 in (3) and Velar Fronting-13 in (4).



Map 15.1: Iglau and Libinsdorf. Squares indicate postsonorant velar fronting. The dark square (Weinelt 1940) indicates that velar fronting produces a palatal after [r], and the white squares (Stolle 1969) depict places where velar fronting fails to apply after [r].

15.3 Schönhengst

Up until 1945 the largest German-language island in the Czech Republic was the Schönhengster Sprachinsel in the Schönhengstgau (Czech: Hřebečsko), a historical region in Bohemia and Moravia. I refer to the Schönhengster Sprachinsel henceforth simply as Schönhengst. As indicated on Map 5.2, Schönhengst was situated in the modern-day Czech Republic, about 150km to the east of Prague. A close-up view of Schönhengst is depicted on Map 15.2, which shows that it was separated from the German-speaking areas in the former province of Silesia (Grafschaft Glatz) by a small strip of land populated by Czech-speaking people. The largest cities of Schönhengst were Zwittau (Svitavy), Mährisch Trübau (Moravská Třebová), and Landskron (Lanškroun). According to the census of 1 December 1930, 80–100% of the population of Schönhengst were ethnic Germans (SDA: Blatt 4). Most of those people were forced to leave Schönhengst after 1945.

According to Wiesinger (1983a: 909) Schönhengst was settled over 800 years ago (between 1240 and 1290) by people coming primarily from the Upper East Franconia region (oberostfränkischer Raum), but also from Central Bavaria and Silesia/North Moravia. The various German dialects represented in Schönhengst are depicted on Blatt 5 in SDA.

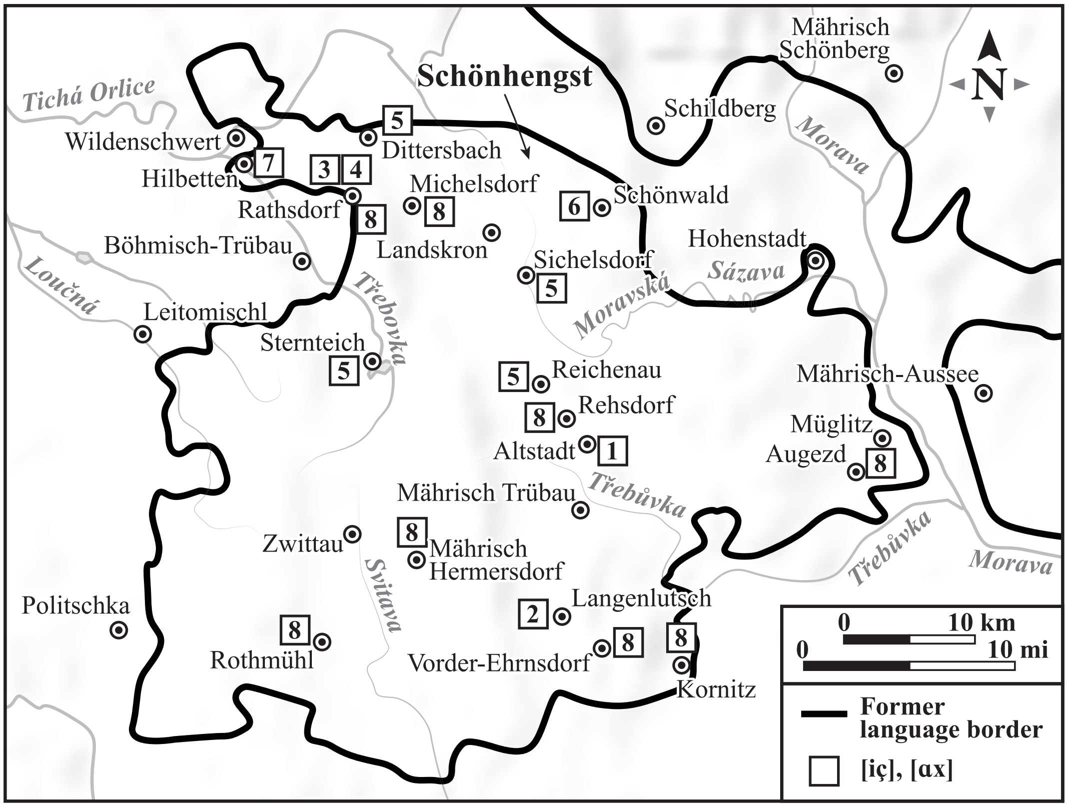
Several descriptions for the Schönhengst dialect(s) point to an area in which velar fronting was active. As I demonstrate below, those works also indicate that the towns and villages of Schönhengst differed from one another in terms of the segments that induced velar fronting; hence, Schönhengst contrasted with Iglau, which had a uniform rule of velar fronting (=4). In the remainder of this section I discuss the status of velar fronting in Schönhengst according to Janiczek (1911), Graebisch (1915), Seemüller (1908b), and Benesch (1979), which I discuss in that order. The places described by those authors are indicated on Map 15.2.[4]

Janiczek (1911) investigates the vocalism in Langenlutsch, conveniently providing transcriptions with separate symbols for velar and palatal fricatives, namely [ç] (=⟦χ⟧) and [x] (=⟦x⟧). The data in (5a) show that the palatal surfaces after any front vowel, while the examples in (5b) demonstrate the occurrence of the velar after any back vowel.

(5) Dorsal fricatives in Langenlutsch (Schönhengst):

a.	liχt	[lɪçt]	Licht	‘light’	33
	knęχt	[knɛçt]	Knecht	‘vassal’	8
	ɑiχ	[ɑiç]	ich	‘I’	27
b.	kūx	[kuːx]	Koch	‘cook’	28
	nǫxt	[nɔxt]	Nacht	‘night’	29
	dōx	[doːx]	Dach	‘roof’	28
	toxt	[tox]	Docht	‘wick’	33
	brɑux	[brɑux]	Bruch	‘fracture’	28

[4]That map also includes markers representing the following four works which only make passing reference to velar fronting: (a) Matzke (1918) provides a phonetically transcribed text for the town of Rathsdorf. Although he does not transcribe dorsal fricatives with separate symbols, he states that velars (gutturals) and palatals surface after back vowels and front vowels respectively (p. 44). (b) Appel (1963: 21) is clear that the ich-Laut and the ach-Laut are allophones of the same phoneme in Hilbetten, but he does not transcribe the difference between those two sounds with separate symbols. (c) In his study of the consonants and vowels in the Sln dialects of North Moravia and the Adlergebirge, Weiser (1937) indicates on his Map 2 and Map 8 that the palatal fricative occurs after [ɛ] in Schönwald/Lichtenstein. (d) Sandbach (1922) is a study of place names in Schönhengst. That work provides phonetic transcriptions with separate symbols for velars and palatals and offers a short description of the phonetics of consonants and vowels. Map 15.2 indicates four of the place names in Sandbach (1922) with a palatal fricative after a front vowel ([i] and [e]), namely Sichelsdorf (p. 8), Dittersbach (p. 16), Reichenau (p. 18), and Sternteich (p. 21).



Map 15.2: Schönhengst. Squares indicate some version of postsonorant velar fronting. 1=Seemüller (1908b), 2=Janiczek (1911), 3=Graebisch (1915), 4=Matzke (1918), 5=Sandbach (1922), 6=Weiser (1937), 7=Appel (1963), 8=Benesch (1979).

c.	štɑrx	[ʃtɑrəx]	stark	'strong'	41
	furx	[fʊrəx]	Furche	'furrow'	41
	khirx	[kʰɪrəx]	Kirche	'church'	41

Janiczek is clear that velar [x] also surfaces after [r], which is realized as the tongue-tip trill (p. 6); see (5c). In his discussion of vowels in the context after /r/ plus labial or velar consonants (p. 41) Janiczek notes that there is a weak epenthetic vowel ("schwacher Sprossvokal") between the rhotic and velar. He transcribes that vowel in some (but not in all) examples as ⟦ᵉ⟧, which is his symbol for a short schwa ([ə]). Janiczek writes (p. 41) that the epenthetic vowel is present in the context between [r] and [x] even though he does not always include it in his phonetic transcriptions.

The data in (5) point to the common pattern whereby /x/ surfaces as palatal after any front vowel. The significance of Langenlutsch is that the epenthetic vowel in (5c) is followed by velar [x] and not palatal [ç]. Recall from §5.4 that Schwa Epenthesis is very common among German dialects but that the overwhelming pattern is for the epenthetic vowel to be followed by the palatal fricative [ç]; see also §12.8.1. The palatal realization is a consequence of Schwa Fronting-2: /Vlx/→|Vləx|→|Vlə̟x|→[Vlə̟ç]. The data in (5c) can be accounted for straightforwardly if Schwa Epenthesis but not Schwa Fronting-2 is active: /Vlx/→[Vləx]. Langenlutsch is the only German dialect discovered in the present survey with an epenthetic vowel but without Schwa Fronting-2.

From the formal perspective, Velar Fronting-13 (=4) is active in Langenlutch. Given that the set of triggers consists solely of front vowels, there is no interaction between that process and Schwa Fronting-2.

Graebisch (1915) gives a phonetically transcribed text in the Rathsdorf dialect. Velars occur after back vowels (=6a), the vocalized-r (=6b), and palatals after front vowel (=6c).

(6) Dorsal fricatives in Rathsdorf (Schönhengst):

a.	nochpr̥	[noxpr̩]	Nachbar	‘neighbor’
	kǫchl	[kɔxl̩]	Küche	‘kitchen’
	rachen	[rɑxən]	rechnen	‘calculate-INF’
b.	kīəćh	[kiːəç]	Kirche	‘church’
c.	ićh	[iç]	ich	‘I’
	mećht	[meçt]	möchte	‘would like-1SG’

The interesting example is (6b), which indicates that r-Vocalization has applied (indicated as ⟦ə⟧) but not epenthesis (recall [kʰɪrəx] from 5c). The occurrence of the palatal fricative after the vocalized-r is common throughout many of the areas discussed in previous chapters (including StG). However, the realization of /x/ as [ç] after the vocalized-r is an anomaly in this particular region because other places in Schönhengst discussed below have [x] in that context. There are two options regarding the analysis of [ç] in (6b): (a) It is synchronically derived from /x/ on the basis of the /i/ preceding the vocalized-r (as in Lower Bavarian; §13.5.2), e.g. /kiːrx/→|kiːəx|→[kiːəç]; or (b) it is an underlying palatal /ç/, as in some of the dialects discussed in Chapter 7, as well as StG (Chapter 17). Option (a) can be shown to be correct if [x] but not [ç] were to surface after the vocalized-r when preceded by a back vowel. No such examples were found in Graebisch (1915). From the formal perspective both Velar Fronting-1 (=2) and Velar Fronting-13 (=4) are compatible with either (a) or (b).

Seemüller (1908b) presents phonetically transcribed texts for speakers from Altstadt. Some data from that work are listed in (7).

(7) Dorsal fricatives in Altstadt (Schönhengst):

a.	glaix	[glaiç]	gleich	‘soon’
	gəšixt	[gəʃiçt]	Geschichte	‘story’
	ʃlęxtɒ	[ʃlɛçtɐ]	schlechter	‘bad-INFL’
b.	khūχlęfl	[kʰuːxlɛfl̥]	Kochlöffel	‘wooden spoon’
	nuχ	[nux]	nach	‘after’
	toχtɒ	[toxtɐ]	Tochter	‘daughter’
	mǫχŋ	[mɔxŋ]	machen	‘do-INF’
c.	duɒχs	[duɐxs]	durchs	‘through the’

The items listed above show that the palatal (⟦x⟧) surfaces after a front vowel and the velar (⟦χ⟧) after a back vowel. Alstadt differs from Langenlutsch in that /r/ is vocalized in the former (=7c), after which [x] surfaces (cf. 6b from Rathsdorf). The occurrence of [x] after the vocalized-r has been discussed earlier (e.g. §3.5, §4.3, §13.5.2). In short, the data in (7) are consistent with either Velar Fronting-1 (=2), which is bled by r-Vocalization in (7c), or Velar Fronting-13 (=4), which does not interact with r-Vocalization.

Benesch (1979) is without a doubt the most valuable source for velar fronting in Schönhengst. The book is devoted to the historical phonology of vowels and consonants (with separate symbols for velars and palatals). What is more, Benesch compares the sound structure of multiple places within Schönhengst, thereby providing a valuable source for how a rule type (velar fronting) can differ from place to place in a small area.

It is clear from the data provided by Benesch that all of the places within Schönhengst he discusses have some version of velar fronting (Benesch 1979: 144–145). The basic generalization is unsurprising: [ç] (=⟦χ⟧) occurs after front vowels and [x] (=⟦x⟧) after back vowels. In the context after a consonant the predominant pattern is for [x] to surface after the coronal rhotic [r] throughout the area with the exception of Mährisch Hermersdorf, which has [ç]. Benesch (p. 144) writes “Nach r erscheint gewöhnlich x, nur H. (Z.G.) neigt in diesem Falle zur χ-Lautung”. (“After r usually only x occurs, but in [Mährisch] Hermersdorf (the Zwittauer region) it ([x]) tends to be pronounced in this context as χ”). In (8) I give a representative selection of data in Benesch’s transcription system with dorsal fricatives in the context after front vowels (=8a), back vowels (=8b), and [r] (=8c). The abbreviations in the six columns correspond to the six towns of Michelsdorf (Mi), Mährisch Hermersdorf (H.), Vorder-Ehrnsdorf (E.), Augezd (A.), Kornitz (K.), and Rehsdorf (Re.). Michelsdorf and Rehsdorf do not have dorsal fricatives after [r] because the latter sound is vocalized in coda position. As in Altstadt (=7c), /x/ surfaces as [x] after the vocalized-r in those two places, e.g. ⟦khīəx⟧ ‘church’.

(8) Dorsal fricatives in six places in Schönhengst:

		Mi.	H.	E.	A.	Ko.	Re.
a.	‘sting’	štīχ	štęiχ	štɑiχ	št$^{\bar{o}}$iχ	štīχ	štɑiχ
	‘cattle’	fīχ	fęiχ	fɑiχ	f$^{\ddot{o}}$īχ	fīχ	
	‘oak’	ɑiχ	oiχ	oɒiχ	ǫiχ		tɑiχ
	‘pond’	tɑiχ		tɑiχ	tɑiχ		tɑiχ
	‘bad’			šlęχt			šlęχt
	‘easy’	lɑeχt	lɑeχt	lęχt		lęχt	lęχt
	‘paint-PRET’	štrīχ	štręiχ	štrɑiχ	štrīχ		štrɑiχ
b.	‘weak’	šwǫx	šwōx	šwōx	šwǫx	šwōx	
	‘wick’	tọ̄xt	toxt	toxt	tōxt	toxt	toxt
	‘shoe’	šụ̄x	ši^{o}x	šaux	š^{o}ūx	šūx	šaux
	‘hose’	šlɑux				šlɑux	šlɑx
c.	‘church’		khiərχ	khiərx	khiərx	khiərx	
	‘through’		duɒrχ	duɒrx	duɒrx		
	‘lark’		lɑrx	lɑrx			

Benesch also provides a number of maps. The most important ones for present purposes are Maps 11 and 14. The former depicts the realizations of /rx/ in Schönhengst for the word ‘church’. Map 14 for *Köchin* ‘cook-FEM’ show that the palatal occurs after a front vowel ([i] or [e]) throughout Schönhengst.

The distribution of dorsal fricatives in the town of Rothmühl (Benesch 1979) differs from the distribution of those sounds in the other six places listed in (8). As indicated in (9), palatal [ç] is restricted to the context after a front unrounded vowel (=9b), while velar [x] occurs after a back vowel (=9a), [r] (=9d), or a front rounded vowel (=9c).

(9) Dorsal fricatives in Rothmühl (Schönhengst):

a.	hūx	[hu:x]	hoch	‘high’	75
	wüox	[wyox]	Woche	‘week’	145
	rōx	[ro:x]	Rauch	‘smoke’	145
	tǫxt	[tɔxt]	Docht	‘wick’	150
	braux	[braux]	Brauch	‘custom’	50
	liɒxt	[liɒxt]	Licht	‘light’	58
	rɑxt	[rɑxt]	recht	‘right’	16
b.	štīχ	[ʃti:ç]	Stich	‘sting’	25
	fīχ	[fi:ç]	Vieh	‘cattle’	103

	štrīχ	[ʃtriːç]	strich	‘paint-PRET’	104
	rɑiχ	[rɑiç]	reich	‘rich’	106
	lɑeχt	[lɑeçt]	leicht	‘easy’	47
	reχtn̥	[reçtn̩]	richten	‘judge-INF’	144
c.	tǖx	[tyːx]	Tuch	‘towel’	62
	šǖx	[ʃyːx]	Schuh	‘shoe’	145
	gərǖx	[gəryːx]	Geruch	‘smell’	36
	zǖxŋ̊	[zyːxŋ̍]	suchen	‘seach-INF’	139
d.	khīərx	[kʰiːərx]	Kirche	‘church’	145
	düɒrx	[dyɒrx]	durch	‘through’	38, 89
	khwɑrx	[kʰwɑrx]	quer	‘across’	113

Front rounded vowels occur (as phonemes) throughout Schönhengst, but they are rare in the context before dorsal fricatives. ⟦ǖ⟧ (=[yː]) – historically [uo] – is the only front rounded vowel found before dorsal fricatives. Benesch describes that sound as equivalent to the long front rounded vowel [yː] in StG *früh* ‘early’ (p. 5). The change from [uo] to [yː] occurred throughout the Rothmühler Gebiet (Benesch 1979: 61); hence, the data in (9d) may hold for other towns in that area as well.

The data in (9) indicate that Rothmühl has a rule of velar fronting which applies to /x/ in the context after front unrounded vowels (=Trigger Type A’’ from Table 12.29). The restricted context is expressed below:

(10) Velar Fronting-12:

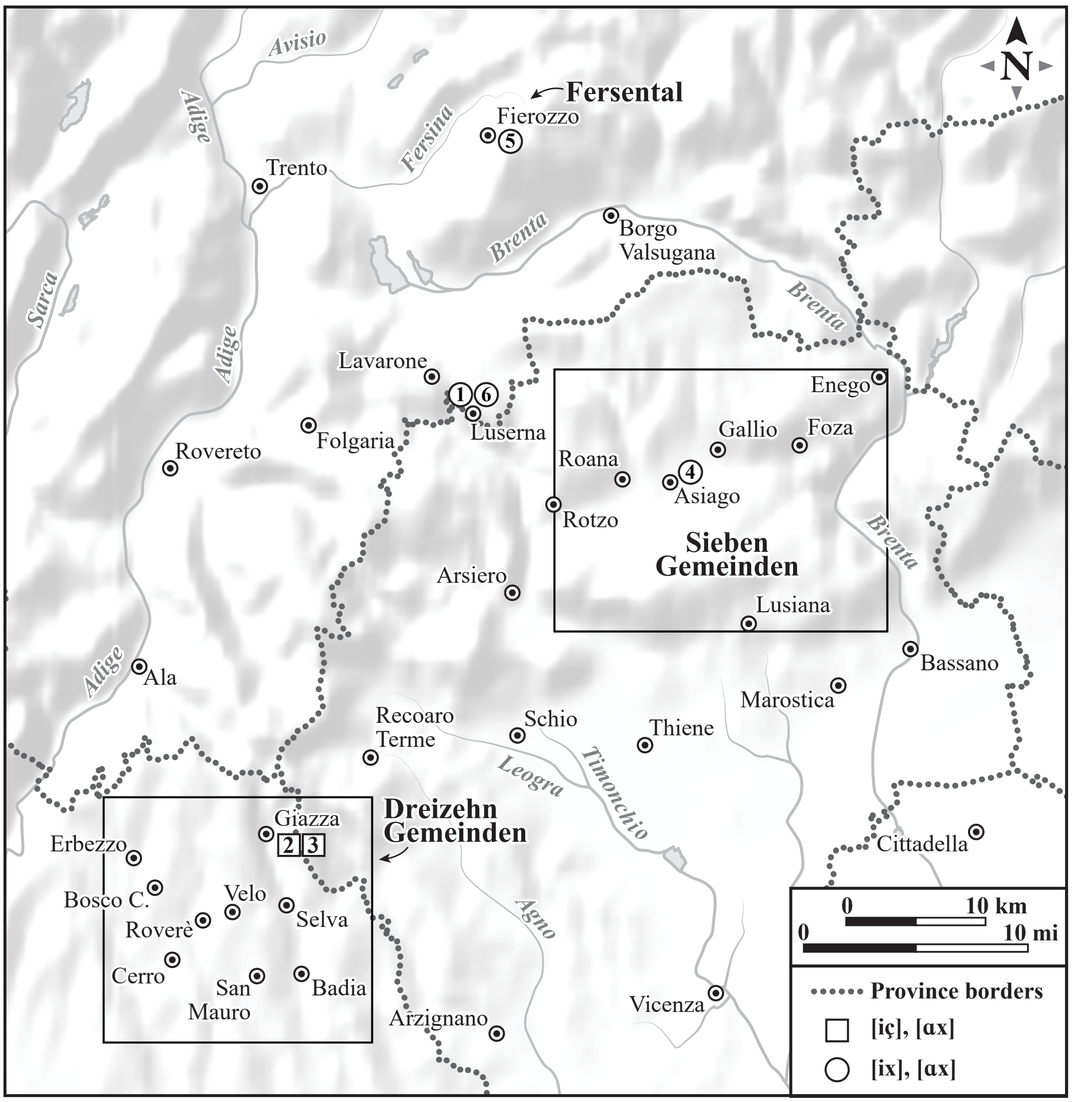
$$\begin{array}{cc} [-\textsc{round}] & \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

Recall from §12.6.1 that the restriction of velar fronting triggers to front unrounded vowels is a very rare pattern which is otherwise only attested in two LG dialects. The only other example of Trigger Type A’’ uncovered in the present survey is South Mecklenburg (Jacobs 1925a,b, 1926).

15.4 Giazza/Dreizehn Gemeinden

Several German-language islands are located in Northeast Italy (Map 15.3). Wiesinger (1983a: 906) identifies three Bav (Cimbrian) islands in that area: (a) Dreizehn

Gemeinden (Thirteen Communities) in the province of Verona, (b) Sieben Gemeinden (Seven Communities) in the province of Vicenza, and (c) the communities of Folgaria, Lavarone, and Lucerna in the province of Trentino. According to Wiesinger (1983a), (a–c) were settled by speakers of Bav dialects (Cimbrian) beginning in the twelfth century.



Map 15.3: Northeast Italy. Rectangles indicate the presence of some version of velar fronting (postsonorant and/or word-initial), and the circles show the absence of velar fronting. 1=Bacher (1905), 2=Schweizer (1939), 3=Mayer (1971), 4=Kranzmayer (1981), 5=Rowley (1986), 6=Tyroller (2003).

The sources for (b–c) indicate that there is no velar fronting, e.g. Luserna (Bacher 1905, Tyroller 2003), Sieben Gemeinden (Kranzmayer 1981). The UG dialect of Fersentalerich (Mòcheno) spoken in Fersental (Rowley 1986) is likewise characterized by the absence of velar fronting. Recall that §12.9.2 contained some remarks on coarticulatory fronting as described in Kranzmayer (1981) and Rowley (1986).

Two sources for the Giazza (including Dreizehn Gemeinden) in (a) above indicate that velar fronting is active. The first of those sources is Mayer (1971), whose speakers have both [x] and [ç]. Mayer proposes a treatment of those sounds cast in traditional phonemic theory, according to which [x] and [ç] derive from /x/. [h] is also included as an allophone of /x/ since it is restricted in its distribution to word-initial position before vowels, while [x] and [ç] only occur after a sonorant. As indicated below, [h] surfaces word-initially before vowels (=11a), while [x] occurs after a back vowel (=11b) and [ç] after a front vowel (=11c) or coronal sonorant consonant (=11d). The phonetic transcriptions in (11) are taken directly from Mayer (1971). The author is clear that [ç] surfaces after front vowels ("Vorder-Zungen-Vokale"), although [i] is the only example Mayer gives for a front vowel preceding [ç].

(11) Dorsal fricatives in Giazza/Dreizehn Gemeinden:

a.	[hurrt]	Hürde	'hurdle'	49
b.	[hǫax]	hoch	'high'	49
	[maxan]	machen	'do-INF'	49
	[foxlox]	Fuchsloch	'foxhole'	49
	[pruax]	Hose	'pants'	49
	[gəmaxt]	gemacht	'do-PART'	52
c.	[niçt]	nicht	'not'	52
	[siçela]	Sichel	'sickle'	49
d.	[khalç]	Kalk	'lime'	49
	[starç]	stark	'strong'	49

The data in (11) display the default pattern whereby velar fronting occurs after a coronal sonorant. That pattern is expressed formally with Velar Fronting-1 (=2).

A second source for velar fronting in Giazza (including Dreizehn Gemeinden) is one predating Mayer (1971) by over thirty years, namely Schweizer (1939). The latter work consists of a series of phonetically transcribed texts of varying length dealing with a wide variety of topics. The significance of those texts is that they can shed some light on the state of velar fronting in a German-language island in the early part of the twentieth century because they distinguish [ç] (=⟦x⟧) and [x] (=⟦χ⟧). Brief remarks on the phonetics of those two sounds are made in the section on phonetic symbols on p. 11. In the list of consonants on that page, Schweizer also includes the affricate ⟦kχ⟧. Although he says nothing on p. 11 about its place of articulation, it is clear from the texts that both velar (⟦kχ⟧) and palatal (⟦kx⟧) affricates occur.

A comparison of the texts presented in Schweizer's work indicates that they were based on the speech of many different informants. It is possible to draw this conclusion because the distribution of the dorsal fricatives in any one text can be shown to be slightly different from the distribution of the same sounds in another text. Unfortunately, Schweizer does not indicate where his informants are from; hence, it is not possible to make a statement on the precise geography of velar fronting in the Cimbrian language islands of Northeast Italy (in the area in and around Giazza).[5]

I give a brief synopsis of the state of velar fronting in Schweizer (1939) by comparing the distribution of velars (⟦χ⟧=[x], ⟦kχ⟧=[kx]) and palatals (⟦x⟧=[ç], ⟦kx⟧=[kç]) in three of his texts. Many of those texts are only a few sentences long, while others consist of between one and two pages. I have selected below three longer texts in order to ensure that enough tokens are present to draw generalizations on the occurrence of the dorsal sounds in question. The velars and palatals in the statistics summarized in Table 15.1 include both fricatives and affricates. I consider the distribution of those sounds both word-initially and in postsonorant position. In both of those contexts I take into consideration the nature of the adjacent sound, where FV=front vowel, BV=back vowel, and CC=coronal sonorant consonant. There is no evidence that finer-grained distinctions are necessary, e.g. high front vowels vs. mid front vowels. The slash (/) indicates context, e.g. 'P/BV' for Table 15.1(a) means that the palatal is in word-initial position followed by a back vowel and for Table 15.1(b) that the palatal is situated after a back vowel. The number in each row in bold is the one that I interpret as an irregularity.

Consider first the word-initial context. Since palatals occur in a number of tokens even before a back vowel in Text 31, it is fairly clear that this pattern reflects nonassimilatory velar fronting. Examples in that context include ⟦kxôfft⟧ (=[kçɔfft]) 'buy-INF', ⟦kxuejer⟧ (=[kçuejer]) 'shepherd-PL (for cows)'. In Chap-

[5]The linguistic atlas for this region (ZFSA) – also authored by Bruno Schweizer – provides a number of maps for the German-language islands of Northeast Italy, including Sieben Gemeinden and Fersental. As noted by Stefan Rabanus in the recent (2012) commentary (ZFSA: 25), Schweizer's (1939) distinction between [x] and [ç] is not indicated on those maps. Rabanus opines in the commentary for Map 114 for *Furche* 'furrow' (p. 284) that Schweizer's ⟦x⟧ can be interpreted as [ç].

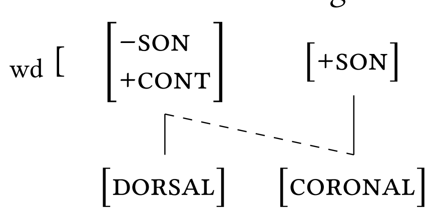
Table 15.1: Distribution of velars and palatals in three texts from Schweizer (1939). Wi.: Word-initial; Ps.: Postsonorant; P.: Palatal; V.: Velar.

	Text no.	P./BV	P./FV	P./CC	V./FV	V./BV	V./CC
a. Wi.	31	33	0	0	**1**	0	0
b. Ps.	31	4	5	5	0	**3**	0
c. Wi.	36	3	3	3	0	0	0
d. Ps.	36	**1**	11	0	0	5	0
e. Wi.	38	**2**	5	1	**2**	36	0
f. Ps.	38	0	24	2	**12**	20	**1**

ter 14 I showed that that type of pattern involved the restructuring of historical velars as underlying palatals and that there is therefore no synchronic rule, e.g. [kçuejer] is /kçuejer/. Word-initial velar fronting in Text 36 is assimilatory because palatals are surfacing only in the context before coronal sonorants. Text 38 likewise appears to illustrate assimilatory velar fronting in word-initial position, although there are four irregularities.

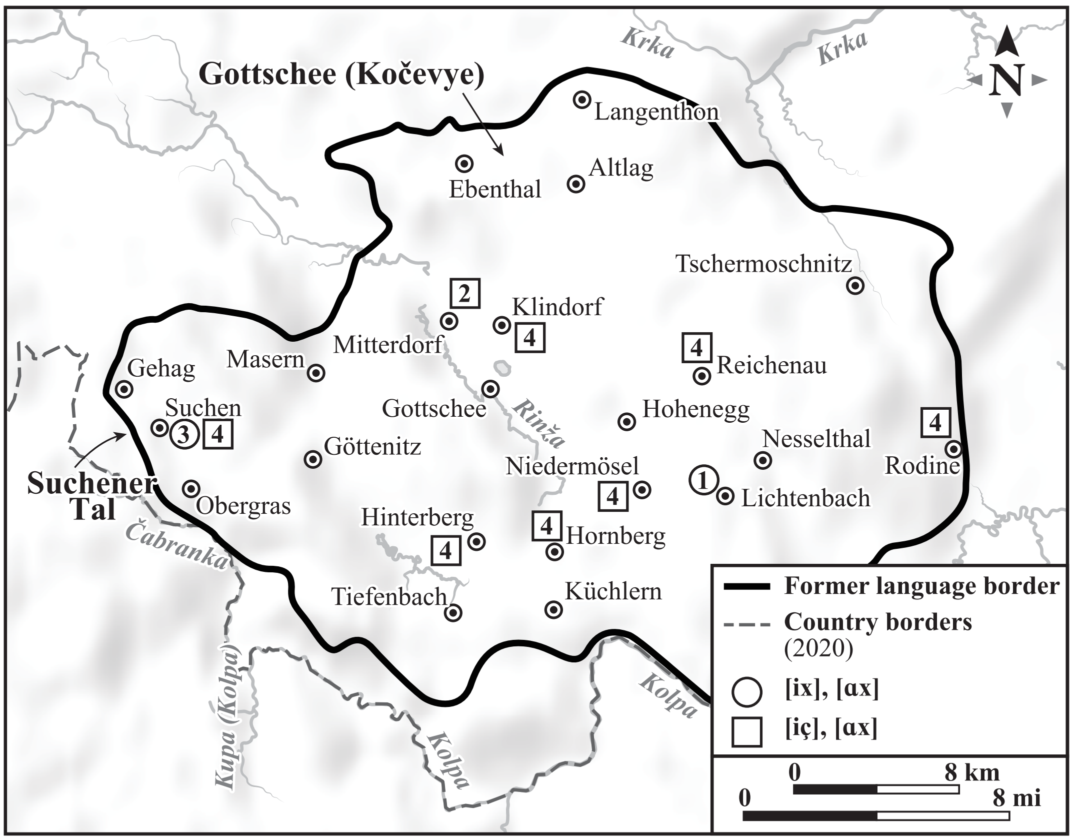
In postsonorant position velar fronting is nonassimilatory in Text 31 (with three irregularities) but assimilatory in Text 36 (with one irregularity). Two examples from Text 36 are ⟦kxnêxt⟧ (=[kçnɛçt]) 'vassal' and ⟦maχen⟧ (=[mɑxən]) 'do-INF'. Text 38 may also reflect the assimilatory pattern, although it is interesting that the speaker(s) on which the data are based have a larger number of irregularities (12). The assimilatory pattern described above is captured formally with Velar Fronting-1 (=2) or the mirror-image process for word-initial position, stated in (12):

(12) Wd-Initial Velar Fronting-8:



15.5 Gottschee

Gottschee was a German-language island in South Slovenia which corresponds roughly to the modern-day municipality of Kočevye (Map 15.4). The area was settled between 1325 and 1360 by speakers of SBav from Upper Carinthia (Oberkärnten) and East Tyrol (Osttirol; Wiesinger 1983a: 907–908).



Map 15.4: Gottschee. Places with velar fronting (postsonorant and/or word-initial) are indicated with squares and places without velar fronting with circles. 1=Tschinkel (1908), 2=Seemüller (1909b), 3=Wolf (1982), 4=Lipold (1984).

Several studies have investigated the sound structure of the German dialects of Gottschee. One of the earliest is Tschinkel (1908), who detected no velar fronting in the town of Lichtenbach (recall §12.9.2). A more recent work is Wolf (1982: 37), who is clear that there is no velar fronting in the area of Suchener Tal. Those works contrast with Seemüller (1909b) for Mitterdorf and Lipold (1984) for the entire Gottschee area because both of those studies indicate that velar fronting was active. In the remainder of this section I discuss the data from the latter two works.[6]

Lipold (1984) is an extremely valuable work on the sound structure of the dialects of Gottschee. That comprehensive study offers an in-depth synchronic treatment of the phonology of the entire area, concentrating specifically on the seven villages of Suchen, Hinterberg, Klindorf, Niedermösel, Reichenau, Rodine, and Hornberg. The book is accompanied with a tape recording of native speakers from those places – recordings presented in written form on pp. 449–529 in phonemic transcriptions (/…/) and narrow phonetic ones ([…]). Lipold (1984) contains copious data from all seven of the villages referred to above – data indicating that those places had a version of velar fronting to be discussed below. The data in the seven places do not appear to differ from one another in any significant way with respect to the patterning of velars and palatals. I therefore concentrate on one particular place (Hinterberg) as a representative of all of Gottschee.

The material discussed below shows that the velar fricative ([x]), the velar stop ([k]), and the velar affricate ([kx]) all have palatal allophones. The rule accounting for surface palatals (velar fronting) is triggered by all and only front vowels (Lipold 1984: 211–212). Gottschee differs from other German dialects because it possesses central vowels (distinct from schwa) which contrast with front vowels and back vowels. For example, there are the two phonemic short front vowels /i e/, two phonemic short back vowels /u o/, and two phonemic short central vowels ⟦ü ö⟧, which I retain in Lipold's transcription system.[7] In contrast to StG, there are no phonetically front rounded vowels like [y ø] (Lipold 1984: 123). The contrast between front vs. central vs. back is captured in Lipold's feature system with the two binary features [±front] and [±back]. In the present framework I express the contrast with the two features [coronal] and [dorsal]. That system is given in Table 15.2 for the six short vowels mentioned above, together with the short low back vowel /ɑ/.

In the inventory of vowels depicted in Table 15.2 there are front (coronal) vowels, which contrast with back (dorsal) vowels and central vowels, which are unmarked for [coronal] and [dorsal].[8]

[6] Velar fronting is absent in the other former German-language island of Slovenia, namely Zarz (Lessiak 1959; Map 3.3). The Slovene language possesses [x](/x/) but no corresponding palatal (Greenberg 2006). There is also no allophonic process fronting /x/ in Slovene.

[7] The datasets presented below indicate that the reflexes of the central vowels of Gottschee are often equivalent to front rounded vowels in StG (e.g. [y ø]) but that in other cases they correspond to StG back vowels (e.g. [u o]).

[8] An alternative to Table 15.2 is to analyze the central vowels as phonologically [coronal] and to adopt the feature [±round] to distinguish those sounds from front unrounded vowels. In that

Table 15.2: Distinctive features for vowels (Gottschee)

	i	e	ü	ö	u	o	ɑ
[coronal]	✓	✓					
[dorsal]					✓	✓	✓
[low]							+
[high]	+	−	+	−	+	−	

Dorsal fricatives in Hinterberg do not occur word-initially, but dorsal affricates and stops do surface in that context: Palatal [cç] surfaces before front vowels (=13a) and the velar before central vowels (=13b), back vowels (=13c), or [r] (=13d). The transcriptions in (13) are in Lipold's system, which employs symbols very similar to the ones I have adopted in this book.

(13) Word-initial dorsal affricates in Hinterberg

a.	cçe:rts$^{\varepsilon}$	Kerze	'candle'	333
	cçe:rb$^{\varepsilon}$	Körbe	'basket-PL'	333
	cçepf$^{\varepsilon}$	Köpfe	'head-PL'	328
b.	kxüxl̩	Küche	'kitchen'	327
	kxü:ts	kurz	'short'	331
c.	kxa:fm̩	kaufen	'buy-INF'	334
d.	kxrüəkx	Krug	'jug'	335

The two stops [k] and [c] pattern like the affricates; hence, [c] surfaces before front vowels (=14a), and [k] before central vowels (=14b), back vowels (=14c), or liquids (=14d).[9]

(14) Word-initial dorsal stops in Hinterberg

a.	cẹs:$^{\varepsilon}$	Schultasche	'book bag'	315
	cẹŋkx	Fußtritt	'kick'	315

alternative approach, phonetic implementation could capture the fact that ⟦ü ö⟧ are not the same vowels as [y ø] in other German dialects. The analysis of ⟦ü ö⟧ in Table 15.2 can be tested by determining whether or not they pattern phonologically as front for processes other than velar fronting.

[9] According to Lipold (1984) the phonemic vowels of Gottschee have allophones, some of which are present in (14), e.g. ⟦ẹ⟧ for /e/). The palatal segments in Gottschee occur in the context of all surface front vowels, including front vowels that are allophones

b.	kük$^{\varepsilon}$	Kuckuck	‘cuckoo’	315
	ˈkürtɑːt	nackt	‘naked’	315
	ˈkölːər	Wamme	‘dewlap’	315
c.	kaːɪ̯f	Taschenmesser	‘pocket knife’	315
	ˈkɔkaɪtsn̩	gackern	‘cluck-INF’	315
	kǫʃː	Wagenkorb	‘basket’	315
d.	krɔmp$^{\varepsilon}$	Krampen	‘pick’	315
	klas$^{\varepsilon}$	Klasse	‘class’	315

Lipold likewise analyzes palatal [ɟ] and velar [g] as allophones word-initially (p. 370). I do not discuss those two stops because of the sparseness of the data containing them.

The data in (15) illustrate the distribution of velar and palatal fricatives in the context after a sonorant: [ç] surfaces after front vowels (=15a) and [x] after central vowels (=15b), back vowels (=15c), or [r] (=15d).

(15) Postsonorant dorsal fricatives in Hinterberg

a.	ˈrɪçtɑr	Richter	‘judge’	301
	ˈesaɪç	Essig	‘vinegar’	309
	gəˈbɪçt	Gewicht	‘weight’	312
	glaːɪ̯ç	gleich	‘soon’	313
	ˈẕleçtɑr	schlechter	‘worse-INFL’	301
	^{u}ɔːẹç$^{\varepsilon}$	Eiche	‘oak’	310
	buɔːẹç	weich	‘soft’	312
	ẕlęçt	schlecht	‘bad’	322
b.	vrüxt	Frucht	‘fruit’	319
	ˈütrüxŋ	wiederkäuen	‘chew cud-INF’	309
	gəˈvlöxtn	geflochten	‘braid-PART’	320
	gəˈvlöːxŋ	geflogen	‘fly-PART’	320
	rö̧xŋ	Roggen	‘rye’	303
	bö̧xŋ	Wochen	‘week-PL’	302
	bö̧x$^{\varepsilon}$	Woche	‘week’	301
	lö̧x	Loch	‘hole’	316
c.	pruːxtl	gebracht	‘bring-PART’	313
	dɔx	Dach	‘roof’	304
	bɔx$^{\varepsilon}$	Wache	‘sentinel’	301
	rę̧ːʌx	Reh	‘deer’	316
	raxt	recht	‘right’	316
	ɬaːx	Lauch	‘leek’	316

d.	düːrx	durch	‘through’	312
	piːrx$^{\varepsilon}$	Birke	‘birch tree’	313
	ʃtuːrx	stark	‘strong’	332
	mr̩x$^{\varepsilon}$	Mähre	‘old mare’	316
	vüːrx$^{\varepsilon}$	Furche	‘furrow’	332
	z̥nǫːʌrxŋ	schnarchen	‘snore-INF’	321

The dataset in (16) illustrates the distribution of velar and palatal affricates in the context after a sonorant: [cç] occurs after front vowels (=16a), and [kx] after central vowels (=16b), back vowels (=16c), or [r] (=16d).

(16) Postsonorant dorsal affricates in Hinterberg

a.	dɪcç$^{\varepsilon}$	dick	‘fat’	312
	ęːʌbɪcç	ewig	‘eternal’	310
	tuɔęcç	Teig	‘dough’	300
	z̥mecçŋ	schmecken	‘taste-INF’	321
	ʃtęcçŋ	stecken	‘stick-INF’	323
b.	rükx$^{\varepsilon}$	Rücken	‘back’	300
	tükx	Tücke	‘peril’	314
	z̥mükxŋ	schmiegen	‘nuzzle-INF’	321
	lükx$^{\varepsilon}$	Lücke	‘gap’	301
	bǫ̈kx	Bock	‘buck’	302
	ʃtǫ̈kx	Stock	‘stick’	323
	gəˈʃrǫ̈kxŋ	erschrocken	‘scared-PART’	323
c.	vlakx	Fleck	‘spot’	320
	ˈakxər	Äcker	‘field-PL’	309
	ɫɔkx$^{\varepsilon}$	Lacke	‘village pond’	301
d.	paːrkx	Berg	‘mountain’	334

Lipold (1984: 370) considers the palatal stops [c ɟ] to be allophones of /k g/ in postsonorant position, although the only example found for Hinterberg is the word [ˈglɪclɪç] ‘fortunate’ for [c] (p. 313).

The formal rules for Hinterberg are stated below for word-initial position (=17a) and postsonorant position (=17b). The triggers for both rules include all and only front vowels but not central vowels, back vowels, or coronal consonants. The target segments for (17b) must minimally include the fricative /x/ and the affricate /kx/. I opt for a broader set of targets, which also includes the stops /k/ and /g/. Although only one example was found for /k/ and no examples for

/g/, I posit the broad set of targets on the basis of Lipold's characterization of palatal stops as allophones in postsonorant position. For word-initial position (=17a) the targets must consist of all dorsal obstruents.

(17) a. Wd-Initial Velar Fronting-6:

$_{\text{wd}}[$ [−SON] [−CONS]

[DORSAL] [CORONAL]

b. Velar Fronting-8:

[−CONS] [−SON]

[CORONAL] [DORSAL]

A second description for a Gottschee dialect is Seemüller (1909b), which is a very brief work consisting of phonetic transcriptions of the Wenkerbogen and other short texts for the Mitterdorf dialect. The transcriptions contain enough words with [ç] (=⟦x⟧) and [x] (=⟦χ⟧) to conclude that the village of Mitterdorf once had a synchronic rule of velar fronting. Consider the examples presented in (18).[10] I retain the transcriptions in the original.

(18) Dorsal fricatives in Mitterdorf:

a.	ix	ich	'I'	25
	mīlix	Milch	'milk'	25
	gəšixtə	Geschichte	'story'	26
	entlix	endlich	'finally'	28
	tsēxnɑi	zehn	'ten'	25
	šlextə	schlechte	'bad-INFL'	26
	dəroixŋ	erreichen	'reach-INF'	28
	lɑixtə	leichter	'easier'	28
b.	bǫ̈χŋ	Wochen	'week-PL'	25
	nöχ	noch	'still'	25
	khöχlefl	Kochlöffel	'wooden spoon'	26
c.	khūχŋ	Kuchen	'cake'	25
	gəprūχt	gebracht	'bring-PART'	27
	toχtər	Tochter	'daughter'	25
	moχŋ	machen	'do-INF'	26

[10] Mitterdorf also possesses the corresponding lenis fricatives [ʝ] (=⟦ɣ⟧) and [ɣ] (=⟦g⟧), which I do not discuss because the texts in Seemüller (1909b) contain only a few items with those segments. (The two words found with ⟦ɣ⟧ occurred after the front vowels [ɪ] and [eː]). The texts in Seemüller (1909b) also contain many words with velar stops ([k kʰ g]), which surface without change after front segments. None of the data presented in that source indicate that velar fronting is active in word-initial position.

	rɑχt	recht	'right'	27
	hōɒχ	hoch	'high'	27
	hēɒχtər	höher	'higher'	27
	gəwīəχtət	gefürchtet	'fear-INF'	28
d.	düɒrχs	durch	'through'	25
e.	trökχnən	trockenen	'dry-INFL'	25

I posit that the features for vowels in Table 15.2 also hold for Mitterwald. Thus, [ç] surfaces after front vowels (=18a) and [x] after central vowels (=18b), back vowels (=18c), or [r] (=18d). One example was found with the velar affricate in the context after a front rounded vowel (=18e), which is consistent with an analysis in which /k/ and /kx/ pattern the same way. The formal rule of velar fronting in (19) for Mitterdorf is Velar Fronting-13 (=4).

15.6 Grisons

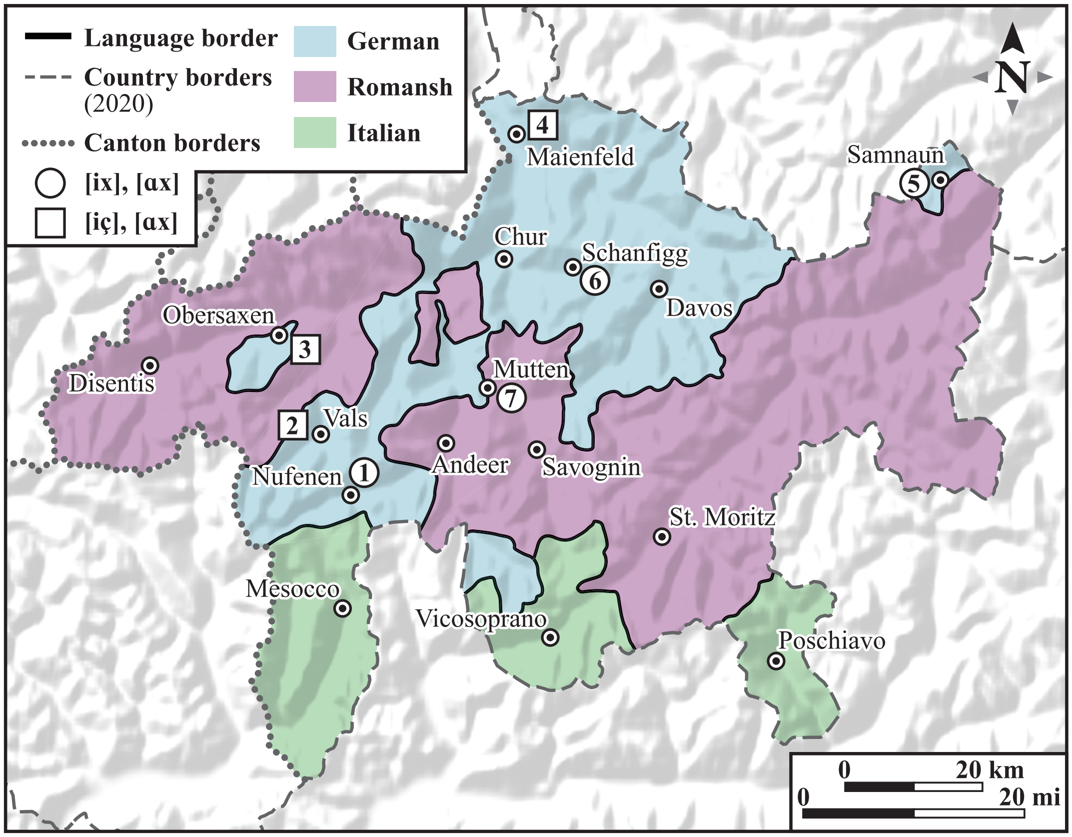
In §6.3 the dialect of Obersaxen was identified as a Walser variety of HstAlmc spoken in West Grisons (Graubünden); Map 15.5. As indicated on that map, Obersaxen is a German-language island because it is encircled by areas populated with speakers of Romansh, a language with neither [ç] nor [x]; see Anderson (2016). There is no question that Obersaxen represents a velar fronting island because Obersaxen itself is a German-language island.

Recall the generalizations concerning velar fronting in Obersaxen: Velars (/x/ and /kx/) surface as palatal in word-initial position before a nonlow front vowel (Wd-Initial Velar Fronting-5) and in postsonorant position after a nonlow front vowel (Velar Fronting-7).

Wiesinger (1983a: 904–906) identifies a number of other places in Grisons which are populated with speakers of Walser German, but an examination of the sources for those varieties reveals that those places do not have velar fronting. Three examples indicated on Map 15.5 are Nufenen (Gröger 1914c), Mutten (Hotzenköcherle 1934), and Schanfigg (Kessler 1931). A more remote (SBav) variety of German in Grisons without velar fronting is Samnaun (Gröger 1924). (I discuss the status of velar fronting in the data from the linguistic atlas of Switzerland (SDS) in §15.7).

The closest place to Obersaxen with velar fronting is Walser German variety of Vals (Gröger 1914e). Like Obersaxen, Vals is a German-language island situated in a German-speaking area without velar fronting.[11]

[11] Map 15.5 also indicates that there is a geographically more distant velar fronting place in North Grisons (Maienfeld; Meinherz 1920) which was discussed in §3.3; see also §15.11.



Map 15.5: Grisons. Velar fronting (postsonorant and/or word-initial) is depicted with a square and the absence of velar fronting with a circle. 1=Gröger (1914c), 2= Gröger (1914e), 3=Brun (1918), 4=Meinherz (1920), 5=Gröger (1924), 6=Kessler (1931), 7=Hotzenköcherle (1934). [Source for language borders: Kanton Graubünden in Wikipedia]

Gröger (1914e) is a phonetically transcribed text from a native speaker of the Vals variety of HstAlmc which reveals that velar fronting is active word-initially in (19) and in postsonorant position in (20). For both contexts the sound undergoing velar fronting is either the fricative /x/ or the affricate /kx/. The items listed in (19) indicate that velar fronting is triggered by front vowels (including low front vowels) but not consonants. In postsonorant position the sounds inducing velar fronting are restricted to nonlow front vowels (20b vs. 20c) or liquids (in 20d). Recall that these generalizations for triggers are not the same as the ones for Obersaxen.

(19) Word-initial dorsal fricatives and affricates in Vals:

a.	xunt	[xunt]	kommt	‘come-3 sg’	45
	xo	[xo]	gekommen	‘came-part’	41
	xoštə	[xoʃtə]	kosten	‘cost-inf’	45
	xɑn	[xɑn]	kann	‘be able-3sg’	46

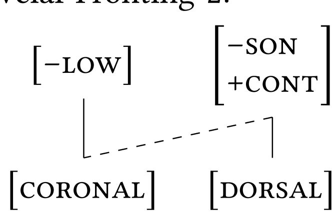
b.	xlepf	[xlepf]	Schläge	‘blow-PL’	42
	xlīs	[xliːs]	kleiner	‘small-INFL’	43
c.	xrummə	[xrʊmmə]	krumme	‘bent-INFL’	41
	kxrušt	[kxrʊʃt]	gekommen	‘come-PART’	46
	kxrɑt	[krɑːt]	gerade	‘just’	43
d.	kχent	[kçent]	gekannt	‘know-PART’	42
	χönə	[çønə]	können	‘be able-INF’	43
	χætsər	[çætsər]	Ketzer	‘heretic’	43

(20) Postsonorant dorsal fricatives and affricates in Vals:

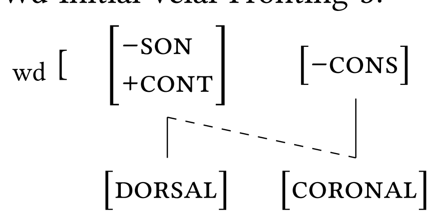
a.	brūxə	[bruːxə]	brauchen	‘need-INF’	43
	būx	[buːx]	Bauch	‘stomach’	42
	lōx	[loːx]	Loch	‘hole’	43
	dokxtər	[dokxtər]	Doktor	‘doctor’	45
	bɑx	[bɑx]	Bank	‘bench’	42
	kmɑxt	[kmɑxt]	gemacht	‘do-PART’	42
b.	tsræxt	[tsræxt]	zurecht	‘justifiably’	45
	mæxtɩgə	[mæxtɪgə]	mächtige	‘powerful-INFL’	44
	ræxt	[ræxt]	recht	‘right’	46
	ksǣxɩ	[ksæːxɪ]	sähe	‘see-3SG.SUBJ’	43
c.	diχ	[ɪç]	you	‘you-ACC.SG’	44
	rükχte	[rʏkçte]	rückte	‘move over-PRET	45
	fəršteкχt	[fərʃtekçt]	versteckt	‘hide-PART’	42
d.	kwürkχt	[kwʏrkçt]	gewirkt	‘seem-PART’	44

The rules of velar fronting for Vals are stated in (21). Velar Fronting-2 accounts for (20c). (20d) requires Velar Fronting-3, which is stated below in (25b). Note that the set of triggers is not the same in word-initial and postsonorant position. Although that finding is rare among German dialects, it is not unattested (§14.7).

(21) a. Velar Fronting-2:



b. Wd-Initial Velar Fronting-3:



As pointed out elsewhere in this book, one must take care in drawing conclusions on velar fronting based on a short text. Although Gröger (1914e) leaves little doubt that velar fronting was active in Vals over a century ago, it is also possible that longer Vals texts from that time frame or from a later time period may reveal that the conclusions drawn here concerning triggers are in need of modification.[12]

It is interesting to consider the description of two of the non-velar fronting varieties of Walser German referred to above. The first is Kessler (1931), who describes a dialect spoken in Schanfigg. Velar /x/ is realized throughout the region as [x] (=⟦x⟧), although the author notes that there are some isolated pockets where [ç] (=⟦χ⟧) occurs. Kessler (1931: 105) writes:

> Das reibegeräusch von kx und x klingt, bes. in der nachbarschaft palataler vocale, bedeutend weniger velar und leiser als in den meisten der nördlichern Schweizermaa. Am stärksten fällt dies in Ar. auf. – Palatalen reibelaut höre ich ausnahmsweise in Lw. und von einer alten Frau in Cf.: χind, halmiχts ('halmiges') gras, iχχonnə 'hinein gekonnt', i χennə-nə níd 'ich kenne ihn nicht', betteχχɩ 'bettdecke' usw. ….
>
> "The frication noise in kx und x sounds, especially in the neighborhood of palatal vowels, considerably less velar and quieter than in most of the more northern Swiss dialects. The most prominent [of these dialects] is Ar. [Arosa] – I hear the palatal fricative exceptionally in Lw. [Langwies] and from an old woman in Cf. [Calfreisen]: χind 'child', halmiχts ('pertaining to a blade') of grass, iχχonnə 'able to go in', i χennə-nə níd 'I don't know him', betteχχɩ 'blanket' etc. …"

Hotzenköcherle (1934: 316–317) makes the same type of observation as Kessler for the speech of a single individual – a woman approximately fifty years old – in the non-velar fronting region of Mutten. Hotzenköcherle notes that his informant has the palatal (⟦χ⟧) realization in the context before and after high front

[12]Two inconsistencies in Gröger (1914e) are: (i) One example indicates that [x] surfaces after a consonant ([l]), i.e. ⟦kwɑlxət⟧ 'churn-PART' (cf. 20d); (ii) One item has word-initial velar [kx] before [æ], i.e. (⟦kxærli⟧ (=[kxærli]) 'fellow-PL' (cf. the third example in 19d). I assume that the inconsistencies here – liquids sometimes do and sometimes do not trigger postsonorant fronting, low front vowels sometimes do and sometimes do not trigger word-initial fronting – fall into the domain of irregularities documented for LG dialects (§12.8.3). Another set of examples in the text only appears to be irregular: If word-initial /x/ or /kx/ occur before a liquid then those obstruents surface as the corresponding palatals if the vowel following the liquid is nonlow and front, e.g. ⟦kχrümmɩ⟧ 'state of being bent'. Several other examples were found in Gröger (1914e) suggesting that nonlow front vowels but not liquids trigger word-initial fronting. The mirror-image generalization is true for postsonorant velar fronting in Obersaxen (§6.3.2).

vowels (⟦i ɩ⟧ and the long counterparts) and occasionally before mid front vowels (⟦e ē^{i}⟧).

The two passages are significant because they suggest that very small-scale velar fronting islands are attested at the level of the individual.

15.7 Interlude: The interpretation of symbols for dorsal fricatives in SDS

In the remainder of this chapter I draw on data from the linguistic atlas for Switzerland (SDS). Since that source adopts an unconventional set of symbols and categories for dorsal fricatives, it is essential that an interpretation for the transcription system in that source be put forth. As indicated above, this is the goal of the present section.[13]

The SDS terms and symbols for dorsal fricatives as well as my interpretation thereof are summarized in Table 15.3 and commented on below. The SDS maps referred to in the remainder of this chapter for dorsal fricatives are listed in Table 15.4. Like SNiB (Table 13.4), SDS adopts a three-way system for classifying dorsal fricatives. That approach is summarized in Table 15.3 with the three categories velar (⟦x⟧), palatal (⟦χ⟧), and prepalatal (⟦χ'⟧/⟦χ''⟧)

Table 15.3: SDS symbols for dorsal fricatives

SDS term and symbol	Phonological Features	Probable phonetic realization
prepalatal ⟦χ'⟧/⟦χ''⟧	[coronal, dorsal]	palatal ([ç]) or alveolopalatal ([ɕ])
palatal ⟦χ⟧	[dorsal] (or [coronal, dorsal])	prevelar ([x̟]) or palatal ([ç])
velar ⟦x⟧	[dorsal]	velar ([x]) or uvular ([χ])

The difficulty with the SDS “palatal” category in the first column of Table 15.3 can be clearly seen in Map II 94 for *Kind* ‘child’. This map shows the realization of the first sound in that word is “palatal” throughout many if not most parts of Switzerland. In fact, on the basis of this map one would have to conclude that the “palatal” fricative (⟦χ⟧) is far more prevalent than the velar fricative (⟦x⟧). If ⟦χ⟧ and ⟦x⟧ are truly equivalent to [ç] and [x] then the maps in SDS would therefore blatantly contradict the claims made in the descriptive grammars of SwG dialects cited in §12.3.1 and indicated on Map 3.2 with circles.

[13]This section has benefited from discussions with Jürg Fleischer.

Table 15.4: Maps from SDS with dorsal fricatives or affricates in word-initial or postsonorant position

Examples	Map no.
Kind ‘child’	II 94
drücken ‘press-INF’	II 95/96
trinken ‘drink-INF’	II 97/98
getrunken ‘drink-PART’	II 99/100
tränken ‘soak-INF’	II 101/102
Gestank ‘stench’	II 103
Anke (Butter) ‘butter’	II 104
Bank ‘bench’	II 105/106
Bänke ‘bench-PL’	II 105/106
Bänklein ‘bench-DIM’	II 105/106
melken ‘milk-INF’	II 109
Chilche (Kirche) ‘church’	II 110
Zeichen ‘sign’	II 111
Speicher ‘attic’	II 112
bache (backen) ‘bake-INF’	II 183
Rechen ‘rake’	II 183
rauchen ‘smoke-INF’	II 201

In order to understand the discrepancy between the traditional view of SwG /x/ as velar ([x]) or uvular ([χ]) and the one portrayed in SDS it is important to consider the following statement made in the introduction to that linguistic atlas (Hotzenköcherle 1962) in the passage on phonetic symbols (pp. 88–89, Footnote 7): “Die Grenze zwischen palatalem χ und velarem x ist praktisch in vielen Fällen schwer zu ziehen; χ deckt in unseren Materialien einen sehr weiten und insofern sehr fragwürdigen Bereich, während x ausgesprochene Extremwerte fixiert und in diesem Sinn … zuverlässiger sein dürfte”. (“The boundary between palatal χ and velar x is in practice difficult to draw; in our material χ covers a very broad and in this respect questionable area, while x depicts highly extreme values and … may be more reliable”).

The preceding quote as well as the similar remarks on the transcriptions for the sounds representing *ch* made on Map II 183 reveal that the authors of SDS consider “palatal” to be a dubious and unreliable realm that cannot be easily assigned a traditional phonetic category. In order to express a place of articulation that is unquestionably more front than ⟦χ⟧, SDS adopts a different category with a unique symbol, namely the prepalatal ("präpalatal") place of articulation, which is transcribed as ⟦χ'⟧. Prepalatal also includes articulations even more front than ⟦χ'⟧, which are consequently transcribed as ⟦χ''⟧.

As indicated in Table 15.3, I see SDS's prepalatal ⟦χ'⟧/⟦χ''⟧ as a phonologically front dorsal fricative, which translates into [coronal, dorsal] given the featural system adopted in this book. Thus, prepalatal ⟦χ'⟧/⟦χ''⟧ can be thought of as the (fortis) sound produced by velar fronting represented in previous chapters with the phonetic symbol [ç]. By contrast, SDS's ⟦x⟧ is phonologically a back dorsal fricative, which is analyzed in my featural system as a simplex [dorsal] sound.

It is not clear how ⟦χ'⟧/⟦χ''⟧) and ⟦x⟧ are actually pronounced. I have provided traditional IPA symbols and diacritics in the final column of Table 15.3, which I comment on here.

Since the sounds traditionally transcribed as [ç] and [x] for varieties of German spoken in Germany can have more than one realization depending on the area and/or the speaker (recall §1.5, §12.9), it would not be unreasonable to assume that the same holds true for the SDS front dorsal ⟦χ'⟧/⟦χ''⟧ and back dorsal ⟦x⟧; recall Table 12.37. For example, ⟦x⟧ might be pronounced by some speakers by raising the tongue dorsum to the soft palate (=velar [x]) and by others by raising the tongue dorsum to the uvula (=uvular [χ]). Likewise, some speakers might articulate ⟦χ'⟧/⟦χ''⟧ by raising the front part of the dorsum to the hard palate (=palatal [ç]) and others by advancing the tongue body so that a sibilant is produced (=[ɕ]), as in the CG dialects investigated in Chapter 10.

The phonetics of the two extremes (i.e. ⟦χ'⟧/⟦χ''⟧ vs. ⟦x⟧) aside, the important point is that the former is a phonologically front dorsal and the latter a phonologically back dorsal. It is clear from the quote from SDS that the authors do not want to commit themselves as to the status of "palatal" ⟦χ⟧. The interpretation I adopt is that – at least in the unmarked case – ⟦χ⟧, like ⟦x⟧, is phonologically a back dorsal, which translates into a representation with a simplex [dorsal] feature. In order to express the fact that ⟦χ⟧ is more front than ⟦x⟧ from the point of view of phonetics, I hold that the unmarked realization of ⟦χ⟧ is a prevelar (=[x̟] in a narrow transcription); recall §12.9.2 and Table 12.37.

A second (marked) option for the realization of ⟦χ⟧ is that the articulation is interpreted phonologically as the same as ⟦χ'⟧/⟦χ''⟧, namely a phonologically front dorsal (= [coronal, dorsal]).

Consider now the evidence in favor of my interpretation of the SDS symbols as described above: First, the symbols for prepalatal fricatives (⟦χ'⟧/⟦χ''⟧) are present on SDS Map II 94 and II 183 for parts of Upper Valais (§15.8) and the Southwest Bernese Oberland (§15.9). Significantly, those prepalatals can be shown to be phonologically front dorsal fricatives on the basis of independent sources. Second, the analysis of ⟦χ⟧ in the unmarked case as phonologically on par with the phonologically back dorsal ⟦x⟧ is consistent with the prevalence of ⟦χ⟧ markers on SDS Map II 94 alluded to above (as well as the other maps in Table 15.4). Third, my interpretation of ⟦χ⟧ in the marked case as a phonologically front dorsal fricative ([coronal, dorsal]) makes sense because markers for ⟦χ⟧ can also be found in areas like the ones alluded to above in which velar fronting is active, i.e. Upper Valais, Southwest Bernese Oberland, as well as parts of East Switzerland (§15.11).

In §15.6 I discussed two velar fronting varieties of HstAlmc Grisons, namely Obersaxen and Vals. The maps in SDS do not unambiguously (dis)confirm the presence of velar fronting in those two places. For Obersaxen the palatal fricative marker ⟦χ⟧ is present on Map II 94, and the palatal affricate marker ⟦kχ⟧ is indicated on Map II 95/96 (for ⟦drịkχ^{æ}⟧ 'press-INF'). By contrast, the prepalatal ⟦χ'⟧ is given in the list of data for Map II 97/98 for *trinkt* 'drink-3SG' (⟦trīχ't⟧). For Vals the SDS maps show either ⟦χ⟧/⟦kχ⟧ or ⟦x⟧/⟦kx⟧.

The SDS data might confirm postsonorant velar fronting of /x/ and /kx/ for Obersaxen if the one prepalatal marker is considered representative and if the two palatal markers are interpreted as a front dorsal. The conclusion for Vals is not as obvious because there are no prepalatal markers indicated given for that place. I conclude that those palatal markers indicated front dorsals.

15.8 Upper Valais, Northwest Italy, and Tessin

The canton of Valais (Wallis) in Southwest Switzerland is traditionally divided into three regions: Lower Valais (Unterwallis), Central Valais (Mittelwallis), and Upper Valais (Oberwallis). The former two are primarily French-speaking, while Upper Valais is predominantly German-speaking. Most settlements in Upper Valais are located in the Rhône Valley between Siders and Oberwald – including the side valleys –, although Upper Valais also extends as far south as Zermatt (Map 15.6). Significantly, Upper Valais is a secluded area of Switzerland because the Rhône Valley is an Alpine valley, which is shut off from the German-speaking areas to the north of the Bernese Alps (Berner Alpen).

The German dialect spoken throughout Upper Valais is HstAlmc, a specific variety of which (Visperterminen) was discussed in §6.2. Wipf (1910) is an invaluable source because it provides a detailed descriptive grammar of a velar fronting variety in a specific village in that region. Several additional sources for dorsal fricatives/affricates in Upper Valais are also known to me. Although those works do not compare with Wipf (1910) in terms of quantity and depth of velar fronting data, they all provide valuable information concerning the extent to which velar fronting is active in other parts of Upper Valais. Map 15.6 indicates the places in that area referred to in the sources I discuss below. The map also includes a number of German-language (HstAlmc) islands in Northwest Italy, as well as one HstAlmc variety in the Italian-speaking canton of Tessin.[14]

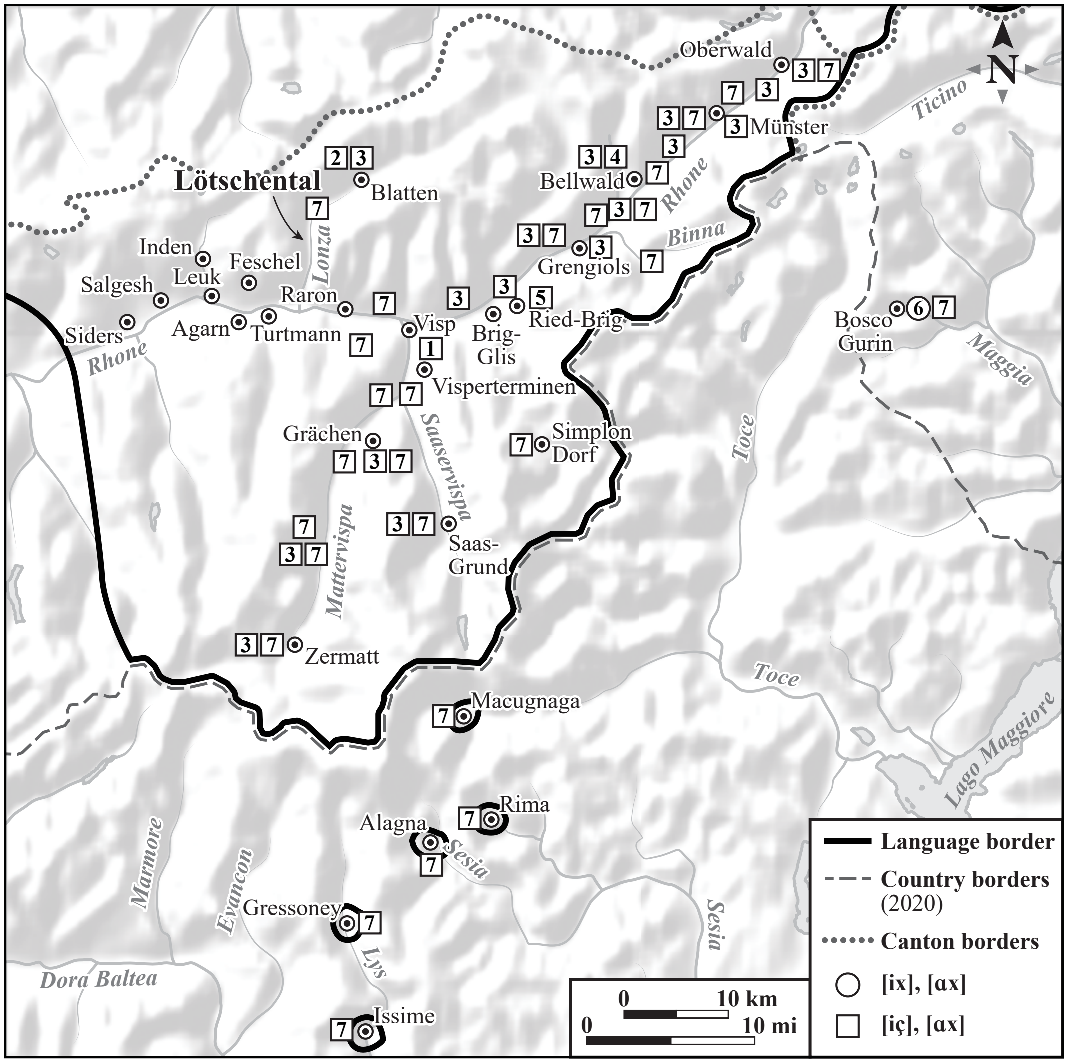
In the remainder of this section I discuss data from additional sources for HstAlmc varieties in Upper Valais. I consider first those studies that focus on specific places and then turn to works that investigate the status of velar fronting in the region as a whole (including Northwest Italy and Tessin). The two major issues I address are: (a) The extent to which velar fronting is attested throughout the entire region and (b) the different requirements concerning the set of velar fronting triggers for those places with that rule.

Henzen (1928) concerns himself with Vowel Reduction in posttonic syllables and Henzen (1932) with the morphology of the genitive. Both articles deal specifically with the dialect spoken in one of the side valleys of the Rhône Valley, namely the area in and around Blatten in the Lonza River Valley (Lötschental), about 20km to the northwest of Visperterminen. Henzen adopts the same phonetic transcriptions as in Wipf (1910), whereby ⟦x⟧=[x] and ⟦χ⟧=[ç]. The data in (22) and (23) have been drawn from the two articles referred to above. The pages in the final column refer to Henzen (1928) and Henzen (1932), which are abbreviated as A and B respectively.

(22) Word-initial dorsal fricatives in Lötschental:

a.	xunt	[xunt]	kommt	‘come-3SG’	B: 98
	xuæ	[xuæ]	Kuh	‘cow’	B:105
	xɑbus	[xɑbus]	Kohl	‘cabbage’	A: 116
b.	χind	[çind]	Kind	‘child’	B: 95
	χiššini	[çiʃʃini]	Kissen	‘pillow’	A: 111
	χeštn	[çeʃtn̩]	Kosten	‘cost-PL’	B: 100
	χend	[çend]	Kinder	‘child-PL’	B: 110
	χɛs	[çɛːs]	Käse	‘cheese’	A: 139

[14]Those (HstAlmc) German-language islands (Issime, Gressoney, Alagna, Rima, and Macugnaga in Italy and Bosco Gurin in Tessin) were settled during the Walser migrations beginning in the thirteenth century (Wiesinger 1983a: 903). Bohnenberger (1913), Jutz (1931), and Moulton (1941) all observe that velar fronting – phrased in their terms as the occurrence of [ç] and [x] as positional variants – is common throughout Upper Valais. Bohnenberger in particular writes that the occurrence of the palatal fricative in the neighborhood of front vowels is typical for the entire region. Bohnenberger represents both sounds with the symbol ⟦χ⟧ and does not provide data from any particular place. Jutz (1931: 208) refers only to Visperterminen as evidence that some South Almc dialects have [x] and [ç]. Moulton (1941: 40) also observes that “Wallis dialects” have [x] and [ç] as positional variants, but his only example is Visperterminen (in addition to the Walser variety of Obersaxen discussed in §15.6).



Map 15.6: Upper Valais, Northwest Italy, and Tessin. Squares indicate some version of velar fronting (postsonorant and/or word-initial), and the circle represents the absence of velar fronting. 1=Wipf (1910), 2=Henzen (1928, 1932), 3=Rübel (1950), 4=Schmid (1969), 5=Werlen (1977), 6=Russ (2002), 7=SDS.

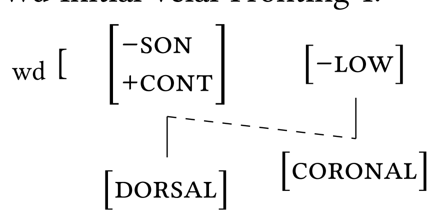
c.	χiæ	[çiæ]	Kühe	‘cow-PL’	B: 95
d.	xæxlæ	[xæxlæ]	Bergdohlen	‘type of bird-PL’	A: 111
e.	χlupf	[çlupf]	Furcht	‘fear’	A: 115

(23) Postsonorant dorsal fricatives in Lötschental:

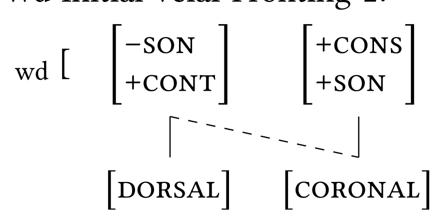
a.	nox	[nox]	noch	‘still’	B: 105
	lōx	[loːx]	Loch	‘hole’	A: 133
	bɑx	[bɑx]	Bach	‘stream’	A: 128
	sɑxx	[sɑxx]	Sache	‘thing’	B: 106
b.	iχ	[iç]	ich	‘I’	B: 95
	riχr	[riçr̩]	reicher	‘richer’	B: 98
	līχ	[liːç]	Leiche	‘body’	B: 105
	teχtr	[teçtr̩]	Tochter	‘daughter’	B: 102
	oiχ	[oiç]	auch	‘also’	A: 132
c.	liæχpmæs	[liæçpmas]	Lichtmess	‘Candlemass’	B: 100
d.	næxti(n)	[næxti(n)]	gestern abend	‘yesterday evening’	A: 112
	suæxid	[suæxid]	sucht	‘search-3SG’	A: 112
	xæxlæ	[xæxlæ]	Bergdohlen	‘type of bird-PL’	A: 111
	dæxxri(n)	[dæxxxri(n)]	Dächern	‘roof-DAT.PL’	A: 135
e.	milχ	[milç]	Milch	‘milk’	B: 104
	lērχ	[leːrç]	Lärchbaum	‘kind of tree’	B: 103

The generalizations concerning triggers for word-initial and postsonorant position in Lötschental are not the same as in Visperterminen, where high front vowels are the sole triggers (=Wd-initial Velar Fronting-4 and Velar Fronting-6). In Lötschental the triggers for word-initial and postsonorant position comprise the set of nonlow front vowels or liquids, i.e. (24) and (25). Note that /æ/ fails to induce fronting if it is a monophthong or the second component of the /uæ/ diphthong (=23d) but that /iæ/ does induce fronting (=23c). That /iæ/ is a velar fronting trigger is precisely the case in Visperterminen; recall the representations for vowels and diphthongs posited in §6.2.1.

(24) a. Wd-Initial Velar Fronting-1:



b. Wd-Initial Velar Fronting-2:



(25) a. Velar Fronting-2:

$$\begin{array}{cc} [-\textsc{low}] & \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

b. Velar Fronting-3:

$$\begin{array}{cc} \begin{bmatrix} +\textsc{cons} \\ +\textsc{son} \end{bmatrix} & \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

(24a) and (24b) together account for the fact that word-initial palatals occur either before a nonlow front vowel or before a sonorant consonant. (25a) and (25b) likewise express the mirror-image generalization for postsonorant position.

Schmid (1969) investigates the dialect spoken in the village of Bellwald. Although the author does not provide extensive datasets, it is clear from the remarks on phonetic symbols and the phonetics of consonants that Bellwald has some version of velar fronting. Schmid (1969: XVI) posits a consonant chart with the three places of articulation for dorsal ("guttural") fricatives and affricates from SDS (recall §15.7): Prepalatal (=⟦χ''⟧/⟦kχ''⟧), palatal-velar (=⟦χ'⟧/⟦kχ'⟧), and velar (=⟦χ⟧/⟦kχ⟧). Schmid (1969: XVII) even gives a clear statement on the pronunciation of the velar fricative:

> In Bellwald wird von den zwei älteren Gewährsgruppen der velare Rebelaut χ unmittelbar vor oder nach i oder e (und deren qualitativen und quantitativen Varianten) als dentaler Reibelaut š gesprochen, vor oder nach einem Liquiden als palataler Reibelaut χ' χ''. Bei der jüngsten Gruppe ist in den gleichen Stellungen meist palatales χ', χ', selten dentales š zu hören.
>
> "The velar fricative χ is pronounced in Bellwald in the two groups of informants as a dental fricative š immediately before or after i or e (and their qualitative and quantitative variants) and as palatal fricative χ' χ'' before or after liquids. In the youngest group of informants palatal χ' χ'', but seldom dental š, can usually be heard in the same contexts. In general there is a tendency today for the soft palatal pronunciation χ'' …"

I interpret velar fronting in Bellwald as follows: For older informants, the target segment is /x/, which shifts to a front dorsal ([coronal, dorsal]) fricative in the context of a coronal sonorant by Velar Fronting-1 (=2).[15] If the coronal sonorant is a front vowel then the derived [coronal, dorsal] fricative surfaces as a sibilant ([ɕ]), but if /x/ is adjacent to a liquid then it is realized as a nonsibilant ([ç]). In the speech of younger informants, /x/ is fronted to [coronal, dorsal] in the context of coronal sonorants and usually surfaces as a nonsibilant ([ç]), rarely as a sibilant ([ɕ]).

[15] Bellwald has low front vowels, but it is not clear from the source whether or not they induce velar fronting.

It is interesting that the older generation of speakers has a sibilant as the output (in the front vowel context) and that the younger generation has replaced the sibilant with the nonsibilant [ç]. This is significant because the historical process of alveolopalatalization described in Chapter 10 documents precisely the reverse development: The nonsibilant [ç] is realized by the younger generation as a sibilant ([ɕ]). To the best of my knowledge, Bellwald is the only variety of German which illustrates the historical change from sibilant to nonsibilant. Bellwald is also unique in the sense that the output of velar fronting differs according to context: A sibilant is created in the context of front vowels and a nonsibilant in the context of liquids.

Werlen (1977) offers a detailed study of the sound structure of the HstAlmc variety spoken in and around Brig (now Brig-Gris) couched in early generative phonology. In his discussion of dorsal fricatives (pp. 187–191), Werlen adopts the SDS transcription system with separate symbols representing three categories of dorsal fricatives (and affricates). Throughout his book, Werlen refers to ⟦χ’⟧ as a “palatalized” ⟦χ⟧ and observes (p. 190) that the rule is a regional distinctive feature (“ein regional distinktives Merkmal”). An example of a place with velar fronting (Palatalization) is Ried-Brig (Werlen 1977: 328). Werlen writes that all of his informants from that place have a strong palatal articulation (i.e. ⟦χ’⟧) for ⟦χ⟧. His examples are given in (26). The five categories in (26a–26e) correspond to five different speakers. I give Werlen’s transcriptions in the first column, but I ignore a few of his diacritics for clarity.

(26) Prepalatal ⟦χ’⟧ in Ried-Brig:

a.	kχ’ẹy bu$^{\text{u̯}}$te	keine Bauten	‘no structure-PL’
	glị̄χ’	gleich	‘same’
b.	kχ’’ērt	gehört	‘hear-PART’
c.	glị̄χ’$^{\alpha}$	das Gleiche	‘the same’
	felị̄χ’t	vielleicht	‘maybe’
	įχ’	ich	‘I’
d.	brüχ’’ya	braucht ja	‘need-3SG’
e.	įχ’	ich	‘I’
	kχ’ērįχ’	höre ich	‘hear-1SG’

Werlen posits a rule of Palatalization (velar fronting) with distinctive features (p. 328) which captures the occurrence of ⟦χ’⟧ in (26). According to that rule, a target dorsal fricative is fronted when adjacent to a front ([−back]) vowel. The output of his rule is an "alveolar" fricative which appears to be identical featurally with the sibilant ⟦š⟧ (p. 230). In the present system the data in (26) are consistent with either Velar Fronting-1 (=2) or Velar Fronting-13 (=4).

Ried-Brig contrasts with neighboring places which apparently only have ⟦χ⟧. Consider the discussion of Glis (Werlen 1977: 338): Werlen observes that only one of his informants from that place palatalizes ⟦χ⟧ to ⟦χ'⟧. Although he does not state this point explicitly, the implication – supported with his phonetic transcriptions – is that the default case for Glis (and for the town of Brig) is that ⟦χ⟧ is realized as ⟦χ⟧ regardless of context. An examination of Werlen's system of distinctive features (p. 23) reveals that his /χ/ phoneme is [+high] and [+back], which are precisely those features necessary to define the velar place of articulation (p. 226). My conclusion is that Werlen's ⟦χ⟧ is not palatal, but velar ([x]); hence, Werlen's speakers from the town of Brig do not have velar fronting. I return to the status of non-velar fronting varieties in Upper Valais below.

Rübel (1950) concerns himself with the various HstAlmc terms relating to cattle breeding in Upper Valais ("Viezucht im Oberwallis") from the perspective of dialectology and lexicography. As peripheral as the topic might sound for a book on the phonology of dorsal consonants, Rübel's work is extremely valuable because the author presents cattle breeding terminology in phonetic transcription which clearly distinguishes places of articulation for dorsal fricatives. What is more, Rübel (1950) does not draw his data from one specific locality, in contrast to Wipf (1910), Henzen (1928, 1932), Schmid (1969), and Werlen (1977). Instead, Rübel lists copious examples from over 50 settlements interspersed along the Rhône Valley from Siders to Oberwald (including the side valleys) as well as towns and villages as far south as Saas-Grund and Zermatt. As such, the book sheds light on how velar fronting differs from place to place within a large region.

Rübel adopts a transcription system (p. XXX) similar to the one employed by SDS with the difference being that Rübel has four categories for dorsal fricatives: ⟦x⟧ for uvular (=[χ]), ⟦χ⟧ for velar (=[x]), ⟦χ'⟧ for palatal (=[ç]), and ⟦χ''⟧ for prepalatal.[16] Impressionistically the uvular fricative is rare in the data provided. By contrast, the symbols for velar, palatal, and the prepalatal are common.

In a surprising (but welcome) departure from his discussion of cattle breeding terminology, Rübel provides a short subsection on the realization of dorsal fricatives (pp. 12–13). In that passage he gives a statement similar to the one from

[16] According to Rübel ⟦χ⟧ corresponds to the (StG) ach-Laut and ⟦χ'⟧ to the ich-Laut (p. XXX, Footnote 2). In the same footnote he describes ⟦χ''⟧ as a palatal colored h-sound ("palatal gefärbter Hauchlaut").

Schmid (1969) cited above, according to which the velar fricative is fronted to either ⟦χ'⟧ or ⟦χ''⟧ in the context before or after i or e (including their qualitative and quantitative variants) or liquids. Like Werlen, Rübel writes of Palatalization ("Palatalisierung"), which is equivalent to velar fronting in the present framework. Rübel (1950: 13) observes that the fronting (Palatalization) of velar to ⟦χ''⟧ is particularly prevalent in the uppermost regions of Goms (the area around Oberwald), in the outer Visp Valley (the area between Visp and Visperterminen) and in Lötschental. (The specific places in those three areas are all indicated on Map 15.6). A selection of data drawn from Rübel (1950: 9) is presented in (27), where my interpretation of his symbols is given in the second column.

(27)	a.	χ'rǫmə	[çrɔmə]
		χ'remə	[çremə]
	b.	χ'romo	[çromo]
		χ'reme	[çreme]
	c.	χrǫmu	[xrɔmu]
		χreme	[xreme]

The data illustrate singular vs. plural realizations for the noun *Krommen* (unclear gloss), and the three different phonetic realizations in (27a–27c) correspond to the different villages in Upper Valais.

Rübel's observation concerning the places in Upper Valais where velar fronting (Palatalization) is most prevalent is important because it establishes that velar fronting is not limited to Visperterminen, Lötschental, Bellwald, and Ried-Brig, but instead that it is a rule that has diffused itself throughout most areas of Upper Valais.

The prevalence of velar fronting in this corner of Switzerland is confirmed by the presence of the many prepalatal markers (⟦χ'⟧) in that region on the SDS maps. Map II 94 for the word-initial dorsal fricative in *Kind* 'child' was already commented on in §15.7, but several other maps in Table 15.4 yield a similar picture. As I discuss below, the underlined sound(s) in the words listed in the first column of Table 15.4 are realized as ⟦χ'⟧ or ⟦χ''⟧ either word-initially or after a coronal sonorant in many places in Upper Valais. The vowels adjacent to the prepalatal markers on those maps are almost always front, although the back vowel context is clear from Map II 183 for *bache (backen)* 'bake-INF' and Map II 201 for *rauchen* 'smoke-INF'.

The authors of SDS note in several places that (Upper) Valais is one of the few places in Switzerland where the prepalatal realization of dorsal fricatives and affricates is common. For example, in the commentary to Map II 201 they write that the prepalatal articulation is attested in numerous places throughout the western part of the Bernese Oberland (see §15.9), Valais, and (Northwest) Italy. (" ... mit präpalataler Artikulation [zeichnen sich] zahlreiche Orte im westlichen Berner Oberland, im Wallis und im IT ... ").

On my Map 15.6 I indicate all of the places in Upper Valais where prepalatal markers occur in word-initial position on Map II 94. The data presented from that region on the other maps listed in Table 15.4 reveal that all of the places with prepalatal markers for Map II 94 – as well as many of the other villages and towns in Upper Valais – also have some degree of velar fronting in postsonorant position. The extent to which velar fronting is present in any one place is determined by the number of prepalatal markers for the maps listed in Table 15.4. It is not the case that every village and town in Upper Valais consistently applies velar fronting, although it is interesting that few of the villages and towns present in Upper Valais in SDS has no prepalatal markers at all. However, the SDS maps in Table 15.4 reveal that some places have significantly more prepalatal markers than palatal markers, while other places have many more palatal markers than prepalatal ones. In general it can be said that velar fronting is more consistent in the following areas: (a) Between Grächen and Zermatt, (b) Simplon Dorf, (c) between Oberwald and Grengiols, (d) in the German-speaking islands in Northwest Italy, and (e) Bosco Gurin (in Tessin). My conclusion concerning the prevalence of velar fronting in those five areas is especially clear on Map II 183 for *bache (backen)* 'bake-INF'. On that map the authors of SDS note in the commentary that the fricative in *Rechen* 'rake' for Zermatt, Oberwald, Simplon Dorf, Alagna, and Rima is a 'very palatal ch.. ' ("sehr palatales *ch* ..."), where underlining is present in the original.

In (28) I list a representative selection of data from SDS from four places in Upper Valais and in (29) from three places in Northwest Italy and Bosco Gurin. It can be observed that ⟦χ'⟧ or ⟦χ''⟧ occur predominantly in the context of high front vowels and after /l/, although a few examples listed below indicate the presence of prepalatals in the neighborhood of back vowels or back consonants like [ŋ].[17]

[17]The data listed in SDS often include multiple tokens for any one place, but only one example is included for each word in (28) and (29). A horizontal line means either that there are no data for that particular example in that particular place or that the data given in SDS for that place contain [h] instead of a dorsal fricative or affricate. The transcriptions given in (28) and (29) are the ones in SDS, although I omit some of the more exotic diacritics for clarity. SDS does not provide complete transcriptions for (28h–28j) and (29h, 29i).

(28) Prepalatal fricatives and affricates in Upper Valais (SDS):

		Zermatt	Grächen	Oberwald	Simplon Dorf
a.	drücken	tri̧kχ'e	trikχ'u	tri̧k'χ"ə	trikχ'u
b.	trinken	trị̄χ"e	trĩ̄χ'u	t$^{\text{ə}}$rị̄χ'ə	trĩ̄χ'u
c.	getrunken	gitrüχ"e	gitrü̃̄χ'ṳ	trü̃̄χ'ə	gitrū$^{\text{i}}$χ"u
d.	tränken	trê$^{\text{i}}$χ"e	trẽ̂$^{\text{i}}$χ'u	t$^{\text{ə}}$rêyχ'ə	trê$^{\text{i}}$χ'u
e.	Gestank	gštö$^{\text{ü}}$χ"	kštõ$^{\text{u}}$χ"	kštâyχ	kštâiχ"
f.	Anke	ö$^{\text{ü}}$χ"e	ö̃̄$^{\text{ü}}$χ'o	ayχ'ə	åyχ'u
g.	Bank	böüχ"	bö̃̄$^{\text{ü}}$χ'	beyχ'	bå̃χ"
h.	Speicher	īχ"	ĩ̄χ"	—	iχ'
i.	backen	χ'	χ'	χ'	—
	Rechen	χ"	—	χ"	χ"
j.	rauchen	—	—	kχ'	kχ"

(29) Prepalatal fricatives and affricates in four German-language islands (SDS):

		Alagna	Rima	Macugnaga	Bosco Gurin
a.	trinken	triŋχ"e	treŋχ"a	trĩŋχ"e	trîŋχ'æ
b.	getrunken	druŋχ"e	gtraŋχ"d	gitruŋχ"es	trǖ$^{\text{æ}}$χ'æ
c.	tränken	dreŋχ"e	traŋχ"an	—	trē$^{\text{ə}}$χ'æ
d.	Anke	aŋgχ"u	aŋχ"a	å̃ŋχ"e	ōχ'æ
e.	Bank	baŋχ"	bāŋχ'	bãŋχ"	bå̄χ'
f.	melken	lχ"	lχ"	lχ'	lχ'
g.	Chilche	χ"il'χ"a	χ"il"χ"o	χ'ilχ"u	χ'elχ'u
h.	backen	χ'	—	χ'χ'	χ'
	Rechen	χ"	χ"	—	—
i.	rauchen	raikχ'-e	raukχ"-a	—	—

Since SDS does not offer a complete set of data for dorsal fricatives for any given place – that is, a set of words in which /x/ and/or /kx/ occurs before or after all phonemic vowels as well as /l r n/ – no definitive conclusions can be drawn concerning targets and triggers for velar fronting for any of the places listed in (28) or (29). Based on the occurrence of prepalatals even in the neighborhood of back segments for some of the places listed above suggest that velar fronting is nonassimilatory (Trigger Type F; Chapter 14).

The data from SDS are important because they confirm the findings of Rübel (1950) concerning the prevalence of velar fronting throughout the south and northeast of Upper Valais. Note the occurrence of the velar fronting markers from SDS on Map 15.6 coincide for the most part with the velar fronting markers from Rübel (1950).[18]

The data discussed up to this point have focused almost exclusively on the areas of Upper Valais to the northeast and south of Visp, but nothing has been said about the towns and villages along the Rhône River to the west of Visp, in particular between Raron and Siders (with the exception of Lötschental, which is a side valley). The maps in SDS indicate that velar fronting is active in this area, but only to a limited extent. Consider the case of Salgesh, which is the westernmost place in Upper Valais on the SDS maps. According to SDS Maps II 96, II 98, II 100, II 104, II 105 the palatal marker ⟦χ⟧ occurs for Salgesh, while the prepalatal ⟦χ'⟧ is present for that village on Maps II 103, II 109. The village of Agarn has even fewer prepalatal markers for those maps (2), while Inden and Turtmann both have 4 and Feschel 3. Map II 183 yields a similar picture: In the west (between Agarn and Raron) and in the general area around Ried-Brig, there is a predominance of velar markers ⟦x⟧, although that would not be surprising even in a velar fronting area because the velar occurs after a back vowel.

The data from Rübel (1950) are similar to the ones from SDS: The places in Upper Valais with a word-initial velar [x] in (27c) extend roughly from Siders to Raron (but excluding the side valley of Lötschental).

My conclusion is that the sources available do not allow one to reach any kind of meaningful conclusion concerning the extent to which velar fronting is active in the western part of Upper Valais.

One striking feature of Map 15.6 is the absence of non-velar fronting places in Upper Valais. One of the reasons for this is that it is not clear how to interpret the palatal ⟦χ⟧ from SDS, which is adopted by some of the works cited above. It was noted above that Werlen's (1977) treatment of the variety spoken in and around Brig-Gris is a non-velar fronting variety, at least for certain speakers.

[18]Sources for one place (Bosco Gurin) do not agree on the status of velar fronting. According to the SDS maps, that place is characterized by nonassimilatory velar fronting. However, in a more recent study devoted specifically to the sounds of Bosco Gurin, Russ (2002: 77) is quite clear that there is no velar fronting. This example suggests that there are (and were) speakers with and without velar fronting in that particular place. I assume that SDS based its maps on those innovative speakers with velar fronting, while Russ based his treatment on conservative speakers without that rule.

In contrast to Ried-Brig, which has velar fronting (Palatalization), there is no equivalent rule for Werlen's other speakers (e.g. from the town of Brig). What is more, as noted earlier, his featural system treats ⟦χ⟧ as a velar. I tentatively conclude that there are non-velar fronting varieties in Upper Valais, but those places cannot be reliably identified based on the sources available at this time. Since it is difficult to know for sure whether or not the velar [x] is present at all in some of the places listed on my Map 15.6, I do not attempt to indicate on that map those places with only front dorsals (=nonassimilatory velar fronting) in contrast to Maps 15.8 and 15.9 below.

Upper Valais can be thought of as a sizable velar fronting island because it is almost completely surrounded by high mountains or areas where a Romance language (Italian or French) is spoken. There is a small corridor in the northeastern part of Upper Valais (around Oberwald) which connects Upper Valais with the rest of German-speaking Switzerland, but the closest dialect – Urserental in the canton of Uri ca. 23km to the northeast – is one without velar fronting (Abegg 1910). The distinction between Northeast Valais (velar fronting) with Southwest Uri (no velar fronting) is depicted well on SDS Map II 183, where the former is covered with markers for prepalatals and the latter with markers for velars.

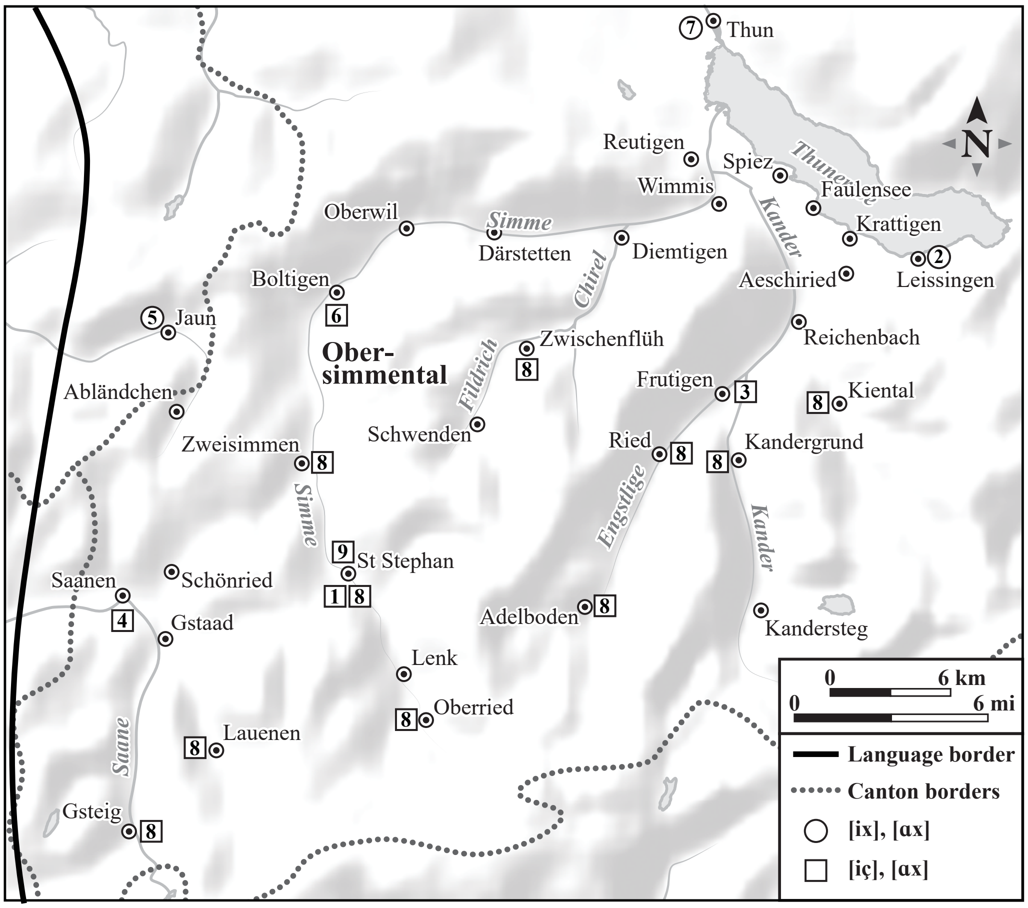
15.9 Southwest Bernese Oberland

The Bernese Oberland (Berner Oberland) is a large area in the southern part of the canton of Bern which corresponds to one of that canton's five administrative divisions (Oberland). The places I discuss below with velar fronting (of /x/ and /kx/) are located in an area I refer to as Southwest Bernese Oberland, which is the region to the south(west) of Thun, as depicted on Map 15.7. The German dialects in this region are classified as HstAlmc.[19]

I discuss first the sources for velar fronting in specific towns and villages in the Southeast Bernese Oberland, and then I turn to data from SDS.

Gröger (1914d) provides a phonetically transcribed text from a native speaker from Saanen which indicates the realization of /x/ and /kx/ as the corresponding palatals in word-initial position (=30). The dataset in (31) indicates that the fronting of /x/ and the corresponding geminate /xx/ are also active after a coronal sonorant.

[19] The earliest work identifying this area as one with [x] and [ç] is Moulton (1941: 63). I discuss below the three places Moulton mentions as well as several others from sources not available to him. Moulton also considers Grindelwald (ca. 15km south of Brienz) to be a place with [x] and [ç]. I do not discuss Grindelwald because Moulton's assessment is based solely on two words in word-initial position. Moulton does not discuss the extent to which the triggers for velar fronting can differ from place to place within the Southwest Bernese Oberland.



Map 15.7: Southwest Bernese Oberland. Squares indicate some version of velar fronting (postsonorant and/or word-initial), and circles indicate the absence of velar fronting. 1=Zahler (1901) 2=Gröger (1914b), 3=Gröger (1914a), 4=Gröger (1914d) 5=Stucki (1917), 6=Henzen (1927), 7=Marti (1985), 8=SDS, 9=SiWS.

(30) Word-initial dorsal fricatives and affricates in Saanen:

a.	xunšt	[xunʃt]	kommst	'come-2SG'	60
	kxobɩ	[kxobɪ]	Jakob	'name'	57
	xɑlbər	[xɑlbər]	Kälber	'cattle-PL'	58
b.	χɩntsfǖšt	[çɪntsfyːʃt]	Kindsfäuste	'child's fist-PL'	58
	χüə	[çʏə]	Kühe	'cow-PL'	57
	χænə	[çænə]	können	'be able-INF'	58
c.	χnæχtə	[çnæçtə]	Knechte	'vassal-PL'	58

(31) Postsonorant dorsal fricatives in Saanen:

a.	kfɩəx	[kfɪəx]	Galtvieh	'young stock'	57
	mɑxxə	[mɑxxə]	machen	'do-INF'	58
b.	ɩχ	[ɪç]	ich	'I'	57
	kšɩχt	[kʃɪçt]	Geschichte	'story'	60
	græχə	[græçə]	unclear gloss		58
c.	mælχə	[mælçə]	melken	'milk-INF'	58

The data provided in (30) and (31) indicate that the set of triggers for velar fronting in both word-initial and postsonorant position is the class of coronal sonorants. The formal rules that account for these generalizations are Wd-Initial Velar Fronting-8 (=12) and Velar Fronting-1 (=2).

Gröger (1914a) provides a phonetically transcribed text from a native speaker from Frutigen indicating the presence of velar fronting in word-initial (=32) and postsonorant position (=33).

(32) Word-initial dorsal fricatives in Frutigen:

a.	xūm	[xuːm]	kaum	'hardly'	57
b.	χelɩ	[çelɪ]	unclear gloss		56
	χönə	[çønə]	können	'be able-INF'	55
	χömɩ	[çømɪ]	käme	'come-3SG.SUBJ'	55
	pχent	[pçent]	gekannt	'know-PART'	57
c.	χnöwwə	[çnøwwə]	niederknien	'kneel down-INF'	57

(33) Postsonorant dorsal fricatives and affricates in Frutigen:

a.	wuxxə	[wuxxə]	Woche	'week'	55
	tōxt	[toːxt]	gedünkt	'think-PART'	55
	mɑxxə	[mɑxxə]	machen	'do-INF'	56
b.	sɩχ	[sɪç]	sich	'reflexive pronoun'	56
	šlæχt	[ʃlæçt]	schlecht	'bad'	56
	ræχt	[ræçt]	recht	'right'	55
	kštekχt	[kʃtekçt]	gesteckt	'stick-PART'	57

As in Saanen, the data in (32) and (33) from Frutigen indicate that velar fronting is induced by all coronal sonorants (=Wd-Initial Velar Fronting-8 and Velar Fronting-1).

Zahler (1901) provides a list of verb conjugations in the HstAlmc dialect of St. Stephan. It is clear from Zahler's data that [x] (=⟦x⟧) and [ç] (=⟦c⟧) are positional variants whose distribution is a function of an adjacent vowel. This can be seen in the three partial paradigms in (34) from Zahler (1901: 229, 231), which illustrate that [ç] surfaces in the context of a front vowel and [x] in the context of a back vowel.[20]

(34) Dorsal fricatives in St. Stephan:

a.	xoə	[xoə]	kommen	'come-INF'
	xųmə	[xʊmə]	komme	'come-1SG'
	xųmšt	[xʊmʃt]	kommst	'come-2SG'
	xųmt'	[xʊmt]	kommt	'come-3SG'
	cemə	[çemə]	kommen	'come-1/3PL'
	cemət'	[çemət]	kommt	'come-2PL'
	ceəmį	[çeəmɪ]	kam	'come-PRET'
	xoə	[xoə]	gekommen	'come-PART'
	xum	[xum]	komm	'come-IMP.SG'
	cemət'	[çemət]	kommt	'come-IMP.PL'
b.	präcə	[præçə]	brechen	'break-INF'
	prįcə	[prɪçə]	breche	'break-1SG'
	prįcšt	[prɪçʃt]	brichst	'break-2SG'
	prįct'	[prɪçt]	bricht	'break-3SG'
	prųxį	[prʊxɪ]	brach	'break-PRET'
	proxə	[proxə]	gebrochen	'break-PART'
c.	šühə	[ʃyhə]	scheuchen	'shoo-INF'
	šüücšt	[ʃyːçʃt]	scheuchst	'shoo-2SG'
	šüüct'	[ʃyːçt]	streicht	'shoo-3SG'
	šüüct'į	[ʃyːçtɪ]	scheuchte	'shoo-PRET'
	kšüüct'	[kʃyːçt]	gescheucht	'shoo-PART'

The data in Zahler (1901) include a number of verbs like the one in (34c) with alternations between [h] and [ç]; recall similar data and discussion from Maienfeld (Meinherz 1920) in §3.3. As in Maienfeld, the alternations involving [h] and

[20] Zahler notes that some speakers have alternant pronunciations. For example, [ç] surfaces in the context of low front vowels for some informants, while others have [x] in that context, e.g. ⟦präcə⟧ 'break-INF' in (34b) vs. ⟦präxə⟧. Variation involving the status of low front vowels as velar fronting triggers has been made repeatedly in this book.

[ç] require an underlying /x/ which shifts to [h] in onset position (between vowels) by Debuccalization. If the vowel preceding that /x/ is front and if /x/ is parsed into the coda, then it surfaces as [ç], as in the final four examples in (34c). Seen in this light, Debuccalization in examples like [ʃyhə] (from /ʃyxə/) bleeds velar fronting; hence, [ç] and [x] have a transparent distribution.

Additional data from Zahler (1901: 231-233) reveal that the set of triggers for velar fronting in St. Stephan does not include nasalized vowels (=35a) or coronal sonorant consonants (=35b).

(35) Postsonorant dorsal fricatives in St. Stephan:

a.	hẽ̆hə	[hẽ̆hə]	hängen	'hang-INF'
	hẽ̆xšt	[hẽ̆xʃt]	hängst	'hang-2SG'
	hẽ̆xt'	[hẽ̆xt]	hängt	'hang-3SG'
	hẽ̆xti̯	[hẽ̆xtɪ]	hing	'hang-PRET'
b.	melhə	[melhə]	melken	'milk-INF'
	mi̯lxə	[mɪlxə]	melke	'milk-1SG'
	mi̯lxšt	[mɪlxʃt]	melkst	'milk-2SG'
	mi̯lxt'	[mɪlxt]	melkt	'milk-3SG'

The items listed in (35a) are particularly significant because they require that the set of triggers for postsonorant velar fronting in St. Stephan be restricted to front [−nasal] vowels. This restriction is without precedent in German dialects and even from the cross-linguistic perspective it is rare, although it is attested in the West African language Fanti (recall §2.3.3).[21]

(36) Velar Fronting-14:

$$\begin{array}{cc} \begin{bmatrix} -\textsc{cons} \\ -\textsc{nasal} \end{bmatrix} & \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} \\ & \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

For word-initial position (=34a) there are no data with nasalized vowels following [x]/[ç]; hence, one cannot know whether or not that context requires a set of triggers consisting solely of front oral vowels. The data in (34a) are consistent with Wd-Initial Velar Fronting-8 (=12) or Wd-Initial Velar Fronting-3 (=21b).

[21] Zahler provides a number of other verbs confirming the same generalization, namely that [x] consistently fails to undergo velar fronting after a nasalized vowel. In all of his examples the [x] that fails to front alternates with [h], cf. the infinitive [hẽ̆hə] 'hang-INF for the verb in (35a). I do not consider this fact to be of significance

A more recent source for St. Stephan is the dictionary for the Simmental (SiWS), which focuses in particular on the dialect of Simmental spoken in that particular town (p. 5). In the pronunciation guide (p. 9) there is a brief statement concerning the pronunciation of dorsal fricatives:

> *ch* sprechen manche Leute durchwegs als ach-Laut (hinten), andere fast ausschliesslich (selbst in Wörtern wie *chlage*, *chriege*) als ich-Laut (vorn), wieder andere als mittleres, am Gaumenbogen gebildetes *ch*, während weitere je nach dem folgenden Konsonanten variieren: rauhes *ch* bei *Sach, Chùchi* (Küche), weiches bei *Chüe* (Kühe), *rìchtig*.
>
> "Some people pronounce *ch* consistently as an ach-Laut (back), others almost exclusively (even in words like fast *chlage*, *chriege*) as an ich-Laut (front), and others as a middle *ch* formed on the palatal arch, while others vary according to the following consonant: rough *ch* in *Sach, Chùchi* (Küche), soft in *Chüe* (Kühe), *rìchtig*".

Since SiWS does not provide phonetic transcriptions it is not possible to compare the data in that source with the ones from Zahler (1901). However, the quote is revealing since it suggests that the dialect of St. Stephan is characterized by considerable variation. On the one hand, there are people without velar fronting, but on the other hand, there are individuals with that rule. Among the latter speakers, some apply velar fronting to produce palatal [ç] in the context of any sound (=nonassimilatory velar fronting), while others restrict the occurrence of palatals to the context of front vowels (assimilatory velar fronting). Reference to the "middle *ch*" suggests that for those speakers velars undergo coarticulatory velar fronting, which produces prevelars. As noted below, nonassimilatory velar fronting is also attested in the data from SDS for the Bernese Oberland.

Henzen (1927: 245) provides some brief remarks on the realization of [x] in the Upper Simmental (Obersimmental), which is broadly defined as the region between Lenk and Boltigen. Henzen's sparse set of examples in (37) shows that the palatal occurs in the context of front vowels and [x] in the context of back vowels.

(37) Dorsal fricatives in Obersimmental:

a.	χeəs	[çeəs]	Käse	'cheese'	245
b.	ɪχ	[ɪç]	ich	'I'	245
	dɪχ	[dɪç]	dich	'you-ACC.SG'	245
c.	nɔx	[nɔx]	noch	still	245

Another (very terse) source for Simmental is Panizzolo (1982: 26), who remarks in passing that /x/ surfaces as palatal [ç]. One item is provided in that source for [ç] in word-initial position, namely orthographic *ch* in *Chäse* 'cheese' and two words for [ç] in postsonorant position, namely [ɑuç] 'also' and [dɔç] 'however'. It is interesting to observe that the final two examples contain the palatal fricative in the context after a back vowel. If these data are representative (and if post-sonorant velar fronting also applies after coronal sonorants) then Panizzolo's variety of Simmental has nonassimilatory velar fronting; recall the quote from SiWS given above.

The maps in SDS confirm that the Southwest Bernese Oberland is a velar fronting area; recall the quote from the commentary to Map II 201 given in the preceding section. That the region depicted on my Map 15.7 is a velar fronting area can be determined on the basis of the many prepalatal markers (⟦χ'⟧) for some of the places listed above as well as for other places in the same general vicinity. One such map is II 94 for *Kind* 'child' with prepalatal markers for eight places in the Southwest Bernese Oberland. All of those villages and towns are depicted on my Map 15.7 with markers indicating velar fronting. I have also included on my map velar fronting markers for Gsteig and Adelboden, which are indicated with the ⟦χ'⟧ symbol in the commentary for Map II 94 for the similar word *Korn* 'grain'. I also include Kiental on my Map 15.7 as a velar fronting place because it is indicated on SDS Map II 183 with the prepalatal marker for *backen (bache)* 'bake-INF'.

In (38) I list four places from SDS in the Southwest Bernese Oberland along with the realization in those places of the five words in the first column. Those five words correspond to five of the maps in Table 15.4. The transcriptions are taken directly from SDS, although I have omitted a few of the diacritics for consonants and vowels for greater transparency. For the words listed below I only list one of the tokens for each of the places listed in the top row. SDS does not provide full phonetic transcriptions for (38d, 38e), but that source does indicate that the prepalatal ⟦χ'⟧ occurs in those places. The marker in SDS for Gsteig for (38d) does not indicate whether or not the dorsal fricative is palatal, prepalatal, or velar.

(38) Dorsal fricatives and affricates in the Southwest Bernese Oberland (SDS):

	Lauenen	Gsteig	Zwischenflüh	Adelboden
a. drücken	drükχ'ə	drükχə	trükχ'ə	trükχ'
b. Anke	ãŋχ'ə	aŋχ'ə	aŋkχə	aŋkχ'ə

c.	Bänklein	bẽ̄kχ'lį	beŋkχ'lį	bḗχ'lį	bēχ'lį
d.	bache	χ'	–	χ'	χ'
e.	rauchen	kχ'	kχ	kχ	kχ

Note that there is some variation in the context of back sounds in (38d, 38e), where both prepalatal and palatal markers occur. Example (38b) likewise illustrates that both prepalatal and palatal occur in the context after a (back) sound, namely the velar nasal preceded by a back vowel.

The sources cited above indicate that velar fronting is well-attested to various degrees in towns and villages confined to an area of about 35km from west to east and 25km from north to south. None of the works mentioned in this section give any indication that velar fronting is active outside of that small region, e.g. to the north of the Lower Simmental (Niedersimmental). The maps in SDS show only palatal markers (but no prepalatal markers) to the (north)west of Saanen (in Abländchen), to the north of Zwischenflüh (in Boltigen, Diemtigen, Reutigen, Faulensee, Aeschiried, and Reichenbach), and in the southwest (in Kandersteg).

The towns and villages in the small area I refer to as the Southwest Bernese Oberland can be thought of collectively as a velar fronting island. That region is bounded to the west by a different language (French), and to the south by the Bernese Alps. The German-speaking area to the west in the neighboring canton of Freiburg (Jaun) and the part of Freiburg to the north of Jaun – the Sensebezirk – has no velar fronting; see Stucki (1917) and Henzen (1927: 20). Marti (1985) offers a description of the Bernese dialect between Thun and the parts of the canton of Bern to the north, but that source is clear that there is no velar fronting (Marti 1985: 21). The absence of velar fronting is also attested in the town of Leissingen (Gröger 1914b) on the southeast shore of Lake Thun (Thunersee). No source is available for the places in the small passage of about 17km separating Leissingen from the Bernese Alps.

15.10 Tyrol

Tyrol is sometimes described as a region without velar fronting. For example, the dialect dictionary for that region (TiWb) classifies [x] (=⟦ch⟧) as a velar (i.e. guttural) fricative (I: p. xix). A similar assessment of the realization of the fortis dorsal fricative in Tyrolean can be found in Luick (1904: 96). More recently, Gabriel (1985: 73) writes that the velar fricative is the usual pronunciation in West Tyrol ("In Westtirol, wo der velare Reibelaut die Regel ist …").

While the absence of velar fronting is probably the norm for most of Tyrol, according to various remarks made in Schatz (1903), there are velar fronting islands in that region. Consider the following passage (Schatz 1903: 21):

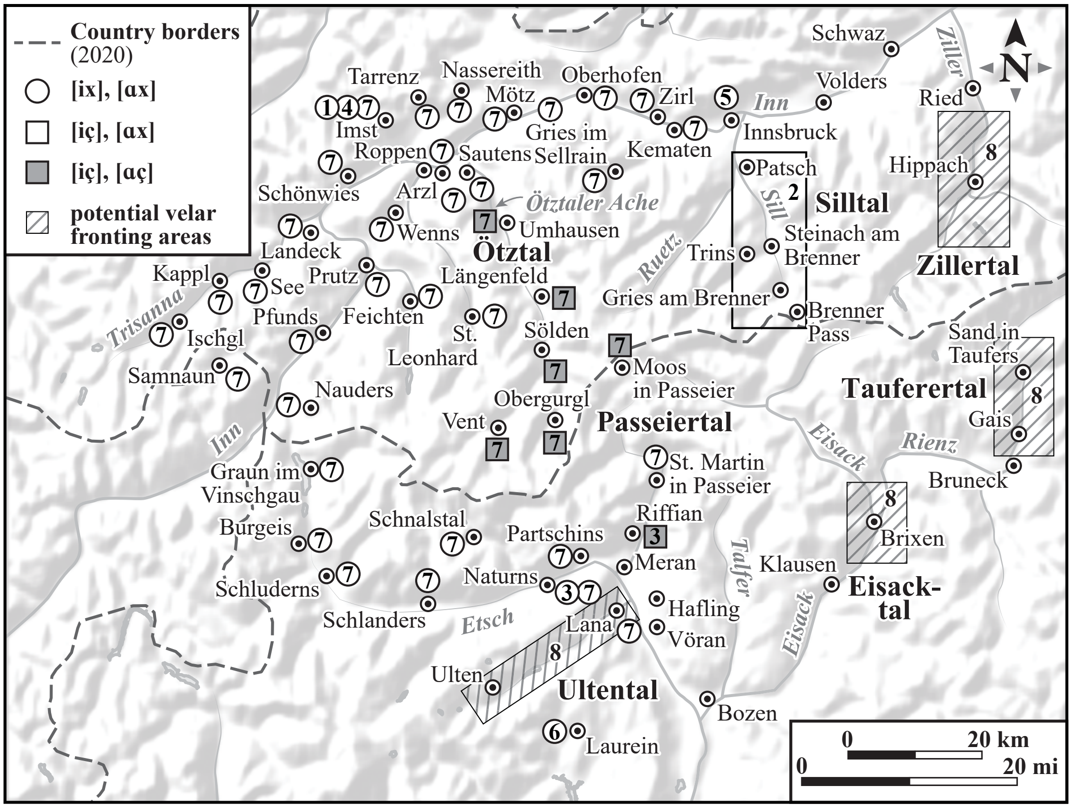
> Der Reibelaut *χ* ist wie alle Gaumenlaute nicht an eine bestimmte Artikulationsstelle gebunden, wie etwa der Lippenreibelaut *f*. Nach Lauten, welche am harten Gaumen gebildet werden, wird auch *χ* etwas weiter vorn gebildet, doch kennt das Inntal und Etschtal … nur mehr einen einzigen Gaumenreibelaut, der am weichen Gaumen gebildet wird. Dagegen hat in Nordtirol das Ötztal, Sill- und Zillertal, in Südtirol das Passeier, das obere Eisack- und Pustertal, das Iseltal … den ach-Laut und den ich-Laut, diesen nach palatalen Vokalen ….
>
> "Like all other dorsal sounds, the fricative *χ* is not bound to a particular place of articulation, as for example the labial fricative *f*. After sounds produced on the hard palate, *χ* has a slightly more advanced pronunciation, but Inntal and the Etchtal only have a single dorsal fricative, which is produced on the soft palate. By contrast, Ötztal, Silltal, Zillertal in North Tyrol, and Passeier(tal), Upper Eisacktal and Pustertal, Iseltal in South Tyrol … have the ach-Laut and the ich-Laut, the latter occurring after front vowels …"

According to the sources cited below, Schatz's observation that velar fronting is active in various enclaves in Tyrol can be confirmed, although the data in those sources do not always agree that the triggers are restricted to front vowels. Map 15.8 indicates areas with and without velar fronting in Tyrol which are commented on below.[22]

I discuss first data from two Ortsgrammatiken and then I turn to the linguistic atlases for this region, namely VALTS and TSA. All of the sources and places described below are depicted on Map 15.8.

Insam (1936) discusses the broad area in and around Meran. In his discussion of phonetics (p. 12) Insam observes that the fortis dorsal fricative (his ⟦χ⟧) – as well as the corresponding affricate (his ⟦kχ⟧) – can be realized as palatal (articulated on the hard palate) or velar (articulated on the soft palate) depending on both the phonological context and the place within the greater Meran region. Insam writes that the realization is palatal in the neighborhood of *i, e* in the valleys ("in den Tälern"), but that it is consistently realized as [x] in Naturns, and usually realized as [x] in Meran. It is clear from the discussion on p. 12 that one of the valleys he is referring to is Passeiertal. His data for Naturns (without velar fronting)

[22] I only consider here the status of velar fronting in secluded parts of Tyrol and therefore do not discuss urban areas. Innsbruck is indicated on Map 3.3 and Map 15.8 as a non-velar fronting variety on the basis of the phonetic transcriptions from one of Moosmüller's (1991) speakers. On the other hand, her second speaker from Innsbruck clearly has (postsonorant) velar fronting.



Map 15.8: Tyrol. The white rectangle indicates assimilatory postsonorant velar fronting, shaded squares nonassimilatory postsonorant velar fronting and circles the absence of postsonorant velar fronting. Lined rectangles are potential velar fronting regions. 1=Schatz (1897), 2=Egger (1909), 3=Insam (1936), 4=Hathaway (1979), 5=Moosmüller (1991), 6=Kollmann (2007), 7=VALTS, 8=TSA.

and Passeiertal (with velar fronting) are presented in (39) and (40) respectively. Although Insam's description implies that palatals only occur after front vowels, he provides several words with those segments in the context after back vowels, e.g. (40b). If these data are representative, then Passeiertal illustrates Trigger Type F (Chapter 14). Other places with postsonorant velar fronting mentioned by Insam (1936: 49) are Ulten and Hafling, although that source only provides a sparse set of data ([siççər] 'certainly', [ʃiɒç] 'unattractive').

(39) Velar fricatives and affricates in Naturns:

a.	šrękχ	[ʃrɛkx]	Schreck	'scare'	12
	glikχ	[glikx]	Glück	'fortune'	12
	šiχχər	[sixxər]	sicher	'certainly'	49
b.	liɒkχ	[liɒkx]	Licht	'light'	12
	šiɒχ	[ʃiɒx]	unschön	'unattractive'	49

	miɒχ	[miɒx]	würde machen	‘would do-1/3sg’	12
	rokχ	[rokx]	Rock	‘skirt’	12
	lukχ	[lukx]	Lücke	‘gap’	12

(40) Palatal fricatives and affricates in Passeiertal:

a.	šręk͡χ	[ʃrɛkç]	Schreck	‘scare’	12
	glik͡χ	[glikç]	Glück	‘fortune’	12
	šiχ͡χər	[siççər]	sicher	‘certainly’	49
b.	liɒk͡χ	[liɒkç]	Licht	‘light’	12
	šiɒ͡χ	[ʃiɒç]	unschön	‘unattractive’	49
	miɒ͡χ	[miɒç]	würde machen	‘would do-1/3sg’	12
	rok͡χ	[rokç]	Rock	‘skirt’	12
	luk͡χ	[lukç]	Lücke	‘gap’	12

Since velar affricates and fricatives are lacking in Passeiertal (in postsonorant position), I treat the palatals in that context as underlying palatals (/ç/, /kç/); recall Chapter 14.

A second velar fronting valley indicated on Map 15.8 is Silltal. Egger (1909) describes the phonetics of consonants and vowels in that area. Egger (1909: 15) stresses that dorsal (“guttural”) fricatives, affricates, and stops can be articulated either on the hard palate in the context after front vowels or on the soft palate in the context of back segments. Since his data for the velar vs. palatal distinction are primarily fricatives (⟦x⟧=[x]; ⟦ẋ⟧=[ç]), I ignore stops and affricates below. The data in (41) illustrate the pattern for postsonorant position:

(41) Dorsal fricatives in Silltal:

a.	pǫxxn̥	[pɔxxn]	backen	‘bake-inf’	16
	dọ̄x	[dɔːx]	Dach	‘roof’	16
	āxl	[ɑːxl]	kränklich	‘sickly’	16
b.	pǣx	[pæːx]	Pech	‘misfortune’	16
c.	fīẋ	[fiːç]	Vieh	‘cattle’	16
	miẋẋl̥	[miççl]	Michael	‘(name)’	16
	šprǖẋ	[ʃpryːç]	Spruch	‘saying’	8
	wöẋẋə	[wøççə]	unclear gloss		8
d.	melẋn̥	[melçn]	melken	‘milk-inf’	16
	wirẋn̥	[wirçn]	wirken	‘seem-inf’	16

The words listed above show that velars occur after back vowels (=41a) or the low front vowel (=41b), while palatals surface after nonlow front vowels (=41c) or coronal sonorant consonants (=41d). Silltal therefore illustrates the relatively uncommon Velar Fronting-2 (=21a).

The maps from VALTS with words containing dorsal fricatives are listed in Table 15.5. The underlined sound(s) surface as dorsal affricates for Map III 5 and as dorsal fricatives in all other maps. The dorsal fricatives can be either in the context after a sonorant or in word-initial position.

Like SDS (Table 15.3), VALTS recognizes three places of articulation for dorsal fricatives/affricates (Gabriel 1985: 74): ⟦χ⟧ (=palatal), ⟦x⟧ (=velar), and ⟦χ'⟧/⟦χ''⟧ (=prepalatal or extreme prepalatal fricative ("präpalataler bzw. extrem präpalataler Reibelaut")). I summarize the three categories in VALTS and my interpretation thereof in Table 15.6.

Given the maps from VALTS, the first area to consider is the one comprising the five velar fronting villages aligned along the Ötztaler Ache (in Ötztal): Umhausen, Längenfeld, Sölden, Obergurgl, and Vent. It is important to stress that those communities are isolated from all of surrounding villages given the mountainous terrain. For example, the closest place to Längenfeld in the west is St. Leonhard (Pitztal), but neither streets nor railways connect that place directly with Längenfeld or with any of the other velar fronting villages in Ötztal. The five velar fronting varieties of Ötztal are similarly cut off from the places to the south, e.g. Schnalstal in Italy (South Tyrol).

The velar fronting markers (lightly shaded squares) in Ötztal on Map 15.8 are indicated on the VALTS maps in Table 15.5 with markers representing prepalatals (⟦χ'⟧/⟦χ''⟧). There can be little doubt that the five velar fronting places in Ötztal collectively comprise a velar fronting island because they are in a secluded valley surrounded by places in which /x/ and /kx/ are consistently realized as velar.[23]

Since the velar fronting island of Ötztal has prepalatal markers in postsonorant position after front vowels, liquids, and back vowels and in word-initial position before any sound, the data from VALTS suggest that this area is characterized by nonassimilatory velar fronting (Trigger Type F; Chapter 14). No indication is given in VALTS that the five velar fronting places in Ötztal have velar [x] or [kx]. If this is the correct interpretation of the maps from VALTS then historical /x/ and /kx/ have restructured to /ç/ and /kç/.[24]

[23]Kranzmayer (1956: 71) perceived of the prepalatal fricatives and affricates in Ötztal as sibilants. As indicated in Table 15.6, I see the sibilant realization of ⟦χ'⟧/⟦χ''⟧ as the alveolopalatal fricative ([ɕ]).

[24]The conclusion drawn here is also consistent with the maps in VALTS for vowels not listed in Table 15.5. Since those maps are concerned with the modern reflexes of etymological vowels, it is not always clear from the markers what the sounds preceding or following those vowels are for any given place. However, in the maps for vowels followed by a dorsal fricative – Map II 190a for *Bach* 'stream' being a typical example – the five velar fronting places in Ötztal (together with Moos in Passeier discussed below) are the only ones with markers for prepalatal fricatives.

Table 15.5: Maps from VALTS with dorsal fricatives/affricates in post-sonorant position and word-initial position

Examples	Map no.
Acker ‘field’	III 41b
bücken ‘stoop-INF’	III 41b
Decke ‘blanket’	III 41b
bachen (=backen) ‘bake-INF’	III 45a
Küche ‘kitchen’	III 45a
Rechen ‘rake’	III 45a
trocken ‘dry’	III 45b
Mark ‘borderland’	III 46
stark ‘strong’	III 47
stärker ‘stronger’	III 47
Birke ‘birch tree’	III 48
Kalk ‘lime’	III 49
melken ‘milk-INF’	III 50
Molken ‘whey-PL’	III 51
Wolke ‘cloud’	III 52
Milch ‘milk’	III 53
Floh ‘flea’	III 59
Flöhe ‘flea-PL’	III 59
Schuh ‘shoe’	III 59
Schuhe ‘shoe-PL’	III 59
Berg ‘mountain’	III 5
Kind ‘child’	III 40a
Kuh ‘cow’	III 40a
Kasten ‘box’	III 40a
klein ‘small’	III 40b
Knie ‘knee’	III 40b
Kraut ‘herb’	III 40b
Kitz ‘young goat’	III 60a
kitzen ‘give birth to young goat-INF’	III 60b

Table 15.6: VALTS symbols for dorsal fricatives and their probable interpretation

VALTS term and symbol	Phonological Features	Phonetic realization
prepalatal ⟦χ’⟧/⟦χ’’⟧	[coronal, dorsal]	[ç], [ç̟], [ɕ]
palatal ⟦χ⟧	[dorsal] (or [coronal, dorsal])	[x̟] (or [ç])
velar ⟦x⟧	[dorsal]	[x], [χ]

Another valley to consider is Passeiertal, in South Tyrol (Italy); recall (40). The VALTS maps in Table 15.5 provide evidence that one particular place in Passeiertal (Moos in Passeier) is a velar fronting village because of the prevalence of prepalatal markers. This generalization holds for /ç/ (< /x/) in postsonorant and word-initial position, but not for the affricate /kx/, which surfaces as [kx] in the example listed on Map III 5.

TSA includes a number of maps for words containing dorsal fricatives and affricates in postsonorant position. The words represented by those maps and the corresponding map number are listed in Table 15.7. The scope of that atlas subsumes both North Tyrol (Austria) and South Tyrol (Italy). The transcription system for TSA includes symbols for two velar fricatives/affricates: ⟦x⟧/⟦kx⟧ for voiceless lenis and ⟦χ⟧/⟦kχ⟧ for voiceless fortis (TSA I: 12). The corresponding lenis and fortis palatal sounds are expressed with the addition of the inverted breve diacritic (⟦̑⟧) over the fricative symbol. In terms of place of articulation, TSA therefore differs from SDS and VALTS in the sense that it only has two place categories for dorsal fricatives and affricates, namely velar and palatal.

An examination of the TSA maps listed above reveals that the typical dorsal place of articulation for the region as a whole is velar. However, several maps depict what appear to be velar fronting islands (recall the quote from Schatz 1903 at the beginning of this section). The difficulty with TSA is that it is not clear how to evaluate the palatal symbols. My interpretation thereof is summarized in Table 15.8.

On the one hand, it could be that ⟦χ⟧ corresponds to my palatal, e.g. [ç] for the fortis [coronal, dorsal] fricative. One area in Tyrol for which this interpretation is correct is Ötztal. Like the maps from VALTS, the ones from TSA – in particular TSA Map 41– indicate the palatal affricate (⟦kχ⟧) in the area surrounding the five velar fronting places in Ötztal on my Map 15.8. On the other hand, it is possible that the palatal symbols depicted on the maps in TSA do not represent my palatals, but instead prevelars, which are phonologically simplex [dorsal] sounds; recall Table 12.37. A case in point is Laurein (Map 15.8). Several of the maps in

Table 15.7: Maps from TSA with dorsal fricatives in postsonorant position

Examples	Map no.
sehen 'see-INF'	27
leihen 'lend-INF'	28
aufhin 'upwards'	29
Föhre 'pine'	35
Truhe 'chest'	36
Schuhe 'shoe-PL'	37
Schmelhe 'something small'	38
Floh 'flea'	39
hoch 'high'	39
Kirche 'church'	40
Lache 'puddle'	41
Birke 'birch tree'	46
wirken 'seem-INF'	46
Milch 'milk'	64

Table 15.8: TSA symbols for dorsal fricatives and their probable interpretation

TSA term and symbol	Phonological Features	Phonetic realization
palatal ⟦χ⟧	[dorsal] (or [coronal, dorsal])	[x̟] (or [ç])
velar ⟦x⟧	[dorsal]	[x], [χ]

TSA suggest that Laurein has velar fronting because of the prevalence of palatal markers (TSA Maps 27, 35, 38, 40). However, as noted in §12.9.2, Kollmann (2007: 175) shows that Laurein /x/ and /kx/ surface as prevelar, which is not identical to the palatal articulation (ich-Laut) of StG. In terms of phonology, Laurein /x/ and /kx/ are simplex [dorsal] sounds that exhibit the effects of phonetic implementation (gradient fronting), not phonological (categorical) fronting. Recall from §15.7 and earlier in the present section that there was a similar difficulty involving the interpretation of "palatal" sounds in SDS and VALTS. In those two sources the problem was resolved by interpreting only the "prepalatal" symbols as phonologically front dorsals and by assigning the "palatal" markers two different interpretations. It can be seen in Table 15.8 that the same strategy is adopted for TSA.

The conclusion is that the regions indicated on the maps in TSA with palatal fricatives and/or affricates can only be interpreted as potential velar fronting islands. I list below four of those valleys, all of which are indicated on Map 15.8.

Table 15.9: Potential velar fronting areas in Tyrol on the basis of the maps in TSA

Place	TSA maps
Zillertal	39, 40, 41, 46
Tauferer Tal	27, 28, 29, 36, 39, 40, 46
Ultental	27, 28, 35, 36, 38, 40, 46
Eisacktal	36, 39

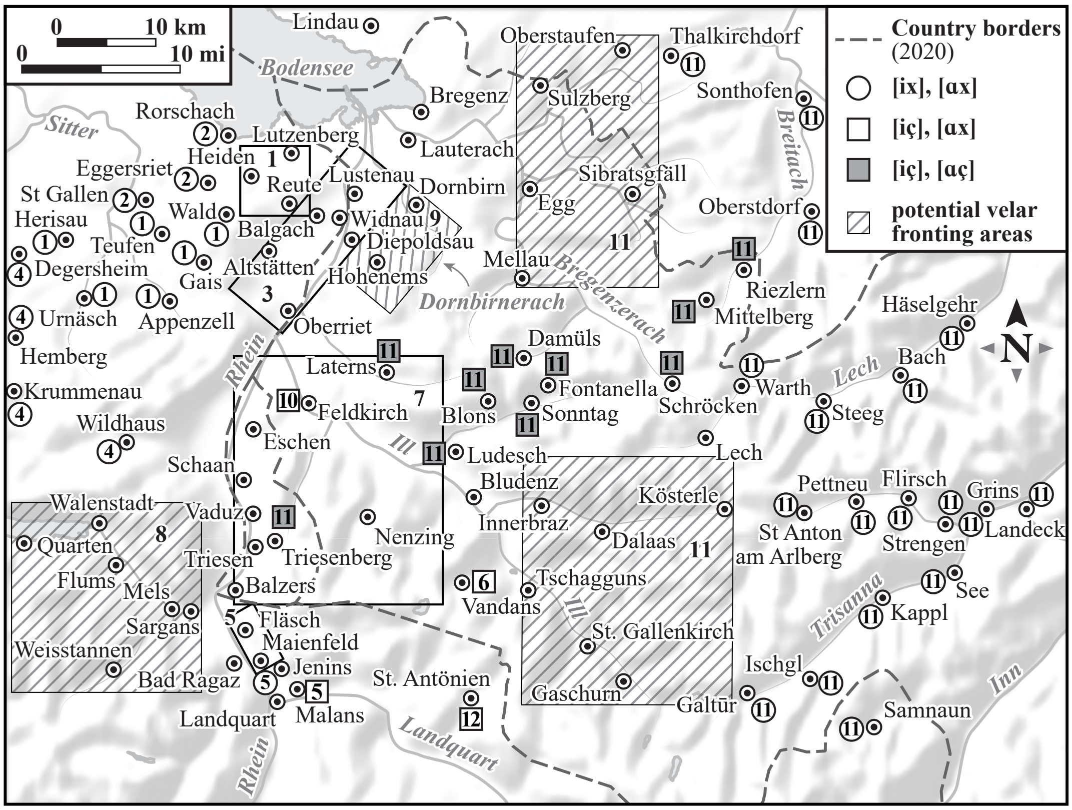
15.11 East Switzerland, Liechtenstein, and Vorarlberg

The region investigated below is depicted on Map 15.9. It measures approximately 100km from east to west and 80km from north to south and consists of East Switzerland, parts of Southwest Germany (Swabia), the Austrian state of Vorarlberg, and the small nation of Liechtenstein. The area depicted on the map is bounded by Switzerland and Italy to the south, Germany to the north, Switzerland to the west, and Austria (Tyrol) to the east.

The region under discussion is intriguing because it consists of areas with velar fronting embedded within a larger, more conservative one which does not have that process. I discuss below the extent to which velar fronting places situated in this region can be thought of as a velar fronting island.

The places depicted on Map 15.9 can be classified into one of three groups: (a) areas with no velar fronting, (b) areas with velar fronting, and (c) potential velar fronting areas. I consider examples of (a–c) in order.[25]

[25]Several sources discussed below document velar fronting in East Switzerland. Unfortunately, the maps from SDS (Table 15.4) shed little light on this issue because most of the sounds in question are represented with palatal markers (⟦χ⟧) which, as discussed in §15.7, are difficult to interpret. The only place on the SDS maps in East Switzerland which has a significant number of prepalatal markers in St. Antönien, which I comment on below.



Map 15.9: East Switzerland, Liechtenstein, Vorarlberg, and West Tyrol. Circles indicate no postsonorant velar fronting, white squares (assimilatory) velar fronting, and diagonal squares (potential) velar fronting. 1=Vetsch (1910), 2=Hausknecht (1911), 3=Berger (1913), 4=Wiget (1916), 5=Meinherz (1920), 6=Jutz (1922), 7=Jutz (1925), 8=Trüb (1951), 9=Gabriel (1963), 10=Bethge & Bonnin (1969), 11=VALTS, 12=SDS.

15.11.1 Areas with no velar fronting

In the eastern parts of Map 15.9 velars like /x/ surface as [x] regardless of context. Those places extend from the town of Samnaun (Switzerland) in the south to Oberstdorf, Sonthofen, and Thalkirchdorf (in Allgäu, Germany) in the north, as well as the numerous villages of Austria (West Tyrol) in between. The western part of Map 15.9 (Switzerland) is also characterized by an absence of velar fronting. This is clearly the case in the northwest from Lake Constance (Bodensee) extending south to the areas around St. Gallen and Appenzell and further south to Toggenburg (e.g. Krummenau, Wildhaus). Not depicted on Map 15.9 is the non-velar fronting area in the canton of Glarus described by Streiff (1915) to the west of Walenstadt and Quarten.

The conclusion is that there is a relatively narrow central region between those two broad non-velar fronting areas on the periphery. The narrow region referred to here is characterized by velar fronting (or potential velar fronting) and forms – roughly speaking – a column of about 65km from east to west and 70km from north to south.[26]

15.11.2 Velar fronting areas

Two velar fronting varieties are attested in Northeast Switzerland. The first is the Rheintal dialect in the canton of St. Gallen (Berger 1913), which was discussed in §3.4. The second is the dialect spoken in Appenzell described by Vetsch (1910). This region subsumes the two cantons of Appenzell Innerrhoden and Appenzell Ausserrhoden, which are both completely surrounded by the canton of St. Gallen.

According to Vetsch (1910: 16), the velar obstruents [k g x kx] can show some degree of coarticulatory fronting in the context before and after front vowels throughout the Appenzell region. However, in part of that area the velar fricative [x] – including the corresponding geminate [xx] – and the velar affricate [kx] surface as palatal (=⟦χ χχ kχ⟧) in the neighborhood of front sounds. Vetsch (1910: 6) calls the area with these palatal sounds Kurzenberg, which subsumes five municipalities (Gemeinden) of Appenzell Ausserrhoden (Heiden, Lutzenberg, Wolfhalden, Walzenhausen, Reute), as well as one municipality of Appenzell Innterrhoden (Oberegg). In the parts of Appenzell not belonging to Kurzenberg, dorsal fricatives and affricates surface as velar even in the context of front sounds. The velar fronting areas Vetsch calls Kurzenberg are situated roughly in the rectangle indicated on Map 15.9.

[26] I am aware of three studies for places in Vorarlberg documenting the absence of velar fronting within that column. Those three places are Hohenems (Seemüller 1909a), Nenzing (Schneider & Marte 1910), and Lauterach (Schneider & Marte 1910). It is possible that the non-velar fronting areas depicted on Map 15.9 were once more extensive than they are in the present day.

The Kurzenberg examples in (42) show the distribution of the velar affricate and its palatal counterpart. In word-initial position, [kx] surfaces a back vowel (=42a) and the palatal [kç] before a front vowel (=42b) or coronal sonorant consonant (=42c). The data in (42) are accounted for formally with Wd-Initial Velar Fronting-8 (=12).

(42) Dorsal affricates in Appenzell (Kurzenberg):

a.	kxɔštə	[kxɔʃtə]	kosten	'cost-INF'	160
	kxɑts	[kxɑts]	Katze	'cat'	160
b.	kχištə	[kçiʃtə]	Kiste	'box'	160
	kχellə	[kçellə]	Kelle	'trowel'	160
c.	kχrɔt	[kçrɔt]	Kröte	'toad'	160
	kχlɛbə	[kçlɛbə]	kleben	'stick-INF'	160
	kχnǖ	[kçnyː]	Knie	'knee'	160

The data in (43) illustrate that the occurrence of postsonorant velars and palatals in Kurzenberg is a function of the preceding vowel. It can be seen here that velars occur after full back vowels (=43a) or after a diphthong ending in schwa (=43b) and that palatals surface after front vowels (=43c). Note that the vowel preceding schwa in (43b) is front. The only examples provided by Vetsch for category (43c) have high front vowels. The optionality involving tonic vowels ([y] vs. [yə]) illustrated in the final example in (43b) and (43c) shows the regularity of velar fronting: If the vowel is front ([y]) then /xx/ surfaces as palatal, but if it surfaces as a diphthong ending in a back vowel (schwa), then /xx/ is realized as velar.

(43) Dorsal fricatives in Appenzell (Kurzenberg):

a.	lɔxx	[lɔxx]	Loch	'hole'	161
	mɑxxə	[mɑxxə]	machen	'do-INF'	161
b.	štiəxx	[ʃtiəxx]	Stich	'sting'	102
	ksiəxt	[ksiəxt]	Gesicht	'face'	102
	trüəxxnə	[tryəxxnə]	trocknen	'dry-INF'	102
c.	līχt	[liːçt]	leicht	'easy'	102
	siχχər	[siçər]	sicher	'certainly'	102
	trüχχnə	[tryççnə]	trocknen	'dry-INF'	161

Recall from §3.4 that the set of velar fronting triggers for Rheintal is restricted to nonlow front vowels because phonologically [+low] sounds like /ɛ/ fail to induce fronting (=Velar Fronting-2 in 21a). Since Vetsch does not provide the crucial data for /x/ in the context of vowels like /ɛ/ it is not possible to say whether or not Appenzell and Rheintal are the same or different in terms of triggers. In any case, the data in (43) can be captured with either Velar Fronting-1 (=2) or Velar Fronting-13 (=4).

One difference between the two neighboring dialects is the patterning of dorsal fricatives in the context after a diphthong consisting of a front vowel plus schwa. As indicated in (43b) the velar fricative in Appenzell surfaces in that context. By contrast, in Rheintal the palatal surfaces in this environment (e.g. [liːəçt] 'light'). The occurrence of the palatal was accounted for with Schwa Fronting-1 (§3.4), which is present in Rheintal, but absent in Appenzell.

The third velar fronting variety in East Switzerland is the one described by Meinherz (1920). Recall from §3.3 that Meinherz's dialect (Maienfeld) subsumes three velar fronting municipalities, namely Maienfeld, Fläsch and Malans. By contrast, the neighboring community of Jenins has no velar fronting. All of those places are indicated on Map 15.9.

The fourth velar fronting area depicted on Map 15.9 is the one described by Jutz (1925), which comprises all of Liechtenstein and South Vorarlberg. It is clear from Jutz (1925) that Liechtenstein-South Vorarlberg has both velar and palatal fricatives. Jutz (1925: 26) writes: "Der Reibelaut χ wird im ganzen Gebiete zwischen den ɑχ- und iχ-Laut unterschieden, von denen hier der velare mit χ, der palatale mit x bezeichnet wird". ("The fricative χ is differentiated in the entire area between the ɑχ- and iχ-Laut, of which the velar is transcribed here with χ and the palatal with x"). At a later point (p. 207), Jutz makes it clear that the dialect also distinguishes palatal and velar affricates.

In word-initial position, the velar affricate occurs before a back vowel (=44a) and the corresponding palatal before a front vowel (=44b) or a coronal sonorant consonant (=44c).[27] The distribution of velars and palatals in (44) can be captured formally with Wd-Initial Velar Fronting-8 (=12).

(44) Dorsal affricates in Liechtenstein-South Vorarlberg:

a.	kχunt	[kxunt]	kommt	'come-3SG'	215
	kχoštə	[kxoʃtə]	kosten	'cost-INF'	207
	kχɑts	[kxɑts]	Katze	'cat'	207
b.	kxīmmə	[kçiːmmə]	Keim	'germ'	207
	kxįfl	[kçɪfl̩]	Kiefer	'pine tree'	229

[27] Affricates are also attested in some parts of Liechtenstein-South Vorarlberg in postsonorant position, but I do not consider these data because of the irregularities referred to in Jutz (1925: 207).

	kxǣr	[kçæːr]	Keller	‘cellar’	223
	kxiərhə	[kçiərhə]	Kirche	‘church’	224
c.	kxrẹ̄ijə	[kçrɛːijə]	krähen	‘crow-INF’	207
	kxlī	[kçliː]	klein	‘small’	207
	kxnẹxt	[kçnɛçt]	Knecht	‘vassal’	207

The data in (45) illustrate the distribution of velar and palatal fricatives in postsonorant position. The velar surfaces after a back vowel (=45a) and the palatal after a front vowel (=45b), or a liquid (=45c). If the first part of a schwa-final diphthong is a front vowel then the dorsal fricative following that diphthong is palatal (=45d), but if the first component of a schwa-final diphthong is a back vowel then a dorsal fricative after that diphthong is velar (=45e). This is the default pattern which can be captured with Velar Fronting-1 (=2).

(45) Dorsal fricatives in Liechtenstein-South Vorarlberg:

a.	rụ̄χ	[rʊːx]	Rauch	‘smoke’	209
	tɑχ	[dɑx]	Dach	‘roof’	209
b.	glīx	[gliːç]	gleich	‘same’	210
	ix	[iç]	ich	‘I’	210
	štịx	[ʃtɪç]	Stich	‘sting’	209
	flüxt	[flyçt]	flicht	‘braid-3SG’	212
	rẹxnə	[rɛçnə]	rechnen	‘calculate-INF’	207
	ǣxərle	[æːçr̩li]	Eichhörnchen	‘squirrel’	213
c.	melx	[melç]	Milch	‘milk’	209
	štɑrx	[ʃtɑrç]	stark	‘strong’	208
d.	tsīəxl	[tsiːəçli]	Zieche, dim	‘cover-DIM’	207
	nüəxtr	[nyəçtr̩]	nüchtern	‘sober’	214
e.	būəχ	[buːəx]	Buch	‘book’	209

To summarize: In postsonorant position and in word-initial position, velar fronting applies in the context of any coronal sonorant. The contrast between palatal and velar in (45d, 45e) requires Schwa Fronting-1 to feed postsonorant velar fronting, as in Rheintal.[28]

[28] Jutz transcribes the palatal fricative occasionally after back vowels, e.g. ⟦prūxt⟧ ‘use-PART’, ⟦fọ̄xt⟧ ‘catch-3SG’, ⟦ǣnədɑxtsk⟧ ‘eighty-one’. These could be transcriptional errors. Alternatively, they might indicate that certain speakers have nonassimilatory velar fronting (Trigger Type F; Chapter 14).

The fifth velar fronting place in the region depicted on Map 15.9 is the town of Vandans in Vorarlberg (Jutz 1922). Jutz observes that Vandans possesses both velar and palatal fricatives and affricates. He writes (p. 276): "Von den Reibelauten bezeichnen χ und x das schriftdeutsche ch, doch mit dem Unterschiede, daβ eine Zweiteilung in den sogegannten ɑχ- und ix-Laut vorgenommen wurde…Diese beiden Laute werden in der Mundart von Vandans und Umgebung deutlich auseinandergehalten". ("Among the fricatives, χ and x depict written German ch with the difference that a distinction between the so-called ɑχ- and ix-sound was made…These two sounds are clearly distinguished in the dialect of Vandans and in the vicinity thereof").

In word-initial position the velar affricate occurs before back vowels (=46a), while the palatal affricate surfaces before front vowels (=46b) or coronal sonorant consonants (=46c). The patterning of velars and palatals in (46) is expressed formally with Wd-Initial Velar Fronting-8 (=12).

(46) Dorsal affricates in Vandans:

a.	kχūə	[kxuːə]	Kuh	'cow'	290
	kχu̧rts	[kxʊrts]	kurz	'short'	290
	kχɑts	[kxɑts]	Katze	'cat'	292
b.	kxind	[kçind]	Kind	'child'	289
	kxį̄rə	[kçɪːrə]	kehren	'sweep-INF'	289
	kxünɩg	[kçynɪg]	König	'king'	290
	kxü̧rpsə	[kçʏrpsə]	Kürbis	'pumpkin'	290
	kxessɩ	[kçessɪ]	Kessel	'kettle'	292
c.	kxrumm	[kçrumm]	krumm	'bent'	292
	kxlę̧bə	[kçlɛbə]	kleben	'stick-INF'	292
	kxlī	[kçliː]	klein	'small'	296

The items listed in (47) reveal that velar fricatives (singleton and geminate) occur after any back vowel (=47a) and that palatals surface after any front vowel (=47b). The occurrence of palatal in (47c) and velar in (47d) can be accounted for with Schwa Fronting-1, as in Rheintal (§3.4) and Liechtenstein-Vorarlberg.[29] The formal rule for (47) is Velar Fronting-1 (=2).

[29] It is not clear whether or not [x] or [ç] surfaces after a consonant because Jutz has words illustrating both patterns, e.g. ⟦wærχχə⟧ 'work-INF' vs. ⟦fu̧rxtiktǖr⟧ 'terribly expensive'. The occurrence of the palatal affricate before liquids in (46c) suggests that [ç] should be the expected dorsal fricative in the mirror image context (i.e. after liquids). A few of the examples in Jutz (1922) have [x] after a back vowel, e.g. ⟦nɑxt⟧ 'night'.

(47) Dorsal fricatives in Vandans:

a.	rū̜χ	[rʊːx]	Rauch	'smoke'	292
	lǫχχ	[lɔxx]	Loch	'hole'	292
	bɑχχ	[bɑxx]	Bach	'stream'	292
b.	glīx	[gliːç]	gleich	'same'	292
	ix	[iç]	ich	'I'	292
	ksi̜xt	[ksɪçt]	Gesicht	'face'	292
	krī̜xt	[krɪːçt]	gerichtet	'judge-PART'	289
	fēx	[feːç]	Vieh	'cattle'	292
	knę̄xt	[knɛçt]	Knecht	'vassal'	291
c.	līəxt	[liːəçt]	Licht	'light'	292
d.	pūəχ	[puːəx]	Buch	'book'	296

In sum, word-initial velar fronting is triggered by all coronal sonorants and postsonorant velar fronting by front vowels.[30]

Bethge & Bonnin (1969) provide a phonetically transcribed text from a native speaker of the Feldkirch dialect (Vorarlberg). The text distinguishes velar fricatives ([x]) from palatal fricatives ([ç]). Although the number of words with those sounds is small, the generalization can be made that [x] surfaces after a back vowel ([ɑ ɑː ʊ]) and [ç] after a front vowel ([ɪ ʏ]). The text contains no examples of dorsal fricatives after sonorant consonants.

The one place in East Switzerland which is indicated in the SDS maps in Table 15.4 with prepalatal symbols is the Walser settlement of St. Antönien in North Grisons. In (48) I give the SDS transcriptions for some of the words in that variety of German. On the basis of (48) I conclude that St. Antönien is a velar fronting variety of SwG, although not enough data are available to draw conclusions concerning the set of triggers.

(48) Prepalatal fricatives and affricates in St. Antönien (SDS):

a. Kind χ''
b. drücken trükχ'ə
c. Gestank ŝtą̄χ'
d. Bank bẹχ'
e. stinkt štīχ't
f. Speicher īχ'

[30]In Vandans, the low front vowels [æ æː] are apparently restricted in their distribution to the context before liquids (Jutz 1922: 289); hence, dorsal fricatives do not occur after those sounds. (No example was found with a word-initial dorsal affricate before a low front vowel).

Finally, I consider the status of velar fronting as indicated on the maps listed in Table 15.5 from VALTS. Recall from Table 15.6 that VALTS recognizes three places of articulation for dorsal sounds, namely velar (⟦x⟧), palatal (⟦χ⟧), and prepalatal (⟦χ'⟧/⟦χ''⟧). Since it is not clear whether or not the palatal markers indicate phonologically [coronal, dorsal] sounds as opposed to phonologically simplex [dorsal] sounds that surface as phonetically fronted velars (prevelars), I focus on those places with the prepalatal markers. An inspection of the maps from Table 15.5 reveals the six velar fronting areas listed in Table 15.10. In the first column I list the area and in the second column villages and towns within that area. The first five of those areas are listed under the names for the respective valleys, while the sixth area is a specific town in Liechtenstein. In the third column I give the maps from VALTS which have prepalatal markers for the towns listed in the second column. Note that the final place listed in Table 15.10 (Triesenberg) is part of a larger area (Liechtenstein) in which velar fronting is attested (recall 45 and 46). The places listed in Table 15.10 also have in common that they were settled by people from Upper Valais during the Walser Migrations (§6.3; Bohnenberger 1913, Wiesinger 1983a: 902).

Table 15.10: Velar fronting areas in Vorarlberg/Liechtenstein on the basis of the maps in VALTS

Area	Town/village	VALTS maps (volume III)
Kleinwalsertal	Mittelberg, Riezlern	40a-b, 45a-b, 46, 47, 49–53
Damülser Tal	Damüls	40a-b, 45a-b, 46, 47, 49–53
Tal der Bregenzer Ache	Schröcken	40a-b, 45a-b, 53
Großes Walsertal	Sonntag, Blons, Fontanella, Raggal	40a-b, 45a, 53
Laternsertal	Laterns	45a-b, 53
Liechtenstein (Oberland)	Triesenberg	45a-b, 46, 47, 49, 53

Since the velar fronting places listed above have prepalatals in postsonorant position after front vowels, liquids, and back vowels and in word-initial position before any sound, they are characterized by nonassimilatory velar fronting (Trigger Type F; Chapter 14). No indication is given in VALTS that the velar fronting places in Table 15.10 have velar [x]; thus, historical /x/ has restructured to /ç/.

15.11.3 Potential velar fronting areas

Trüb (1951) investigates the historical development of vowels in the SwG dialect spoken in the area of Walensee-Seeztal (to the west of Liechtenstein). In his charts for consonants (pp. xix–xx), Trüb classifies all dorsal stops and fricatives (fortis/lenis/long/short) – his ⟦k g χ⟧ – as "palatal", although he lists the equivalent nasal (⟦ŋ⟧) as "velar". In Footnote 1 (p. xx) he writes: "Das *ch* unserer Landschaft wird im allgemeinen palatal gebildet, also weder präpalatal noch velar". ("The *ch* in our region is generally pronounced palatal, that is neither prepalatal nor velar"). Given this statement and the proximity of Walensee-Seeztal to the velar fronting areas to the immediate east, I consider it possible that velar fronting may be active in the region. However, given the brevity of the statement in Footnote 1, it is also possible that Trüb's "palatals" may in fact be prevelars; recall Kollmann's (2007) conclusion concerning the realization of sounds like /x/ in Laurein.

Gabriel (1963) investigates historical changes affecting vowels and the inflectional morphology in Vorarlberger Rheintal, a large region in Northwest Vorarlberg which subsumes Dornbirn, Lustenau, and Hohenems. In the section on the phonetics of consonants, Gabriel (1963: 79) provides a one-page description of fricatives. In his transcription system (p. 45), ⟦x⟧ and ⟦χ⟧ represent voiceless lenis and voiceless fortis respectively. Gabriel provides a concise statement concerning the place of articulation of ⟦x⟧ and ⟦χ⟧ on p. 79: "x, χ bezeichnet immer den ich-Laut". ("x, χ always denote the ich-Laut"). On the basis of that terse statement, it could be the case that (nonassimilatory) velar fronting was active historically in the region; however, it could also be the case that we are dealing with prevelars. (In contrast to VALTS and SDS, Gabriel presupposes only two places of articulation for dorsal fricatives).

VALTS provides a wealth of data from most of the places listed on Map 15.9. Recall that the velar fronting areas listed in Table 15.10 all have prepalatal markers (⟦χ'⟧/⟦χ''⟧) for the maps listed in Table 15.5. Those maps also indicate a number of places in Vorarlberg with palatal markers (⟦χ⟧). Two of those broad areas are indicated on my Map 15.9. First, there is the region south of Lech and east of Vandans. Second, there is the area around Oberstaufen (Allgäu, Germany) extending south to the area around Mellau (Vorarlberg, Austria). Since /x/ is realized in these two regions as "palatal" it is possible that they are characterized by velar fronting, but it is also conceivable that the "palatals" represent phonetically fronted velars (prevelars).

It is not easy to determine the status of the narrow – but sizable – velar fronting column depicted on Map 15.9. On the one hand, it is possible that that column represents several different velar fronting enclaves (islands) that happen to be in the same general vicinity. On the other hand, it could be that the region as a whole is one large velar fronting area. Since the northernmost potential velar fronting region on Map 15.9 extends into an area in Southwest Germany with velar fronting (Swabia), the second interpretation suggests that the column is not a velar fronting island at all, but instead a velar fronting peninsula.

15.12 Summary

Table 15.11 lists the places with postsonorant velar fronting discussed in this chapter. I include not only those places that are uncontroversially velar fronting islands but also some of the places discussed in §15.11 that are probably parts of a large velar fronting peninsula. The modern-day countries are listed in the second column (AT = Austria, CH = Switzerland, CZ = Czech Republic, LI = Liechtenstein, IT = Italy, SL = Slovenia). I do not include any of the areas referred to as potential velar fronting areas, nor do I give those sources with a dataset that is too sparse to determine velar fronting triggers. For greater transparency I summarize the triggers for postsonorant velar fronting in the final column of Table 15.11 in lieu of the formal rules posited above. If velar fronting is induced by one or more consonant, then this information is stated in the final column. If not enough data are presented in the source to determine whether or not consonants serve as velar fronting triggers, then no reference to consonants is made in the final column. Most of the case studies summarized here only mention data involving liquids (/r l/) as triggers and omit /n/; hence, one can only speculate that the latter sound will always be a velar fronting trigger if one or more of the liquids do.[31]

The significance of Table 15.11 is that it lists a number of geographically disperse places with a wide variety of velar fronting triggers. In certain cases, the triggers represent common patterns, while in other cases they are either rare or otherwise unattested in German dialects. In the following summary I relate how those findings match up with the historical stages posited in Chapter 12 and Chapter 14.

The narrowest set of triggers is attested in Visperterminen (high front vowels but not coronal sonorant consonants), while a slightly broader one (nonlow front vowels but not coronal sonorant consonants) can be observed in Obersaxen. Chapter 13 demonstrates that the pattern for Visperterminen (Stage 2a) is the norm in Lower Bavaria; the restricted set of triggers for Obersaxen (Stage 2b) is attested outside of Switzerland and depicted on Map 12.1. Rothmühl represents a restricted case of triggers that is otherwise only occurring in South Mecklenburg (front unrounded vowels; Stage 2a''). According to one description of St. Stephan,

[31] Table 15.11 categorizes places only according to the triggers because the places discussed in this chapter do not display variation concerning the target segments. One exception is Gottschee, where according to Lipold (1984) the targets for postsonorant and word-initial velar fronting consist of all velar obstruents.

Table 15.11: Velar fronting triggers (postsonorant) in velar fronting islands

Place		Source	Velar fronting triggers
Libinsdorf	CZ	Weinelt (1940)	FV or /l r n/
Iglau	CZ	Stolle (1969)	FV but not /r/
Altstadt	CZ	Seemüller (1908b)	FV
Langenlutsch	CZ	Janiczek (1911)	FV but not /r/
Rathsdorf	CZ	Graebisch (1915)	FV
Michelsdorf, Rehsdorf	CZ	Benesch (1979)	FV
Mährisch Hermersdorf	CZ	Benesch (1979)	FV or /r/
Vorder-Ehrnsdorf, Augezd, Kornitz	CZ	Benesch (1979)	FV but not /r/
Rothmühl	CZ	Benesch (1979)	Front unrounded V but not /r/
Giazza/Dreizehn Gemeinden	IT	Schweizer (1939)	FV or liquids (and back V for some speakers)
Giazza/Dreizehn Gemeinden	IT	Mayer (1971)	FV or liquids
Hinterberg (and other places	SL	Lipold (1984)	FV but not /r/
Mitterdorf	SL	Seemüller (1909b)	FV but not /r/
Vals	CH	Gröger (1914e)	Nonlow FV or liquids
Obersaxen	CH	Brun (1918)	Nonlow FV but not liquids
Visperterminen	CH	Wipf (1910)	High FV but not liquids
Lötschental	CH	Henzen (1928)	Nonlow FV or liquids
Upper Valais	CH	Rübel (1950)	FV or liquids
Bellwald	CH	Schmid (1969)	FV or liquids
Ried-Brig	CH	Werlen (1977)	FV
St. Stephan	CH	Zahler (1901)	Front nonnasalized V
Frutigen	CH	Gröger (1914a)	FV
Saanen	CH	Gröger (1914d)	FV or /l/
Silltal	AT	Egger (1909)	Nonlow FV or liquids
Passeiertal	IT	Insam (1936)	FV, liquids, or back V
Ötztal, Passeiertal	AT; IT	VALTS	FV, liquids, or back V
Appenzell	CH	Vetsch (1910)	FV
Rheintal	CH	Berger (1913)	Nonlow FV or liquids
Maienfeld	CH	Meinherz (1920)	FV or liquids
Vandans	AT	Jutz (1922)	FV
Liechtenstein-South Vorarlberg	LI; AT	Jutz (1925)	FV or liquids
Feldkirch	AT	Bethge & Bonnin (1969)	FV

the velar fronting triggers consist solely of front nonnasalized vowels. The latter pattern is the only one of its kind in German dialects and that it is also extremely rare outside of Germanic. The set of nonlow front vowels or liquids (Stage 2c) is attested as a trigger in Vals, Lötschental, Silltal, and Rheintal. The default pattern for German dialects (front vowels or liquids as postsonorant velar fronting triggers) is well-attested in the material investigated in the present chapter (Stage 2d). Finally, the nonassimilatory velar fronting (Stage 2e) is well-documented for several places (e.g. Ötztal).

Table 15.12 presents the velar fronting triggers for word-initial position for the places discussed in this chapter. That table shows that there is considerable variation concerning velar fronting triggers in word-initial position. For example, there is a narrow set of triggers in Visperterminen (Stage 2a), Obersaxen (Stage 2b), Lötschental and Rheintal (Stage 2c), South Vorarlberg-Liechtenstein (Stage 2d), and Ötztal (Stage 2e).

Table 15.12: Velar fronting triggers (word-initial) in velar fronting islands

Place		Source	Velar fronting triggers
Giazza/Dreizehn Gemeinden	IT	Schweizer (1939)	FV or liquids (and back V for some speakers)
Hinterberg (and other places)	SL	Lipold (1984)	FV but not /r/
Vals	CH	Gröger (1914e)	FV but not liquids
Obersaxen	CH	Brun (1918)	Nonlow FV but not liquids
Visperterminen	CH	Wipf (1910)	High FV but not liquids
Lötschental	CH	Henzen (1928, 1932)	Nonlow FV or liquids
Upper Valais	CH	Rübel (1950)	FV or liquids
Bellwald	CH	Schmid (1969)	FV or liquids
Ried-Brig	CH	Werlen (1977)	FV
St. Stephan	CH	Zahler (1901)	FV
Frutigen	CH	Gröger (1914a)	FV or /n/
Saanen	CH	Gröger (1914d)	FV or /n/
Ötztal, Passeiertal	AT; IT	VALTS	FV, liquids, or back V
Appenzell	CH	Vetsch (1910)	FV or /r, l, n/
Rheintal	CH	Berger (1913)	Nonlow FV or liquids
Vandans	AT	Jutz (1922)	FV or liquids
Liechtenstein-South Vorarlberg	LI; AT	Jutz (1925)	FV

With the exception of St. Stephan, all of the historical stages described in Tables 15.11 and 15.12 are attested in the varieties of velar fronting discussed in Chapters 3–13. The importance of velar fronting triggers for velar fronting islands is that – as islands – velar fronting must have phonologized in each place independently (polygenesis). It is therefore remarkable that the places listed in Tables 15.11 and 15.12 confirm to the typologically attested generalizations discussed in Chapter 12 and Chapter 13. For example, the segments inducing (assimilatory) velar fronting consist of a natural class drawn from the set of sounds referred to throughout this book as coronal sonorants. The attested natural classes for triggers listed in Tables 15.11 and 15.12 obey the Implicational Universal for Palatalization Triggers without exception; hence, none of the unattested Trigger Types discussed in §12.8.1 can be found among velar fronting islands.

The one unique case mentioned above (St. Stephan) is consistent with the rule generalization approach adopted in this book. The set of velar fronting triggers in that place (front oral vowels) suggests that that natural class be assigned a unique Trigger Type with its own historical stage. All other velar fronting varieties of German discussed in this book fall into two groups: (a) those with only oral vowels and (b) those with oral vowels and nasalized vowels but where dorsal fricatives are absent after the latter sounds (e.g. Visperterminen). Since St. Stephan is the only velar fronting variety discovered in which dorsal fricatives occur in the context after front nasalized vowels it is not possible to know how rare or common that pattern is.

16 When and where was velar fronting phonologized?

16.1 Introduction

Although the preceding chapters have offered a diachronic treatment of velar fronting in a broad spectrum of German dialects, nothing at all has been said about how that change fits into the well-established stages in the history of German (Appendix E). In the present chapter I demonstrate how the linguistic evidence discussed in this book can shed light on when velar fronting was phonologized. That linguistic evidence is shown to be corroborated by philological evidence discussed in the earlier literature. I also discuss the extent to which the material from German dialects discussed in previous chapters can shed light on where velar fronting was phonologized.

Establishing an accurate time frame for the phonologization of velar fronting requires that I consider first word-initial position (§16.2) and then postsonorant position (§16.3). The question of where (geographically) velar fronting might have been phonologized can be found in §16.4. Next, I address the issue of directionality as it relates to the earliest phonologized rule of velar fronting (§16.5). In §16.6 I take a closer look at the historical model proposed in §2.5 and show how it accounts for the general patterns discussed in Chapters 3–13. Finally, in §16.7 I discuss the extent to which it is possible to make meaningful statements concerning why velar fronting was phonologized in a certain place and time but not in another place or time.

16.2 Word-initial position

Insight into the dating of the fronting of word-initial WGmc $^{+}$[ɣ] can be adduced from those dialects in which that original velar is now an opaque palatal (Chapters 7–8). Recall that opaque palatals are underlying segments like /ç/ or /ʝ/ occurring in the context of a nonfront sound that was historically front ([coronal]). It was argued at length that opaque palatals were once palatal allophones of velars at the point in time before the original front trigger ([coronal]) was removed.

Significantly, velar fronting must have been active before the elimination of the original [coronal] trigger. If the chronology of the latter change can be ascertained then it stands to reason that the dating of the originally allophonic rule of velar fronting can be inferred as well.[1]

A plethora of dialects was discussed earlier in which the reflex of WGmc ⁺[ɣ] is palatal in word-initial position before front vowels or before schwa in the *ge*-prefix (e.g. [çə]/[ʝə]; cf. StG [gə]) but velar before full back vowels. Examples include Eph (Dorste, §4.4; Eilsdorf, §8.3; Dingelstedt am Huy, §8.4), Wph (Elspe and Schieder-Schwalenberg, §7.2), as well as several LG and CG varieties spoken in the northeast of pre-1945 Germany in Chapter 11. In such dialects, the realization of an etymological velar as palatal before schwa follows if that palatal was created by velar fronting when schwa was still [i]. The chronology of the sound change producing schwa from full vowels like [i] (Vowel Reduction) can be ascertained to a fair degree of accuracy on the basis of orthographic evidence.[2] The assimilatory fronting of WGmc ⁺[ɣ] before an etymological [i] in word-initial position is most prevalent in LG. However, since much more is known on the time frame for Vowel Reduction in HG, I discuss first that evidence before I consider parallel data from LG.

The earliest attested stages of HG were OHG (750–1050) and MHG (1050–1350). In OHG the prefix referred to above was rendered orthographically as *ga*-, *gi*-, and *ge*-, whose vowels I interpret as [ɑ], [i], and [ə] respectively (Braune 2004: 73–74). In general it can be said that *ga*- was significantly more common in early OHG, but that *gi*- and then later *ge*- established themselves. By the end of the ninth century, *gi*- was the most common realization in all OHG dialects, and in late OHG *ge*- had become more and more prevalent. By early MHG *ge*- was the sole realization (Paul 2007: 108). The frequency of the three realizations of *ga*-, *gi*-, and *ge*- depended on the dialect of OHG. For example, *gi*- was first attested in CG (Franconian) dialects of OHG at the beginning of the ninth century.[3]

[1]The other etymological velar in word-initial position is WGmc ⁺[k], including the ⁺[k] after a sibilant in WGmc ⁺[sk]. The evidence discussed below concerns the dating of the fronting of word-initial ⁺[ɣ], but that evidence cannot be extended to the fronting of the fortis velar. The only dialects discovered in which the modern reflex of WGmc ⁺[k] is an opaque palatal at the left edge of a word are EPo (Kreis Konitz; §11.5) and HPr (Reimerswalde; §11.6). Since the sound changes responsible for creating the underlying palatal in those places were specific to those particular dialects, no evidence is available to my knowledge to determine the chronology of velar fronting.

[2]I do not discuss other (dialect-specific) sound changes that led to the development of opaque palatals in word-initial position because the dating of those changes is not as well-established, e.g. r-Deletion in Reinhausen (§7.2).

[3]The scholarly literature on the realization of the *ge*- prefix in early Gmc is vast; some of those studies are cited in the standard reference grammar of OHG (Braune 2004: 73–74). I do not attempt to summarize those works here. It needs to be stressed that my treatment concerns

A similar development from [i] to [ə] in the *ge-* prefix can be observed in the earliest stages of LG, namely OSax (800–1150) and MLG (1150–1600). Given the paucity of textual evidence from OSax, not as much is known concerning the progression from *gi-* to *ge-* in specific OSax dialects as in OHG varieties (see King 1965 for some discussion on OSax). The most significant generalization is that in OSax the two most common realizations of the prefix in question were *gi-* and *ge-*, where the former was far more common than the latter (Holthausen 1900: 42). The transition from *gi-* to *ge-* appears to have been completed by the onset of MLG (Lasch 1914: 125).

In light of the developments discussed above it can be concluded that the fronting of word-initial WGmc $^{+}$[ɣ] began when the vowel of the *ge-* prefix was still [i], meaning that velar fronting must have been phonologized before that [i] (/i/) was restructured to schwa (/ə/). The conclusion is that the phonologization of velar fronting in word-initial position began no later than late-OHG/OSax and that the opaque in word-initial position was in place by early MHG/MLG. It is difficult to establish a precise century during OHG/OSax when velar fronting was phonologized, although it can be said with a fair degree of certainty that velar fronting in word-initial position – or after a sonorant (§16.3) – was not inherited from WGmc because one other WGmc language (Dutch) fails to have it.[4]

Table 16.1 summarizes the status of the word-initial palatal deriving historically from WGmc $^{+}$[ɣ] in HG (CG) and LG respectively. I assume here that the initial palatal in the prefix in the first column is a lenis fricative, although other palatal realizations are possible depending on the dialect, e.g. fortis fricative ([ç]) or stop ([c] or [ɟ] in West Mecklenburg, Sebnitz, and Seifhennersdorf; recall Chapter 11).[5]

itself only with the OHG progenitor of modern-day *ge-* in dialects referred to above where the original velar is now a palatal and the vowel is schwa. The important point is that realizations like [jə] only make sense if the vowel of the prefix was once a trigger for velar fronting, e.g. [ɣi].

[4]Sound changes resembling velar fronting occurred independently in other branches of Gmc (NGmc and WGmc). As I point out in Appendix I there are significant differences between those changes (Velar Palatalization) and velar fronting in HG/LG; hence, it could not have been the case that velar fronting was inherited from WGmc.

[5]On occasion, one encounters statements in some of the literature which maintain that velar fronting in StG arose during or shortly after MHG. An examination of those sources reveals that such claims are based solely on speculation. For example, Penzl (1975: 107) asserts that [x] developed a palatal allophone after front vowels and sonorant consonants in Late MHG, but he gives no evidence. Cercignani (1979: 63) uncritically accepts Penzl's claim, which is also adopted in textbooks (Schmidt 2007: 288). Russ (1982: 85) opines that velar fronting "… is probably not very old, since it does not exist in all German dialects …".

Table 16.1: Chronology of word-initial velar fronting of WGmc ⁺[ɣ] in CG (a) and LG (b)

	Realization of *ge-*	Time frame	Status of palatal from WGmc ⁺[ɣ]:
a.	[ʝi] (from /ɣi/)	ca. 750–1000	Allophone
	[ʝə] (from /ʝə/)	after ca. 1000	Palatal quasi-phoneme
b.	[ʝi] (from /ɣi/)	ca. 800–1150	Allophone
	[ʝə] (from /ʝə/)	after ca. 1200	Palatal quasi-phoneme

The palatal allophone referred to in Table 16.1 ([ʝ]) and corresponding velar ([ɣ]) were in complementary distribution. This implies that the etymological glide (WGmc ⁺[j]) was still realized as a glide and that Glide Hardening (§4.2) had not yet been phonologized; recall the case studies discussed in Chapter 8. Hall (2014b) discusses the chronology of Glide Hardening in LG at length, since that change was an important component of the development from glide ([j]) to lenis velar fricative ([ɣ]) after short vowels, traditionally referred to as Schärfung. Hall's conclusion is that Glide Hardening must have been active in OSax because the change from [j] to [ɣ] was completed by the end of the OSax era.

The chronology of the fronting of word-initial WGmc ⁺[ɣ] as summarized in Table 16.1 only holds for those dialects listed above in which the modern reflex of that historical velar is palatal before front vowels or before schwa but velar before full back vowels. In some dialects WGmc ⁺[ɣ] is realized in word-initial position as palatal before front vowels and velar before all back vowels, including schwa (e.g. Soest, §4.3). In a very common pattern exemplified primarily by CG dialects, WGmc ⁺[ɣ] is realized as palatal in word-initial position before any sound (recall Stage 2e dialects discussed in Chapter 14). The Soest pattern was argued in §7.4 to involve the same chronology as the one depicted in Table 16.1. On the basis of the rule generalization model, the extension of velar fronting triggers to the broadest context (word-initially before all sounds) must have postdated the change from velar to palatal before all and only front vowels in Table 16.1.

A number of commentators have noted that there is strong orthographic evidence from earlier stages of German that WGmc ⁺[ɣ] had a palatal variant before front vowels. That evidence is significant because it lends independent support to the chronology proposed above. I only present a brief overview of the philological facts here since they are discussed in much greater detail in Van der Hoek (2010) and references cited therein. The philological evidence is strongest in OSax: In that language the letter used to represent WGmc ⁺[j] was the same as the letter used for WGmc $^+$[ɣ], e.g. *giung* (<WGmc $^+$[juŋg] 'young'). Likewise when WGmc $^+$[ɣ] appeared before *i* or *e*, it is not unusual to find a spelling *i* or *hi* (or zero), e.g. *ieldan* (cf. *geldan* 'pay-INF'). Philological evidence for the fronting of word-initial WGmc $^+$[ɣ] in OHG is scanty, although those facts hold for northern (Franconian) dialects which were presumably the progenitor of the CG dialects referred to in Table 16.1(a). In those OHG dialects the letter representing WGmc $^+$[ɣ] is *j* before front vowels, e.g. Rpn *iechose*, which is apparently a proper name.

16.3 Postsonorant position

The dating of velar fronting in word-initial position was established on the basis of the chronology of a sound change creating opaque palatals (Vowel Reduction). A number of changes were discussed earlier (Chapter 7 and Chapter 9) that produced opaque palatals in postsonorant position, but unlike Vowel Reduction, most of those changes were dialect-specific and not pan-German developments. Since no historical evidence is known to me on the dating of those sound changes (r-Retraction, Vowel Retraction, Syncope), I do not discuss them and leave this issue open for further research provided data becomes available. One might hope that Vowel Reduction could provide clues on the dating of postsonorant velar fronting, but only a very small number of dialects discussed earlier have opaque palatals created by that change. One example (Wermelskirchen in §7.3) is the word [iːvəç] (/iːvəç/) 'eternal' (cf.OHG *ēwīg* and StG [eːvɪç] with the unreduced front vowel [ɪ]). That item from Wermelskirchen suggests that velar fronting was phonologized before Vowel Reduction, but Vowel Reduction could have postdated OHG in that type of word because it was specific to a particular CG dialect.

Two reliable linguistic arguments can be adduced for the dating of velar fronting in postsonorant position. The first of those arguments comes from the findings from §14.7: If velar fronting is attested in word-initial position then the same process is also present in postsonorant position in the same dialect for the same target segment. That implication is exceptionless in the present survey of German dialects. The reason for the absence of dialects with velar fronting in word-initial position but no fronting in postsonorant position was attributed to history: Velar fronting began in postsonorant position and then spread geographically to such a degree that an extension of velar fronting to word-initial position was only possible if that dialect already had postsonorant velar fronting.

The consequence of the findings from §14.7 is that the fronting of WGmc $^+$[ɣ] in postsonorant position must have already been phonologized in the dialects discussed in §16.2 (summarized in Table 16.1) prior to the phonologization of the fronting of WGmc $^{+}$[ɣ] in word-initial position. Recall that the type of dialect referred to here was particularly prevalent in LG, i.e. Eph (Dorste, §4.4; Eilsdorf, §8.3; Dingelstedt am Huy, §8.4), Wph (Elspe and Schieder-Schwalenberg, §7.2). The generous time frame for HG and LG in Table 16.1 leaves plenty of breathing room for velar fronting in both contexts: Postsonorant fronting of WGmc $^{+}$[ɣ] may have been phonologized at the beginning of the ninth century and then spread geographically over the next hundred years at which point the change was extended to word-initial position.

The second linguistic argument for establishing a time frame for the phonologization of postsonorant velar fronting pertains to the fortis fricative [x]. Recall that postsonorant [x] has two main progenitors, namely WGmc $^{+}$[x] (for HG and LG) and WGmc $^{+}$[k] (for HG). The challenge in this case is clear: The velar and palatal reflexes of [x] are both spelled the same way in the earliest attested HG and LG branches (cf. StG *ch* for [x] and [ç]). Hence, there is no philological evidence telling us when *ch* first started being realized as palatal after front vowels. However, linguistic evidence can prove beneficial. Recall from §2.3 and §12.8.2 the following exceptionless implication:

(1) Implicational Universal for Velar Fronting Targets-2:
If a lenis sound undergoes velar fronting then the corresponding fortis sound does as well.

That implication accounts for the synchronic fact that there are dialects in which the targets for velar fronting are fortis (/x/) and lenis (/ɣ/) sounds (Target Type M/Stage 2bb), or fortis (/x/) but not lenis (Target Type L/Stage 2aa). Significantly, there is no dialect where a lenis velar (/ɣ/) undergoes fronting but the corresponding fortis sound (/x/) does not.

(1) can tell us something about when the fronting of postsonorant [x] was phonologized, although that evidence only holds for certain dialects. Consider the many Target Type M dialects referred to in Chapter 12 which have no velar fronting in word-initial position. In that type of system it can be concluded that postsonorant velar fronting was phonologized first with the /x/ target and that the change only later extended to /ɣ/. However, no conclusions can be drawn concerning when the postsonorant fronting of /x/ was phonologized. More revealing are Stage 2bb dialects with velar fronting in word-initial position. Representative examples were mentioned above, namely LG, i.e. Eph (Dorste, Eilsdorf, Dingelstedt am Huy) and Wph (Elspe, Schieder-Schwalenberg), as well as LG and CG varieties spoken in the northeast of pre-1945 Germany. In those places it

can be deduced that word-initial WGmc $^+$[ɣ] was fronted allophonically during OHG/OSax and that the fronting of /ɣ/ (from WGmc $^+$[ɣ]) in postsonorant position had been phonologized before then. Significantly, it can also be concluded on the basis of (1) that the fronting of postsonorant [x] (< WGmc $^+$[x]/$^+$[k]) had been phonologized even before the fronting of postsonorant [ɣ] (< WGmc $^+$[ɣ]).

The conclusions concerning the general time frame for velar fronting are summarized in (2):

(2) a. In many LG (and some CG) varieties, the fronting of WGmc $^+$[ɣ] must have been phonologized in word-initial position in OHG/OSax; see Table 16.1. In those same dialects, the allophonic palatal had become an underlying (opaque) palatal by early MHG/MLG;
   b. In the dialects referred to in (2a), the fronting of /ɣ/ (< WGmc $^+$[ɣ]) must have been phonologized in postsonorant position even before it was phonologized in word-initial position;
   c. In the dialects referred to in (2b) the fronting of /x/ (< WGmc $^+$[x]/$^+$[k]) must have been phonologized in postsonorant position even before the fronting of /ɣ/ (< WGmc $^+$[ɣ]) in postsonorant position.

16.4 Remarks on geography

It was noted in Chapter 12 and Chapter 14 that the areal distribution for the various velar fronting patterns appears somewhat haphazard and does not always give a clear indication of whether or not there are (or were) isoglosses separating the postulated historical stages. Nevertheless, the material on German dialects discussed in previous chapters does give some clues concerning the relative age of velar fronting in certain areas with respect to others.

One point needs to be stressed at the outset: The presence of velar fronting islands only makes sense if velar fronting had more than place of origin. Few definitive conclusions can be reached on the focal area(s) for velar fronting in Germany and Austria. On the one hand, one could adopt monogenesis and claim that there was only one original place where velar fronting was phonologized. On the other hand, since velar fronting islands are well-attested in Switzerland/Tyrol among other places (Chapter 15), there is no principled reason why polygenesis could not be correct for Germany.

That point aside, there is agreement in the literature that sound change begins in a focal area and then spreads both temporally and geographically from that point of origin (§2.4.1 and §16.6 below). Spreading can involve more than one factor, but the two that are most significant for velar fronting are the triggers and/or targets, which gradually expand in the focal area to include more and more segments. The original change in the focal area also spreads geographically in the sense that outlying areas adopt it. Significantly, the change is active the longest in the focal area, and it is there where it reaches its most general form in terms of the number of triggers/targets. However, in some of the outermost areas the change never progresses to the more general contexts in the focal area. The important point is that the focal area for velar fronting – the place where that process is phonologized – is that place where the set of triggers/targets is most general.

On the basis of the various velar fronting patterns discussed in previous chapters, one generalization is that velar fronting must be quite old in CG varieties of OHG but much more recent in LG (OSax). Map 16.1 indicates the major dialect areas of OHG and OSax referred to here. Consider the following four pieces of evidence.[6]

(A) In postsonorant position those CG/LG varieties with a narrow set of triggers are not common. By contrast, WCG (Rpn, MFr) has the broad set of triggers (coronal sonorants) without exception (Table 12.9). The narrow triggers in those LG (Wph) places and the broad triggers in WCG (Rpn, MFr) make sense if velar fronting in postsonorant position was present longer in WCG (Rpn, MFr) than in LG (Wph).

(B) In postsonorant position, LG (Wph) dialects have a strong preference for a narrow set of targets (/x/ but not /ɣ/; Stage 2aa=Target Type L), but the more inclusive set of targets (/x/ and /ɣ/; Stage 2bb=Target Type M) are more prevalent in WCG (Rpn, MFr). In fact, no Stage 2aa dialect was found among Rpn/MFr dialects in the survey given in Chapter 12. Compare Table 12.15 for Wph with Table 12.9 for Rpn/MFr.

(C) In word-initial position, LG (Wph, Eph) dialects are well-attested with a narrow set of triggers (Table 12.16 for Wph and Table 12.18 for Eph). By contrast, velar fronting in many WCG varieties (e.g. Rpn) exhibits the broadest possible set of triggers (Stage 2e); see Table 14.2. Recall that Stage 2e is the change from velar to palatal as a nonassimilatory change. The dichotomy between broad vs. narrow triggers in word-initial position suggests that velar fronting has been present longer in WCG (Rpn) and is of more recent origin in LG (Wph, Eph).

[6]A fifth difference between the two dialects is alveolopalatalization, which is well-attested in CG but not in LG. I do not consider alveolopalatalization because that change began much later than OHG/OSax; recall the discussion in §10.6.1.

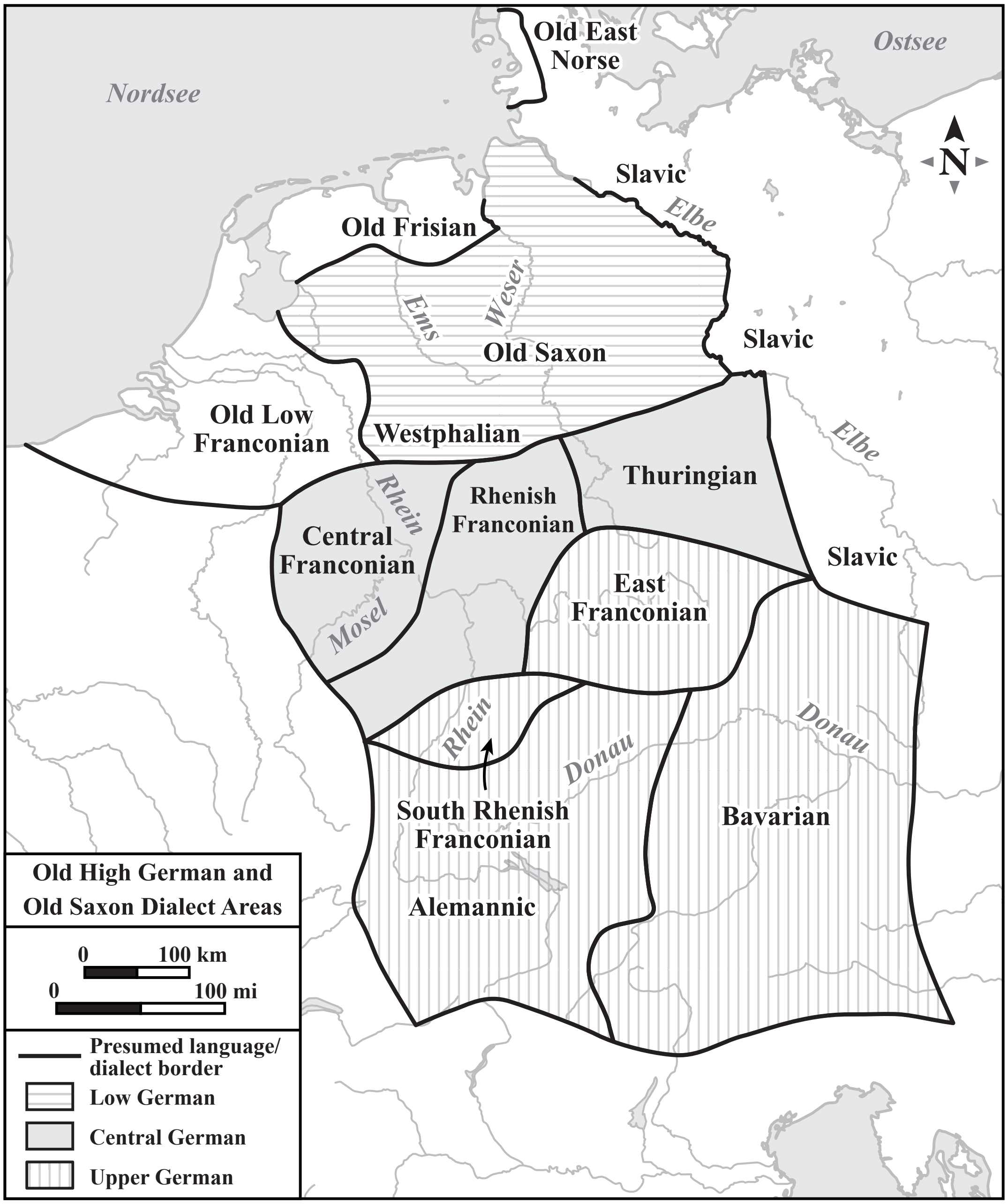
(D) Within the Wph dialect continuum certain communities can be identified in relatively close proximity which represent the incremental assimilatory stages for velar fronting triggers in word-initial and postsonorant position; recall the discussion of Wph in §12.5.2. The significance of those Wph places is that they point to a region where velar fronting was phonologized relatively late (in contrast to other areas). In particular, the focal area for the change was not in the Wph region. Instead, that change was phonologized elsewhere and then spread geographically from that focal area to the Wph region thereby leaving relics in the modern era.

On the basis of (A)-(C) it can be concluded that velar fronting has been active for a long time in many varieties of WCG, but the status of velar fronting in UG varieties of OHG is not as clear. The shift of WGmc $^{+}$[ɣ] to palatal in word-initial position did not occur in UG because that original fricative was restructured to [g] (/g/), which was not a velar fronting target. And since the change from WGmc $^{+}$[ɣ] to [g] also occurred in postsonorant position in UG, it is difficult to find UG varieties in which the target for postsonorant velar fronting is anything other than /x/; hence, UG is not one of the dialects referred to in (2). No conclusions at all can be drawn concerning when /x/ first developed a palatal allophone in UG, although the data discussed for Lower Bavaria from SNiB points to a fairly recent date (§13.4).[7]

16.5 Directionality revisited

The typological literature on Velar Palatalization makes extensive reference to a directionality parameter (§2.3.5). Recall that directionality is not an issue for velar fronting in German dialects because postsonorant velar fronting always applies from left-to-right (progressively), cf. StG [kuːxən] 'cake' vs. [kʏçə] 'kitchen'. Since the vowel to the right of the target is schwa, speakers do not have the option of applying velar fronting regressively. However, in the velar fronting island of Visperterminen (§6.2) the rule creating schwa (Vowel Reduction) never occurred; hence, there are many native words (or assimilated loanwords) in which a potential velar fronting trigger is to the right of a target (e.g. [xuxxi] 'kitchen').

[7]Conclusions concerning the status of NLG are also tentative. In contrast to Wph/Eph, NLG exhibits the broadest possible set of triggers for assimilatory fronting in postsonorant position (Table 12.14). That table also reveals that the prevalent pattern for NLG is that velar fronting has a broad set of targets (Stage 2bb=Target Type M). It is conceivable that there was also a focal area for velar fronting for NLG varieties of OSax, but since this topic is purely speculative I do not pursue it further.



Map 16.1: Continental West Germanic languages (ca. ninth century). Adapted from Meineke & Schwerdt (2001: 209).

The conclusion is that when velar fronting was phonologized in Visperterminen speakers had a choice between two directions and that – for whatever reason – they opted for the one direction and not the other.

Visperterminen is not unique. Since Vowel Reduction affected any unstressed full vowel, there must have been many words in OHG/OSax with a velar fronting target (/x/) situated between a (stressed) back vowel and an (unstressed) front vowel, i.e. words containing sequences like [ɑxi], [ɑxe] etc. If so, could velar fronting have been phonologized as a regressive assimilation in some dialects of OHG/OSax? In the remainder of this section I argue that the answer must have been negative and that when velar fronting was phonologized it applied progressively in every variety.

To illustrate this point, consider the items from OHG in the first column of (3). These OHG examples consist of a partial paradigm for a verb in (3a), a noun in (3b), and an adjective in (3c). The verb, noun, and adjective presented here have in common that the bare stem ends in [x] and that at least one of the inflectional suffixes begin with a front vowel.

(3)		OHG	Stage A	Stage B	
	a.	suochu [suoxu]	[suoxu]	[zuːxə]	‘seek-1SG’
		suochis [suoxis]	[suoçis]	[zuːçst]	‘seek-2SG’
		suochit [suoxit]	[suoçit]	[zuːçt]	‘seek-3SG’
	b.	bah [bɑx]	[bɑx]	[bɑx]	‘stream’
		bahes [bɑxes]	[bɑçes]	[bɑçəs]	‘stream-GEN.SG’
	c.	hōh [hoːx]	[hoːx]	[hoːx]	‘high’
		hōhēr [hoːxeːr]	[hoːçeːr]	[hoːçɐ]	‘high-MASC.SG’
		hōhiu [hoːxiu]	[hoːçiu]	[hoːçə]	‘high-FEM.SG’

The interesting examples are the ones in the first column with front vowels in the suffix. If there had been OHG dialects in which velar fronting was phonologized as a rule spreading the frontness feature from right-to-left (regressively), then those early dialects must have been realized phonetically as in the Stage A column above. If the inflectional suffixes underwent the same changes as in StG (Vowel Reduction, Syncope, r-Vocalization), then Stage A could have conceivably developed into Stage B.

No dialect in the present survey has anything resembling Stage B. Although that hypothetical dataset has a contrast between [x] and [ç] after a back vowel, Stage B is nothing at all like the dialects discussed in Chapter 9 with phonemic palatals. The focus of that chapter was on dialects with a contrast between [x] and [ç] after a back vowel, where the back vowel *before* [ç] was historically front, e.g. minimal pairs in Wissenbach (§9.2) like [dɑx] 'roof' (cf. StG *Dach*) vs. [dɑç] 'dike' (cf. StG *Deich*). Recall that velar fronting is still active in dialects like Wissenbach to account for regular [x]~[ç] alternations in morphological paradigms. But Stage B in (3) represents an entirely different type of system than the one discussed in Chapter 9 because it contains many stems with [x]~[ç] alternations after back vowels. From the synchronic perspective Stage B requires a rule fronting /x/ to palatal in morphologically-defined contexts, e.g. in the second and third person singular of verbs or in the genitive singular of nouns. In the typological literature on Velar Palatalization referred to throughout the present book, the observation has been made that Palatalization rules can apply in some languages in such morphological contexts. Thus, from the cross-linguistic perspective, Stage B in (3) might be conceivable. However, no dialect investigated in the present book exhibits that pattern.

More than one explanation for the lack of Stage B dialects is possible. Here are two: (a) Stage B is no longer attested in modern dialects, although it was present at an earlier stage. The cells in the Stage B paradigms with [ç] underwent a later analogical change to [x], thereby producing the pattern found in StG, e.g. [zuːçst], [zuːçt] > [zuːxst], [zuːxt]. (b) Stage B is not attested in modern dialects, nor was it ever attested at any earlier stage. The reason for that gap is that velar fronting was phonologized consistently as a progressive assimilation in all German dialects without exception.

Explanation (a) relies on the assumption that there was an analogical change of [ç] to [x], but it cannot account for the fact that every Stage B dialect changed into the familiar StG-type pattern without exception and that there are no relics preserving that Stage B system. Although analogy has undeniably played an important role in the history of German, explanation (a) also cannot account for the fact that stem allomorphy is quite persistent among verbs and nouns in StG as well as German dialects. Thus, explanation (a) begs the question of why [ç] would change the deviant [x] to eliminate stem allomorphy when stem allomorphy is elsewhere so robustly attested?

I contend that the only conceivable reason for the lack of Type B systems is (b). The generalization from §2.3.5 is repeated in (4):

(4) Directionality of Velar Fronting: If a target for velar fronting is situated after a sonorant and before a vowel then the trigger for velar fronting is always the sonorant to the immediate left of that velar sound.

(4) is admittedly little more than a statement of what is true, but it explains nothing. Put differently, why is it that German dialects described from 1860 to

the present in Germany (including the pre-1945 borders) exhibit variation for targets and triggers as well as limited variation concerning outputs, but no variation at all with respect to directionality? One could argue that (4) makes sense if velar fronting were phonologized only once (monogenesis), in which case the progressive direction was simply inherited when than original rule spread outwards from the original focal area. However appealing that explanation might be, it cannot account for velar fronting islands, which phonologized velar fronting with slightly different triggers but with the same progressive direction. Regrettably, the proper explanation for (4) cannot be offered.[8]

16.6 The historical model

In §2.5 I posited a historical model (Figure 2.2), and in Chapters 3–14 I demonstrated in a series of detailed case studies how those data fit into the various stages proposed in the model. The point of this section is to provide a brief summary of the most important patterns involving velar fronting and to demonstrate how they exemplify the model I have proposed.

On the basis of the patterning of velar fronting in HG/LG dialects much can be inferred about the nature of Stage 2 and Stage 3. As noted earlier, Stage 1 has not been taken into consideration because the original sources for velar fronting do not provide the necessary data (e.g. the degree to which [x] is gradiently fronted based on the nature of the adjacent vocoid). I make first a few speculative remarks on the nature of Stage 1, especially in light of the claims I advanced in the earlier part of this chapter on the time frame for the phonologization of velar fronting. The bulk of this section is devoted to a discussion of Stage 2 and Stage 3.

16.6.1 Stage 1

This is the point at which the phonological rule of velar fronting is absent. Stage 1 is therefore represented by any language where velar sounds do not undergo a categorical fronting in the context of front sounds.

[8]One might attempt to argue that velar fronting was phonologized consistently in the left-to-right direction because other rules active in German dialects at that time also involved the progressive spreading of a feature. This is an appealing idea; however, it is counterexemplified by the most well-known rule of OHG/OSax, namely i-Umlaut, which spreads the features of frontness and height from /i/ to the left, e.g. OHG [gɑst] 'guest' vs. [gesti] 'guest-PL'. A brief glance at the sound changes for OHG in Braune (2004) does not reveal any clear candidates for regular progressive spreadings.

The nature of Stage 1 needs to be further refined in light of the findings presented in the preceding chapters. First, velar fronting involves left-to-right (progressive) spreading in every HG/LG variety that has that process (§16.5). Second, when velar fronting phonologizes at Stage 2, the target for that change is the fortis fricative /x/, and the triggers are high front vowels like /i/. These three properties together mean that Stage 1 in the context of the present book can be defined specifically as any dialect/language which possesses sequences like /ix/ ([ix]), where the velar does not undergo categorical fronting. An example of a modern Gmc language that can be classified as Stage 1 is Dutch.

As noted earlier, it is common for velars to be articulated in a slightly more forward position along the palate in the neighborhood of front vowels than in the neighborhood of back vowels. However, this is the coarticulatory (phonetic) fronting of velars and not the categorical change characterized by velar fronting. It has been stressed throughout this book that velar fronting is phonological and not phonetic; hence, the Stage 1 languages under discussion may have the coarticulatory fronting of /x/ after /i/.[9]

In the preceding chapters I have documented a number of Stage 1 LG/HG varieties. Many of those lects are located along the Dutch border, but a surprising finding in the present book is that non-velar fronting islands are attested as well, e.g. Kreis Stolp (Map 11.2).

I claim that there was an earlier point in the history of Gmc (Stage 1) when the phonological rule of velar fronting was not present. Since velar fronting was phonologized at an early stage (OHG/OSax), I conjecture that Stage 1 was represented by the WGmc language.

16.6.2 Stage 2

I hypothesize that the earliest stages of OHG/OSax were characterized by Stage 1 coarticulatory fronting of /x/ in the context after /i/. At Stage 2 (also OHG/OSax) that gradient phonetic process was phonologized. Put differently, at Stage 2 the difference between phonetically fronted /x/ in the context after /i/ and back /x/ in the context of vowels like /u/ at Stage 1 was exaggerated to the point where speakers perceived of the two articulations as different sounds: Palatal [ç] and velar [x]. The phonologization of velar fronting occurred sometime during the time frame discussed earlier in this chapter for OHG/OSax.

Stage 2 was characterized by the reinterpretation by the younger generation of the gradient coarticulatory fronting from Stage 1 of the older generation as

[9] Recall from §12.9.2 that several sources for UG varieties suggest that there is coarticulatory fronting of velars like /x/ in the context after /i/.

a categorical process relating two distinct articulations. Thus, the change from Stage 1 to Stage 2 was intergenerational.

Since velars and palatals did not contrast at Stage 2, those segments stood in an allophonic relationship: [ç] and [x] were associated with one phoneme (/x/), whose realization as palatal was expressed formally with a specific version of velar fronting. That rule spread the feature [coronal] from a high front vowel to a following /i/, thereby producing [ç]. Hence, phonologization (Stage 2) involved the addition of a phonological rule into the Phonology component depicted in Table 2.1. Once in the grammar that synchronic process remained active until it was modified in light of the various changes involving triggers and targets discussed below.

The change from Stage 1 to Stage 2 is depicted in Table 16.2. Stage 2 is given as Stage 2a because it was defined in terms of a narrow set of triggers, as described below. I give sample underlying and phonetic representations in the second column. Note that the underlying representations for Stage 1 are acquired without change by the following generations of speakers (Stage 2a).[10]

Table 16.2: Change from Stage 1 to Stage 2a

Stage	Underlying and phonetic representations	Triggers for velar fronting
1	/ix/ [ix], /ex/ [ex] /ɑx/ [ɑx]	No rule
2a	/ix/ [iç], /ex/ [ex] /ɑx/ [ɑx]	/i/

In the intergenerational, listener-based approach described in §2.5, Stage 1 and Stage 2a represent a speaker and a listener respectively. The former utters a word containing [ix] – where the fricative shows the effects of coarticulatory fronting ([x̟]), – but the listener acquiring the language misperceives that prevelar as palatal. The change from Stage 1 (speaker) to Stage 2a (listener) involves not only the emergence of a new pronunciation ([ç]), but also the interpretation of that new sound as a phonological unit. The listener does this by relating the new palatal ([ç]) with the other dorsal fricative ([x]) as allophones, whose distribution is expressed with the newly acquired rule of velar fronting.

[10] In the case studies discussed above a total of fourteen versions for postsonorant velar fronting are posited (Appendix D). The set of narrow triggers at Stage 2a in Table 16.2 therefore suggests that the correct version of velar fronting is Vel-Fr-6, discussed in §6.2.2. In the remainder of this section I continue to discuss the expansion of triggers in the rule generalization model in terms of segments (/i/, /e/ etc.), but these generalizations can easily be translated into one of the formal rules posited earlier.

As stressed throughout this book, velar fronting was phonologized in more than one place. A moment's reflection reveals that this scenario also implies a temporal dimension. Imagine the younger generation of speakers in a particular place (P_1) acquiring the rule of velar fronting at Stage 2a at a particular point in time (T_1). If phonologization happens in a different place (P_2), and if there is no contact between speakers of P_1 and P_2 because they are separated by hundreds of kilometers then it is unlikely that velar fronting in P_2 is also phonologized precisely at T_1. What this suggests is that the phonologization of velar fronting began in certain places during OHG/OSax but that the process of phonologization in other places (P_2, P_2 …) must have continued on into the future as well (e.g. MHG/MLG).

I describe now how rule generalization occurred with the rule of velar fronting as it was originally phonologized (Table 16.2).

When velar fronting made the jump from Stage 1 to Stage 2a it affected only a single velar segment (/x/), it was triggered by a narrow set of triggers (/i/), and the output was palatal ([ç]). What is more, velar fronting was phonologized as a progressive assimilation meaning that the trigger was to the immediate left of the target.

The gradual expansion of targets and triggers is depicted abstractly for targets and triggers in Figure 2.1. In Figure 16.1 I modify Figure 2.1 in order to show how the set of triggers expanded in time and space for velar fronting. The three Trigger Types depicted here were defined in Table 14.1. Recall from that table that there are a number of other stages which correspond to expanded sets of triggers. I focus here only on three stages indicated below, although the same principles hold for the additional stages.

In Figure 16.1 I compare three contexts for velar fronting, namely after all high front vowels (represented by /i/), after all nonlow front vowels (represented by /i/, /e/), and after all front vowels (represented by /i/, /e/, /æ/). Low front vowels (/æ æː/) were phonemicized by the onset of MHG/MLG (ca. 1050). Recall that many modern LG/HG dialects possess at least one low front vowel.

Consider first column A, which illustrates how velar fronting (Vel Fr) spread temporally: Phonologization occurred in a particular place (P_1) for the target (/x/) and the narrow trigger (/i/). Stage 2a is depicted with the white square. At some later point in time (Stage 2b), Vel Fr generalized in P_1 to include all high front and mid front vowels (/i/, /e/), which is depicted with the gray square. Next, Vel Fr was generalized in P_1 further at a later period in time (Stage 2c') by applying after all front vowels (/i/, /e/, /æ/). This point is illustrated with the black square.

The rule generalization model means that varieties of HG/LG where Vel Fr applies after all front vowels were preceded by a stage in which the triggers were

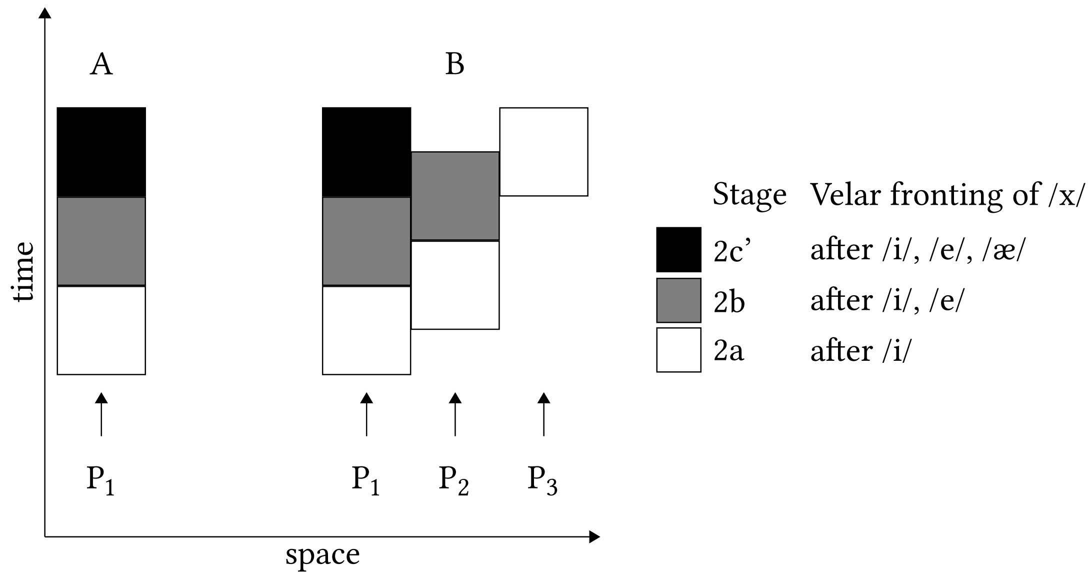


Figure 16.1: Rule generalization in time and space for velar fronting with three Trigger Types

nonlow front vowels, which was preceded by a stage when the triggers were the high front vowels. It is not possible to provide direct evidence for this type of temporal spread because it would require a description of a dialect spoken at a particular place (P) at a particular time (T) and another description of the same variety spoken in P at a time earlier or later than T. Although that type of direct evidence is lacking, there is indirect evidence for the progression of triggers as depicted in Figure 16.1. See in particular Chapter 13 and Map 13.3, which document places throughout Lower Bavaria which represent the three historical stages depicted in Figure 16.1.

According to the rule generalization model the addition of triggers and targets proceeds not only temporally (column A of Figure 16.1), but also in terms of space (column B). As shown under column B, Vel Fr was phonologized in P_1 for the target /x/ and the trigger /i/, defined as Stage 2a and depicted with a white square, and at a later point in time Vel Fr generalized its triggers to attain Stage 2b in P_1 (gray square). At some point when Vel Fr was active at Stage 2a in P_1, Vel Fr also spread geographically to P_2. When Vel Fr was phonologized in P_2 its triggers were defined narrowly as Stage 2a (white square). At the top of column B it can be seen that Vel Fr was generalized further in P_1 to attain Stage 2c' (black square) and that Vel Fr also spread temporally to P_2 by attaining the targets and/or triggers representing Stage 2b (gray square). At some point Vel Fr was then phonologized with the narrow set of triggers (white square) in a third place (P_3).

The gradual increase in the number of triggers meant that each stage resulted in a modification of the rule of velar fronting that was active for that synchronic stage. When a new stage was attained, the younger generation reanalyzed the earlier rule by generalizing the number of triggers. For example, speakers at Stage 2a had underlying and phonetic representations like the ones in Table 16.3 with a rule of velar fronting applying only after high front vowels. The younger generation (Stage 2b) inherited the same underlying generations, but then extended the rule so that it applied after all and only nonlow front vowels. The next generation (Stage 2c') consequently inherited the same underlying representations from Stage 2b, but then generalized the context of the rule (after all front vowels) and therefore the /x/ in sequences like /ix/, /ex/, /æx/ (but not the /x/ in /ɑx/) was realized as [ç].

Table 16.3: Change from Stage 2a to Stage 2b to Stage 2c'

Stage	Underlying and phonetic representations	Triggers for velar fronting
2a	/ix/ [iç], /ex/ [ex], /æx/ [æx], /ɑx/ [ɑx]	/i/
2b	/ix/ [iç], /ex/ [eç], /æx/ [æx], /ɑx/ [ɑx]	/i/, /e/
2c'	/ix/ [iç], /ex/ [eç], /æx/ [æç], /ɑx/ [ɑx]	/i/, /e/, /æ/

Each of the three stages in Table 16.3 represents a slightly different synchronic system. That point is expressed in the final column, which lists the triggers that need to be expressed formally in the synchronic rule of velar fronting for that stage. For example, the Stage 2a rule spreads [coronal] from a [+high] segment to /x/, but the next generation of speakers who expand the set of targets to the one for Stage 2b have a rule spreading [coronal] from a [−low] sound to /x/. The next generation of speakers then acquires a rule spreading [coronal] from all front vowels to /x/.

Figure 16.1 depicts the expansion of triggers for postsonorant velar fronting with /x/ as the sole target segment. Velar fronting also involved a gradual expansion of target segments. Thus, the first velar to serve as target was /x/, the second was /ɣ/, and the third was the set of noncontinuants (/k g ŋ/). Table 16.4 lists underlying and phonetic representations for sequences consisting of a high front vowel (/i/) followed by the fortis velar fricative (/x/), the corresponding lenis (/ɣ/) and the three velar noncontinuants (/k/, /g/, /ŋ/). It can be seen in the second column below that velar fronting is phonologized at Stage 2aa because that is the stage in which /x/ is the sole target segment. At Stage 2bb the target consists of all and only velar fricatives, and at Stage 2cc of all velar consonants.

Table 16.4: Change from Stage 2aa to Stage 2bb to Stage 2cc

Stage	Underlying and phonetic representations	Targets for velar fronting
2aa	/ix/ [iç], /iɣ/ [iɣ], /ik/ [ik], /ig/ [ig], /iŋ/ [iŋ]	/x/
2bb	/ix/ [iç], /iɣ/ [iʝ], /ik/ [ik], /ig/ [ig], /iŋ/ [iŋ]	/x/, /ɣ/
2cc	/ix/ [iç], /iɣ/ [iʝ], /ik/ [ic], /ig/ [iɟ], /iŋ/ [iɲ]	/x/, /ɣ/, /k/, /g/, /ŋ/

The set of target segments for the individual stages is expressed formally with features in the various versions of velar fronting. For example, for speakers representing Stage 2aa velar fronting spreads [coronal] to [+consonantal, −sonorant, +continuant, +fortis, dorsal], but the next generation extends the targets at Stage 2bb to [+consonantal, −sonorant, +continuant, dorsal] and then the later generation at Stage 2cc to [+consonantal, −sonorant, dorsal].

The spread from /x/ to additional target sounds as depicted in Table 16.4 proceeded temporally as well as spatially. Evidence for these three stages comes from HG/LG dialects: Many varieties are attested in which /x/ is the sole trigger, but a number of varieties are attested in the same general areas where the targets are broader (Map 12.4). The broadest set of targets (Stage 2cc) is attested in a small number of dialects spoken in the eastern areas of pre-1945 Germany (Map 11.2).

I have described how the rule generalization model can be applied to the triggers and targets for (postsonorant) velar fronting, but it needs to be stressed that the spread from a narrow to broad set of triggers (Table 16.3) and the spread from a narrow to a broad set of targets (Table 16.4) did not always match up. Put differently, when phonologization occurs, Stage 2a for triggers goes hand in hand with Stage 2aa for targets, but some dialects extend the set of triggers at a faster rate than the set of targets. This point accounts for the fact that many varieties of HG/LG are attested with the narrowest set of targets (/x/) but with the broadest set of triggers (coronal sonorants); see Chapter 12 for examples.

Earlier on in this chapter I discussed the connection between postsonorant velar fronting and word-initial velar fronting. The conclusion (§16.3) is that the former must have preceded the latter. Thus, the phonologization of velar fronting with /x/ as the target and front vowels like /i/ as the triggers and the gradual increase in the number of triggers occurred before word-initial velars succumbed to phonologization.

The word-initial velar which served as the target for velar fronting went through the same stages for triggers and targets as depicted above for postsonorant position. Table 16.5 illustrates the most common pattern for word-initial velar fronting: At Stage 1, WGmc ⁺/ɣ/ exhibited coarticulatory fronting in word-initial position before /i/. The younger generation of speakers interpreted that fronted velar (Stage 2aa) as a palatal ([ʝ]) and therefore a specific version of word-initial velar fronting was acquired by those speakers. Underlying and phonetic representations are given below. Recall from Table 16.4 that the target for Stage 2aa in postsonorant position is /x/; however, dialects displaying the pattern in Table 16.5 have no /x/ in word-initial position; hence, /ɣ/ is the only dorsal fricative in that context. At Stage 2cc the younger generation of speakers extends the set of targets to include velar stops as well; in the dialects referred to here /k/ is the only noncontinuant in word-initial position.

Table 16.5: Change from Stage 2aa to Stage 2bb to Stage 2cc (word-initial)

Stage	Underlying and phonetic representations	Targets for Velar fronting
1	/ɣi/ [ɣi], /ki/ [ki]	No targets
2aa	/ɣi/ [ʝi], /ki/ [ki]	/ɣ/
2bb	/ɣi/ [ʝi], /ki/ [ci]	/ɣ/, /k/

At Stage 2aa and 2bb the synchronic rule of word-initial velar fronting differs slightly in order to express the target segments. Thus, [coronal] spreads to [+consonantal, −sonorant, +continuant, dorsal] at Stage 2aa and to [+consonantal, −sonorant, dorsal] at Stage 2bb.

At Stage 2 the synchronic rule of velar fronting interacts transparently with synchronic and diachronic rules changing those targets and triggers. This means that velar fronting could be fed or bled by another rule (synchronically or diachronically); recall Figure 2.5. This transparent relationship holds during the expansion of targets and triggers as described above; see (5). The underlying and phonetic representations here do not depict specific words, but instead entire classes of words. /i/ represents high front vowels, /e/ mid front vowels, and /eɑ/ a diphthong ending in a back vowel.

(5)	a.		/iɣ/	/iɣ-ə/	/ix/	b.	/ix/	/ex/	>	/ix/	/eɑx/
		Fnl Fort	ix	-----	----		[iç]	[eç]		[iç]	[eɑx]
		Vel Fr	iç	-----	iç						
			[iç]	[iɣə]	[iç]						

(5a) illustrates the most common synchronic feeding relationship. In that type of system (e.g. Soest, §4.3), there are two phonemic velar fricatives (/x/, /ɣ/), but only the fortis fricative /x/ serves as a target for velar fronting; hence, the synchronic rule of velar fronting illustrates Stage 2aa for targets. As shown in (5a), Final Fortition (Fnl Fort) feeds velar fronting (Vel Fr). This example shows that the target for velar fronting could be either an underlying fortis velar fricative or a fortis velar fricative derived by Final Fortition. In this example regular morphophonemic alternations of the type [x]~[ɣ] imply that Final Fortition is synchronically active.

(5b) depicts a bleeding relationship. The two examples to the left of the wedge show that velar fronting is active as a synchronic rule at Stage 2. At a later point (to the right of the wedge) a sound change replaces a front vowel with a diphthong ending in a back vowel. Since there are no alternations between [e] and [eɑ] that change is diachronic, meaning that it restructures underlying representations. Significantly, after the change from /e/ to /eɑ/ the /x/ in /eɑx/ surfaces as velar [x] and not as palatal [ç] because the second part of the diphthong /eɑ/ is not a trigger for velar fronting. In this example the change from /e/ to /eɑ/ bleeds velar fronting. The historical bleeding relationship discussed here is well attested in many varieties of HG and LG.

16.6.3 Stage 3

The transparent relationship between velar fronting and other processes described above for Stage 2 can change into an opaque relationship. Stage 3 is the cover term for velar fronting when velar fronting is opaque. Two types of opacity are attested: (a) some velars surface unexpectedly as velars in the context of velar fronting (underapplication); or (b) some palatals deriving historically from velars occur unexpectedly in the back vowel context (overapplication).

As discussed in Chapters 5–11, underapplication and overapplication are each manifested in two ways. For underapplication, the two options are: (aa) velar fronting is counterfed synchronically by another process, or (ab) neutral vowels emerge. For overapplication the two historical paths are: (ba) the emergence of palatal quasi-phonemes, or (bb) the emergence of phonemic palatals that contrast with velars. In all four cases the change from Stage 2 to Stage 3 is intergenerational; hence, the older generation has velar fronting, which interacts transparently with other rules, and the younger generation acquires the opaque forms.

I consider the four scenarios described above in order:

(aa): In this system there is a synchronic rule (Rule X) that creates new target segments which can potentially undergo velar fronting. Since those new velars fail to undergo that process, velar fronting is counterfed by Rule

X. In the case studies exemplifying (aa) discussed in Chapter 5 both velar fronting and Rule X are active synchronically. In (6) I focus on a dialect in which Rule X is Final Fortition. Stage 3 is depicted to the right of the wedge in (6). That opaque system is the outgrowth of the transparent system in (5), repeated in (6) to the left of the wedge.

(6)

	Stage 2			>		Stage 3		
	/iɣ/	/iɣ-ə/	/ix/			/iɣ/	/iɣ-ə/	/ix/
Fnl Fort	ix	-----	----		Vel Fr	----	----	iç
Vel Fr	iç	-----	iç		Fnl Fort	ix	----	----
	[iç]	[iɣə]	[iç]			[ix]	[iɣə]	[iç]

Sequences like [ix] at Stage 3 illustrate underapplication opacity because Final Fortition counterfeeds velar fronting.

(ab): In this scenario a historical process (Rule Y) creates new front vowels which can potentially serve as triggers for velar fronting. Since those new front vowels fail to induce velar fronting, the latter process is counterfed historically by Rule Y. In the case studies discussed in Chapter 6 illustrating (ab), Rule Y is no longer active synchronically. Instead, it restructures underlying representations for a younger generation of speakers. The emergence of the neutral vowel /øix/ at Stage 3 is illustrated in (7). The non-neutral vowel /ei/ is included for comparison.

(7)

Stage 1		>	Stage 2		>	Stage 3	
/oux/	/eix/		/oux/	/eix/		/øix/	/eix/
[oux]	[eix]		[oux]	[eiç]		[øix]	[eiç]

The important point is that surface sequences like [øix] illustrate underapplication opacity. From the synchronic perspective, velar fronting at Stage 2 is inherited by Stage 3 speakers, but those speakers also acquire the unique representation for neutral vowels whereby the /i/ in /øi/ is no longer [coronal].

(ba): In this type of dialect a historical process (Rule Z) eliminates triggers for velar fronting, but that change fails to bleed velar fronting. An example of Rule Z is the change from a front vowel to schwa (/ə/) in an unstressed syllable (Vowel Reduction). In (8) I illustrate a system that is common (Chapter 7). At Stage 2 velar fronting is active in word-initial position.

When Vowel Reduction changes unstressed vowels – including crucially unstressed front vowels like /i/ – to /ə/ the palatal remains even though schwa would be expected to be preceded by [x]. Ellipsis in the first example at Stage 2 and Stage 3 means that there is a part of the word containing a stressed vowel.

(8)

	Stage 2:				Stage 3:	
/xi…/	/xe/	/xɑ/	>	/çə…/	/xe/	/xɑ/
[çi…]	[çe]	[xɑ]		[çə…]	[çe]	[xɑ]

In this type of example Vowel Reduction counterbleeds velar fronting. From the synchronic perspective speakers at Stage 3 acquire underlying representations like the ones to the right of the wedge. The phonetic palatal [ç] at Stage 3 is clearly an underlying palatal synchronically (/ç/) because its original trigger has been eliminated. That underlying palatal is a quasi-phoneme because [ç] and [x] never contrast in the context before schwa.

(bb): In this type of dialect there is a historical process (Rule Z) which eliminates triggers for velar fronting, but that change does not bleed velar fronting. An example of Rule Z attested in the dialects discussed in Chapter 9 is the replacement of a diphthong ending in a front vowel with a back monophthong (/ɑi/ > /ɑ/).

(9)

	Stage 2:				Stage 3:	
/ɑx/	/ix/	/ɑix/	>	/ɑx/	/ix/	/ɑç/
[ɑx]	[iç]	[ɑiç]		[ɑx]	[iç]	[ɑç]

Synchronically the younger generation of speakers acquires underlying representations like the ones to the right of the wedge. The palatal must be treated as an underlying sound (/ç/) because the earlier trigger is no longer present.

The two overapplication outcomes (ba and bb) do not imply that velar fronting is lost at Stage 3. First, in a dialect in which [x] and [ç] (< [x]) only contrast in the context of one or more back vowel, [ç] can be synchronically derived from /x/ in the context of front vowels. Second, there are still regular morphophonemic alternations triggered by Umlaut represented by StG [bɑx] 'stream' vs. [bɛçə] 'stream-PL'. Even though Umlaut alternations like [ɑ]~[ɛ] are irregular, if a stem has a front vowel alternant and if that front vowel is followed by a dorsal fricative which is a trigger for velar fronting then the dorsal fricative surfaces as palatal. This generalization is true for all dialects without exception. The transition from Stage 2 to Stage 3 in (9) therefore entails two changes. First, the original palatal allophone for the older generation is now a phonemic palatal for the younger generation. And second, velar fronting undergoes the change from an allophonic process (Stage 2) to a neutralization (Stage 3). Likewise in varieties with the palatal quasi-phoneme /ç/ the change from Stage 2 to Stage 3 involves a reinterpretation of velar fronting from an allophonic rule to a quasi-neutralization.

One of the parameters mentioned earlier (output of velar fronting) is not indicated in Figure 2.2. Recall from Chapter 10 that there are two different outcomes for a /x/ target: nonsibilant palatal [ç] and sibilant alveolopalatal [ɕ]. Alveolopalatalization involves two modifications to the Stage 2 system with the allophones [x] and [ç]. First, [ç] is realized for innovative speakers as the new allophone [ɕ] which is phonetically and phonologically distinct from postalveolar [ʃ] (/ʃ/). Second, [ɕ] and [ʃ] merge for the next generation to [ɕ], which is phonemic (/ɕ/) because it contrasts with [x] (/x/) in the context after a back vowel. That merger does not exhibit opacity because the new phoneme /ɕ/ in the context after a back vowel does not derive historically from a velar (but instead from the coronal [ʃ]). The three stages for alveolopalatalization are depicted in Table 16.6. Stage 2 is the same as Stage A.

Table 16.6: Alveolopalatalization

Stage	Underlying and phonetic representations
2 (=A)	/ix/ [iç], /ɑx/ [ɑx], /iʃ/ [iʃ], /ɑʃ/ [ɑʃ]
B	/ix/ [iɕ], /ɑx/ [ɑx], /iʃ/ [iʃ], /ɑʃ/ [ɑʃ]
C	/ix/ [iɕ], /ɑx/ [ɑx], /iɕ/ [iɕ], /ɑɕ/ [ɑɕ]

It is argued that alveolopalatalization ([ç ʃ] > [ɕ]) is not expressed in terms of phonological rules; hence the realization of /x/ as [ç] at Stage 2/Stage A is captured formally with the same rule of velar fronting as the realization of /x/ as [ɕ] at Stage B. That the output of velar fronting is realized first as a nonsibilant and then only later as a sibilant is expressed not in the phonology, but instead with rules of phonetic implementation.

16.7 Velar fronting and the actuation problem

One question not addressed above is why velar fronting failed to phonologize in other languages/dialects with /x/. Put differently: Why was velar fronting phonologized at one particular time (ca. twelve hundred years ago) and in one particular place (modern-day Germany) but not at another time or in another place? The question posed here is a very general one that not only pertains to velar fronting but to any type of change. Weinreich & Herzog (1968) call it the ACTUATION PROBLEM, which they phrase as follows (p. 102): "What features can account for the actuation of changes? Why do changes in a structural feature take place in a particular language at a particular time, but not in other languages with the same feature, or in the same language at other times?"[11]

Nine years before Weinrich, Labov and Herzog published their article, Lüdtke (1959) pondered the actuation problem with respect to velar fronting. In particular, he made a proposal for why velar fronting was phonologized in Germany and not in the Netherlands: Lüdke observed that German (=LG/CG) has a phonemic lenis /ʝ/, – in present terms, the etymological palatal – which served as a catalyst for the creation of fortis [ç] by velar fronting. The reason the fronting of velars after front vowels was not phonologized in the Netherlands is that Dutch has a palatal glide /j/ (< WGmc $^{+}$/j/), but no /ʝ/. Since there is no palatal fricative phoneme in the Dutch system (Gussenhoven 1992, Booij 1995, Verhoeven 2005) there was no precondition for the phonologization of velar fronting.

Lüdke's proposal is an attractive one, but it is not consistent with my claim that WGmc $^{+}$/ɣ/ underwent velar fronting to the palatal fricative allophone [ʝ] in word-initial position before Glide Hardening created the phoneme /ʝ/ from WGmc $^{+}$/j/ (§4.2). One might respond that my claim concerning the time frame for Glide Hardening is not correct. This may be the case; however, there is a deeper reason for why it is difficult to successfully account for the geography of velar fronting given the type of approach advocated by Lüdke. In particular, the truly difficult question is why that change failed to phonologize in the H(st)Almc and SBav regions of Switzerland and Austria (Tyrol). Those dialects are similar to Dutch in the sense that they possess the palatal glide /j/ (<WGmc $^{+}$/j/) and not the corresponding fricative. Assuming for the sake of argument that there is an independent reason for why velar fronting failed to phonologize in Switzerland and Austria (Tyrol), there remain two unresolved questions: (a) Why was velar fronting phonologized throughout UG (LAlmc, Swb, EFr, NBa, MBav) in

[11] For recent discussion of the actuation problem the reader is referred to Walkden (2017). See also Janda (2005: 401), who discusses briefly the actuation problem with respect to the fronting of velars before front vowels, i.e. Velar Palatalization as described in Appendix I.

South Germany and Austria?, and (b) why was velar fronting phonologized in a number of places (Chapter 15) independently from one another? The reason why these two questions are difficult to answer is that whatever structural feature one proposes for the non-velar fronting varieties of H(st)Almc and SBav, that same structural feature is most likely present in all of the places in (b) and in many of the places in (a).

17 Velar Fronting in Standard German

> Ihnen beiden verschiedenen Lauten des *ch* … weiss ich keine schicklicheren Namen zu geben, als wenn ich jenen den Achlaut, diesen aber den Ichlaut nenne.[1]
>
> Gottfried August Bürger (1798: 131)

17.1 Introduction

Previous chapters have scrutinized the status of velar fronting in a broad selection of regional varieties of German. The goal of the present chapter is to discuss the patterning of the ich-Laut and the ach-Laut in StG and to demonstrate that the distribution of those sounds reflects patterns encountered in previous chapters. §17.2 presents a representative selection of data and an analysis thereof, and §17.3 concludes by considering three of the research questions from §1.4.4 in light of the treatment of StG. §17.2 also includes a few brief remarks on the distribution of [ç] and [x] in the standard German language of Austria (StAG) and shows how StG differs from StAG.

17.2 Data and analysis

StG (de Boor et al. 1969, Krech 1982, Mangold 2005) has the phonemic front vowels /iː ɪ yː ʏ eː ɛ ɛː øː œ/, the phonemic back vowels /uː ʊ oː ɔ ɑː ɑ ə/, and the three phonemic diphthongs /ɑi ɔy ɑu/. The literature cited in §1.2 has focused almost exclusively on the data described below.

The two dorsal fricatives are [x] and [ç]. Lenis [ɣ] is not a surface sound, although there is a synchronically derived |ɣ| (from /g/), as in LRG (§5.3.1). There is no lenis palatal fricative ([ʝ]).[2]

[1]"I do not know a more fitting name to give the two different sounds of *ch* … than if I call the one the ach-Laut and the other the ich-Laut".

[2]A long-standing debate in the literature is whether or not the initial sound in words like *ja* 'yes' is a fricative ([ʝ]) or a glide ([j]). In contrast to many of the LG and CG varieties discussed in

The patterning of [x] and [ç] is expressed for postsonorant position in (1).[3]

(1) /x/ /ç/

[x] [ç]

The patterning of [ç] and [x] can be summarized as follows: (A) [ç] – but not [x] – surfaces after a front vowel but not after a phonemic back vowel, and [x] – but never [ç] – occurs after a phonemic back vowel but not after a front vowel, (B) [ç] surfaces after the two coronal sonorant consonants [n l], but [x] never does, (C) [ç] – but never [x] – occurs after the back vowel [ɐ] or after the dorsal consonant [ʀ], both of which derive from /ʀ/, and (D) [ç] – but never [x] – is the realization of *ch* in the diminutive suffix -*chen* regardless of the nature of the preceding sound. I demonstrate below that [ç] and [x] in (A)-(B) derive from /x/ by velar fronting, while the [ç] in (C)-(D) is an underlying palatal (/ç/). As discussed below, the contexts described in (C) and (D) involve (historical) overapplication opacity because [ç] (from an earlier velar) was historically preceded by a front ([coronal]) sound.

The items listed below exemplify generalization (A): [x] surfaces after phonemic back vowels in (2a and 3a) and [ç] after front vowels in (2b and 3b). The dorsal fricatives in (2) are in coda position, but the same sounds are in intervocalic position in (3). The data in (2) and (3) together therefore show that the syllable cannot be a factor in the distribution of [x] and [ç]. [x ç] in examples like the ones in (2) and (3) are the modern realizations of historical fortis velars (WGmc *[k x]).[4]

the present book, StG does not have alternations between [ɣ] and [ʝ] indicating that the latter sound patterns phonologically like a fricative. I treat the StG sound represented by *j* henceforth as the glide ([j]). See Wiese (1996b) and Hall (2007) for discussion and formal treatments.

[3]Neither of those sounds occur in word-initial position in the native lexicon. The basic generalizations concerning the patterning of word-initial [x] and [ç] in loanwords is unclear and is therefore not discussed in the present chapter. See Appendix G and Robinson (2001) for elaboration.

[4]There are several accidental gaps. For example, no native words are attested in which a dorsal fricative occurs after [e:], although [ç] surfaces after short [e] in the nonnative word *Mechanik* 'mechanics'. After [o:] and before a vowel, [x] is apparently only attested in the toponym *Bochum*. The only word to my knowledge with a dorsal fricative ([ç]) following [ø:] is the realization of the morpheme *hoch* 'high' with an umlauted stem vowel (i.e. [hø:ç-] in [hø:çst] 'extreme'). Finally, no dorsal fricatives occur after [ə].

(2) Postvocalic dorsal fricatives (from /x/) in the coda:

a.	[tuːx]	Tuch	‘towel’
	[bʊxt]	Bucht	‘bay’
	[hoːx]	hoch	‘high’
	[kɔx]	Koch	‘cook’
	[nɑːx]	nach	‘after’
	[bɑx]	Bach	‘stream’
	[bɑux]	Bauch	‘stomach’
b.	[ziːç]	siech	‘ailing’
	[lɪçt]	Licht	‘light’
	[gəʀʏçt]	Gerücht	‘rumor’
	[gəʃpʀɛːç]	Gespräch	‘conversation’
	[ʀɛçt]	recht	‘right’
	[høːçst]	höchst	‘extreme’
	[vœç.nə.ʀɪn]	Wöchnerin	‘woman in childbed’
	[ʀɑiç]	Reich	‘empire’
	[ɔyç]	euch	‘you-DAT/ACC.PL’

(3) Postvocalic dorsal fricatives (from /x/) before a vowel:

a.	[kuːxən]	Kuchen	‘cake’
	[bəɑnʃprʊxən]	beanspruchen	‘claim-INF’
	[knɔxən]	Knochen	‘bone’
	[ʃprʀɑːxə]	Sprache	‘language’
	[mɑxən]	machen	‘do-INF’
	[tɑuxən]	tauchen	‘dive-INF’
b.	[ʀiːçən]	riechen	‘smell-INF’
	[møːklɪçə]	mögliche	‘possible-INFL’
	[flyːçə]	Flüche	‘curse-PL’
	[kʏçə]	Küche	‘kitchen’
	[gəmɛːçɐ]	Gemächer	‘chamber-PL’
	[lœçɐ]	Löcher	‘hole-PL’
	[ɑiçə]	Eiche	‘oak tree’
	[kɔyçən]	keuchen	‘gasp-INF’

The distribution of [x] and [ç] as in (2) and (3) is also reflected in many morphophonemic alternations like the one in (4): [x] surfaces after a back vowel in the morphologically underived word (e.g. singular noun) and [ç] after the corresponding front vowel (via Umlaut) in the morphologically derived word (e.g. plural noun). As in (2) and (3), [x ç] in examples like these derived historically from WGmc *[k] or *[x].

(4) [x]~[ç] alternations (from /x/):

a.	[buːx]	Buch	‘book’
	[byːçɐ]	Bücher	‘book-PL’
b.	[lɔx]	Loch	‘hole’
	[lœçɐ]	Löcher	‘hole-PL’
c.	[bɑx]	Bach	‘stream’
	[bɛçə]	Bäche	‘stream-PL’

The data in (2–4) are captured by analyzing the dorsal fricatives as /x/, which surfaces as palatal after a front vowel by Velar Fronting-1:

(5) Velar Fronting-1:

$$\begin{array}{cc} [+\textsc{son}] & \begin{bmatrix} -\textsc{son} \\ +\textsc{cont} \end{bmatrix} \\ | & | \\ [\textsc{coronal}] & [\textsc{dorsal}] \end{array}$$

A second source for the surface (coda) palatal fricative [ç] can be seen in (6a, 6b). These words illustrate an alternation between [g] and [ç] after the vowel [ɪ]: The alternant with [ç] occurs in coda position and the one with [g] before a vowel. The [g]~[k] alternations in (6c) show that coda /g/ – like all other voiced obstruents – undergoes Final Fortition to [k] after any vowel other than [ɪ]. The [g]~[ç] alternations in (6a, 6b) are analyzed in the literature cited earlier with an underlying /g/ that spirantizes to [ɣ] in the coda after the vowel [ɪ] by g-Spirantization-2 in (7); cf. g-Spirantization-1, which applies in the context after all vowels (§4.2). Alternating [g] and [ç] in examples like the ones in (6) derived historically from WGmc *[ɣ].[5]

(6) [g]~[ç] alternations (from /g/):

a.	[køːnɪç]	König	‘king’
	[køːnɪgə]	Könige	‘king-PL’
b.	[leːdɪç]	ledig	‘single’
	[leːdɪgə]	ledige	‘single-INFL’

[5] According to Mangold (2005), the stem-final sound in words like the ones in (6a, 6b) is realized as [k] – and not as the expected [ç] – in the context after [ɪ] and before a morpheme containing [ç], e.g. *königlich* [køːnɪk.lɪç] ‘royal’. I do not discuss this type of example because it is not directly related to the topic of velar fronting.

c. [tɑk] Tag 'day'
[tɑigə] Tage 'day-PL'

(7) g-Spirantization-2:

$$\begin{bmatrix} -\text{SON} \\ -\text{CONT} \\ -\text{FORTIS} \\ \text{DORSAL} \end{bmatrix} \longrightarrow [+\text{cont}] \;/\; \text{ɪ} \_\_ \; C_0 \;]_\sigma$$

In examples like *König* and *ledig* in (6a, 6b) g-Spirantization-2 produces a derived coda |ɣ| which shifts to |x| via Final Fortition and then surfaces as [ç] by Velar Fronting-1. Hence, surface [ç] in StG can derive from /x/ in (2)-(4) or from /g/ in (6a, 6b). See Hall (1992: 228), Wiese (1996b: 207; 211–212), Robinson (2001), Ito & Mester (2002), and Glover (2011, 2014) for formal treatments of g-Spirantization-2 in StG.[6]

A potential drawback with g-Spirantization-2 involves [g]~[ç] alternations after the diphthong /ɑi/, e.g. [tɑik] 'dough' vs. [tɑigɪç] 'doughy'. If the second part of /ɑi/ is analyzed as /ɪ/ (e.g. Hall 1992, Wiese 1996b), then the incorrect prediction is made that the /g/ should surface as [ç] in coda position in words like [tɑik] (from /tɑɪg/). I argue that the /ɪ/ which serves as the vocalic trigger for g-Spirantization-2 is phonologically [−tense] because it contrasts with the [+tense] vowel /iː/. The second part of the diphthong /ɑi/ is not marked for tenseness because there is no contrast between a diphthong ending in [i] and one ending in [ɪ]. Given this treatment, the /g/ in a word like /tɑig/ is correctly predicted not to spirantize. The reader is referred to Noelliste (2017), who applies that type of treatment to the diphthongs of Ramsau am Dachstein, and to §13.5.1 for a discussion of the diphthongs in CBav varieties of Lower Bavaria.

The words in (8) exemplify the occurrence of [ç] after the two sonorant coronal consonants [l n]; recall generalization (B). The [ç] in examples like these is the modern realization of a historical fortis velar (WGmc *[k x]).

(8) Postconsonantal dorsal fricatives (from /x/):
a. [mœnç] Mönch 'monk'
b. [ɛlç] Elch 'moose'

Palatal [ç] in items like the ones in (8) is precisely what one would expect given that the set of triggers for Velar Fronting-1 consists of all coronal sonorants and

[6]Final Fortition counterbleeds g-Spirantization-2, otherwise the final segment a word like /køːnɪg/ would shift to |k| and bleed g-Spirantization-2. As in Altengamme (§4.2), the type of counterbleeding relationship between Final Fortition and spirantization described here does not involve opacity.

that /l n/ are both [coronal] and [+sonorant]. Hence, surface [ç] after /l n/ derives from /x/.

Palatal [ç] – but not velar [x] – surfaces after dorsal /ʀ/, which is realized optionally in the phonetic representation the consonant [ʀ] or as the vowel [ɐ]; recall generalization (C). Representative examples are presented in (9a). The same [ʀ]/[ɐ] variants occur after any short vowel and before an optional coda consonant; see (9b). After any long vowel, /ʀ/ surfaces as [ɐ]; see (9c). The literature in which data like these are discussed include Moulton (1962: 36), Hall (1993), Mangold (2005: 54), Wiese (1996b: 253ff.), and Glover (2014). The [ç] in words like the ones in (9a) derived historically from a fortis velar fricative (WGmc *[x] or *[xx]). The significance of the examples in (9a) is that they involve (historical) overapplication opacity because the palatal (from an earlier velar) surfaces after a back sound.

(9) [ʀ] and [ɐ] (from /ʀ/):

a.	[dʊʀç], [dʊɐç]	durch	‘through’
	[kɪʀ.çə], [kɪɐ.çə]	Kirche	‘church’
b.	[ɪʀt], [ɪɐt]	irrt	‘be mistaken-3sg’
	[ɪ.ʀən]	irren	‘be mistaken-inf’
c.	[tyːɐ]	Tür	‘door’
	[tyː.ʀən]	Türen	‘door-pl’

I analyze the sound underlying [ʀ]/[ɐ] in (9) as /ʀ/, which surfaces as [ɐ] by (10). I do not attempt to capture the optionality of that process after short vowels – a condition that accounts for the variant pronunciations in (9a, 9b). The target (/ʀ/) is [+consonantal, +sonorant, −nasal, dorsal], and the output ([ɐ]) is [−consonantal, +sonorant, −nasal, dorsal]; hence, r-Vocalization only changes [±consonantal]; see Hall (1992: 57, 1993), Wiese (1996b: 256), and Glover (2014).

(10) r-Vocalization:

$$\begin{bmatrix} \text{+CONS} \\ \text{+SON} \\ \text{−NASAL} \\ \text{DORSAL} \end{bmatrix} \longrightarrow [\text{−cons}] \;/\; \_\_\; C_0\;]_\sigma$$

Since the trigger Velar Fronting-1 in (5) bears the frontness feature ([coronal]), that process cannot apply after /ʀ/, which is [dorsal]. It is precisely for that reason that I analyze [ç] in the context after a rhotic as an underlying palatal (quasi-phoneme), e.g. /dʊʀç/ and /kɪʀçə/ for (9a). One might attempt to argue that /x/ can produce [ç] after /ʀ/ if the latter sound is analyzed phonologically as [coronal], but that treatment was considered and rejected for various regional dialects in §7.4.2. For further discussion see §17.3.1.

Recall from Chapter 7 that several varieties of German are attested in which the palatal quasi-phoneme occurs in the context of various back sounds, including the vocalized-r. It was demonstrated in that chapter that there was an earlier historical stage in which dorsal /ʀ/ was coronal (/r/), and that the earlier /r/ triggered the shift from /x/ to [ç] by velar fronting, which at that point was an allophonic rule. All surface palatals at that earlier stage were derived from /x/, but when the old front segment /r/ became back (/ʀ/) by r-Retraction (§3.4), the surface palatal was quasi-phonemicized in that one context. Given that development it is not surprising that StG has [ç] after a back (dorsal) sound because that back sound used to be front.

The StG words with the diminutive suffix *-chen* presented in (11) indicate that that the initial sound in that suffix consistently surfaces as [ç], regardless of whether or not it occurs after a stem ending in a back vowel in (11a), a front vowel in (11b), or a consonant in (11c). The initial fricative in that suffix is a historical velar (WGmc *[x]). The most significant example is the one (11a), since palatal [ç] otherwise never occurs after a front vowel; hence, example (11a) exemplifies (historical) overapplication opacity. The examples in (11) illustrate generalization (D) stated earlier.

(11) StG *-chen* (/-çən/):

a.	[tɑuçən]	Tauchen	'rope-DIM' (cf. [tau] Tau 'rope')
b.	[ɑiçən]	Eichen	'egg-DIM' (cf. [ɑi] Ei 'egg')
c.	[hʏntçən]	Hündchen	'dog-DIM' (cf. [hʊnt] Hund 'dog')

Note that there are examples of minimal pairs, e.g. [tɑuxən] 'dive-INF' (from 3b) vs. [tɑuçən] 'rope-DIM' (from 11a).

I follow Robinson (2001) in analyzing the initial segment of *-chen* as an underlying palatal (/ç/). Hence, a word like [tɑuçən] 'rope-DIM' is underlyingly /tɑu-çən/. The underlying palatal drives support on the basis of the history of the *-chen* suffix, as discussed below in §17.3.2.

The occurrence of [ç] after the vocalized-r in (9) and after back vowels in (11a) points to surface opacity in StG. By contrast, the distribution of [ç] and [x] in StAG is transparent (Hildenbrandt 2013, Moosmüller et al. 2015). In StAG [ç] surfaces after a front vowel and [x] after a back vowel, including the vocalized-r, e.g. [kiɐxɛ] 'church'. Since *-chen* does not occur in StAG, there are no words where [ç] surfaces after a back vowel. (I mention two additional differences between

StG and StAG here: First, in StAG there are no alternations between [g] and [ç], as in (6); cf. StAG [køːnɪk] 'king', [køːnɪgə] 'king-PL'. Second, [ç] is realized as [k] in StAG in word-initial position in loanwords, e.g. StAG [kemiː] 'chemistry'. See Appendix G for discussion).

17.3 Discussion

I consider three of the research questions posed earlier (§1.4.4) that have been discussed intensively in the literature on the synchronic phonology of German. The literature referred to here concerns itself primarily with StG, although the same questions are also relevant for many of the dialects investigated in preceding chapters. In §17.3.1, I consider and reject the proposal that the rhotic ([ʀ]/[ɐ]) is an articulation conducive to velar fronting. In §17.3.2 I defend the treatment proposed above with an underlying palatal in *-chen*. Finally, in §17.3.3 I discuss the question of whether or not the rule relating [ç] and [x] derives the palatal from the velar or the velar from the palatal and argue in favor of the former treatment.

17.3.1 /ʀ/ is not a phonetically natural environment for [ç]

In his discussion of the distribution of German [x] and [ç], Robinson (1992: 78–81) cites some of the phonetics literature – in particular Ulbrich (1972) – suggesting that surface vocalized-r ([ɐ]) is phonetically a front vowel. According to the material collected by Ulbrich, the [ɐ] in the context after a short vowel and before a palatal fricative (e.g. in a word like [dʊɐç] 'through' from 9a) is further forward than the [ɐ] in other contexts. Robinson's conclusion is that [ɐ] is a "phonetically natural environment for [ç]".

Since his (pan-dialectal) equivalent of Velar Fronting-1 spreads [coronal] from a sonorant sound to a following /x/, Robinson concludes that [ɐ] should therefore be analyzed phonologically as [coronal].[7] Robinson emphasizes that the occurrence of a palatal after [ɐ] is the expected realization of /x/. One could rephrase Robinson's position in the present framework by asserting that the occurrence of [ç] after [ɐ] is transparent, although Robinson eschews the latter term. In any case I reject his interpretation and argue instead that palatal [ç] after [ɐ] exemplifies opacity and not transparency. I therefore analyze the palatal in words like

[7] In fact, it is not entirely clear from the passage in Ulbrich that [ɐ] can be considered a front vowel from the point of view of phonetics. Robinson's translation of the passage in question is '[ɐ] tends…a great deal toward [ə] or [ɪ]', but [ə] is central and not front.

[dʊɐç] 'through' as an underlying palatal (quasi-phoneme) and not as a palatal derived from /x/. Two arguments can be levelled against Robinson's treatment, which I consider in turn.

First, there are German dialects with some version of velar fronting after front vowels, but /x/ surfaces in those dialects without change as [x] after [ɐ]. Data from two of those dialects (from §3.5 and §4.3 respectively) are repeated in (12). As discussed earlier, the realization of /x/ as [x] in examples like these is the expected (i.e. transparent) realization because the sound preceding /x/ is [dorsal] and not [coronal]. Recall from §2 that [x] surfaces after the vocalized-r in StAG as well.

(12) Velar [x] (from /x/) after [ɐ] (from /ʀ/) in Soest (a) and Ramsau am Dachstein (b):

a.	[bɛːɐx]	Berg	'mountain'
	[tvɛːɐx]	Zwerg	'dwarf'
b.	[ʃtɔɐx]	Storch	'stork'
	[kiɐxŋ]	Kirche	'church'

Robinson does not discuss dialects like the ones in (12). If [ɐ] were a front (i.e. [coronal]) vowel in StG (as per Robinson), then it is not clear how he would analyze the dialects in (12). One could speculate that the [ɐ] in that type of dialect is phonetically further back than the [ɐ] in StG (and perhaps phonologically [dorsal] as well), but this strategy stands in clear contrast to the implicit claim in Robinson (2001) that his treatment holds for all German dialects. In any case, I hold that the burden of proof lies on the shoulders of linguists who claim that there are dialects with a coronal [ɐ] and those with a dorsal [ɐ].

Second, and most important, it is not clear how Robinson's treatment actually works. According to his analysis, the [coronal] sound [ɐ] derives from /ʀ/, which is he analyzes as a singleton [dorsal]; see Robinson (2001: 113). His equivalent of Velar Fronting-1 spreads [coronal] from a sonorant to a following dorsal fricative, although he sees the target segment as [+high] and not [dorsal]. In any case, underlying /x/ correctly surfaces as the corono-dorsal fricative [ç] after a front vowel, as in my own treatment. However, Robinson never says how /ʀ/ changes from [dorsal] to [coronal] in words like [dʊɐç] 'through' and [kɪɐçə] 'church'. Since Robinson sees every instance of [ɐ] is [coronal] and not simply the [ɐ] before [ç], the change from [dorsal] to [coronal] needs to occur in a context-free fashion. One can speculate that the featural change described here is a part of r-Vocalization (which Robinson never formalizes), but if so, we have no explanation for why the vocalization of a consonant should also entail the change in place.

None of these problems hold for the present analysis. As noted above, Velar Fronting-1 correctly fails to affect the /x/ in examples like the ones in (12) and therefore surfaces without change as [x]. The dorsal fricative in StG examples like [dʊɐç] 'through' and [kɪɐçə] 'church' cannot be /x/, otherwise [x] would be the expected surface realization. The surface palatal fricative in examples like those is therefore an underlying palatal (quasi-phoneme). If it is true that [ɐ] is further forward before [ç] than in other contexts, then this is due to phonetic implementation and is not an articulation that a phonological analysis can or should account for. Put differently, the fronted [ɐ] in words like [dʊɐç] 'through' is a consequence of [ç] and not the other way around.

17.3.2 Status of *-chen*

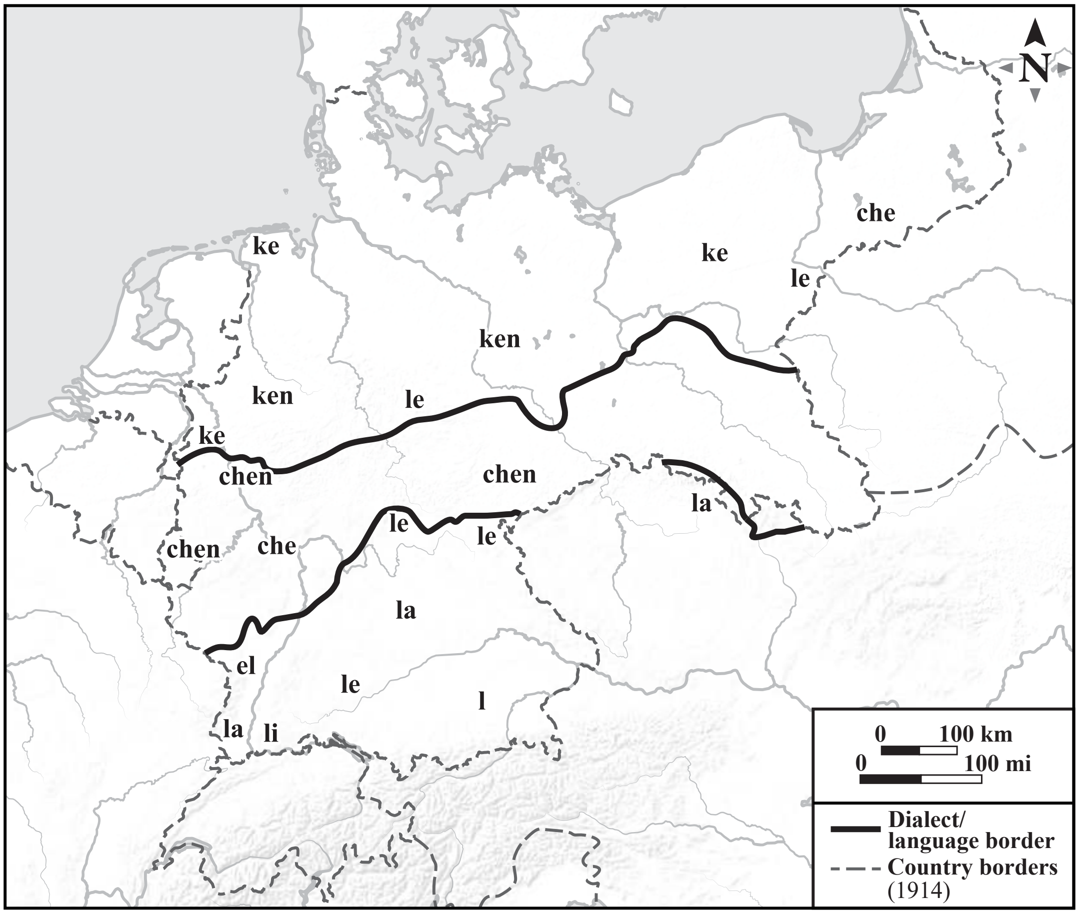
It was noted in chapter 1 that the analysis of [-çən] in words like [tauçən] 'rope-DIM' in (11a) is moot for most of the dialects discussed in the present book because those dialects do not have [-çən] or any variant of that suffix with [ç]. See also Robinson (2001: 64–70), who bases his remarks on the maps in Tiefenbach (1987). See Map 17.1.

For example, LG dialects have a [k]-initial diminutive that is some variant of [-kən], while UG varieties have an [l]-initial variant of [-lɑin], the latter of which also occurs in StG, e.g. *Kindlein* 'child-DIM'; cf. *Kind* 'child'. Not surprisingly, those patterns are reflected in the original sources cited earlier. For example, in the HstAlmc dialect of Visperterminen (§6.2), Wipf (1910: 168–172) discusses at length the following realizations of the diminutive in her dialect: [-i], [-li], [ji], [-tsi], [-tʃi] and [-ki], but no mention is made of a variant with [ç]. The same point holds for the Wph dialect of Soest (§4.3), where the diminutive appears to be consistently realized as [kn̩]; see Holthausen (1886).

These points aside, it is undeniably the case that [-çən] – or a similar variant with [ç] – occurs in many of the other dialects investigated in the preceding chapters, in particular CG dialects, on which StG is based. Some of the CG sources cited earlier list examples with *-chen*, while others do not. In (13) I give examples from three of the former dialects. In each item, *-chen* surfaces with [ç] even after stems ending in non-front segments:

(13) [-çən] after nonfront sounds in CG dialects:

a.	kœpçən	[kœpçən]	Tasse	'cup-DIM'	Hasenclever (1905: 86)
b.	kibχən	[kibçən]	Kuh, dim	'cow-DIM'	Hofmann (1926: 151)
c.	begχən	[begçən]	Bock, dim	'buck-DIM'	Schirmer (1932: 21)



Map 17.1: Diminutive suffixes in High and Low German. Adapted from Tiefenbach (1987).

The problem that has been discussed at length in the theoretical literature cited in §1.2 is how to account for the opaque palatal in *-chen* after a stem ending in a back vowel in StG (as in 11a), although the same issue holds for the realization of that suffix after nonfront segments in other varieties of German, as in (13).

As stated above, I hold that the initial segment in the diminutive suffix [-çən] in StG is an underlying palatal (/ç/). The same analysis can be applied to dialect data like the ones in (13). Since the target segment for velar fronting is by definition a velar that process cannot affect the /ç/ in /-çən/, which therefore surfaces as [çən] even after nonfront sounds. An analysis of the initial segment in [-çən] as an underlying velar /x/ with a separate rule applying only at the left edge of a morpheme is hardly credible for the simple reason that the rule required would only apply in a single morpheme.

The underlying palatal /ç/ in [-çən] is a direct consequence of the history of that suffix. The MHG reflex of [-çən] was *-ichen* (Seebold 2011: 171). The reader is also referred to the extensive discussion of the German diminutive suffixes in Schirmunski (1962: 475–488). Since the dorsal fricative represented by *ch* followed the front vowel *i*, it was realized as the palatal fricative [ç] at the point where velar fronting became phonologized (=Stage 2 in the historical model described in §2.5). When the initial vowel [i] in *-ichen* was elided, [ç] came to stand after any stem, even if that stem ended in a back vowel. At that point, the original allophone [ç] changed into /ç/, as indicated in (14). I give the underlying and phonetic representations for both historical stages. I include only the relevant features for /i/ and /x/, namely [coronal] and [dorsal]:

(14)

/i	x	ə	n/	>	/ç	ə	n/
[i	ç	ə	n]	>	[ç	ə	n]
[coronal]	[dorsal]				[coronal]	[dorsal]	

To the left of the wedge the dorsal fricative is underlyingly /x/, which surfaces as [ç] by some version of velar fronting. The result of that spreading operation is the creation of a synchronically derived complex segment which is [coronal] and [dorsal]. When the initial /i/ was elided the feature [coronal] was retained on the newly-created underlying segment /ç/.

17.3.3 Velar to palatal or palatal to velar?

An issue dealt with at length in the literature on StG phonology is whether or not the rule relating [ç] and [x] derives the former from the latter or the latter from the former (§1.2, §7.4.3). The same question can be posed with respect to the velars and palatals in the velar fronting dialects discussed in the present book. The two options referred to here are stated in (15), where (15a, 15b) apply in the post-sonorant context and (15c, 15d) word-initially. In (15), [x] and [ç] are understood to be representative for any type of velar and palatal respectively.[8]

(15)
a. /ç/ ⟶ [x] / …
b. /x/ ⟶ [ç] / …
c. /ç/ ⟶ [x] / $_{\mathrm{Wd}}$[…
d. /x/ ⟶ [ç] / $_{\mathrm{Wd}}$[…

[8]From the historical perspective, (15b, 15d) are uncontroversially correct, but the debate described below holds for the synchronic phonology. If (15a) and/or (15c) can be shown to be correct synchronically, then rule inversion must have taken place; recall Neuendorf (§8.5).

Compare, for example, the treatment proposed for StG above, which adopts (15b), with the one in (16) and (17), which presupposes (15a). Variants of (15a) for StG have been proposed in a number of the works cited earlier (e.g. Wurzel 1980, Meinhold & Stock 1982, Hall 1989).

(16) Underlying /ç/ in StG (rejected):

a.	/tuːç/	⟶	[tuːx]	'scarf'
b.	/lɪçt/	⟶	[lɪçt]	'light'
c.	/dʊʀç/	⟶	[dʊʀç], [dʊɐç]	'through'

(17) Hypothetical alternative to velar fronting (rejected):
/ç/ → [x] / {back vowels}__

The consequence of the treatment in (16) and (17) is that it must require a special provision for the occurrence of [ç] in the diminutive suffix [çən] after a back vowel; recall [tɑuçən] 'rope-DIM' from (11a).

The "velar to palatal" approach in (15b, 15d) was uncritically adopted for StG as well as the German dialects discussed in Chapters 3–15, but it is important to consider what the proposed treatment for those varieties might look like if velars were being derived from palatals, as in (15a, 15c). Although one variety was discussed earlier in which the "palatal to velar" change in word-initial position (=15c) is the only possible one (Neuendorf in §8.5), it is demonstrated below that in the overwhelming number of dialects – including StG – the "velar to palatal" analysis is correct.

There are three reasons why a rule changing a palatal to a velar either leads to treatments that are far less explanatory than ones with a velar changing to a palatal or does not even work on technical grounds. (The unique case of Neuendorf is discussed at the end of this section). For convenience, I refer henceforth to the "palatal to velar" treatment in (15a, 15c) as the Pa⟶Ve Analysis.

The first argument against the Pa⟶Ve Analysis pertains to the dialects discussed in Chapters 8–10 and many of the varieties in Chapter 11. Those dialects have in common that velars (e.g. [x], [ɣ]) and palatals (e.g. [ç], [ʝ]) contrast in the context of the same back sounds. As demonstrated in those chapters, velar fronting is still active synchronically as a rule neutralizing the palatal vs. velar contrast to palatal in the context of front segments. That type of dialect is important because the Pa⟶Ve Analysis does not even work technically. As a representative example, consider Schlebusch (§10.3.1): [x] occurs only after a back vowel, but [ɕ] surfaces after a front vowel, coronal sonorant consonant, or back vowel. On the basis of these generalizations it was demonstrated that velar fronting applies to /x/ in the context after a coronal sonorant. For example, /x/ surfaces as [ɕ] in [lø:ɕə] 'hole-PL' (from /lø:x-ə/), but /x/ is realized without change as [x] in [lɔx] 'hole' (from /lɔx/). It was noted in §10.3.1 that one does not even have the option of analyzing such data with an underlying /ɕ/ which surfaces as [x] after a back vowel, as in (15a). The reason is that there are many morphemes with nonalternating [ɕ] after a back vowel which would incorrectly undergo the rule, e.g. [vrɔɕ] 'frog (from /vrɔɕ/)' (cf. [vrøɕ] 'frog-PL' from /vrøɕ/).

In Table 17.1 I provide a list of dialects investigated in Chapters 8–11 in which the Pa⟶Ve Analysis does not work (as in Schlebusch) because velars and the corresponding palatals contrast in the neighborhood of the same back vowel. The examples in the final three rows refer to word-initial position, while the remaining ones refer to postsonorant position. The velars and palatals in question are listed in the final column. I do not attempt to list all of the dialects investigated in Chapters 8–11 involving word-initial [ʝ] and [ɣ]/[g] because that is an extremely common pattern.

Recall from Table 10.1 that there are many CG varieties like Schlebusch, Luxembourgish, Leipzig, Cologne, Frankfurt am Main/Montabaur that could be added to the Table 17.1.

The second reason for calling the Pa⟶Ve Analysis into question is that the alternative rules involved often require disjunctions in which one of the contexts is clearly ad hoc. As a representative example consider the distribution of word-initial [x] and [ç] in Soest (§4.3): Recall that [x] surfaces in that variety before back vowels or sonorant consonants and [ç] before front vowels. The correct rule therefore converts /x/ to palatal in word-initially before a front vowel. If /ç/ were taken as basic then the rule would create [x] in word-initial position before (a) back vowels or (b) sonorant consonants (/l n ʀ/). The problem is that context (b) is an arbitrary list of sounds that fails to express the assimilatory nature of the rule. In Table 17.2 I list some of the dialects investigated in Chapters 3–11 which, like Soest, require an awkward disjunction given the Pa⟶Ve Analysis. In the final column I list the arbitrary contexts that would be required if the velar is derived from the palatal.

A deeper generalization is expressed in Table 17.3, which lists four of the Trigger Types discussed in Chapter 12 and shows the connection between those Trigger Types and the kind of ad hoc contexts required. For example, the Pa⟶Ve Analysis for any dialect with Trigger Type A requires palatals to be realized as velar in the context of nonhigh front vowels or coronal sonorant consonants. The additional problematic Trigger Types and the corresponding disjunctions are listed in Table 17.3 as well.

The reader may recall that disjunctions were posited in several varieties discussed in the previous chapters; however, in contrast to the problematic ones in

Table 17.1: Pa→Ve Analysis not possible after a sonorant or word-initially

Place/Region	Section	Sounds
Wissenbach	§9.2	[ç] and [x]
Langenselbold	§9.2	
Weidenhausen	§9.2	
Ebsdorf	§9.2	
Atzenhain/Grünberg	§9.2	
Zell im Mümlingtal	§9.3	
Heppenhaim	§9.3	
Schlebusch	§10.3	[ɕ] and [x]
Luxembourgish	§10.3	
Leipzig	§10.3	
Cologne	§10.4	
Frankfurt am Main/Montabaur	§10.4	
Kreis Bütow	§11.5	[ɲ] and [ŋ]
Lauenburg	§11.5	[c] and [k]
Kreis Konitz	§11.5	[ç ɲ] and [k ŋ]
Reimerswalde	§11.7	[c ɟ] and [k g]
Many dialects	§8, §10, §11	[ʝ] and [ɣ]/[g]
Kreis Konitz	§11.5	[ç] and [k]
Reimerswalde	§11.7	[c ɟ] and [k g]

Tables 17.2 and 17.3, the disjunctions in the present analysis all involve assimilations. Consider as a representative example, the distribution of velars ([x] and [kx]) and palatals ([ç] and [kç] in Rheintal §3.4). In that section it was shown that the velars surface in the context of (a) nonlow front vowels, or (b) coronal sonorant consonants, captured formally with two versions of velar fronting (both assimilatory). By contrast, an alternative given the P→V Analysis requires the two contexts: (a) back vowels, or (b) nonlow front vowels, but the (b) context is ad hoc.

The third reason for rejecting the P→V Analysis is that in a number of dialects there is a [dorsal] segment serving as a target for velar fronting that is derived synchronically from a [dorsal] nontarget segment. The derived sound in question (|x|) can have more than one synchronic source, namely: (a) /ɣ/ (by Final

Table 17.2: Disjunctions with an ad hoc context assuming the Pa→Ve Analysis

Place/Region	Section	Ad hoc context
Rheintal Rhoden Kamnitz	§3.4 §5.2 §11.5	/ç/⟶[x] in context of low front vowels
Soest Dorste	§4.3 §4.4	/ç/⟶[x] word-initially before a sonorant consonant
Obersaxen	§6.3	/ç kç/⟶[x kk] in context of low front vowels and /ʏu/
Visperterminen	§6.2	/ç kç/⟶[x kk] in context of nonlow front vowels and neutral vowels
Kreis Rummelsburg	§11.5	/ç ʝ/⟶[x ɣ] after front lax vowels
Rauchenberg Rhöntal	§7.2	/ç/⟶[x] after any back vowel other than /ɑː/

Table 17.3: Connection between Trigger Type and ad hoc contexts necessary given the Pa→Ve Analysis

Trigger Type	Ad hoc disjunction
A	Nonhigh front vowel or coronal sonorant consonant
B	Nonlow front vowel or coronal sonorant consonant
C/AA	Nonlow front vowel
D/BB	Coronal sonorant consonant

Fortition), (b) /g/ (by some version of g-Spirantization and Final Fortition), or (c) /ʀ/ (by Laryngeal Assimilation-2 or Final Fortition). The problem for the Pa⟶Ve Analysis is that the type of dialect referred to here requires a rule fronting the derived velar |x| which would be required alongside the rule creating [x] from an underlying palatal; see Glover (2014), who makes the same point for StG. Consider Soest as a representative example. Alternations from that dialect between [ɣ] and [ç] in words like [stui.ɣə] 'climb-INF' vs. [stɪçst] 'climb-2SG' require an underlying velar /ɣ/ which surfaces as [ɣ] after a vowel in a word-internal onset (in [stui.ɣə] from /stuiɣ-ə/). That velar undergoes Final Fortition to |x| in coda position and then velar fronting to [ç] after a front vowel (in [stɪçst] from /stɪɣ-st/). If the Pa⟶Ve Analysis is adopted to capture the complementary distribution of [x] and [ç] not deriving from /ɣ/, e.g. [nɪçtə] 'niece' /nɪçtə/ and [lʊxt] 'air' /lʊçt/, then the rule backing /ç/ to [x] would be unable to front the derived |x| to [ç]. In Table 17.4 I list in the third column the three types of derived velars referred to above and a selection of some of the corresponding dialects from Chapters 3–5 in the first column. Note that Soest has Target Type L discussed in Chapter 12; hence, that one dialect is simply one representative example of a significantly larger set of dialects. Impressionistically many CG varieties not discussed in the present book have some version of g-spirantization; hence, the two examples Altengamme and LRG are simply two representative instances of a much larger sample of German dialects.

Table 17.4: Dialects with a derived velar (|x|) which undergoes fronting

Place/Region	Section	Source for derived velar
Soest	§4.3	|x| from /ɣ/
Altengamme	§4.2	|x| from /g/
LRG	§5.3	
Upper Austria	§3.6	
Erdmannsdorf	§5.3	|x| from /ʀ/
LRG	§5.3	

StG can be included in the list of dialects with |x| derived from /g/. Recall from (9) that there are examples involving [g]~[ç] alternations like [køːnɪç] 'king' vs. [køːnɪgə] 'king-PL'. That type of word requires that /g/ shift to the corresponding fricative (i.e. |ɣ| by g-Spirantization-2 and to |x| by Final Fortition), which then surfaces as [ç] by velar fronting.

There is a small set of dialects discussed earlier in which the relationship between velars ([x]) and palatals ([ç]) is potentially free from the three problems discussed above. In that type of system, velars and palatals fulfill the following three conditions: (a) they are in complementary distribution, (b) the palatals occur in the context of all front vowels (and not a subset thereof), and (c) there are no derived velars that undergo fronting to palatal. Potential examples are listed in Table 17.5. The dialects listed from Chapter 3 are Almc or CBav varieties attested in South Germany, Switzerland, and Austria and ones from Chapter 7 are Eph-speaking areas once spoken in North Germany. Consider Erdmannsweiler as a representative example. In that dialect [ç] surfaces after a front vowel or coronal sonorant consonant and [x] after a back vowel. The velar fronting treatment proposed in §3.2 could be replaced with a Pa→Ve Analysis given in the final column of Table 17.5. Note that this is only a potential example of a dialect in which a P→V Analysis works technically because the dialect does not possess low front vowels like [æ]. Since that vowel is not present in Erdmannsweiler one cannot know for sure if [ç] or [x] surfaces after that sound. If [ç] surfaced after [æ] then Erdmannsweiler would be a true example of a dialect in which the Pa→Ve Analysis works technically, but if [x] surfaced after [æ] then the Pa→Ve Analysis would require an ad hoc disjunction ("palatal shifts to velar after a low front vowel"). The same indeterminacy holds for Maienfeld, Ramsau am Dachstein, Reinhausen, and Schieder-Schwalenberg. By contrast, Elspe possesses [æ], before which [ç] occurs; hence, the facts from word-initial position in Elspe represent the only clear-cut case in which the Pa→Ve Analysis works technically. Additional examples of dialects like Elspe are ones in which (a–c) are fulfilled which (like Elspe) represent Trigger Type E.

The only example of a German dialect uncovered in the present book in which the relationship between velars and palatals actually requires a rule converting an underlying palatal to velar (as in 15a, 15c) is Neuendorf (§8.5). The correct rule for that dialect (Wd-Initial Palatal Retraction) is stated in prose form in the final column of Table 17.5. Recall from §8.5 that Wd-Initial Palatal Retraction in Neuendorf had a peculiar history: In particular, it was the product of rule inversion from a pre-Neuendorf system with velar fronting. That earlier fronting operation reverted to Wd-Initial Palatal Retraction by the elimination of one of the [coronal] triggers (r-Deletion). It was also mentioned in passing in that earlier chapter (§8.6) that it is notoriously difficult to find unambiguous examples of "palatal to velar" assimilations in any natural language. (In fact, I have found none). That kind of cross-linguistic evidence suggests that it would be misguided to propose a reanalysis of the velar fronting operations for the dialects in Table 17.4 as in the final column.

Table 17.5: Dialects in which the Pa⟶Ve Analysis is technically possible or required

Place/Region	Section	Alternative rule
Erdmannsweiler Maienfeld Ramsau am Dachstein	§3.2 §3.3 §3.5	/ç/⟶[x] after a back vowel
Elspe Reinhausen	§7.2	/ç/⟶[x] word-initially before a [dorsal] vowel
Schieder-Schwalenberg	§7.2	/ç/⟶[x] word-initially before a [dorsal] sonorant
Neuendorf	§8.5	/ç/⟶[x] word-initially before a [dorsal] vowel

In sum, the relationship between velars and palatals in the overwhelming number of German dialects investigated in this book require a rule fronting the velar to the palatal (and not the reverse). That generalization also holds for StG, which has a derived velar (|x|) like the dialects listed in Table 17.4. The only case in which a dialect actually requires a rule backing a palatal to a velar, that type of system emerged via rule inversion.

18 Summary and conclusion

I recapitulate here the status of velar fronting as a synchronic rule (§18.1, §18.2), provide a brief synopsis of that process from the historical perspective (§18.3), and then discuss the significance of my findings (§18.4). The chapter concludes with a series of questions I leave open for further research (§18.5).

18.1 Velar fronting viewed synchronically

Velar fronting differs structurally from dialect to dialect along three parameters: (a) segments undergoing the change (targets), (b) segments inducing the change (triggers), and (c) the nature of the fronted sound created (outputs). Targets consist of one or more velar sound ([k g kx x ɣ ŋ]) and triggers of some combination of coronal sonorants, i.e. front vowels or coronal sonorant consonants ([r l n]). Velar fronting can apply either in a word-initial onset or in postsonorant position.

The relationship between velars (e.g. [x]) and palatals (e.g. [ç]) is expressed with a rule converting the former into the latter (velar fronting) and not the reverse. Both contexts for that rule (word-initial and postsonorant) have a number of different versions depending on the nature of triggers and targets. All versions of velar fronting are regular in the sense that there are no lexical exceptions.

In the overwhelming number of dialects investigated, the front vowel triggers for velar fronting exhibit variation along the height dimension: In some varieties, the segments inducing fronting subsume only high front vowels, in others high and mid front vowels but not the low front vowels, and in yet others all front vowels, regardless of height. The fronting of velars can also be induced by a coronal sonorant consonant ([r l n]). In the most common velar fronting system – the default pattern – the triggers consist of all front vowels and all coronal sonorant consonants. In many areas, historical velars succumbed to velar fronting regardless of the nature of the adjacent sound; thus, velars surfaced as palatal even in the context of back vowels. It is probably not the case that nonassimilatory velar fronting remains active synchronically.

In many varieties, the set of target sounds for velar fronting subsumes all and only velar fricatives ([x] and [ɣ]), but in other systems the target consists solely of [x] but not [ɣ]. In yet another set of dialects, velar fronting affects not only [x] and [ɣ], but also velar stops and the velar nasal (velar noncontinuants). In dialects with the velar affricate [kx], that sound can also undergo fronting.

In the typical velar fronting system the target segments are realized as the corresponding palatals; hence, only place changes, while manner does not, i.e. [k g kx x ɣ ŋ] surface as [c ɟ kç ç ʝ ɲ] respectively. In the type of dialect referred to here, velar fronting alters a place feature only; in the formal model adopted that feature is [coronal], which spreads from a front ([coronal]) trigger to a velar ([dorsal]) target, thereby creating a complex corono-dorsal (palatal) segment. A common pattern for many varieties of CG is that the fortis fricative /x/ is realized in the front vowel context as the (sibilant) alveolopalatal fricative [ɕ]. Velar fronting in such alveolopalatalizing dialects only alters a place feature; hence, [coronal] spreads to a [dorsal] target, and sibilancy is assigned to that complex segment by rules of phonetic implementation.

An important theme discussed at length in the preceding chapters is the ways in which velar fronting interacts with synchronic and diachronic changes creating or eliminating structures which can potentially undergo or trigger it. In many dialects the relationship between velars (e.g. [x]) and the corresponding palatals (e.g. [ç]) is transparent because velars only occur in the back vowel context and palatals only when adjacent to front sounds. In that type of system, independent processes can either feed or bleed velar fronting. When velars and palatals have a transparent relationship they stand in complementary distribution and are classified as allophones.

A transparent relationship between velars and palatals does not obtain in other dialects. For example, in many varieties, both dorsal articulations occur in the context of front segments. Hence, in addition to expected sequences (e.g. [iç]), there are also unexpected ones (e.g. [ix]). In other systems velars and palatals both occur in the context of back segments; hence, expected sequences (e.g. [ɑx]) occur alongside unexpected ones (e.g. [ɑç]). Both types of system exemplify opacity: A sequence like [ix] in the first system and [ɑç] in the second one illustrate the underapplication and overapplication of velar fronting respectively.

Two types of underapplication have been identified: In one system velar fronting actively creates palatals (e.g. [ç]) from velars (e.g. /x/), and the opaque velar in the front vowel context (e.g. [x] in [ix]) is derived from an independent segment (/A/). In that dialect a sequence like [ɪx] (from /iA/) illustrates the underapplication because the rule creating [x] from /A/ counterfeeds velar fronting. In another type of system, velar fronting is active synchronically (e.g. /ix/ is realized as [iç] and /ɑx/ as [ɑx]), but [x] surfaces unexpectedly in the context of neutral vowels, i.e. front vowels that are phonetically front but which behave phonologically as nonfront (e.g. /øix/ is realized as [øix]). An important generalization is that such neutral vowels were historically back (e.g. [øi] < [ou]). Since [øi] is synchronically /øi/ and not /ou/, systems with neutral vowels do not involve a synchronic counterfeeding relationship between velar fronting and Vowel Fronting ([øi] /øi/ < [ou] /ou/). However, Vowel Fronting does exemplify the historical underapplication of velar fronting.

Two types of overapplication can be distinguished: In one, palatals (e.g. [ç]) occur in the context of front vowels and certain nonfront sounds ([Bk]) and velars (e.g. [x]) only in the context of nonfront sounds with the exception of [Bk]. Observe that palatals ([ç]) and velars ([x]) stand in complementary distribution. All instances of palatals ([ç]) in the context of front vowels derive from the corresponding velars, but opaque palatals ([ç]) in the context of [Bk] are underlying (/ç/) and not derived from velars. Underlying (opaque) palatals in like those are referred to in the present book as palatal quasi-phonemes. In another type of system, velars and palatals both contrast in the neighborhood of the same back sounds. In that type of dialect velars and palatals are both underlying sounds in the context of the same back vowels (e.g. /x/ and /ç/). Underlying palatals in that type of example are referred to throughout this book as phonemic palatals. In dialects where palatals and velars are both phonemic, velar fronting is still active synchronically in order to capture regular alternations between velars and palatals because palatals but never velars surface in the front vowel context.

18.2 Additional properties of velar fronting

Velar fronting is categorical and not gradient because it relates only two articulations – velar (back dorsal) and palatal (front dorsal) – and not multiple articulations, i.e. the fine-grained back dorsals and/or front dorsals observable in the phonetics. This interpretation of velar fronting accounts for the fact that the back dorsal fricative (e.g. [x]) and the front dorsal fricative (e.g. [ç]) can be perceived by native speakers and that there are established colloquial terms for those two categories (ach-Laut and ich-Laut). By contrast, the distinction between various articulations within the back dorsal or front dorsal category lie below the threshold of consciousness of the linguistically naïve speaker and hence no colloquial terms exist to characterize them. This assessment of velar fronting is true for StG, but it also derives support from most of the descriptive studies on German dialects cited above, whose authors decided to describe the distribution of two categories (velar and palatal) and ignore finer-grained distinctions.

In those dialects where data are available, velar fronting fails to apply in connected speech as a phrasal (postlexical) rule. The trigger and target for velar fronting (in both the word-internal and postsonorant context) therefore belong to the same word. It can also be said that the trigger and target belong to the same morpheme, although the formal rules of velar fronting posited above do not need to encode that fact into their structural description because there are no words where a target (e.g. /x/) and trigger are separated by a morpheme boundary.

In the vast majority of dialects under investigation the trigger and target for velar fronting are adjacent. In some dialects the trigger and target can be separated by an intermediate sound (Q). If Q is schwa (/ə/) then the velar after Q surfaces as palatal if the sound preceding Q is a front trigger (e.g. /iəx/⟶[iə̹ç] vs. /uəx/⟶[uəx]). It was shown that velar fronting is such cases is fed by a process creating a fronted ([coronal]) schwa ([ə̹]). In dialects where Q is a liquid (e.g. /ilx/⟶[ilç] vs. /ɑlx/⟶[ɑlx]) it was argued that velar fronting is fed by a process merging the frontness feature of the vowel with the frontness feature of the liquid.

One way in which rules of assimilation can vary cross-linguistically is in terms of direction: If the trigger is to the right of the target then spreading is right-to-left (regressive), but if the trigger is to the left of the target then spreading is left-to-right (progressive). If a velar target is situated between two sonorants (e.g. vowels) then spreading is always progressive. That generalization is true without exception; it holds for the native words which have been the object of investigation of the present book as well as nonnative words (Appendix G). Significantly, this is one way velar fronting in German dialects differs from Velar Palatalization because typological work has demonstrated that there are languages in which the latter process can be regressive and others in which it can be progressive.

18.3 Velar fronting viewed diachronically

At an early point in the history of Gmc – namely WGmc – velar fronting was absent (Stage 1). It is hypothesized that velars ([x]) at Stage 1 were subject to some coarticulatory (phonetic) fronting in the context of front vowels, especially high front vowels like [i]. Phonologization (Stage 2) occurred when the difference between velar [x] and the slightly fronted variant (prevelar) was exaggerated to the point where the latter was realized as palatal ([ç]), while the latter remained velar ([x]). At that point velar fronting became active as a synchronic process relating the two dorsal sounds. The target segment for velar fronting at that early stage was the fortis fricative [x] and the triggers were high front vowels like [i].

The newly phonologized rule of velar fronting diffused in terms of time and place to include a greater set of targets (Stage 2a > Stage 2n) and/or triggers (Stage 2aa > Stage 2n). Targets could expand to include not only fortis [x] but also lenis [ɣ], and then noncontinuants ([k g ŋ]). The set of triggers likewise increased to include high and mid front vowels, then all front vowels, and finally all coronal sonorants. In some regions velar fronting went one step further in applying as a nonassimilatory change in the context of front and back segments alike. Those historical stages are all preserved in dialects described in the modern era (late nineteenth century to the present). Of particular significance is Lower Bavaria, where over two hundred villages and towns represent three distinct historical stages.

A small number of dialects display a unique behavior suggesting that the historical paths described in the preceding paragraph need not be slavishly adhered to without exception. In particular, there are cases where velar fronting triggers are sensitive to tenseness (Kreis Rummelsburg), roundedness (Plettenberg, South Mecklenburg, Mitterdorf), and stress (Sörth). Although those places suggest idiosyncratic developments, it is significant that the peculiar sets of triggers comprise natural classes of sounds (e.g. front unrounded vowels, nonlow front tense vowels, high front unstressed vowels) and not arbitrary lists of segments.

The Stage 2 allophonic rule relating [x] and [ç] has undergone a change in many CG varieties whereby the palatal allophone [ç] developed into [ɕ]. Such alveolopalatalizing dialects were shown to require more than one stage. Evidence for those stages comes from modern CG dialects.

Variation in terms of space (regional dialects) directly reflects changes along the temporal dimension. That interpretation of time is applied in the present book to velar fronting. Hence, dialects with a more restricted set of triggers (e.g. only nonlow front vowels) preserve an earlier historical stage than dialects with the full set of triggers (all coronal sonorants), which represent a later stage. The same point holds for dialects with a small set of targets (e.g. /x/) vs. those with an expanded set (e.g. /x ɣ/).

The phonologization of velar fronting occurred independently at more than one place (polygenesis). The most conclusive evidence against a single point of origin (monogenesis) comes from the many velar fronting islands. Whether or not monogenesis of polygenesis was correct for velar fronting in areas where velar fronting is the norm (i.e. most of Germany) is a question that cannot be known.

The conclusion was drawn is that the WGmc language represented Stage 1; hence, velar fronting at that time was absent. The reason for this conclusion is that the linguistic evidence points to velar fronting in the earliest attested stages, namely OHG and OSax: Although velar fronting was not phonologized in a single place at a single point in time, it can be said that the change must have had at least one point of origin somewhere in an area corresponding to modern-day northwest Germany by the end of the ninth century. The reason for that time frame is that velar fronting predated the change from full vowel velar fronting triggers like [i] to schwa (Vowel Reduction), which was complete by the onset of MHG/MLG. Velar fronting was phonologized first in postsonorant position and the extension of that process to word-initial position came later. Evidence is strong that velar fronting is much older in CG (Rpn/MFr) dialects of OHG and is of a much more recent origin in LG (Wph) varieties of OSax.

When velar fronting was in the process of expanding through time and space to include a greater number of targets and triggers, velars ([x]) and palatals ([ç]) stood in a transparent (allophonic) relationship. Changes affecting the velar fronting target/trigger often interfered with the allophonic nature of velar fronting by producing opacity (Stage 3). For example, rules creating new velar targets (e.g. /ʀ/ > /x/) could exhibit underapplication if those new velars failed to undergo velar fronting. Likewise sound changes eliminating the front ([coronal]) trigger (e.g. /i/ > /ɑ/ or /r/ > /ʀ/) could lead to the historical overapplication of velar fronting. Overapplication occurred if the original front sound (e.g. /r/) once served as a trigger for velar fronting, but the original palatal allophone remained palatal even after the front trigger has been removed, e.g. /rx/ [rç] > /rç/ [rç]. The palatal fricative [ç] in the diminutive suffix *-chen* has a similar history: That [ç] was once preceded by a front vowel (cf. MHG *-ichen*), the loss of which led directly to the creation of the underlying palatal /ç/. That palatal is retained to the present day in those dialects with *-chen* [çən].

The emergence of palatal quasi-phonemes or phonemic palatals like /ç/ exemplifies what is referred to in the traditional literature on historical linguistics as a phonemic split, whereby the original trigger for a rule creating an allophone [A] from the phoneme /B/ causes the original allophone [A] to become the phoneme /A/.

Dialect-specific changes affecting the velar fronting target/trigger could interfere with the allophonic nature of velar fronting in other ways. In particular, the historically allophonic rule of velar fronting could undergo either rule loss or rule inversion. Rule loss is attested most clearly in the neighboring dialects of North Luxembourg (Nordösling), East Belgium (in and around Burg-Reuland), and West Central Germany (Lützkampen and Dahnen) with (alveolo)palatals (e.g. [ɕ]/[ç]) but no velars (e.g. [x]); hence, all historical velars in those places are realized as palatals. In that type of system the original rule of velar fronting was lost because earlier velars (e.g. /x/) were later restructured as phonemic palatals (e.g.

/ç/). Rule inversion is attested in a particular place (Neuendorf) where earlier palatal allophones ([ç] from /x/ in the context of front vowels) were restructured as underlying palatals and a rule retracting those sounds to velar ([x] from /ç/ in the context of back vowels). Rule inversion was shown to be a direct consequence of a sound change eliminating one of the earlier triggers for velar fronting.

18.4 Significance of the findings

The conclusions described in §18.1–§18.3 bear on several questions probed at length in the cross-linguistic research on phonology (diachronic and synchronic), language-specific research on German phonology, as well as typology.

The most significant contribution of the present work to linguistic scholarship is that it represents an in-depth investigation of the ways in which a single rule (velar fronting) can be phonologized in different dialects in different ways. It is my hope that the data in the Ortsgrammatiken and linguistic atlases which served as the basis for my treatment of velar fronting will inspire future linguists to conduct similar case studies on other types of changes.

The literature on historical German phonology has remained silent on the origin of the palatal allophone [ç] because earlier stages of German (and StG) spell [x] and [ç] the same way. The present book has demonstrated that it is possible to shed light on the origin of [ç] by putting aside orthography and by considering linguistic arguments.

This book sheds light on proposals made in the literature on the life cycle of a rule, e.g. Hyman (1976), Dressler (1976), Kiparsky (1995), Bermúdez-Otero (2007), Hyman (2013), Kiparsky (2015), Bermúdez-Otero (2015), Ramsammy (2015), Sen (2016), and Turton (2017). Although the works cited here (as well as those of scholars not mentioned) endorse a variety of different models, they generally agree that a purely phonetic (gradient) process becomes phonologized as an allophonic (categorical) rule whose effects later become opaque and then ultimately lost from the grammar entirely. That general trajectory is corroborated in the present cross-dialectal treatment of velar fronting, although there are various quirks in the German dialects investigated (referred to above) and commented on below.

The gradual increase in the number of targets/triggers when velar fronting was phonologized as an allophonic can be captured in the rule generalization model. That theory derives support from sound changes within and outside of Gmc, e.g. Davis et al. (1999), Bermúdez-Otero (2015). That the historical progression among triggers proceeds according to vowel height is corroborated in the present study, although some rare places suggest that the original high front vocalic trigger may have expanded along alternate dimensions (roundedness, tenseness, orality, stress). The tentative analysis of the way in which rule generalization occurred in those unique communities can be corroborated in the future if parallel cases in independent languages become known.

The present treatment sheds light on how an originally transparent change can develop opaque outputs. Although the change from a transparent system to an opaque one has been observed by a number of linguists cited earlier, the types of opaque systems attested in the present book are much more fine-grained than the commonly occurring ones discussed in the literature. Consider the following examples:

One case of underapplication opacity comes in the form of neutral vowels. Precedent for neutral vowels outside of Gmc comes from Inuit dialects spoken in Alaska described and analyzed by Dresher (2009). However, the models cited above for the life cycle of a rule appear not to recognize that type of change. To the best of my knowledge Dresher's work is not referred to in the literature on the life cycle of a rule.

Overapplication as attested in German dialects was shown to be more subtle than what is typically assumed in the literature on phonemic splits in historical linguistics. The reason is that palatal allophones of velars can develop into either palatal quasi-phonemes or phonemic palatals. Palatal quasi-phonemes are not defined the same way as the vocalic quasi-phonemes proposed by Kiparsky (2015). A significant difference between the two approaches is that palatal quasi-phonemes in the present treatment always emerge as a direct consequence of the elimination of a (velar fronting) trigger and not before that trigger is lost (as per Kiparsky). What is more, only in my approach is it possible for the original velar to revert back to an underlying velar after the loss of the conditioning environment. That change was shown to be attested in several LG varieties, e.g. Schieder-Schwalenberg.

The case of rule loss mentioned above demonstrates that the expulsion of velar fronting from the grammar is not necessarily preceded by a morphologized and/or lexicalized version of velar fronting, contrary to what is sometimes postulated for the life cycle of a rule (Hyman 2013).

The one case involving the change from a historical rule of velar fronting to a later rule of retraction (Wd-Initial Palatal Retraction in Neuendorf) involves a true case of rule inversion and therefore poses a challenge for the claim made in McCarthy (1991) that true rule inversion does not exist. The fact that the inverted rule of retraction is apparently unattested cross-linguistically lends yet additional support to the established claim that rule inversion can create crazy rules (e.g. Vennemann 1972, McCarthy 1991, Blevins 2004, Hall 2009b).

In terms of German phonology the present cross-dialectal study sheds light on how the distribution of [x] and [ç] in StG should best be analyzed. First, the two sounds are related by a rule fronting the velar to the palatal and not the reverse (contrary to many treatments proposed in the literature cited earlier, including my own). Second, the [ç] in the diminutive suffix *-chen* ([-çən]) and in the post-rhotic (/ʀ/) context are underlying palatals (/ç/). That synchronic treatment (which is corroborated by the history of [ç] in those two contexts) therefore accounts for the presence of [-çən] even after stems ending in a back vowel and [ç] after the vocalized (back) rhotic ([ɐ]). The occurrence of [ç] after [ɐ]/[ʀ] is not in any way natural, contrary to the assertion made by Robinson (2001). Finally, the investigation of German dialects undertaken in the previous chapters should put to rest Robinson's (2001) claim that velar fronting is a "low-level, phonetic rule" and his implicit claim that the rule is essentially the same in all German dialects.

The present study contributes to the literature on Velar Palatalization typology (e.g. Neeld 1973, Chen 1973, Bhat 1978, and especially Bateman 2007, 2011, 2007, Kochetov 2011, and Krämer & Urek 2016). That the front vowel triggers for velar fronting vary along the height dimension derives support from that literature. This book also corroborates the finding in the cross-linguistic studies referred to above that front vowel triggers for velar fronting only rarely refer to nonheight features. Another significant finding in the present study is that velar fronting can be triggered by front vowels and front (coronal) consonants. That finding does not appear to have support outside of German. The fricative targets for velar fronting in German dialects affect /x/ or /x ɣ/ but not /ɣ/ to the exclusion of /x/. That generalization is a corollary of similar claims made in the literature (e.g. Guion 1998, Hall & Hamann 2006 and Hall et al. 2006).

A typological oddity uncovered in the present study is the synchronic rule retracting an underlying palatal to velar in the back vowel context (Neuendorf), which represents one of the few known cases of "palatal to velar" assimilations. I am unaware of parallel examples outside of German.

18.5 Questions for future research

Any book of this magnitude will inevitably leave many questions open, and the present work is no exception. I describe below several general and specific topics touched on briefly in Chapters 2–17 that could be pursued in future research.

A number of open questions pertain specifically to phonological models. Some of those issues are described in (1–5). A question concerning phonetics is posed in (6).

(1) Structure of palatals: A complex place representation for palatals was adopted, according to which those segments are both [coronal] and [dorsal]. One could alternatively argue that palatals are simplex [coronal] or simplex [dorsal] segments (see §2.2.2 for references). No attempt was made in this book to compare and contrast the complex representation with simplex one. Whether or not there are significant differences among the various approaches is a question that needs to be determined.

(2) Structure of alveolopalatals: It was argued (Chapter 10) that alveolopalatal sounds like /ɕ/ have a structure that is identical to the corresponding palatals (/ç/) and that the difference between the two types of articulation involves rules of phonetic implementation. This approach is very different from the one proposed by authors who have looked at alveolopalatals in German (e.g. Herrgen 1986, Hall 2014a, Féry 2017) as well as the equivalent sounds in other languages (e.g. Rubach 1984 for Polish). It remains to be seen whether or not the phonetic implementation approach endorsed in Chapter 10 has more to offer than the ones cited above.

(3) Analysis of front vowels: A featural model was adopted in which front vowels are [coronal] and back vowels (including phonetically central vowels) are [dorsal]. That treatment can be contrasted with approaches (e.g. Chomsky & Halle 1968, Sagey 1986, Kostakis 2015). No attempt has been made in this book to compare the present treatment with those alternative ones, but this endeavor could be undertaken in the future.

(4) Adjacency: In the default case, the velar fronting target is adjacent to its trigger, but several patterns involving nonadjacency are well-attested in German dialects (§12.8.1). Much research in phonology has concerned itself with the topic of adjacency (e.g. Odden 1994); hence, one could consider how any of the patterns involving the nonadjacency of velar fronting targets and triggers fits into this overall research program.

(5) Opacity: This is a topic that has been discussed at length in theoretical phonology. A number of models have been proposed to account for various types of opacity, but those models have been shown to make different predictions. In particular, proponents of Optimality Theory have put forth a number of specific proposals concerning opaque rule interaction (see McCarthy 2002 for discussion). Since the present study has dealt with a num-

ber of cases involving both synchronic and diachronic opacity one could apply those formal models to the German data presented in this book.

(6) Non-velar fronting varieties: A number of places have been identified with velar sounds like [x] without a corresponding palatal. Little was said about that type of system, but it would be interesting to take a close look at the realization of those velars after all phonemic vowels and sonorant consonants in order to determine whether or not the degree of fronting in the coronal sonorant context in the phonetics matches the proposed steps for Stage 2 for the phonology. Is there a significant difference between non-velar fronting varieties, or do the same facts obtain in all of them?

Several open questions fit into the literature cited throughout this book on Velar Palatalization typology. Three such issues are described here:

(7) Palatal Retraction: The Eph variety once spoken in Neuendorf was shown to have regular alternations between [x] and [ç] requiring a synchronic rule converting the former (/ç/) into the latter ([x]) in word-initial position before back vowels (§8.5). That rule (Wd-Initial Palatal Retraction) was the product of rule inversion. A question for further research concerns languages with similar rules changing a palatal into a velar in the neighborhood of back sounds. As noted earlier, no examples are presently known to me, nor are such examples discussed in the Velar Palatalization literature. If such rules are attested were they the result of rule inversion or did they arise in some other way?

(8) Vocalic triggers for velar fronting: The triggers for the various versions of velar fronting are defined primarily in terms of vowel height. A few varieties were discussed in which the triggers are nonheight features, namely tenseness, rounding, and stress. A recent publication (Cardoso & Honeybone 2022) argues that vowel length is a factor in defining the set of triggers for velar fronting in Liverpool English. What is the entire range of parameters defining the set of triggers for velar fronting (Velar Palatalization) in the languages of the world?

(9) Adjacency: The dialects under investigation reveal various conditions on the type of segment that can intervene in nonadjacent velar fronting targets and triggers (§12.8.1). Are other languages attested with similar patterns, or is German unique?

The present work has left several questions unanswered concerning velar fronting in German dialects. The topic I find the most intriguing is stated here:

(10) Alveolopalatalization: This has been a change in progress primarily in CG from at least the late nineteenth century to the present day. It was proposed (Chapter 10) that there are two distinct stages, but a question for future work is whether or not this is the correct prediction for German varieties that are just starting to undergo alveolopalatalization. Does the phonologization of alveolopalatalization always involve those two stages, or are other stages attested?

Finally, the treatment of velar fronting begs several questions that in all likelihood have no answer. The three most intriguing questions in my view are the ones stated below. Recall that all three questions were mentioned briefly in previous chapters.

(11) Actuation Problem: Why was velar fronting phonologized in certain places (e.g. Germany) but not in others (e.g. most of German-speaking Switzerland and West Tirol)?

(12) Directionality: Why was velar fronting phonologized as a progressive spreading (and not as a regressive spreading) in all HG and LG varieties with that rule?

(13) Uniqueness: Velar fronting in the many varieties of HG and LG is a textbook case of assimilation, which can easily be expressed with phonological units. If this is the case, then why is it that the typological literature referred to earlier has not discovered a parallel case outside of German with the unique properties associated with velar fronting (e.g. target includes at least one velar fricative, triggers include coronal consonants, left-to-right spreading)?

Since I cannot offer answers to (11–13) I simply leave them open for the inquisitive reader to ponder.

Appendix A: Classification of High and Low German dialects

The classification of German dialects has been discussed at length in the literature on dialectology from the early nineteenth century up to the present day (e.g. Schmeller 1821, Götzinger 1836, Wenker 1877, Behaghel 1911, Reis 1912, Lenhardt 1916, Weise 1919, Sütterlin 1924, Mitzka 1943, Priebsch & Collinson 1958, Martin 1959, Schirmunski 1962, König 1978, Noble 1983, Wolf 1983, Schönfeld 1983, Wiesinger 1983b, Lameli 2013, Niebaum & Macha 2014, Herrgen & Schmidt 2019). There is consensus that dialects can be organized into two large categories, namely High German (HG) and Low German (LG). There is also agreement that the former can be split into two groups as well: Central German (CG) and Upper German (UG). The overall classification can therefore be depicted as in Figure A.1:

Low German (Niederdeutsch)

High German (Hochdeutsch)
- Central German (Mitteldeutsch)
- Upper German (Oberdeutsch)

Figure A.1: High German vs. Low German

The three broad groupings depicted above (LG, CG, UG) can be further subdivided. Thus, CG and LG can be seen as consisting of a western and an eastern half, i.e. West Central German (WCG), East Central German (ECG), West Low German (WLG), and East Low German (ELG). UG can likewise be broken down into three groups: Alemannic (Almc), Bavarian (Bav) and East Franconian (EFr). The dialect groups just described (WCG, ECG, WLG, ELG, Almc, Bav, EFr) can be further decomposed into more fine-grained categories, although the proposals in the literature differ slightly from author to author. See Figures A.2 and A.3 for the expanded list of the LG and HG dialects that I will be adopting and making reference to throughout this book. The names for the specific categories within LG and HG are the one from Wiesinger (1983b), although he eschews the two broad groupings WLG and ELG. The dialects listed in Figures A.2 and A.3 are indicated below on Map A.1.

Low German (Niederdeutsch):
- West Low German (Westniederdeutsch)
  - North Low German (Nordniederdeutsch)
  - Westphalian (Westfälisch)
  - Eastphalian (Ostfälisch)
- East Low German (Ostniederdeutsch)
  - Brandenburgish (Brandenburgisch)
  - Mecklenburgish-West Pomeranian (Meklenburgisch-Vorpommersch)
  - Central Pomeranian (Mittelpommersch)
  - East Pomeranian (Ostpommersch)
  - Low Prussian (Niederpreußisch)

Figure A.2: Branches of Low German

High German (Hochdeutsch):

- Central German (Mitteldeutsch):
  - West Central German (Westmitteldeutsch)
    - Low Franconian (Niederfränkisch)
    - Rhenish Franconian (Rheinfränkisch)
    - Central Franconian (Mittelfränkisch)
      - Moselle Franconian (Moselfränkisch)
      - Ripuarian (Ripuarisch)
    - Central Hessian (Zentralhessisch)
    - North Hessian (Nordhessisch)
    - East Hessian (Osthessisch)
  - East Central German (Ostmitteldeutsch)
    - Thuringian (Thüringisch)
    - Upper Saxon (Obersächsisch)
    - North Upper Saxon-South Markish (Nordobersächsisch-Südmärkisch)
    - Silesian (Schlesisch)
    - High Prussian (Hochpreußisch)
- Upper German (Oberdeutsch):
  - Alemannic (Alemannisch)
    - High Alemannic (Hochalemannisch)
    - Highest Alemannic (Höchstalemannisch)
    - Low Alemannic (Niederalemannisch)
    - Swabian (Schwäbisch)
  - Bavarian (Bairisch)
    - North Bavarian (Nordbairisch)
    - Central Bavarian (Mittelbairisch)
    - South Bavarian (Südbairisch)
  - East Franconian (Ostfränkisch)

Figure A.3: Branches of High German

Map A.1: Dialects of High German and Low German. Dialect boundaries from Wiesinger (1983b).

Appendix B: Historical map

Map B.1: The German Empire 1871–1918. Source: https://commons.wikimedia.org/w/index.php?curid=3387306 by ziegelbrenner (Own drawing/Source of Information: Putzger – *Historischer Weltatlas*, 89. Auflage, 1965)

Appendix C: List of German dialects investigated

All varieties of German discussed in this book are given below in a series of tables classified into the dialects introduced in Appendix A. The classification is consistent with the one in Wiesinger & Raffin (1982) and Wiesinger (1987) for those works which appeared in 1985 or before.

In the first column of the tables listed below I identify for each variety the place and/or region where it is (or was) spoken, in the second column I indicate where that place or region is (or was) situated in terms of administrative divisions, and in the final column I list the original source. For each table the dialects are listed in chronological order according to the reference given in the final column. Some of those sources focus on a very specific place (e.g. a particular village), while others describe a cluster of villages, a city, or a larger region which might be coterritorial with an administrative division (e.g. a particular county). On the other hand, some of the original sources only give a vague indication of where the variety is spoken (e.g. by referring to areas between rivers or mountain ranges). Administrative divisions differ from country to country. If the dialect is spoken in Germany then the country is not indicated in the second column, but the state (Bundesland), county (Kreis/Landeskreis), and/or government district (Regierungsbezirk) are provided. The countries referred to below are abbreviated as follows: Austria (AT), Belgium (BE), Canada (CAN), the Czech Republic (CZ), Estonia (ES), France (FR), Hungary (HU), Italy (IT), Latvia (LA), Liechtenstein (LI), Luxembourg (LX), Mexico (MEX), the Netherlands (NL), Poland (PO), Romania (RO), Russia (RUS), Slovakia (SLK), Slovenia (SL), Switzerland (CH), Ukraine (UKR), and the United States of America (USA). For those countries I only occasionally include the respective administrative divisions. For all dialects once spoken in the eastern provinces of pre-1945 Germany – East Pomeranian (EPo), Low Prussian (LPr), High Prussian (HPr), Silesian (Sil) – the original names of the province, county and city/town are provided. For all other dialects I list the current name of the respective county. The modern German states and pre-1945 provinces are abbreviated according to the final column of the first table.

Table C.1: Modern States (Bundesländer) of Germany and pre-1945 provinces (Provinzen) of the German Empire

State (German)	State (English)	Abbv.
Baden-Württemberg	Baden-Württemberg	BWb
Bayern	Bavaria	Bvr
Brandenburg	Brandenburg	Brbg
Bremen	Bremen	Brm
Hamburg	Hamburg	Hbg
Hessen	Hesse	Hss
Mecklenburg-Vorpommern	Mecklenburg-Vorpommern	MVpm
Niedersachsen	Lower Saxony	LSxn
Nordrhein-Westfalen	North Rhine-Westphalia	NRW
Rheinland-Pfalz	Rhineland-Palatinate	RnPl
Saarland	Saarland	Srd
Sachsen	Saxony	Sxn
Sachsen-Anhalt	Saxony-Anhalt	SxAn
Schleswig-Holstein	Schleswig-Holstein	SHst
Thüringen	Thuringia	Thra
Province (German)	**Province (English)**	**Abbv.**
Ostpommern	East Pomerania	EPmr
Ostpreußen	East Prussia	EPr
Posen	Posen	Pos
Schlesien	Silesia	Sil
Westpreußen	West Prussia	WPr

Table C.2: High(est) Alemannic

Place/Region	Administ. Division	Source
Kerenzen (Glarus Nord)	CH; Glarus	Winteler (1876)
St. Stephan	CH; Bern	Zahler (1901)
Hohenems	AT; Vorarlberg	Seemüller (1909a)
Lauterach, Nenzing	AT; Vorarlberg	Schneider & Marte (1910)

Place/Region	Administ. Division	Source
Urserental (area around Realp)	CH: Uri	Abegg (1910)
Kesswil	CH: Thurgau	Enderlin (1910)
Todtmoos-Schwarzenbach	BWb; Kreis Waldshut	Kaiser (1910)
Appenzell	CH; Appenzell Innerrhoden	Vetsch (1910)
Visperterminen	CH; Valais	Wipf (1910)
In and around St. Gallen	CH; St. Gallen	Hausknecht (1911)
Rheintal	CH; St. Gallen	Berger (1913)
Nufenen, Vals; Leissigen, Frutigen, Saanen	CH: Grisons; CH: Bern	Gröger (1914a,b,c,d,e)
Entlebuch	CH; Lucern	Schmid (1915)
Glarus	CH; Glarus	Streiff (1915)
Toggenburg	CH; St. Gallen	Wiget (1916)
Jaun	CH; Freiburg	Stucki (1917)
Obersaxen (Mundaun)	CH; Grisons	Brun (1918)
Bündner Herrschaft (Maienfeld, Fläsch, Malans, Jenins)	CH; Grisons	Meinherz (1920)
Berner Seeland (area around Biel)	CH; Bern	Baumgartner (1922)
Vandans	AT; Vorarlberg	Jutz (1922)
Zürcher Oberland	CH; Zürich	Weber (1923)
South Vorarlberg; LI	AT; Vorarlberg; LI	Jutz (1925)
Markgräflerland	BWb; Freiburg	Beck (1926)
Sensebezirk and the Southeast Seebezirk	CH; Freiburg	Henzen (1927)

Place/Region	Administ. Division	Source
Lötschental	CH; Valais	Henzen (1928, 1932)
Area around Schächental	CH; Uri	Clauss (1929)
Schanfigg	CH; Grisons	Kessler (1931)
Mutten	CH; Grisons	Hotzenköcherle (1934)
Schaffhausen	CH: Schaffhausen	Wanner (1941)
Upper Valais	CH: Valais	Rübel (1950)
Walensee-Seeztal	CH: Grisons, Glarus	Trüb (1951)
Brienz	CH: Bern	Susman Schulz (1951)
Bern	CH: Bern	Keller (1961)
Vorarlberger Rheintal (Dornbirn, Hohenems,Lustenau)	AT; Vorarlberg	Gabriel (1963)
Jestetten	BWb	Keller (1963)
Kreis Feldkirch	AT; Vorarlberg	Bethge & Bonnin (1969)
Bellwald	CH; Valais	Schmid (1969)
Brig-Gris	CH; Valais	Werlen (1977)
Area between Thun and Jura	CH; Bern	Marti (1985)
Bosco Gurin	CH; Tessin	Russ (2002)
Zürich	CH; Zürich	Fleischer & Schmid (2006)
Kleinwalsertal, Damülser Tal, Tal der Bregenzer Ache, Großes Walsertal, Laternsertal; Triesenberg	AT; Vorarlberg LI	VALTS
Upper Valais, Southwest Bernese Oberland, St. Antönien	CH; Valais, Bern, Grisons	SDS

Table C.3: Low Alemannic

Place/Region	Administ. Division	Source
Münsterthal	FR; Alsace	Mankel (1886)
Ottenheim (Schwanau)	BWb; Ortenaukreis	Heimburger (1887)
Basel	CH; Basel-Stadt	Heusler (1888)
Forbach	BWb; Landkreis Rastatt	Heilig (1897)
Colmar	FR; Alsace	Henry (1900)
Oberschopfheim (Friesenheim)	BWb; Ortenaukreis	Schwend (1900)
St. Georgen	BWb; Schwarzwald-Baar-Kreis	Ehret (1911)
Rheinbischofsheim (Rheinau)	BWb; Ortenaukreis	Weik (1913)
Oberweier (Bühl)	BWb; Landkreis Rastatt	Wasmer (1915, 1916a,b)
Area between Renchtal and Schuttertal	BWb; Ortenaukreis	Kilian (1935)
Freiburg im Breisgau	BWb	Eckerle (1936)
Northwest Switzerland	CH; Basel-Stadt	Schläpfer (1956)
Barr	FR; Alsace	Keller (1961)
Blaesheim	FR; Alsace	Philipp (1965)
Mulhouse	FR; Alsace	Bethge & Bonnin (1969)
Metzeral	FR; Alsace	Zeidler (1978)
Mittelbaden (large area between Baden-Baden and Lahr)	BWb	Schrambke (1981)
Breisgau	BWb	Klausmann (1985a,b)
Colmar	FR; Alsace	Klausmann (1985a,b)
Benfeld	FR; Alsace	Rünneburger (1985)

Place/Region	Administ. Division	Source
Urach (Vöhrenbach), Titisee-Neustadt	BWb; Schwarzwald-Baar-Kreis, Landkreis Breisgau-Hochschwarzwald	E.M. Hall (1991a,b)
Mortzwiller, Oberhergheim, Thanvillé, Weiterswiller, Lembach	FR	ALA

Table C.4: Swabian

Place/Region	Administ. Division	Source
Horb am Neckar	BWb; Landkreis Freudenstadt	Kauffmann (1887, 1890)
Reutlingen	BWb; Landkreis Reutlingen	Wagner (1889)
Münsingen	BWb; Landkreis Reutlingen	Bopp (1890)
Villingen-Schwenningen	BWb; Schwarzwald-Baar-Kreis	Haag (1898)
Ries	Bvr: Swabia	Schmidt (1898)
Mühlingen	BWb; Landkreis Konstanz	Müller (1911)
Liggersdorf (Hohenfels)	BWb; Landkreis Konstanz	Dreher (1919)
Pforzheim	BWb; Pforzheim	Sexauer (1927)
Blaubeuren	BWb; Alb-Donau-Kreis	Strohmaier (1930)
Area around Herrenberg	BWb; Landkreis Böblingen	Zinser (1933)

Place/Region	Administ. Division	Source
Staudengebiet (southwest of Augsburg)	Bvr: Swabia	Moser (1936)
Dreistammesecke	Bvr: Swabia	Nübling (1938)
Area around Bavendorf (Ravensburg)	BWb; Landkreis Ravensburg	Schöller (1939)
Beuren	BWb; Landkreis Wangen	Bausinger & Ruoff (1959)
Erdmannsweiler; Neckar- und Donaugebiet	BWb; Schwarzwald-Baar-Kreis	Besch (1961)
Freudenstadt	BWb; Landkreis Freudenstadt	Baur (1967)
Memmingen	Bvr; Swabia	Hufnagl (1967)
Kreis Balingen	BWb	Bethge & Bonnin (1969)
Graben	Bvr; Landkreis Augsburg	König (1970)
Large area between Augsburg and Donauwörth	Bvr; Landkreis Augsburg, Landkreis Donau-Ries	Ibrom (1971)
Stuttgart	BWb; Stuttgart	Frey (1975)
Tuningen, Donaueschingen	BWb; Schwarzwald-Baar-Kreis	E.M. Hall (1991a,b)
Ebersbach (near Kaufbeuren)	Bvr; Swabia	SBS
Büßlingen (Tengen), Überlingen, Wangen	BWb; Landkreis Konstanz; Bodenseekreis; Landkreis Ravensburg	SSA

Place/Region	Administ. Division	Source
Gerstetten, Sontheim an der Brenz, Rudersberg	BWb; Landkreis Heidenheim; Rems-Murr-Kreis	SNBW
Wangen im Allgäu (Wangen im Allgäu)	BWb; Landkreis Ravensburg	VALTS

Table C.5: South Bavarian

Place/Region	Administ. Division	Source
Imst	AT; Tyrol	Schatz (1897)
Tyrol	AT; Tyrol	Schatz (1903)
Silltal	AT; Tyrol	Egger (1909)
Samnaun	CH; Grisons	Gröger (1924)
Area around Meran (Naturns, Passeiertal)	IT; South Tyrol	Insam (1936)
St. Ruprecht bei Villach	AT; Carinthia	Kurath (1965)
Imst	AT; Tyrol	Hathaway (1979)
Graz, Innsbruck	AT; Styria, Tyrol	Moosmüller (1991)
Garmisch-Partenkirchen	Bvr; Upper Bavaria	Stein-Meintker (2000)
Laurein	IT; South Tyrol	Kollmann (2007)
Zillertal; Tauferer Tal, Ultental, Eisacktal	AT; Tyrol IT; South Tyrol	TSA
Ötztal; Passeiertal	AT; Tyrol IT; South Tyrol	VALTS

Table C.6: Central Bavarian

Place/Region	Administ. Division	Source
Vienna	AT	Gartner (1900)
Rot-Tal	Bvr; Lower Bavaria	Schwäbl (1903)
Loosdorf	AT; Lower Austria	Seemüller (1908a)
St. Georgen an der Gusen	AT; Upper Austria (Mühlviertel)	Seemüller (1909d)
Pilgersham	AT; Upper Austria (Innkreis)	Seemüller (1909c)
Marchfeld	AT; Upper Austria	Pfalz (1911)
Neckenmarkt	AT; Burgenland	Bíró (1918)
Upper Austria	AT; Upper Austria	Haasbauer (1924)
Hausruckviertel	AT; Upper Austria	Mindl (1924/1925)
Böhmerwald (broad area to the northeast of Passau)	Bav, CZ	Kubitschek (1926)
Freutsmoos	Bvr; Upper Bavaria	Kufner (1957)
Munich	Bvr	Kufner (1957)
Broad area ca. 80km southeast of Munich and 40km northwest of Salzburg	Bvr	Kufner (1960)
Linz and Gmünden	AT	Keller (1961)
Area between Isar and Inn rivers and Austrian border (Kiefersfelden, Isarwinkel)	Bvr; Upper Bavaria	Maier (1965)
Munich	Bvr	Bethge & Bonnin (1969)
Großberghofen (Erdweg)	Bvr; Upper Bavaria	Gladiator (1971)
Large area between Augsburg and Aichach	Bvr; Swabia	Ibrom (1971)

Place/Region	Administ. Division	Source
Area in western Hungary at the confluence of the Danube and Raab Rivers	HU	Manherz (1977)
Hallertau	Bvr; Upper Bavaria, Lower Bavaria	Zehetner (1978)
Vienna	AT	Moosmüller (1987)
Salzburg, and Vienna	AT	Moosmüller (1991)
Ramsau am Dachstein	AT; Styria	Noelliste (2017)
Grafrath, Weilheim	Bvr; Upper Bavaria	SBS
Many place in Lower Bavaria	Bvr; Lower Bavaria	SNiB

Table C.7: North Bavarian

Place/Region	Administ. Division	Source
West Bohemia	Bvr, CZ	Gradl (1895)
Nürnberg	Bvr; Central Franconia	Gebhardt (1907)
Egerland	Bvr, CZ	Eichhorn (1908)
Eisendorf	CZ	Seemüller (1908c)
Untereichenbach (Schwabach)	Bvr; Central Franconia	Hain (1936)
Asch (Westsudetenland)	CZ	Gütter (1962a)
Schönbach (Westsudetenland)	CZ	Gütter (1962b)
Lauterbach (Westsudetenland)	CZ	Gütter (1963b)
Graslitz (Westsudetenland)	CZ	Gütter (1963a)
Bergstetten (Laaber)	Bvr; Upper Palatinate	Dozauer (1967)

Place/Region	Administ. Division	Source
Rezat-Altmühl (area to southwest of Nürnberg)	Bvr; Central Franconia	Schödel (1967)
Kreis Wunsiedel; Kreis Schwabach	Bvr; Upper Franconia; Central Franconia	Bethge & Bonnin (1969)
Windischeschenbach	Bvr; Upper Palatinate	Denz (1977)
Kallmünz	Bvr; Upper Palatinate	Götz (1987)
Eslarn	Bvr; Upper Palatinate	Bachmann (2000)
Raitenbuch, Dettenheim (Weissenburg), Mörnsheim	Bvr; Central Franconia, Upper Bavaria	SBS
Heuberg (Hilpoltstein), Ebenried (Allersberg)	Bvr; Central Franconia	SMF
Zinzenzell, Herrnsaal (Kehlheim), Atting	Bvr; Lowr Bavaria	SNiB
Miltach	Bvr; Upper Palatinate	SNOB

Table C.8: South Bavarian island

Place/Region	Administ. Division	Source
Erdmannsdorf/Zillertal	Sil; Kreis Hirschberg/AT; Tyrol	Siebs (1906)

Table C.9: East Franconian

Place/Region	Administ. Division	Source
Schöneck	Sxn; Vogtlandkreis	Hedrich (1891)
Pfersdorf (Hildburghausen)	Thra; Landkreis Hildburghausen	Hertel & Hertel (1902)
Heilbronn	BWb	Braun (1906)
Wachbach (Bad-Mergentheim)	BWb; Main-Tauber-Kreis	Dietzel (1908)
Vogtland (Trieb)	Sxn; Vogtlandkreis	Gerbet (1908)
Klein-Allmerspann (Gerabronn)	BWb; Landkreis Schwäbisch Hall	Blumenstock (1911)
Bamberg	Bvr	Batz (1911)
Rot-Tal (area to the south of Schwäbisch Hall)	BWb; Landkreis Schwäbisch Hall	Knupfer (1912)
Frankenland (Königheim, Steinbach bei Wertheim, Höpfingen)	BWb; Main-Tauber-Kreis, Neckar-Odenwald-Kreis	Heilig (1912)
Bonnland	Bvr; Lower Franconia	M. Schmidt (1912b)
Kleinschmalkalden (Floh-Seligenthal)	Thra; Landkreis Schmalkalden-Meiningen	Dellit (1913)
Schmalkalden	Thra; Landkreis Schmalkalden-Meiningen	Kaupert (1914)
Gaisbach	BWb; Hohenlohekreis	Sander (1916)
Fichtelgebirge (area between Bayreuth and Plauen)	Bvr, Sxn	Meinel (1932)

Place/Region	Administ. Division	Source
Schefflenz	BWb; Neckar-Odenwaldkreis	Roedder (1936)
Frankenwald	Bvr; Upper Franconia	Werner (1961)
Suhl	Thra	Kober (1962)
Waldau (Schleusingen)	Thra; Landkreis Hildburghausen	Bock (1965)
East Franconia (area north of Bayreuth)	Bvr	Steger (1968)
Spessart	Bvr	Hirsch (1971)
West Central Franconia	Bvr	Diegritz (1971)
Obermainraum (area between Bamberg and Bayreuth)	Bvr; Upper Franconia	Trukenbrod (1973)
In and around Heilbronn	BWb	Jakob (1985)
Weingarts (Kunreuth)	Bvr; Upper Franconia	Schnabel (2000)

Table C.10: East Hessian

Place/Region	Administ. Division	Source
Bad Salzungen	Thra; Wartburgkreis	Hertel (1888)
Bad Hersfeld	Hss; Landkreis Hersfeld-Rotenburg	Salzmann (1888)
Rhöntal (Eichenzell, Dipperz, Margretenhaun)	Hss, Bvr	Glöckner (1913)
Fulda	Hss; Landkreis Fulda	Noack (1938)

Place/Region	Administ. Division	Source
Broad area in and around Bad Hersfeld	Hss; Landkreis Hersfeld-Rotenburg	Martin (1957)
Hintersteinau	Hss; Main-Kinzig-Kreis	Müller (1958a)
Werra-Fuldaraum (area in and around Hünfeld)	Hss	Weber (1959)
Schlitzerland (Area around Schlitz)	Hss; Vogelbergkreis	Krafft (1969)
Fuldaer Land (Kreis Fulda, Kreis Hünfeld)	Hss	Wegera (1977)
Bad Salzschlirf	Hss; Landkreis Fulda	Post (1985)
Petersberg (Fulda)	Hss; Landkreis Fulda	Schwarz (1992)
Area in and around Fulda	Hss; Landkreis Fulda	Dingeldein (1995)

Table C.11: Central Hessian

Place/Region	Administ. Division	Source
Naunheim (Wetzlar)	Hss; Lahn-Dill-Kreis	Leidolf (1891)
Großen-Buseck bei Gießen	Hss; Landkreis Gießen	Wagner & Horn (1900)
Atzenhain (Mücke), Grünberg	Hss; Vogelsbergkreis, Landkreis Gießen	Knauss (1906)
Schlierbach (Bad Endbach)	Hss; Landkreis Marburg-Biedenkopf	Schaefer (1907)

Place/Region	Administ. Division	Source
Friedberg	Hss; Wetteraukreis	Reuß (1907)
Marburg	Hss; Landkreis Marburg-Biedenkopf	Freund (1910)
North Pfahlgraben (area south of Gießen)	Hss; Landkreis Limburg-Weilburg	Faber (1912)
Wissenbach (Eschenburg)	Hss; Lahn-Dill-Kreis	Kroh (1915)
Frankfurt am Main	Hss	Rauh (1921)
Selters bei Weilburg	Hss; Landkreis Limburg-Weilburg	Schwing (1921)
Langenselbold (Hanau)	Hss; Main-Kinzig Kreis	Siemon (1922)
Hanau	Hss; Main-Kinzig-Kreis	Urff (1926)
Wetterfeld (Laubach)	Hss; Landkreis Gießen	Schudt (1927)
Ebsdorf (Ebsdorfergrund)	Hss; Landkreis Marburg-Biedenkopf	Bender (1938)
Weidenhausen (Gladenbach)	Hss; Landkreis Marburg-Biedenkopf	Friebertshäuser (1961)
In and around Mammolshain (Königstein im Taunus)	Hss; Hochtaunuskreis	Schnellbacher (1963)
Area around Marburg	Hss; Landkreis Marburg-Biedenkopf	Spenter (1964)
Frankfurt am Main	Hss	Bethge & Bonnin (1969)

Place/Region	Administ. Division	Source
Erbstadt (Nidderau)	Hss; Main-Kinzig-Kreis	Schudt (1970)
Central Vogelsberg	Hss	Hasselbach (1971)
Central Hesse (area between Gießen and Marburg)	Hss	Hasselberg (1979)
Frankfurt am Main	Hss	Féry (2017)

Table C.12: North Hessian

Place/Region	Administ. Division	Source
Blankenheim (Bebra)	Hss; Landkreis Hersfeld-Rotenburg	Dittmar (1891)
Loshausen-Zella (Willingshausen)	Hss; Schwalm-Eder-Kreis	Schoof (1913a,b,c)
Amtshausen (Bad Laasphe)	NRW; Kreis Siegen-Wittgenstein	Hackler (1914)
Kreis Alsfeld	Hss	Heidt (1922)
Oberellenbach (Alheim)	Hss; Landkreis Hersfeld-Rotenburg	Hofmann (1926)
Rauschenberg	Hss; Landkreis Marburg-Biedenkopf	Bromm (1936)
Loshausen (Willingshausen)	Hss; Schwalm-Eder-Kreis	Corell (1936)
Niederhessen (area south of Kassel)	Hss	Hofmann (1940)
Battenberg (Eder), Bad Wildungen	Hss; Landkreis Waldeck-Frankenberg	Martin (1942)

Place/Region	Administ. Division	Source
Kassel	Hss	Müller (1958b)
Siegerland/Eichsfeld	Hss; Landkreis Waldeck-Frankenberg	Möhn (1962)
Holzhausen am Reinhardswald (Immenhausen)	Hss; Landkreis Kassel	Arend (1991)

Table C.13: Rhenish Franconian

Place/Region	Administ. Division	Source
Mainz	RnPl	Reis (1892)
Southeast Palatinate	RnPl	Heeger (1896)
Handschuhsheim (Heidelberg)	BnWb	Lenz (1900)
Zaisenhausen	BnWb; Landkreis Karlsruhe	Wanner (1907, 1908)
Ober-Flörsheim	RnPl; Landkreis Alzey-Worms	Haster (1908)
Beerfelden	Hss; Odenwaldkreis	Wenz (1911)
Mönchzell (Meckesheim)	BnWb; Rhein-Neckar-Kreis	Reichert (1914)
Warmsroth	RnPl; Landkreis Bad Kreuznach	Martin (1922)
Kaulbach	RnPl; Landkreis Kusel	Christmann (1927)
Ludwigshafen am Rhein	RnPl	Krell (1927)
Spessart (Ettlingen)	BnWb; Landkreis Karlsruhe	Lauinger (1929)

Place/Region	Administ. Division	Source
Odenwald (Zell im Mümlingtal, Bad König)	Hss	Freiling (1929)
Heppenheim	Hss; Kreis Bergstrasse	Seibt (1930)
Plankstadt	BnWb; Rhein-Neckar-Kreis	Treiber (1931)
Saarbrücken	Sld	Kuntze (1932)
Speyer	RnPl	Waibel (1932)
Pfungstadt	Hss; Landkreis Darmstadt-Dieburg	Grund (1935)
Vorderpfalz (Nußdorf)	RnPl; Landau	Bertram (1937)
Eberbach	BnWb; Rhein-Neckar-Kreis	Kilian (1951)
South Odenwald/Ried	Hss; Odenwaldkreis	Bauer (1957)
Darmstadt	Hss	Keller (1961)
Oftersheim	BnWb; Rhein-Neckar-Kreis	Liébray (1969)
Zweibrücken	RnPl	Castleman (1975)
South Palatinate (Dahn, Wilgartswiesen, Iggelbach)	RnPl; Landkreis Südwestpfalz, Landkreis Bad Dürkheim	Karch (1980)
Wackernheim (Ingelheim am Rhein), Nackenheim, Alzey, Wallertheim, Bechtheim	RnPl; Landkreis Mainz-Bingen, Landkreis Alzey-Worms	Karch (1981)
Saarbrücken	Sld	Steitz (1981)
Gabsheim	RnPl; Landkreis Alzey-Worms	Post (1987)

Place/Region	Administ. Division	Source
Großrosseln	Sld	Pützer (1988)
Michelstadt	Hss; Odenwaldkreis	Durrell & Davies (1989)
Langatte, Laning, Schorbach	FR	ALLG
Remschingen, Bretten	BnWb; Enzkreis; Landkreis Karlsruhe	SNBW
Schneppenbach, Wintersbach	Bvr; Lower Franconia	SUF

Table C.14: Moselle Franconian

Place/Region	Administ. Division	Source
Prüm	RnPl; Eifelkreis Bitburg-Prüm	Büsch (1888)
Birkenfeld	RnPl; Landkreis Birkenfeld	Baldes (1896)
Merzig	Sld; Kreis Merzig-Waden	Fuchs (1903)
Lubeln; Kanton Falkenberg	FR	Tarral (1903)
Siegerland (area around Siegen)	NRW: Kreis Siegen-Wittgenstein	Reuter (1903)
Sehlem	RnPl; Landkreis Bernkastel-Wittlich	Ludwig (1906)
Kenn	RnPl; Landkreis Trier-Saarburg	Thomé (1908)
Sörth	RnPl; Landkreis Altenkirchen	Hommer (1910)
Vianden	LX	Engelmann (1910)

Place/Region	Administ. Division	Source
Laubach	RnPl; Landkreis Cochem-Zell	Wimmert (1910)
Kreis Ottweiler (area in and around Hasborn)	Sld	Scholl (1912)
Saarhölzbach (Mettlach)	Sld	Thies (1912)
Ihren (Winterspelt), Sellerich, Weinsheim	RnPl; Eifelkreis Bitburg-Prüm	Meyers (1913a,b)
Arzbach	RnPl; Rhein-Lahn-Kreis	Bach (1921)
Arel	BE	Bertrang (1921)
Saarlouis	Sld	Lehnert (1926)
Echternach	LX; Echternach	Palgen (1931)
Ittersdorf (Wallerfangen)	Sld; Landkreis Saarlouis	Pallier (1934)
Nordösling	LX; Clervaux	Bruch (1952)
Kreis Wittlich	RbPl	Bethge & Bonnin (1969)
East Belgium (Burg-Reuland)	BE	Hecker (1972)
Area around Burg-Reuland	BE	Cajot & Beckers (1979)
Bell (Mendig)	RnPl; Landkreis Mayen-Koblenz	Mattheier (1987)
Horath (Hunsrück)	RnPl; Landkreis Bernkastel-Wittlich	Reuter (1989)
Beuren(near Trier)	RnPl	Peetz (1989)
Lxm	LX	Gilles (1999)
Montabaur	RnPl: Westerwaldkreis	Féry (2017)
Lützkampen/Dahnen	RnPl; Eifelkreis Bitburg-Prüm	MRhSA

Place/Region	Administ. Division	Source
Elzange	FR	ALLG

Table C.15: Ripuarian

Place/Region	Administ. Division	Source
Aix-la-Chapelle (Aachen)	NRW	Rovenhagen (1860)
Cologne	NRW	Wahlenberg (1877)
Krefeld	NRW	Röttsches (1877)
Werden (Essen)	NRW	Koch (1879)
Remscheid	NRW	Holthausen (1885a,b)
Ronsdorf (Wuppertal)	NRW	Holthaus (1887)
Mülheim an der Ruhr	NRW	Maurmann (1889)
Aachen	NRW	Jardon (1891)
Large area in western part of Rpn dialect area	NRW	Schmitz (1893)
Aegidienberg (Bad Honnef)	NRW; Rhein-Sieg Kreis	Müller (1900)
Erftgebiet	NRW	Münch (1904 [1970])
Wermelskirchen	NRW; Rheinisch-Bergischer Kreis	Hasenclever (1905)
In and around Cologne	NRW	Müller (1912)
Dülken (Viersen)	NRW	Frings (1913)
Broad area in the northeastern part of the Ripuarian dialect area	NRW	Lobbes (1915)
Niederembt (Elsdorf)	NRW; Rhein-Erft-Kreis	Grass (1920)

Place/Region	Administ. Division	Source
Düsseldorf	NRW	Zeck (1921)
Schelsen (Grevenbroich, Mönchengladbach)	NRW; Rhein-Kreis Neuss	Greferath (1922)
Oberste Zeith (Seelscheid)	NRW; Rhein-Sieg-Kreis	Mackenbach (1924)
Broad area in Oberbergischer Kreis, e.g. Eckenhagen, Berghausen	NRW; Oberbergischer Kreis	Branscheid (1927)
Kreis Eupen	BE	Welter (1929)
Montzen	BE	Welter (1933)
Schlebusch (Leverkusen)	NRW	Bubner (1935)
Aachen	NRW	Welter (1938)
Cologne	NRW	Heike (1964)
Gleuel (Hürth)	NRW; Rhein-Erft-Kreis	Heike (1970)
Moresnet (Plombières)	BE	Jongen (1972)
East Belgium (Elsenborn, Wallerode, Recht, St. Vith, Manderfeld)	BE	Hecker (1972)
Burscheid	NRW; Rheinisch-Bergischen Kreis	Heinrichs (1978)
Area around St. Vith	BE	Cajot & Beckers (1979)
Krefeld	NRW	Bister-Broosen (1989)
Euskirchen, Dahlem, Monschau, Zülpich, Langerwehe, Nörvenich, Jülich, Bonn, Heinsberg, Mönchengladbach,	NRW	Cornelissen et al. (1989)
Rimburg	NL; Limburg	Hinskens (1992)

Place/Region	Administ. Division	Source
Düsseldorf/ Cologne (Lower Rhine German)	NRW	Hall (1993)
Erp (Erftstadt)	NRW; Rhein-Erft-Kreis	Kreymann (1994)
Niederbachem, Oberbachem (Wachtberg)	NRW; Rhein-Sieg-Kreis	Fuss (2001)

Table C.16: Low Franconian

Place/Region	Administ. Division	Source
Area between Geldern and Viersen	NRW	Ramisch (1908)
Homberg (Duisburg)	NRW	Meynen (1911)
Kalkar	NRW; Kreis Kleve	Hanenberg (1915)
Kreis Moers	NRW; Kreis Wesel	Bethge & Bonnin (1969)
Kleve	NRW	Stiebels (2013)

Table C.17: Thuringian

Place/Region	Administ. Division	Source
North Thuringia (in and around Nordhausen)	Thra; Landkreis Nordhausen	Schultze (1874)
Stiege (Oberharz)	SxAn; Landkreis Harz	Liesenberg (1890)
Eisenach	Thra	Flex (1893)
Bad Frankenhausen	Thra; Kyffhäuserkreis	Frank (1898)

Place/Region	Administ. Division	Source
Osterland (Oberschwöditz, between Zeitz and Naumburg)	SxAn; Burgenlandkreis	Trebs (1899)
Mansfeld	SxAn; Landkreis Mansfeld-Südharz	Hennemann (1901)
Leinefelde	Thra; Landkreis Eichsfeld	Hentrich (1905)
Altenburg	Thra; Landkreis Altenburger Land	Daube (1906)
Buttelstedt	Thra; Landkreis Weimarer Land	Kürsten & Bremer (1910)
Southwest Thuringia	Thra	Kürsten (1910, 1911)
Niddawitzhausen (Eschwege)	Hss; Werra-Meissner-Kreis	Rasch (1912)
Northeast Thuringia, southeast Sachsen-Anhalt	Thra, SxAn	Hankel (1913)
Eichsfeld	Northwest Thra	Hentrich (1920)
Honsteinisch (area north of Sondershausen)	Thra, SxAn	Rudolph (1924/1925)
Sondershausen	Thra; Kyffhäuserkreis	Schirmer (1932)
Gera	Thra	Dietrich (1957)
Unterellen (Gerstungen)	Thra; Wartburgkreis	Spangenberg (1962)
East Thuringian	Thra	Spangenberg (1974)
Dudenrode, Netra	Hss; Landkreis Witzenhausen, Landkreis Eschwege	Guentherodt (1982)
Ludwigsstadt	Bvr; Upper Franconia	Harnisch (1987)

Place/Region	Administ. Division	Source
Thuringian dialect overview	Thra	Spangenberg (1989)
Barchfeld (Barchfeld-Immelborn)	Thra; Wartburgkreis	Weldner (1991)
Itzgrund (area between Bamberg and Coburg)	Bvr; Upper Franconia	Spangenberg (1998)

Table C.18: Upper Saxon

Place/Region	Administ. Division	Source
Erzgebirge (Annaberg-Buchholz, Freiberg)	Sxn; Erzgebirgskreis, Landkreis Mittelsachsen	Goepfert (1878)
Leipzig	Sxn	Albrecht (1983)
Greiz	Thra; Landkreis Greiz	Hertel (1887)
Zwickau	Sxn; Landkreis Zwickau	Philipp (1897)
Brüx	CZ	Hausenblas (1898)
Zschorlau	Sxn; Erzgebirgskreis	Lang (1906)
Schokau (Starý Šachov)	CZ	Pompé (1907)
Saalkreis	SxAn	Bremer (1909)
Northwest Bohemia	CZ	Hausenblas (1914)
Large area between Dresden and Chemnitz (meiβnisch)	Sxn	Große (1955)
Leipzig	Sxn	Große (1957)

Place/Region	Administ. Division	Source
West Lausitz	Sxn; Landkreis Bautzen, Landkreis Sächsische-Schweiz Osterzgebirge	Protze (1957)
Salzfurtkapelle (Zörbig)	SxAn; Landkreis Anhalt-Bitterfeld	Schönfeld (1958)
Area in and around Dresden	Sxn	Fleischer (1961)
Vorerzgebirge	Sxn	Bergmann (1965)
Large area, especially south of Chemnitz and Freiberg	Sxn	Becker (1969)
Kreis Oschatz (ca. 55km east of Leipzig)	Sxn	Bethge & Bonnin (1969)
Chemnitz	Sxn	Kahn & Weise (2013)

Table C.19: Silesian

Place/Region	Administ. Division	Source
Seifhennersdorf	Sxn; Landkreis Görlitz	Michel (1891)
Sebnitz	Sxn; Landkreis Sächsische-Schweiz Osterzgebirge	Meiche (1898)
Kieslingswalde	Sil; Kreis Habelschwerdt	Pautsch (1901)
Lehmwasser	Sil; Landkreis Waldenburg	Hoffmann (1906)
Schlesische Mundart	Sil; CZ; North Moravia; AT	von Unwert (1908)

Place/Region	Administ. Division	Source
Kreis Hirschberg (Riesengebirge), Alt-Waltersdorf bei Habelschwerdt (Grafschaft Glatz)	Sil	Graebisch (1912a,b)
Kunewald	Sil; CZ	Giernoth (1917)
Groβ-Schönau, Seifnehhersdorf, Sebnitz, Markersdorf	Sxn; Landkreis Görlitz	Wenzel (1919)
Reichenberg	CZ	Kämpf (1920)
East Bohemia	CZ	Festa (1925)
Römerstadt, Sternberg	Sil; Troppau	Rieger (1935)
North Moravia (Marschendorf, Kunzendorf, Schildberg, Nieder-Ullersdorf, Rokitnitz)	CZ	Weiser (1937)
Bremberg	Sil; Kreis Jauer	Halbsguth (1938)
Grafschaft Glatz	Sil; Kreis Glatz	Blaschke (1966)
Kay	Brbg; Kreis Züllichau-Schwiebus	Messow (1965)
Hohenelbe, Grulich, Bärn	Sil, CZ	SchlSA

Table C.20: North Upper Saxon-South Markish

Place/Region	Administ. Division	Source
Dubraucke (Eichwege)	Brbg; Landkreis Spree-Neiβe; Döbern	Goessgen (1902)
Aken (Elbe)	SxAn; Landkreis Anhalt-Bitterfeld	Bischoff (1935)

Place/Region	Administ. Division	Source
South Brandenburg	Brbg; Landkreis Elbe-Elster	Kieser (1963)
Friedersdorf (Doberlug-Kirchhain)	Brbg; Landkreis Elbe-Elster	Seibicke (1967)
Weidenhain (Dreiheide)	Sxn; Landkreis Nordsachsen	Krug (1969)
Berlin	Berlin	Bethge & Bonnin (1969)
Grassau (Schönewalde)	Brbg; Landkreis Elbe-Elster	Stellmacher (1973)
Wittenberg	SxAn; Landkreis Wittenberg	Langner (1977)
Berlin	Berlin	Schönfeld (1986, 2001)

Table C.21: High Prussian

Place/Region	Administ. Division	Source
Kreis Wormditt, Kreis Guttstadt, Kreis Heilsberg	EPr	Stuhrmann (1896)
WPr/EPr	general description of HPr	Ziesemer (1924)
Rollnau, Kahlau, Hagenau, Kreis Mohrungen	EPr	Kuck (1927)
Kreis Rosenberg	WPr; Kreis	Kuck (1933)
Reimerswalde	EPr; Kreis Heilsberg	Kuck & Wiesinger (1965)
Kahlau, Hagenau, Kreis Mohrungen, Kreis Heilsberg	EPr	Tessmann (1969)

Table C.22: North Low German

Place/Region	Administ. Division	Source
Greetsiel (Krummhörn)	LSxn; Landkreis Aurich	Hobbing (1879)
Burg (Dithmarschen)	SHst: Dithmarschen	Kohbrok (1901)
Oldenburg	LSxn; Oldenburg	vor Mohr (1904)
Lathen	LSxn; Landkreis Emsland	Schönhoff (1908)
Badbergen	LSxn; Landkreis Osnabrück	Vehslage (1908)
Bleckede	LSxn; Landkreis Lüneburg	Rabeler (1911)
Finkenwärder (Hamburg)	Hbg	Kloeke (1914)
Burg (Dithmarschen)	SHst: Dithmarschen	Stammerjohann (1914)
Stapelholm (Bergenhusen)	SHst; Kreis Schleswig-Flensburg	Sievers (1914)
Altengamme (Hamburg)	Hbg	Larsson (1917)
Hollenstedt; Jade	LSxn; Landkreis Harburg; LSxn; Landkreis Wesermarsch	Götze (1922)
Heide (Dithmarschen)	SHst	Jörgensen (1928/1929)
Kreis Herzogtum Lauenburg	SHst	Heigener (1937)
Diepenau (Samtgemeinde Uchte)	LSxn; Landkreis Nienburg	Schmeding (1937)
Borgstede (Varel)	LSxn; Landkreis Friesen	Feyer (1939)

Place/Region	Administ. Division	Source
Baden (Achim)	LSxn; Landkreis Verden	Feyer (1941)
Grambkermoor bei Bremen	Brm	Bollmann (1942)
Jadebusen	LSxn; Wilhelmshaven	Schmidt-Brockhoff (1943)
Hemmelsdorf; Kreis Eutin	SHst; Kreis Ostholstein	Pühn (1956)
Kirchwerder	Hbg	von Essen (1958)
Harburg	Hbg	Keller (1961)
Kreis Kiel	SHst	Bethge & Bonnin (1969)
Oldenburger Ammerland	LSxn; Oldenburg	Mews (1971)
Nordstrand	SHst	Willkommen (1999)
Altenwerder	Hbg	Höder (2010)

Table C.23: Westphalian

Place/Region	Administ. Division	Source
Soest	NRW; Kreis Soest	Holthausen (1886)
Kreis Lippe	NRW; Kreis Lippe	Hoffmann (1887)
Adorf (Diemelsee)	Hss; Landkreis Waldeck-Frankenberg	Collitz (1899)
Schieder-Schwalenberg	NRW; Kreis Lippe	Böger (1906)
Kirchspiel Courl (Dortmund)	NRW	Beisenherz (1907)
Elspe (Lennestadt)	NRW; Kreis Olpe	Arens (1908)
Hiddenhausen	NRW; Kreis Herford	Schwagmeyer (1908)

Place/Region	Administ. Division	Source
Area in and around Paderborn	NRW	Brand (1914)
Borken	NRW; Kreis Borken	Herdemann (1921 [2006])
Gütersloh	NRW; Kreis Gütersloh	Wix (1921)
Behringhausen (Castrop-Rauxel); Schinkel (Osnabrück)	NRW; Kreis Recklinghausen	Götze (1922)
Rhoden (Diemelstadt)	Hss; Landkreis Waldeck-Frankenberg	Martin (1925)
Plettenberg	NRW; Märkischer Kreis	Gregory (1934)
Mülheim/Ruhr, Byfang/Ruhr, Hamm/Lippe	NRW	Hellberg (1936)
Ostbevern	NRW; Kreis Warendorf	Holtmann (1939)
Southeast Sauerland	NRW	Schulte (1941)
Willingen, Sudeck (Diemelsee), Freienhagen (Waldeck)	Hss; Landkreis Waldeck-Frankenberg	Martin (1942)
Grafschaft Bentheim	LSxn; Landkreis Grafschaft Bentheim	Rakers (1944)
Altenluenne	LSxn; Landkreis Emsland	Borchert (1955)
Lüdenscheid	NRW; Märkischer Kreis	Frebel (1957)
Münster	NRW	Keller (1961)
Kreis Tecklenburg	NRW	Bethge & Bonnin (1969)

Place/Region	Administ. Division	Source
Nienberge (Münster)	NRW	Seymour (1970)
Riesenbeck (Hörstel)	NRW; Kreis Steinfurt	Bethge (1970)
Reelkirchen (Blomberg)	NRW; Kreis Lippe	Stellmacher (1972)
Laer	NRW; Kreis Steinfurt	Niebaum (1974, 1982)
Müschede (Arnsberg)	NRW; Hochsauer-landkreis	Niebaum et al. (1976)
Breckerfeld, Hagen, Iserlohn	NRW	Brandes (2011)

Table C.24: Eastphalian

Place/Region	Administ. Division	Source
Meinersen (Samtgemeinde Meinersen)	LSxn; Landkreis Gifhorn	Bierwirth (1890)
Börßum (Samtgemeinde Oderwald)	LSxn; Landkreis Wolfenbüttel	Heibey (1891)
Magdeburger Börde (Schnarsleben)	SxAn; Landkreis Börde	Roloff (1902)
Eilsdorf (Huy)	SaAn; Landkreis Harz	Block (1910)
Cattenstedt (Blankenburg)	SaAn; Landkreis Harz	Damköhler (1919)
Reinhausen (Gleichen)	LSxn; Landkreis Göttingen	Jungandreas (1926, 1927)
Ramlingen (Burgdorf)	LSxn; Landkreis Region Hannover	Jarfe (1929)
Lesse (Salzgitter)	LSxn; Landkreis Wolfenbüttel	Löfstedt (1933)

Place/Region	Administ. Division	Source
Dorste (Osterode)	LSxn; Landkreis Göttingen	Dahlberg (1934, 1937)
Dorste (Osterode), Hasede (Hildesheim)	LSxn; Landkreis Göttingen, Landkreis Hildesheim	Mackel (1939)
Dingelstedt am Huy (Huy)	SxAn; Landkreis Harz	Hille (1939)
Werratal (area surrounding Witzenhausen)	Hss; Werra-Meißner-Kreis	Hassel (1942)
Area around Braunschweig	LSxn	Pahl (1943)
Emmerstedt (Helmstedt)	LSxn	Brugge (1944)
Neuendorf (Teistungen)	Thra; Landkreis Eichsfeld	Schütze (1953)
Mascherode (Braunschweig)	LSxn	Bethge & Flechsig (1958)
Göddeckenrode, Isingerode	SxAn; Landkreis Harz LSxn; Landkreis Wolfenbüttel	Lange (1963)
Kreis Hannover, Kreis Wolfenbüttel	LSxn	Bethge & Bonnin (1969)
Kamschlaken (and several other nearby towns and villages)	LSxn; Osterode am Harz, Landkreis Göttingen	Göschel (1973)
Celle	LSxn	ACeM

Table C.25: Mecklenburgish-West Pomeranian

Place/Region	Administ. Division	Source
Ivenack-Stavenhagen	MVpm; Landkreis Mecklenburgische Seenplatte	Holst (1907)
Barth	MVpm; Landkreis Vorpommern-Rügen	Schmidt (1912a)
Wolgast	MVpm; Landkreis Vorpommern-Greifswald	Warnkross (1912)
West Mecklenburg	MVpm; Landkreis Nordwestmecklenburg	Kolz (1914)
South Mecklenburg	MVpm; Landkreis Ludwigslust-Parchim	Jacobs (1925a,b, 1926)
Rehna, Schwerin	MVpm	Teuchert (1927)
Kaarβen (Amt Neuhaus)	LSxn; Landkreis Lüneburg	Dützmann (1932)
Ratzeburg, Rostock, Lank (Lübtheen)	SHst, MVpm	Teuchert & Schmitt (1933)
Stargard (area to the north of Neustrelitz)	MVpm	Blume (1933a,b,c,d)
South Stargard	MVpm	Teuchert (1934)
Kreis Wismar	MVpm; Landkreis Nordwestmecklenburg	Bethge & Bonnin (1969)
Greifswald, Schwerin	MVpm	Prowatke (1973)
Survey of ELG (e.g. Teterow)	MVpm	Schönfeld (1989)

Table C.26: Brandenburgish

Place/Region	Administ. Division	Source
In and around Magdeburg	SxAn	Krause (1895)
Kreis Jerichow I (region in and around Möckern)	SxAn; Landkreis Jerichower Land	Krause (1896)
Besten	Brbg; Landkreis Dahme-Spreewald	Siewert (1907)
Neumark	PL	Teuchert (1907b,c)
Warthe (Uckermark)	Brbg; Landkreis Uckermark	Teuchert (1907a)
Prenden (Wandlitz)	Brbg; Landkreis Barnim	Seelmann (1908)
Neu-Golm (Bad Saarow)	Brbg; Landkreis Oder-Spree	Siewert (1912)
Ostmärkische Mundart (Kreise Arnswalde, Friedeberg)	PL	Seelmann (1913)
Strodehne (Havelaue)	Brbg; Landkreis Havelland	Hildebrand (1913)
Lüneburger Wendland	LSxn: Landkreis Lüchnow-Dannenberg	Selmer (1918)
Rebenstorf (Lübbow)	LSxn; Landkreis Lüchnow-Dannenberg	Götze (1922)
Letschin	Brbg; Landkreis Märkisch-Oderland	Teuchert (1930)
Jerichower Land	SxAn	Bathe (1932)
Kleinwusterwitz (Jerichow)	SxAn	Bathe (1937)
Arendsee (Altmark)	SxAn; Altmarkkreis-Salzwedel	Törnqvist (1949)

Place/Region	Administ. Division	Source
Hinzdorf (Wittenberge)	Brbg; Landkreis Prignitz	Bretschneider (1951)
Heckelberg	Brbg; Landkreis Märkisch-Oderland	Teuchert (1964)
Large area in the western part of Brandenburg	Brbg	Bathe (1965)
Schollene	SxAn; Landkreis Stendal	Gebhardt (1965), Schönfeld (1965)
Survey of ELG (e.g. Tempelfelde)	Brbg	Schönfeld (1989)

Table C.27: Central Pomeranian

Place/Region	Administ. Division	Source
Kreis Greifenhagen and Kreis Königsberg	PL	Brose (1955)
Burg Stargard	MVpm; Landkreis Mecklenburgische Seenplatte	Prowatke (1973)

Table C.28: East Pomeranian

Place/Region	Administ. Division	Source
Putzig (Posen)	PL	Teuchert (1913)
Kreis Konitz	WPr; Kreis Konitz	Semrau (1915a,b)
Lauenburg	EPmr; Kreis Lauenburg	Pirk (1928)
Kreis Schlawe	EPmr; Kreis Schlawe	Mahnke (1931)

Place/Region	Administ. Division	Source
Kreis Saatzig	EPmr; Kreis Saatzig	Kühl (1932)
Kreis Bütow, Kreis Rummelsburg	EPmr; Kreis Bütow, Kreis Rummelsburg	Mischke (1936)
Kreis Lauenburg, Kreis Stolp	EPmr; Kreis Lauenburg, Kreis Stolp	Stritzel (1937)
Kamnitz	EPmr; Kreis Bublitz	Tita (1921 [1965])
Sępóno Krajeńskie	WPr	Darski (1973)

Table C.29: Low Prussian

Place/Region	Administ. Division	Source
EPr	General descriptions of LPr	Gortzitza (1841), Lehmann (1842), Förstemann (1850), Fischer (1896), Kantel (1900), Betcke (1924), Ziesemer (1924), Schönfeldt (1977)
Alt-Thorn	EPr	Wagner (1912)
Königsberg	EPr; Kreis Königsberg	Mitzka (1919)
Danziger Nehrung	EPr	Mitzka (1922)
Willuhnen	EPr; Kreis Pillkallen	Natau (1937)
In and around Mandtkeim	EPr; Kreis Fischhausen	Bink (1953)
Bieberstein bei Barten	EPr	Tessmann (1966)

Table C.30: German-language islands

Place/Region	Administ. Division	Source
ES, LA	LG island (Baltic German)	Sallmann (1872), Mitzka (1923a,b), Masing (1926), Deeters (1939)
Burgberg, Mediasch, Bistritz, Schäßburg	MFr island (Transylvania Saxon) in RO	Scheiner (1887), Kisch (1893), Scheiner (1922), Klein (1927), Maurer (1959), Bruch (1966)
Hobgarten, Leibitz, Dobschau, Käsmark	CG island (Zipser German) in SLK	Lumtzer (1894, 1896), Gréb (1921), Kövi (1911), WbMD
Lusern, Giazza/Dreizehn Gemeinden, Sieben Gemeinden	SBav (Cimbrian) islands in Northeast IT	Bacher (1905), Schweizer (1939), Mayer (1971), Kranzmayer (1981), Tyroller (2003)
Mitterdorf, Suchener Tal, Suchen, Hinterberg, Klindorf, Niedermösel, Reichenau, Rodine, Hornberg	SBav island (Gottschee) in SL	Tschinkel (1908), Seemüller (1909b), Wolf (1982), Lipold (1984)
Altstadt, Langenlutsch, Rathsdorf, Hilbetten, Michelsdorf , Mährisch Hermersdorf, Vorder-Ehrnsdorf, Augezd, Kornitz, Rehsdorf, Rothmühl	HG island (Schönhengst) in CZ	Seemüller (1908b), Janiczek (1911), Graebisch (1915), Matzke (1918), Sandbach (1922), Appel (1963), Benesch (1979)

Place/Region	Administ. Division	Source
RUS, UKR, MEX, USA (Indiana, Missouri, Kansas, Oklahoma), CAN	LPr island (Plautdietsch)	Quiring (1928), Goerzen (1952), Lehn (1957), Mierau (1964), Moelleken (1966), Jedig (1966), Buchheit (1978), Loewen (1988), Naiditch (2005), Nieuweboer (1999), Siemens (2012), Cox et al. (2013), te Velde & Vosburg (2021)
North UKR	CHes island	Sokolskaja & Sinder (1930)
Jamburg (UKR)	NBav island	Schirmunski (1931)
Sathmar	HG island in RO	Moser (1937)
Libinsdorf	CG island in CZ	Weinelt (1940)
Many states on the East Coast and Midwest	German-language island (Pennsylvania German) in USA	Frey (1942), Reed (1947), Buffington & Preston (1954), Kelz (1971)
Zarz	Bav island in SL	Lessiak (1959)
USA (Texas)	German language island (Texas German, Texas Alsatian)	Gilbert (1963, 1964), Eikel (1966), Gilbert (1970), Boas (2009), Roesch (2012), LATG
Iglau	NBav island in CZ	Stolle (1969)
Milwaukee (USA) and Mucsi (HU)	Hes island in Wisconsin (USA)	Gommermann (1975)
Banat	German-language island (Banat Swabian) in RO	Barba (1982), Wolf (1987), Dama (1987), Mileck (1997)

Place/Region	Administ. Division	Source
Fersental	SBav island (Mòcheno) in Northeast IT	Rowley (1986)
Concordia	LG island in Missouri (USA)	Ballew (1997)
Issime, Gressoney, Alagna, Rima, Macugnaga	SBav islands in Northwest IT	SDS

Table C.31: Standard languages

Language	Source
Modern Standard German (StG)	Krech (1982), Mangold (2005)
Standard Swiss German (StSwG)	Hove (2002), Hove & Haas (2009)
Standard Austrian German (StAG)	Moosmüller et al. (2015)

Table C.32: Other varieties of German

Comments	Source
Variety of High German spoken in Kiel	Glover (2011, 2014)
Unspecified variety of German; data obtained by introspection	Moltmann (1990)
Ethnolects spoken in Berlin	Auer (2002),Wiese (2012), Jannedy & Weirich (2014)

Appendix D: Versions of velar fronting

I list below the triggers and targets for all versions of velar fronting posited in this book for word-initial position and postsonorant position. For several versions of velar fronting in word-initial position the target segment can optionally be preceded by a word-initial sibilant. This requirement is not expressed below in the first table.

Table D.1: Targets and triggers for velar fronting in word-initial position

Rule:	Trigger:	Target:
Wd-In Vel Fr-1	[−low, coronal]	[−son, +cont, dorsal]
Wd-In Vel Fr-2	[+cons, +son, coronal]	[−son, +cont, dorsal]
Wd-In Vel Fr-3	[−cons, coronal]	[−son, +cont, dorsal]
Wd-In Vel Fr-4	[+high, coronal]	[−son, +cont, peripheral]
Wd-In Vel Fr-5	[−low, coronal]	[−son, +cont, peripheral]
Wd-In Vel Fr-6	[−cons, coronal]	[−son, dorsal]
Wd-In Vel Fr-7	[+high, −round, coronal]	[−son, +cont, dorsal]
Wd-In Vel Fr-8	[+son, coronal]	[−son, +cont, dorsal]

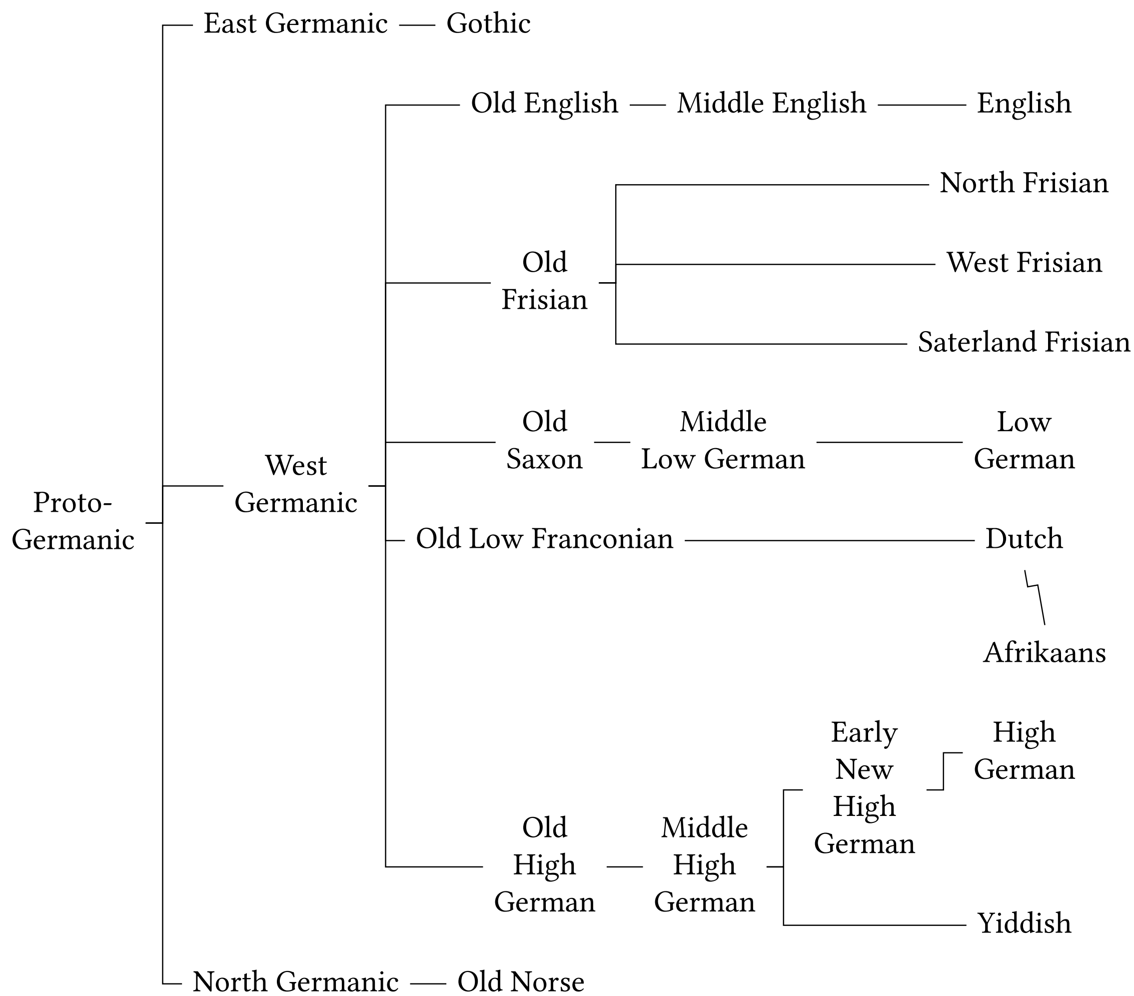
Table D.2: Targets and triggers for velar fronting in postsonorant position

Rule:	Trigger:	Target:
Vel Fr-1	[+son, coronal]	[−son, +cont, dorsal]
Vel Fr-2	[−low, coronal]	[−son, +cont, dorsal]
Vel Fr-3	[+cons, +son, coronal]	[−son, +cont, dorsal]
Vel Fr-4	[+son, coronal]	[−son, +cont, +fortis, dorsal]
Vel Fr-5	[−low, coronal]	[−son, +cont, +fortis, dorsal]
Vel Fr-6	[+high, coronal]	[−son, +cont, peripheral]
Vel Fr-7	[−low, coronal]	[−son, +cont, peripheral]
Vel Fr-8	[−cons, coronal]	[−son, dorsal]
Vel Fr-9	[+son, coronal]	[+cons, dorsal]
Vel Fr-10	[+tense, coronal]	[−son, +cont, dorsal]
Vel Fr-11	[+high, −round, coronal]	[−son, +cont, dorsal]
Vel Fr-12	[−round, coronal]	[−son, +cont, dorsal]
Vel Fr-13	[−cons, coronal]	[−son, +cont, dorsal]
Vel Fr-14	[−cons, −nasal]	[−son, +cont, dorsal]

Appendix E: Family tree for Germanic languages

A number of proposals have been made for the classification of Germanic languages; see Robinson (1992) for some useful discussion and references. There is widespread agreement that the original language (Proto-Germanic) had three branches: West Germanic, North Germanic, and East Germanic. Those three groupings are depicted in the family tree below. A number of scholars have proposed that West and North Germanic derived from an earlier Northwest Germanic group. The reader is referred to Fulk (2018: 22ff.) for an assessment of the arguments for the Northwest Germanic grouping and general discussion (including many useful references) of the Germanic language family tree.

The most significant branches for present purposes are the ones culminating in High German (HG) and Low German (LG). The dates for the HG branch given below are in accordance with the ones usually assumed in the scholarly literature; see, for example, Paul (2007: 9–10). The distinction among the early stages of the LG branch is not as clear cut as it is for HG. I adopt henceforth the stages and dates in Foerste (1957). A useful summary of the dates for the HG and LG branches can be found in Schmidt (2007: 16–22).



High German:		Low German:	
Old High German (OHG):	750–1050	Old Saxon (OSax):	800–1150
Middle High German (MHG):	1050–1350	Middle Low German (MLG)	1150–1600
Early New High German (ENHG):	1350–1650	Low German:	1600–present
High German:	1650–present		

Figure E.1: Germanic languages

Appendix F: Modern reflexes of historical dorsal sounds

A central goal of the present book is to determine the realization of original (WGmc) velars in modern HG and LG dialects. As a point of reference this appendix shows how historical velars developed into those modern HG dialects on which StG is based (henceforth HG). The sounds discussed below also include the etymological palatal glide; hence the appendix considers the modern reflexes of dorsal sounds.

The changes discussed below have been discussed at length in the earlier literature, e.g. Wright (1907), Prokosch (1938), von Kienle (1969), Russ (1978a, 1982), Szulc (2002), and Fulk (2018). Two works discussing the development of original velars into modern German dialects include Behaghel (1911) and especially Schirmunski (1962).

I consider first the development of WGmc dorsal sounds in terms of their probable phonetic realizations based on the conclusions drawn from scholars of Gmc like the ones cited above. At the end of this appendix I show how the phonetic dorsals of WGmc fit into a system of contrastive sounds (phonemes).

WGmc velars surfacing in word-initial position were $^{+}$[k ɣ], as well as the $^{+}$[k] in $^{+}$[sk] clusters. PGmc $^{+}$[x] did not occur in word-initial position in WGmc because it either debuccalized to [h] before a vowel in (1a) or deleted before a consonant in (1b). Phonetic representations for the words listed in (1) and below can be inferred from the StG orthography.

(1) a. PGmc $^{+}$[x] > HG [h] Heer 'army', Herz 'heart'
    b. PGmc $^{+}$[x] > HG ∅ lachen 'laugh-INF' (cf. Go *hlahjan*), rein 'pure' (cf Go *hrains*)

All instances of word-initial [x]/[ç] in HG are loanwords (Appendix G). The reason why no native word begins with [x]/[ç] is that the earlier reflex of those sounds (PGmc $^{+}$[x]) either underwent h-Deletion or Debuccalization. Since there were no independent (German-specific) changes that introduced new instances of word-initial [x]/[ç] in HG, there are no native words beginning with those sounds.

The modern reflex of WGmc $^{+}$[k] in word-initial position is [k] in (2a), while WGmc $^{+}$[sk] is now realized as [ʃ] in (2b). WGmc $^{+}$[ɣ] in word-initial position is [g] in (2c).

(2) a. WGmc $^{+}$[k] > HG [k] Kuh 'cow', Kind 'child'
  b. WGmc $^{+}$[sk] > HG [ʃ] Schaf 'sheep', schöpfen 'ladle-INF', schlafen 'sleep-INF'
  c. WGmc $^{+}$[ɣ] > HG [g] Gast 'guest', gelb 'yellow', Glas 'glass'

The traditional phonetic symbol for WGmc $^{+}$[ɣ] is "g", although most scholars confusingly consider that word-initial sound to be a lenis fricative ([ɣ]) and not the corresponding stop ([g]). The reason the velar in question was realized as a fricative word-initially is that this is how it was realized in most of the earliest attested WGmc languages, i.e. OE, OLF; see Moulton (1972: 173) and Ringe (2006) for a similar conclusion concerning PGmc. The same generalization must also be true for the earliest stages of LG because an initial dorsal fricative (from WGmc $^{+}$[ɣ]) is the norm in LG (Wph) dialects described at the end of the nineteenth and early twentieth centuries (Chapter 4). It is therefore assumed throughout the present book that the initial sound in words like the ones in (2c) was a phonetic fricative (WGmc $^{+}$[ɣ]), which shifted to [g] in an early stage (OHG).

The developments in (1) and (2) are depicted in (3):

(3) Modern reflexes of historical velar obstruents in word-initial position:

$^{+}$[x]	$^{+}$[k]	$^{+}$[sk]	$^{+}$[ɣ]	PGmc
|	|	|	|	
$^{+}$[h]	$^{+}$[k]	$^{+}$[sk]	$^{+}$[ɣ]	WGmc
|	|	|	|	
[h]	[k]	[ʃ]	[g]	HG

WGmc velars surfacing after a sonorant were $^{+}$[k x ɣ], as in (4):

(4) a. WGmc $^{+}$[x] > HG [x]/[ç] Furche 'furrow', Nacht 'night', fechten 'fence-INF'
  b. WGmc $^{+}$[k] > HG [x]/[ç] Dach 'roof', Reich 'empire'
  c. WGmc $^{+}$[ɣ] > HG [g] Wagen 'car', liegen 'lie-INF', folgen 'follow-INF'
  d. WGmc $^{+}$[ɣ] > HG [ç] König 'king'

The original fortis fricative is retained as a fricative, which undergoes velar fronting in the context of front sounds in (4a). WGmc $^{+}$[k] is realized as a velar fricative in postsonorant position in (4b) by the High German Consonant Shift (Braune 2004). The new velar fricative created by the latter change undergoes velar fronting in the context after front segments. Since the High German Consonant Shift did not affect LG, the LG reflex of WGmc $^{+}$[k] is [k]. As a consequence, there are significantly more words containing [x]/[ç] in HG than in LG. In the default case, WGmc $^{+}$[ɣ] is realized in HG as [g] in (4c), but in the context after [ɪ] in coda position, it is realized as [ç] in (4d).

Comparative evidence from the earliest attested WGmc languages supports treating the original velar in (4c, 4d) as a fricative ($^{+}$[ɣ]) and not as a stop, but the same conclusion can be drawn from HG and LG dialect data. As attested in a number of varieties discussed in this book, the original WGmc sound in (4c, 4d) is retained as a velar/palatal fricative after any vowel; hence, the [g] in the HG words in (4c) is realized as [ɣ]/[ʝ]. The same generalization holds in final position, e.g. words like *Tag* 'day' and *Sieg* 'victory' where the final sound is [k] in HG is [x]/[ç] in many HG and LG varieties.

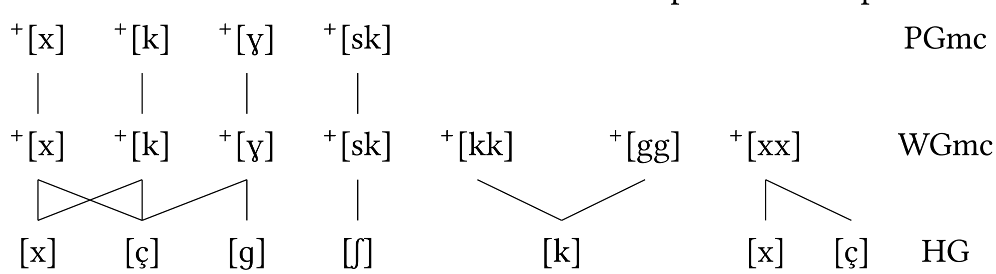
Historical geminate velar stops underwent Degemination in (5a, 5b). In (5c) it can be seen that WGmc $^{+}$[xx] degeminated and now surfaces as velar or palatal depending on the nature of the preceding sound.

(5) a. WGmc $^{+}$[kk] > HG [k] Rock 'skirt', recken 'stretch-INF'
  b. WGmc $^{+}$[gg] > HG [k] Brücke 'bridge', Mücke 'mosquito'
  c. WGmc $^{+}$[xx] > HG [x]/[ç] lachen 'laugh-INF', Küche 'kitchen'

The WGmc geminates in (5) were typically derived from the corresponding singletons before [j] by WGmc Gemination (Simmler 1974, Murray & Vennemann 1983, Murray 1986, Ham 1998, Denton 1998, Fulk 2018). Others emerged after a short vowel from the High German Consonant Shift.

The developments in (4)–(5) are illustrated in (6). Not depicted here is the velar nasal (HG [ŋ]), which only surfaced in early Gmc in nasal-stop clusters, e.g. $^{+}$[ŋk] and $^{+}$[ŋk].

(6) Modern reflexes of historical velar obstruents in postsonorant position:



The WGmc palatal glide – referred to throughout this work as the etymological palatal – is retained as a palatal in word-initial position in HG; see (7a). In some modern varieties the original word-initial palatal glide is retained as a glide (e.g. in Almc; see Chapter 3); however, in many other varieties the original glide is now realized as a palatal fricative, e.g. Chapter 4 for LG, Chapter 9 for HG (CG). These two realizations of the original glide are depicted in (8). In some LG varieties (Chapter 10) WGmc $^{+}$[j] in examples like the ones in (7a) is now realized as a sibilant fricative ([ʒ]). In contexts other than word-initial position, the original palatal glide deletes, as in (7b).

(7) a. WGmc $^{+}$[j] > HG [j]/[ʝ] ja 'yes', Jugend 'youth'
b. WGmc $^{+}$[j] > HG ∅ recken 'stretch-INF', bitten 'ask-INF'

(8) Modern reflexes of the palatal glide:

$^{+}$[j] WGmc

[j] [ʝ] HG

Among the WGmc velar sounds discussed above there is agreement among scholars that $^{+}$[k] was phonemic (/k/) because it contrasted with other consonants (e.g. /p/, /b/, /t/, /d/). $^{+}$[h] and $^{+}$[x] stood in complementary distribution, where the former surfaced only word-initially and the latter elsewhere. I capture that distribution with the WGmc phoneme /x/, which was realized as $^{+}$[h] in word-initial position by the synchronic reflex of the historical change referred to above (Debuccalization). Note that the allophonic distribution of $^{+}$[h] and $^{+}$[x] is inherited into many modern varieties of HG, e.g. Maienfeld (§3.3). The velar nasal was an allophone of /n/, since $^{+}$[ŋ] only occurred before a homorganic stop ($^{+}$[ŋk] and $^{+}$[ŋg]) and $^{+}$[n] elsewhere (see Moulton 1972: 171 for PGmc). Thus, the WGmc phoneme was /n/, which was realized as $^{+}$[ŋ] before a velar sound by Regressive Nasal Place Assimilation. (The WGmc phoneme /m/ contrasted with /n/ initially, medially, and finally). The two lenis velars $^{+}$[ɣ] and $^{+}$[g] are considered by most scholars to be allophones of a single phoneme. In early Gmc (e.g. OE, OLF) the fricative had a much wider distribution than the stop: [g] surfaced only after $^{+}$[ŋ] and in gemination ($^{+}$[gg]) and [ɣ] in the elsewhere case (initially, medially between a vowel or liquid and a vowel, and finally after a vowel or liquid); see Moulton (1972: 173) and Szulc (2002: 113–114) on PGmc. It is not always clear from the scholarly literature how the synchronic relationship between $^{+}$[ɣ] and $^{+}$[g] should be expressed. Here are two options: (a) There was a WGmc phoneme /g/

that was realized as $^{+}$[ɣ] in the contexts listed above, or (b) there was a WGmc phoneme /ɣ/ that was pronounced $^{+}$[g] after a homorganic nasal and in gemination. For purposes of this book I adopt (b) and not (a) because of the wider distribution of WGmc $^{+}$[ɣ]. As a consequence I posit that there was a change I call g-Formation (e.g. Chapter 3 and elsewhere), which shifted that original fricative /ɣ/ to the stop [g]. Finally, the etymological palatal (WGmc $^{+}$[j]) is a phonemic (underlying) glide (/j/). No scholarly works to my knowledge have actually argued that /j/ is phonemic (as opposed to being synchronically derived from another sound, presumably /i/), but the basic line of argumentation discussed in Hall (2017) for the glides of MHG can be extended to WGmc as well.

Appendix G: The status of [x] and [ç] in loanwords

Dorsal fricatives in nonnative words occur either word-initially or after a sonorant. The purpose of this appendix is to introduce some of the data and to provide brief remarks on the difficulties they pose for a potential analysis.

G.1 Word-initial position

There are no native words of StG beginning with [x] or [ç]; the historical reasons for that gap are discussed in Appendix F. Word-initial [x] or [ç] discussed in the literature referred to in §1.1 therefore all involve loanwords like the ones in (1). Representative examples of words with [ç] are listed in (1a) and ones with [x] in (1b). The pronunciation in the first column is the one found in Mangold (2005).

(1)	a.	[çemiː]	Chemie	‘chemistry’
		[çiːnɑ]	China	‘China’
		[çɑrɪsmɑ]	Charisma	‘charisma’
		[çolɛsteriːn]	Cholesterin	‘cholesterol’
	b.	[xɔtɛk]	Chotek	‘Chotek’
		[xɛp]	Cheb	‘Cheb’
		[xʊntɑ]	Junta	‘junta’

According to one school of thought, words like the ones in (1a) are integrated (assimilated) loanwords, while the ones in (1b) are non-integrated (unassimilated). That approach therefore sees the palatal [ç] as the only acceptable pronunciation in word-initial position, while initial [x] can be ignored because it lies on the extreme periphery of the German lexicon. Some of the authors who accept a variant of that view include Wurzel (1980: 956), Hall (1989: 3), Wiese (1996b: 210), and Noske (1997: 232, Footnote 3), although other names could be added to that list as well.

The theoretical literature cited above almost invariably treats loanwords like the ones in (1a) on par with native words. In §1.2 I describe briefly one such approach to StG dorsal fricatives, according to which the data in (1a) are crucial in determining whether or not the underlying dorsal fricative in postsonorant position in fully native words is /x/ or /ç/. The argument is that by including the data in (1a), [ç] occurs in a wider set of contexts than [x], since the former occurs after front vowels, after sonorant consonants, or word-initially, while the latter surfaces only after back vowels. The implication is that surface [x] should be derived from the segment with the wider distribution, namely /ç/. Given that approach, velar fronting regularly creates [x] from /ç/ after a back vowel, and in word-initial position /ç/ surfaces without change as [ç]. On this approach the surface [x] in (1b) is ignored because it is present in unassimilated words.

Robinson (2001) criticizes the approach described above – correctly in my view – on the grounds that the decision to classify a loanword as integrated or non-integrated is arbitrary. He writes (p. 58): "…it cannot honestly be said that any of the analyses I have looked at [regarding data like the ones in (1), T.A.H.] give any independent criteria for what constitutes a fully integrated loanword in German (that is, one which in the relevant respects adheres to German phonological patterns)".

The nature of the word-initial fricative in (1) can vary depending on the dialect/speaker. For example, many speakers substitute the [ç] in (1a) with either [ʃ] or [k]. Noske (1997: 222) gives the examples in (2), which can be taken to be representative for some speakers. It needs to be stressed that speakers with the [ʃ] or [k] pronunciation in (2) will have [x] and [ç] as predictable positional variants in postsonorant position; hence, the examples with [ʃ] or [k] in (2) cannot be interpreted as an across-the-board avoidance of dorsal fricatives.

(2)	[çiːʀʊɐk], [kiːʀʊɐk], [ʃiːʀʊɐk]	Chirurg	'surgeon'
	[çemiː], [kemiː], [ʃemiː]	Chemie	'chemistry'
	[çiːnɑ], [kiːnɑ], [ʃiːnɑ]	China	'China'
	[çɑʀɪsmɑ], [kɑʀɪsmɑ], [ʃɑʀɪsmɑ]	Charisma	'charisma'
	[çoːlɛsteʀiːn], [koːlɛsteʀiːn], [ʃoːlɛsteʀiːn]	Cholesterin	'cholesterol'

The three pronunciations in (2) are sometimes interpreted as belonging to different dialects. For example, according to Pilch (1966: 254), the pronunciation with [ç] is preferred for northeast German speakers ("Nordostdeutsche"), while speakers in the northwest prefer [ʃ] and speakers in the south [k]. Recall from §17.2 that [k] is typical for StAG.

Many speakers have yet another realization of word-initial dorsal fricatives like the ones in (1). Consider first the variety of German spoken in the city of Kiel (Map 4.1) described by Glover (2014). As indicated in (3), Glover's speakers have a very different pattern than the one in StG (1). In particular, Kiel has no word-initial [x]; hence, the StG examples in (1b) are realized with the stop [k] or the glide [j]; see (3b, 3c). It needs to be stressed that the pronunciation in (3c) holds for speakers with no knowledge of Spanish. Significantly, the only word-initial dorsal fricative acceptable to Glover's speakers is [ç], but only before a front vowel; see (3a).

(3)	a.	[çemiː]	Chemie	'chemistry'
		[çiʀʊɐk]	Chirurg	'surgeon'
	b.	[kɑːʀɪsmɑ]	Charisma	'charisma'
		[kolɛsteʀiːn]	Cholesterin	'cholesterol'
	c.	[jʊntɑ]	Junta	'junta'

From a formal point of view, the word-initial [ç] can be analyzed as a word-initial allophone of /x/; the [k] in (3b) derives synchronically from /k/ and the glide in [j] from the corresponding vowel (/i/), although the treatment of glides is peripheral to the analysis of dorsal fricatives.[1]

According to Hove & Haas (2009), the distribution of postsonorant [x] and [ç] in StSwG is as in StG: [x] after a back vowel and [ç] after coronal sonorants. In word-initial position, [ç] occurs before a front vowel in (4a), but before a back vowel in (4b) or consonant in (4c), either [x] or [k] occurs. Thus, word-initial /x/ in StSwG shows a fronting to palatal [ç] in (4a) by a version of velar fronting. (The variant pronunciation with [k] derives synchronically from /k/).

(4)	a.	[çemiː]	Chemie	'chemistry'
		[çiʁʊʁgiː]	Chirurgie	'surgery'
	b.	[xaːɔs], [kaːɔs]	Chaos	'chaos'
		[xaʁaktəʁ], [xaʁaktəʁ]	Charakter	'character'
	c.	[xʁoːm], [kʁoːm]	Chrom	'cholesterol'

A similar generalization concerning word-initial dorsal fricatives holds for the data discussed in Jessen (1988), although he accepts both [x] and [ç] in word-initial position in his speech. Jessen argues that the two sounds stand in an

[1]Impressionistically, I can confirm the data in (3a, 3b) on the basis of numerous discussions with native speakers through the years. I recall many speakers who express extreme aversion to pronouncing [ç] in word-initial position before a back vowel (e.g. in the final two words in 1a). Those speakers invariably pronounce those words with [k]. My view on the initial sound in (3b) is shared by Rapp (1841: 32), who opines that a [ç] in word-initial position before a back vowel – his examples are *Chaos, Character, Cholera* – would sound "abominable" ("abscheulich").

allophonic relationship in word-initial position, where the choice between the two is determined by the following vowel: [ç] before a front vowel, as in (2a) and [x] before a back vowel, as in (2b). The rule he posits relating [x] and [ç] is bidirectional and therefore applies postvocalically in words like *mich* [mɪç] 'me-ACC' and *Krach* [kʀɑx] 'noise' and progressively in word-initial position, as in (2). Word-initial [ç] before a back vowel in words like *Charon* [çɑːʀɔn] 'Greek mythological figure' and *Chauke* [çɑukə] 'Germanic tribe' (cf. Latin *Chauci*) are treated as exceptions (Jessen 1988: 391).

Although there is disagreement in the literature concerning the status of words like the ones in (1b) vs. (1b), there is a general consensus that the examples cited in the pronouncing dictionaries in which a dorsal fricative appears in word-initial position before a consonant are truly unacceptable. This generalization is true for both [ç], as in (5a) and [x], as in (5b). The examples in (5) were drawn from Mangold (2005). However, recall from (4c) that some speakers of StSwG have [x] in that context.

(5)	a.	chtonisch	[çtoːnɪʃ]	'underground'
		chrysander	[çʀyzandɐ]	'(name)'
	b.	Chmel	[xmɛl]	'(name)'
		Chrobak	[xʀoːbak]	'(name)'

See Robinson (2001: 60), who remarks in a footnote that he omits from his discussion the pronunciations of word-initial *ch* before a consonant because they have typically not played a role in the analysis of word-initial [x] and [ç].

The observation made in the works cited above is that the status of word-initial dorsal fricatives in loanwords depends to a large extent on geography. This is precisely the conclusion drawn by AADG and WDU, which provide maps illustrating the pronunciation of word-initial *ch* in several of the words listed above. For example, according to AADG, the initial sound in the word *Charisma* is realized as [kʰ] throughout almost all of Germany and Austria and as [x] throughout most of Switzerland. Of the six hundred sixty-nine speakers involved in the survey, only two had the [ç] realization prescribed in the pronouncing dictionaries. WDU Map 112 in Volume 2 likewise depicts the areal distribution of the initial sound in the word *China*.

G.2 Postsonorant position

Four representative examples of loanwords containing postsonorant dorsal fricatives are presented in (6). The pronunciation indicated here is the one for StG

(Mangold 2005). These examples show the same pattern described earlier for dorsal fricatives in native words: [x] surfaces after a back vowel in (6a) and [ç] after a front vowel in (6b) or sonorant consonant in (6c). Since I make some reference below to stress I include the diacritic in (6) and below.

(6)	a.	[mɑzoˈxɪsmʊs]	Masochismus	‘masochism’
	b.	[ˈɛço]	Echo	‘echo’
	c.	[kolˈçoːzə]	Kolchose	‘kolkhoz’
		[tutɑnˈçɑːmon]	Tutanchamon	‘Tutanchamon’

In a very small number of works discussed below the observation has been made that some speakers have an alternate pronunciation for the item listed in (6a). That example and a few other words are presented in (7). Note that palatal [ç] occurs in some items after a back vowel.

(7)	a.	[mɑzoːˈçɪsmʊs]	Masochismus	‘masochism’
		[ˈmɑzoːx]	Masoch	‘Masoch’
	b.	[ɔynuːˈçɪsmʊs]	Eunuchismus	‘eunuchism’
		[ɔyˈnuːx]	Eunuch	‘eunuch’
	c.	[hypoːˈçɔndɐ]	Hypochonder	‘hypochondriac’

The data in (7) are drawn from the first publication to my knowledge in which the alternate pronunciation for words like the one in (6a) is discussed, namely Kenstowicz (1994: 308). That author attributes the examples in (7) to an unpublished manuscript (Moltmann 1990). Kenstowicz has an exercise involving the distribution of German [x] and [ç] which includes not only some of the familiar examples involving [x] and [ç] in native words but also the words in (7). Note that the items in (7a) and (7b) show an alternation between [x] and [ç].[2] A more recent treatment of examples like the ones in (7) is Taylor (2010).

One of the reasons why the alternate pronunciation (e.g. [mɑzoˈçɪsmʊs] in 7a vs. [mɑzoˈxɪsmʊs] in 6a) is difficult to assess is that it is not clear what the data are one is supposed to be analyzing. The problem is that neither Kenstowicz nor the final source I discuss below provides a complete set of data. Some of the factors any analysis needs to consider are: (a) stress, (b) the nature of the vowel following the dorsal fricative, (c) the nature of the vowel preceding the dorsal fricative, and (d) syllabification.

[2]Kenstowicz has incomplete transcriptions which only include the vowel plus dorsal fricative sequence (i.e. “[oːx]” for the first example in 7a and “[uːç]” for the first example in 7b). No transcription is provided for the item in (7c), other than [ç].

On the basis of the words in (7), one might hypothesize that the dorsal fricative is realized as [ç] before a stressed syllable. Since feet in German are trochaic (Féry 1998), one could argue that speakers with the pronunciation in (7) have a rule deriving [ç] from /x/ in foot-initial position. The prediction would therefore be that /x/ surfaces as [x] after a back vowel if the fricative is not foot-initial, as in (6b). The problem is that Kenstowicz does not include that type of example in his exercise; hence, one cannot know if the analysis is correct.

A second published treatment of the [mɑzoːˈçɪsmʊs]-type data in (7) is Merchant (1996: 711). He lists – in addition to the familiar examples involving [x] and [ç] in native words – the six words in (8). The phonetic transcriptions are the ones given in that source; I include the diacritic for stress for reference. Merchant includes neither the item in (7c) nor the ones in (6b, 6c).

(8)	a.	[mɑzoːˈ.çɪst]	Masochist	‘masochist’
		[ˈmɑzoːx]	Masoch	‘Masoch’
	b.	[oɪnuːˈçɪsmus]	Eunuchismus	‘eunuchism’
		[ɔyˈnuːx]	Eunuch	‘eunuch’
		[ɔynuːçɪˈziːrən]	eunuchisieren	‘make-PL into a eunuch’
	c.	[paroːˈçiː]	Parochie	‘parish’

The third item in (8b) is the only one that speaks against the foot-based analysis referred to above. Merchant argues that the dorsal fricative is realized as [ç] in syllable-initial position. Thus, a word like the first one in (8a) is parsed [mɑ.zoː.çɪst]. By contrast, the realization of the dorsal fricative is [x] after a back vowel and before a vowel if that dorsal fricative is ambisyllabic, e.g. the [x] in a (native) word like *rauchen* [raʊxən] ‘smoke-INF’.

A drawback with the analysis of Merchant is that it relies on analyzing certain intervocalic consonants as ambisyllabic (e.g. the [x] in [raʊxən] ‘smoke-INF’) for which there is no independent evidence at all. To be clear: It has been proposed in the literature on StG that certain intervocalic consonants are ambisyllabic, but those studies agree that ambisyllabic consonants are situated between a short vowel and another vowel (Wiese 1996b). The analysis of the [x] in a word like [raʊxən] ‘smoke-INF’ as ambisyllabic therefore derives no independent support. The reader is also referred to studies arguing against ambisyllabic consonants in German (Jensen 2000).

Appendix H: Inventories of nonsyllabic sounds

The system of phonemic (contrastive) nonsyllabic sounds (consonants and glides) in the broad dialect groupings from Appendix A (UG, CG, LG) are discussed below. Those three groupings are indicated on Map A.1. Some discussion of consonants (and vowels) in more specific regional varieties of German can be found in Keller (1961) and Russ (1989). Two important sources for LG are Sarauw (1921) and Foerste (1957).

In Table H.1 I list the underlying (phonemic) nonsyllabic segments in typical UG dialects investigated in this book. Stops (but not affricates or fricatives) show a two-way laryngeal contrast (i.e. fortis /t/ vs. lenis /d/). The affricate /kx/ is enclosed in parentheses because it is restricted to certain Almc varieties of SwG and to Tyr varieties of SBav. The one rhotic phoneme can be either coronal (/r/) or dorsal (/ʀ/), depending on dialect.[1]

Table H.1: UG nonsyllabic segments

stops	p b	t d			k g	
affricates	pf	ts	tʃ		(kx)	
fricatives	f	s	ʃ		x	h
nasals	m	n			ŋ	
liquids		l, r				
glides	w			j		

[1] I omit from consideration those segments that only occur in nonnative words, namely the lenis postalveolar fricative /ʒ/ and the lenis postalveolar affricate /dʒ/. The original sources cited in the present book often provide very detailed phonetic descriptions for the consonants and vowels in the respective dialects. Some of those descriptions refer to sounds not discussed in this appendix, but on closer inspection many of those segments can be analyzed as allophones of one of the sounds present in Tables H.1–H.3. In an effort to maintain a clear focus I try not to burden the reader with unnecessary commentaries regarding sounds that might not be relevant for my analysis of velar fronting.

The palatal fricative [ç] is present in most UG dialects investigated in this book, although that sound is derived synchronically from /x/. Rare varieties of LAlmc treat [ç] as a phoneme (/ç/); see §14.3.2. The initial sound in StG words like *ja* 'yes' behaves phonologically in UG as a glide ([j]) and not as a fricative ([ʝ]). The glide /w/ (=/v/ in StG words like [vɑs] 'what' and [tsvɑi] 'two') is referred to in some dialect descriptions as a (lenis) bilabial fricative (=IPA [β]).

In Table H.2 and Table H.3 I present a list of the contrastive nonsyllabic segments in the CG/LG dialects under investigation. A two-way laryngeal contrast characterizes most of the stops (e.g. fortis /t/ vs. lenis /d/) and most of the fricatives (e.g. fortis /s/ vs. lenis /z/). Affricates are absent from LG. In CG only /pf/ and /ts/ – but never /kx/ – are present. As in Table H.1, the one rhotic consonant in Tables H.2 and H.3 is either as coronal (/r/), or dorsal (/ʀ/) depending on the dialect. The postalveolar fricative /ʃ/ is absent in many conservative varieties of WLG which preserve WGmc $^{+}$[s] as [s] (/s/) before a consonant (e.g. [s] for [ʃ] in StG *Stadt* [ʃtɑt] 'city', *schreiben* [ʃʀɑibən] 'write-INF') or after a rhotic (e.g. [s] for [ʃ] StG *Kirsche* [kɪʀʃə] 'cherry'). Other varieties of LG have phonemicized [ʃ] (/ʃ/) in those contexts. The sibilant fricative [ʃ] (/ʃ/) in many varieties of CG is realized as alveolopalatal [ɕ]; see Chapter 10.

Table H.2: CG nonsyllabic segments

stops	p b	t d			k (g)	
affricates	pf	ts	tʃ			
fricatives	f v	s z	ʃ	ʝ	x (ɣ)	h
nasals	m	n			ŋ	
liquids		l, r				

Table H.3: LG nonsyllabic segments

stops	p b	t d			k (g)	
fricatives	f v	s z	(ʃ)	ʝ	x (ɣ)	h
nasals	m	n			ŋ	
liquids		l, r				

The two sounds [g] and [ɣ] (as well as [ʝ] and [x ç]) in Tables H.2 and H.3 are related diachronically and synchronically. In many dialects – including StG – there are regular alternations between [g] and [x ç], although other dialects show alternations between [g] and [ɣ ʝ x ç]. For example, in one commonly attested system, [g] surfaces as [g] word-initially and as [ɣ] or [ʝ] in a word-internal onset depending on whether or not a back vowel or a front vowel precedes. In that type of system, the dorsal fricatives derived from /g/ surface as [x] or [ç] in coda position after a back vowel and front vowel respectively. Thus, there is synchronic rule of g-Spirantization, which itself feeds velar fronting.

A number of writers have observed that the sound transcribed in Tables H.2 and H.3 as [v] is realized as an obstruent ([v]) in syllable-initial position (e.g. [vɑs] 'what') and as a glide-like (approximant) sound in the context after a word-initial consonant; the symbol usually used for that realization is [ʋ]. Thus, the [v] in a StG word like [tsvɑi] 'two' is realized in that type of dialect as [tsʋɑi]; see Wiese (1996b: 235–242). An extensive discussion of similar data from Wph can be found in Hall (2014c).

Appendix I: Velar fronting parallels in a selection of Indo-European languages

The typological literature cited throughout this book stresses that the fronting of velar sounds in the neighborhood of front vocoids like [i] and [j] is a phonetically plausible development that is well-attested in the languages of the world. The purpose of this appendix is to briefly assess the (in)stability of velars in the neighborhood of front vocoids in a small set of Indo-European languages. In particular, I focus on those Gmc languages (WGmc/NGmc) not discussed in this book, as well as the two major language families spoken in the immediate vicinity of German-speaking countries, namely Slavic and Romance. The name for the fronting of velars in the literature cited below differs from author to author; for the sake of consistency, I refer to it as Velar Palatalization, which is also the term typically adopted in the typological literature (§2.3). In the following paragraphs I consider the status of Velar Palatalization from the diachronic perspective, but I also assess its role as a synchronic process in modern languages.

The purpose of this appendix is not to present data illustrating Velar Palatalization in a representative selection of phonological contexts for each language. Instead, I summarize the basic facts as they are presented in the works cited and give a few selected examples for illustration. With the exception of my discussion of North Frisian, I restrict my discussion of the standard languages and make no attempt to assess the status of the palatalization/fronting of velars in regional dialects.

In order to facilitate a comparison between velar fronting in German dialects and Velar Palatalization in the languages spoken (or once spoken) in north-central Europe it is important to consider Velar Palatalization in terms of the same parameters for velar fronting. Those parameters are: (a) the nature of the target velar consonant, (b) the nature of the trigger, (c) the nature of the output, (d) directionality (right-to-left or left-to-right), and (e) the position of the target consonant in the word (word-initial, word-medial, word-final).

I turn now to the individual language families:

I.1 Germanic

The fronting of a velar in the neighborhood of front vocoids is not well-attested as a synchronic rule in modern Gmc languages (Hall 2020), although that type of historical change has occurred. I consider NGmc and WGmc in that order:[1]

I.1.1 North Germanic

In an early stage (ca. thirteenth century) velar stops (/k g/) were fronted before front vocoids (Haugen 1976, 1982). The change was regular in word-initial position, but in word-medial position it was not as widespread. The output sounds of Velar Palatalization when it was phonologized were probably the corresponding palatal stops ([c ɟ]), which were later realized differently depending on the language. In particular, earlier [c ɟ] are retained as palatals in Icelandic ([cʰ c]), but in Norwegian they are realized as [ç j] and in Swedish as [ɕ j], cf. the initial segment in the verb 'give-INF': Icelandic *gefa* [cɛːva], Norwegian *gi* [jiː], Swedish *ge* [jeː]. The palatal sounds in those cognates derive from velar [g] in ON *gefa*.

In modern Scandinavian languages there are vestiges of the historical process of Velar Palatalization in the form of morphophonemic alternations; see Kristoffersen (2000: 112) for Norwegian, Arnason (2011: 101–103) for Icelandic, and Riad (2014: 109) for Swedish. Although Velar Palatalization was once an allophonic process (e.g. [k] and [c] were positional variants), the modern reflexes of the palatals created by that historical process (or the sounds they later developed into) now contrast with velars; hence, any synchronic process mirroring Velar Palatalization is a rule of neutralization. For example, [k] and [c] contrast in Icelandic, e.g. [cœːr̥] 'done' vs. [kœːrouhtʏr̥] 'impure, feculent'; alternating examples include [kʰɔːma] 'come-INF' vs. [cʰɛːmʏr̥] 'come-3SG'. Recall from §6.5.1 and §7.4.1 that Anderson (1981) and Calabrese (2005) both capture similar velar vs. palatal alternations in Icelandic with synchronic rules mirroring the historical process of Velar Palatalization.

Riad (2014: 108, Footnote 27) observes that Velar Palatalization also affected the historical lenis velar (PGmc ⁺[ɣ]) in the context after liquids (/l r/) in Swedish. That change can be observed in Swedish words like [bærːj] 'mountain', where palatal [j] corresponds to /g/ in StG, cf. the cognate [bɛʀk] /bɛʀg/).

[1] I do not discuss the philological evidence purported to document Velar Palatalization in earlier stages of Gmc (e.g. Van der Hoek 2010 on OHG and OLF) because that evidence is simply too sparse and speculative to draw conclusions concerning the status of the parameters listed above.

I.1.2 West Germanic

I.1.2.1 English

As discussed at length in the scholarly literature, Velar Palatalization regularly applied in the context of front segments in OE; Hogg (2011: 252–270) and Minkova (2014: 84–88) offer two recent treatments of this topic.

Hogg (2011: 252–270) presents a very detailed discussion of Velar Palatalization in OE. Although the generalization is simple – velar consonants are fronted in the context of front segments – there are a number of restrictions regarding the target velar, the front vocoid trigger, and the position of the target and trigger within the word. (Hogg 2011: 253–254 opines that the complex set of conditions can be simplified by taking syllable structure into consideration). The conditions referred to are as follows: In initial position any velar consonant underwent Velar Palatalization before a front vowel, e.g. +*ɣellan* > *yell;* +*kīdan* > *chide.* In word-final position all velar consonants were palatalized after (short or long) /i/, e.g. +*dīk* > *ditch*, but after nonhigh front vowels only velar fricatives served as targets, e.g. +*dæɣ* > *day*. In word-medial position a velar consonant was always palatalized before /i/ or /j/. Velar fricatives underwent the same change in medial position after any front vowel provided that a back vowel did not directly follow, e.g. +*reɣn* > *rain*.

In its earliest stage Velar Palatalization created palatal allophones (e.g. [c ç] from /k x/), but the pronunciation of those palatal sounds was modified by later changes. For example, palatal stops like [c] is now realized as the postalveolar affricate ([tʃ]), as indicated in the modern English examples listed above.

Modern English has many alternations involving a velar stop ([k g]) and a coronal fricative or affricate ([s ʃ dʒ]), e.g. *electri[k]~electri[s]ity, logi[k]~logi[ʃ]ian, analo[g]ous~analo[dʒ]y.* Those alternating forms have been argued to involve the fronting an underlying velar (/k g/) in the context of a following front vocoid by rules of Velar Softening and Palatalization (Chomsky & Halle 1968, Borowsky 1990, Halle 2005).

I.1.2.2 Frisian

WGmc +/k/ and +/ɣ/ underwent Velar Palatalization in initial position before front segments in OFr (Laker 2007, Bremmer 2009). According to the latter author (Bremmer 2009: 30–31), /k/ was realized as the affricate [ts] and /ɣ/ as a continuant.[2] Examples include +*kerka-* > *tserl* 'man' (cf. StG [kɛʁl] 'fellow') and

[2]Bremmer's symbol for [ɣ] is ⟦g⟧, and his symbol for the corresponding continuant is ⟦j⟧, the latter of which was realized orthographically in OFr as *i*. I interpret Bremmer's ⟦j⟧ as the corre-

$^+$*gelda-* > *ield* 'money' (cf. StG [gɛlt]). In word-medial position, $^+$/k/ likewise underwent the same changes to [ts] before $^+$/i/ or $^+$/j/, e.g. $^+$*dīkjan* > *dītsa* 'build-INF dike-PL' (cf. English *dike*). In medial position the geminate stop $^+$/gg/ and the nasal-stop cluster $^+$/ng/ ($^+$[ŋg]) fronted before $^+$/i/ or $^+$/j/. $^+$/gg/ was realized as the lenis affricate [dz], $^+$*saggjan-* > *sedza* 'say-INF' (cf. StG [zɑːgən]), and $^+$/ng/ ($^+$[ŋg]) as [ndz], e.g. $^+$*langi-* > *lendze* 'length' (cf. StG [lɛŋə]). In final position, $^+$/ɣ/ was realized as [ʝ] in the context after /e/, e.g. $^+$*wega-* > *wei* 'way' (cf. StG [veːk] /veːg/). Additional complications include the etymological source of the palatalization triggers and the retention of $^+$/k/ in $^+$/sk/ clusters.

Modern Frisian consists of three separate branches (Walker 1989): West Frisian (spoken in the Dutch province of Friesland), North Frisian (spoken in the county of Nordfriesland in the German state of Schleswig-Holstein), and Saterland Frisian (spoken in the district of Cloppenburg in the German state of Lower Saxony). The location of all three Frisian languages is indicated on Map A.1. Given that North Frisian and Saterland Frisian are coterritorial with a velar fronting language (LG), one might suspect that those Frisian languages also have some version of velar fronting.[3] This appears to be the case for North Frisian, although some sources simply make passing reference to velar fronting without providing the necessary details. For example, Bauer (1925: 25) writes that the Moringer dialect has the (fortis) velar and palatal fricatives and that those sounds have a distribution as in StG. Brandt (1913: 43) makes a similar statement for the Goeharden dialect. Jensen (1925: 44–45) likewise asserts that the velar and palatal fricatives in Wiedingharde are distributed according to the frontness of the preceding vowel. Unfortunately, Bauer, Brandt, and Jensen transcribe velars and palatals with the same phonetic symbol; hence, it is not possible to determine the parameters for velar fronting in the dialects they describe. Tedsen (1906: 20) observes that the North Frisian dialect spoken on the island of Föhr has a fortis palatal and a fortis velar fricative which are transcribed with two distinct symbols, i.e. ⟦χ⟧ (=[ç]) and ⟦x⟧ (=[x]). The dialect also has the lenis velar fricative [ɣ] (=⟦ʒ⟧), which can occur after any type of vowel. On the basis of the data from Tedsen (1906) it can be concluded that velar fronting only affects the fortis fricative /x/, which has the allophone [ç] after high front vowels ([i y]) and [x] after back vowels, e.g. ⟦giχl̥⟧ 'violin' (cf. StG *Geige*), ⟦ryχ⟧ 'rough' (cf. StG *rauh*) vs. ⟦lɑxt⟧ 'easy' (cf. StG *leicht*). Since no examples were found in that source for either [ç] or [x] in the context after nonhigh front vowels or consonants it is not possible

sponding palatal fricative /ʝ/ [ʝ]. Bremmer assumes that the change from $^+$/k/ to [ts] included more than one intermediate stage, namely $^+$/k/ > /kʲ/ > /tʲ/ > /ts/.

[3] West Frisian velars (e.g. [x]) are stable in the context before or after front vowels (Sipma 1913, Cohen et al. 1959, Hoekstra 2001).

to know for sure whether or not the set of triggers consists only of high front vowels. Siebs (1909: 176) states that the North Frisian variety of Helgoland has an ich-Laut and an ach-Laut. Since the dictionary in that work gives lexical entries phonetically with separate symbols for velars and palatals it is easy to see that [ç] surfaces after any front vowel and [x] after any back vowel. (No examples were found in Siebs 1909 for the context after a consonant).

According to Sjölin (1969: 67), Fort (1980: 65), and Fort (2001: 412) Saterland Frisian has both [x] and [ɣ], but there are no corresponding palatals. In his phonetic study of Saterland Frisian, Peters (2017) writes that /x/ is usually realized as a velar fricative, but that some speakers have a palatal variant after front vowels.

I.1.2.3 Afrikaans

According to Combrink & de Stadler (1987: 80), the velar stop /k/ (= orthographic *k*) and the velar fricative /x/ (= orthographic *g*) surface as the corresponding palatals ([c] and [ç]) in word-initial position before a front vowel, e.g. the initial segment in *gieter* 'watering' (cf. StG [giːsən] 'water-INF') and *geld* 'money' (cf. StG [gɛlt] 'money') is [ç], and the *k* in *kies* 'choose-INF' (cf. StG [kiːzə] 'choose-INF') is [c]. The rule of Velar Palatalization ("Palatalisasie") posited by Combrink & de Stadler (1987: 80) is triggered by a front vowel but not by a consonant. Since [ç] and [c] are not contrastive sounds of Afrikaans, Velar Palatalization is an allophonic process. The generalizations concerning the distribution of the velars [k x] and the corresponding palatals are also clear from earlier sources for Afrikaans (Wilson 1964, De Villiers 1969).[4]

I.2 Slavic

Velar Palatalization occurred more than once in the history of Slavic (Carlton 1990). Those changes are usually referred to in the literature as First Velar Palatalization and Second Velar Palatalization. Both had in common that they affected velar stops and fricatives in the context of a following front vocoid, but – as shown below – they created a different set of outputs. Those historical changes

[4]Data and references for word-initial velar fronting in Afrikanns can be found under "Palatalisation" in the online grammar of Afrikaans in Taalportaal (https://taalportaal.org). According to that source, word-initial velar fronting is only triggered by a "high vowel, (especially the high front [i] vowel)". Taalportaal also notes that /ɦ/ undergoes fronting to [ʝ] before a high front vowel, e.g. [ʝiərs] (/ɦers/) 'reign-INF'.

have left their trace in modern Slavic languages in the form of alternations involving velars and coronals (see Rubach 2011 for a survey). For example, the targets for the First Velar Palatalization in Kashubian (West Slavic, Map A.1) are /k g x/, the outputs are [tʃʲ dʒʲ ʃʲ], and the triggers are front vowels (/i ɛ/) which follow the targets, cf. *kale[k]-a* 'invalid' vs. *kale[tʃʲ]-i* 'invalid-NOM.PL', *dro[g]-a* 'road' vs. *dro[dʒʲ]-i* 'road-NOM.PL', *mu[x]-a* 'fly' vs. *mu[ʃʲ]-i* 'fly-NOM.PL'. By contrast, the Second Velar Palatalization creates dental sibilants, but the context is morphologically conditioned. For example, in Ukrainian (East Slavic) the targets are /k ɣ x/, which surface as [tsʲ zʲ sʲ] before an /i/, but only in the dative or locative singular, e.g. *ru[k]-a* 'hand' vs. *ru[tsʲ]-i* 'hand-DAT/LOC.SG', *mu[x]-a* 'fly' vs. *mu[sʲ]-i* 'fly-DAT/LOC.SG'.

I.3 Romance

The palatalization of velars was an important sound change that applied more than once in the history of Romance languages (Buckley 2009 and references cited therein). The First Palatalization occurred in Proto-Romance (third century), at which point /k/ and /g/ served as targets in the context before front vowels (/i e ɛ/). The eventual outputs in Old French for those two target segments were the coronal affricates [ts dʒ], which later shifted to [s z] in modern French. For example, the [ts] and [dʒ] in Old French /tsɛnt/ 'hundred' and /ardʒɛnt/ 'silver, money' were originally [k] and [g], but they are now realized as [s] and [ʒ], i.e. French [sã], [aʀʒã]. The Second Palatalization occurred in Gallo-Romance, two centuries after the First Palatalization. The velar target sounds for the Second Palatalization were /k g/, which became /tʃ dʒ/ in Old French. Since the First Palatalization had eliminated most sequences of /k g/ plus front vowel there were very few native words with those sequences when the Second Palatalization was active; however, some loanwords demonstrate that front vowels served as triggers for the Second Palatalization, and some native items show that the glide /j/ could also induce fronting of a preceding velar, e.g. the initial segment in Old French /tʃjær/ 'dear' was originally /k/. However, the vowel that most commonly served as the trigger for the Second Palatalization is usually transcribed as ⟦a⟧, e.g. Old French /tʃamp/ 'field', /dʒambə/ 'leg', where the initial segments derived historically from /k/ and /g/ respectively. Buckley (2009) argues that ⟦a⟧ represented the low front vowel [æ] when the Second Palatalization was active, in which case the sounds that served as triggers for that change were all and only front vocoids.

Among the modern Romance languages, Italian has been argued to have a synchronic rule of Velar Palatalization which is an outgrowth of the same process in Latin (Krämer 2009). According to that source, Velar Palatalization is both phonologically and morphologically conditioned. For example, a velar stop (/k/) is realized as [tʃ] in the context before /i/ in noun plurals, e.g. [a'mi:ko] 'friend' ~ [a'mi:tʃi] 'friend-PL' ~ [a'mi:ke] 'friend-FEM.PL'. Velar Palatalization similarly accounts for the alternation between [g] and [dʒ] in second conjugation nouns, but the same process fails to apply in first conjugation nouns.

I.4 Conclusion

It was mentioned above that the historical processes of Velar Palatalization – like the historical process of velar fronting in German – underwent more than one stage. Those stages can be defined according to the nature of the output (e.g. [ki] > [ci] > [tʃi] for English), but they can also be interpreted in terms of the life cycle proposed by Hyman (2013) from §14.6.3. For example, in most of the languages discussed in this appendix Velar Palatalization in its initial stage created fronted allophones (e.g.. [c], [ɟ], [ç], [ʝ]) which later became phonemicized. Depending on the language, the original allophonic process of Velar Palatalization might have later become morphologized (e.g. in Ukrainian) and ultimately lost (in the case of English).

Although there are clear parallels between Velar Palatalization and velar fronting in the languages/language families discussed in this appendix, it is important stress that there are four significant differences:

Targets: The target segments for the languages with Velar Palatalization all include velar stops. By contrast, velar fronting in German dialects always affects at least one velar fricative, but in the unmarked case, velar stops are unaffected. Those German dialects in which velar fronting affects one or more velar stop are not common and are restricted geographically to the areas described in Chapter 11.

Triggers: It has been stressed throughout this book that the triggers for velar fronting in the unmarked HG/LG dialects include not only front vowels but also coronal consonants, i.e. /l r n/. By contrast, the unmarked triggers for Velar Palatalization in the languages discussed above do not include consonants. The one counterexample to this generalization is Swedish, where /l r/ served as triggers for a following velar.

Outputs: If the input segment for Velar Palatalization is a stop, then the output is typically a coronal affricate, e.g. /k/ is realized as [tʃ] (or in some languages as [ts]). In those marked German dialects in which a velar stop serve as targets for velar fronting, the output is a palatal stop, e.g. /k/ is realized as [c]. By contrast, no variety of German has been found in the present survey which creates an affricate (e.g. [tʃ]) from an underlying stop (e.g. /k/).

Directionality: If Velar Palatalization applies in word-medial position then the trigger is to the right of the target; hence, Velar Palatalization applies regressively (from right-to-left). The two examples discussed above involving left-to-right palatalization (Swedish, OE) also had spreading in the opposite direction. By contrast, in word-medial position velar fronting applies from left-to-right in every dialect of HG and LG without exception.

The conclusion is that velar fronting must be seen as a phenomenon distinct from Velar Palatalization.

Appendix J: List of places in Lower Bavaria (SNiB)

1. Arnbruck
2. Zinzenzell
3. Gossersdorf
4. Moosbach
5. Zell
6. Prackenbach
7. Viechtach
8. Drachselsried
9. Bodenmais
10. Bayer. Eisenstein
11. Scheuereck
12. Wiesenfelden
13. Rattiszell
14. Haibach
15. Klinglbach
16. Kirchaitnach
17. Teisnach
18. Brandten
19. Rabenstein
20. Zwiesel
21. Lindberg
22. Riedenburg
23. Baiersdorf
24. Painten
25. Oberzeitldorn
26. Bärnzell
27. Dachsberg
28. Perasdorf
29. Achslach
30. Zachenberg
31. March
32. Regen
33. Rinchnach
34. Frauenau
35. Finsterau
36. Essing
37. Kelheim
38. Herrnsaal
39. Peising
40. Atting
41. Straubing
42. Parkstetten
43. Bogen
44. Schwarzach
45. Bernried
46. Grafling
47. Bischofsmais
48. Kirchberg im Wald
49. Eppenschlag
50. Spiegelau
51. Neuschönau
52. Mauth
53. Mitterfirmiansreut
54. Philippsreut
55. Eining
56. Pullach

57. Großmuß
58. Schneidhart
59. Wallkofen
60. Perkham
61. Feldkirchen
62. Aiterhofen
63. Irlbach
64. Mariaposching
65. Metten
66. Mietraching
67. Urlading
68. Hunding
69. Innernzell
70. Grafenau
71. Schlag
72. Ringelai
73. Kreuzberg
74. Herzogsreut
75. Haidmühle
76. Mühlhausen
77. Biburg
78. Sallingberg
79. Herrngiersdorf
80. Mallersdorf
81. Laberweinting
82. Hainsbach
83. Oberwalting
84. Oberschneiding
85. Grafling
86. Rottenmann
87. Plattling
88. Seebach
89. Waltersdorf
90. Schöllnach
91. Thurmansbang
92. Lembach
93. Waldenreut
94. Kumreut
95. Karlsbach
96. Grainet
97. Altreichenau
98. Neureichenau
99. Train
100. Obereulenbach
101. Pattendorf
102. Hofendorf
103. Langenhettenbach
104. Asbach
105. Mengkofen
106. Hailing
107. Waibling
108. Haidlfing
109. Oberpöring
110. Aholming
111. Niedermünchsdorf
112. Winzer
113. Außernzell
114. Eging am See
115. Tittling
116. Prag
117. Unterhöhenstetten
118. Heindlschlag
119. Breitenberg
120. Lindkirchen
121. Attenhofen
122. Pfeffenhausen
123. Türkenfeld
124. Oberergoldsbach
125. Martinshaun
126. Unholzing
127. Dornwang
128. Thürnthenning
129. Mamming

130. Landau
131. Exing
132. Hartkirchen
133. Forsthart
134. Künzing
135. Windorf
136. Rathsmannsdorf
137. Ruderting
138. Büchlberg
139. Raßberg
140. Germannsdorf
141. Thalberg
142. Volkenschwand
143. Obersüßbach
144. Weihmichl
145. Oberglaim
146. Essenbach
147. Niederaichbach
148. Weigendorf
149. Frauenbiburg
150. Englmannsberg
151. Haunersdorf
152. Ruppertskirchen
153. Münchsdorf
154. Pörndorf
155. Aldersbach
156. Zeitlarn
157. Sandbach
158. Heining
159. Passau
160. Kellberg
161. Untergriesbach
162. Wegscheid
163. Gründkofen
164. Landshut
165. Jenkofen
166. Kröning
167. Aham
168. Frontenhausen
169. Failnbach
170. Malgersdorf
171. Hainberg
172. Mitterhausen
173. Johanniskirchen
174. Amsham
175. Sachsenham
176. Ortenburg
177. Dorfbach
178. Neukirchen/Inn
179. Haunwang
180. Vilsheim
181. Geisenhausen
182. Seyboldsdorf
183. Schalkham
184. Hölsbrunn
185. Reicheneibach
186. Falkenberg
187. Niedernkirchen
188. Nöham
189. Waldhof
190. Untertattenbach
191. Griesbach im Rottal
192. Hütting
193. Sulzbach
194. Baierbach
195. Haarbach
196. Aich
197. Wolfsegg
198. Huldsessen
199. Hebertsfelden
200. Postmünster
201. Voglarn

202. Asenham
203. Asbach
204. Kühnham
205. Pocking-Hartk.
206. Babing
207. Wurmsham
208. Mitterskirchen
209. Rogglfing
210. Randling
211. Wittibreut
212. Kösslarn
213. Malching
214. Rotthalmünster
215. Aigen
216. Würding
217. Gumpersdorf
218. Eggstetten
219. Stubenberg
220. Ering
221. Kirchdorf am Inn

Appendix K: List of dialect dictionaries

AaWb: *Aachener Sprachschatz. Wörterbuch der Aachener Mundart. Beiträge zur Kultur- und Wirtschafts-Geschichte Aachens und seiner Umgebung*. Hermanns, Will. 1970. Aachen: J.A. Mayer Verlag.

DoWb: *Dortmunder Wörterbuch*. Schleef, Wilhelm. 1967. Cologne: Böhlau Verlag.

DrWb: *Mundart im Heinsberger Land. Dremmener Wörterbuch*. Gillessen, Leo. 1999. Cologne: Rheinland-Verlag.

HaWb: *Hamburgisches Wörterbuch*. Kuhn, Hans & Ulrich Pretzel (eds.), 1956–2006. 5 volumes. Neumünster: Karl Wachholtz.

KWb: *Das Kölsche Wörterbuch. Kölsche Wörter von A-Z*. Bhatt, Christa & Alice Herrwegen. 2005. Cologne: Verlag J. P. Bachem.

MiElWb: *Mittelelbisches Wörterbuch*. Kettmann, Gerhard (ed.), 2002–2008. 2 volumes. Berlin: Akademie Verlag.

NKSS: *Neuer Kölnischer Sprachschatz*. 1956. Wrede, Adam. 3 volumes. Cologne: Greven.

NSSS: *Neunkirchen-Seelscheider Sprachschatz*. 2013. Zweite Auflage. Lammert, Leo & Paul Schmidt. Neunkirchen-Seelscheid: Heimat und Geschichtsverein Neunkirchen-Seelscheid e.V.

ObersWb: *Wörterbuch der obersächsischen und erzgebirgischen Mundarten*. Müller-Fraureuth, Karl. 1914. 2 volumes. Dresden: Wilhelm Baensch.

PWb: *Pommersches Wörterbuch*. Herrmann-Winter, Renate & Matthias Vollmer. 2007. Berlin: Akademie Verlag.

RWb: *Rheinisches Wörterbuch*. Müller, Josef (ed.), 1928–1971. 9 volumes. Bonn: Fritz Klopp Verlag.

SbWb: *Saarbrücker Wörterbuch*. Braun, Edith & Max Mangold. 1984. Saarbrücken: Saabrücker Druckerei und Verlag.

SchlHWb: *Schleswig-Holsteinisches Wörterbuch.* (Volksausgabe). Mensing, Otto. 1927–1935, 5 volumes. Neumünster: Karl Wachholtz.

SchwWb: *Schwäbisches Wörterbuch.* Auf Grund der von Adelbert v. Keller begonnenen Sammlungen und mit Unterstützung des württembergischen Staates. Bearbeitet von Fischer, Hermann. 1904–1936. 6 Volumes. Tübingen: H. Laupp'schen Buchhandlung.

SHesWb: *Südhessisches Wörterbuch.* Begründet von Friedrich Maurer nach den Vorarbeiten von Friedrich Mauer, Friedrich Stroh und Rudolf Mulch. Bearbeitet von Rudolf Mulch. 1965–2010. 6 volumes. Marburg: N.G. Elwert.

SiWS: *Simmentaler Wortschatz. Wörterbuch der Mundart des Simmentals (Berner Oberland). Mit einer grammatischen Einleitung und mit Registern.* Armin Bratschi und Rudolf Trüb unter Mitarbeit von Lily Trüb sowie Maria Bratschi und Ernst Max Perren. Zeichnungen von Rolf Oberhänsli. Thun: Ott Verlag.

TeWb: *Wörterbuch der Teltower Volkssprache.* (*Telschet Wöderbuek*). Lademann, Willy. 1956. Berlin: Akademie-Verlag.

TiWb: *Wörterbuch der Tiroler Mundarten.* Schatz, Josef. 1955. 2 volumes. Innsbruck: Universitätsverlag Wagner.

TrWb: *Trierer Wörterbuch. Mit Sprachgesetzen derselben und Sprachproben in Prosa und Poesie.* Christa, Peter. 1927/1969. Wiesbaden: Dr. Martin Sandig.

WbKM: *Wörterbuch der Kölner Mundart.* Hönig, Fritz. 1952. Cologne: Verlag J. P. Bachem.

WbMD: *Wörterbuch der Mundart von Dobschau.* Lux, Julius. 1961. Marburg: N.G. Elwert.

WbUS: *Wörterbuch der unteren Sieg.* Fischer, Helmut. 1985. Cologne: Rheinland Verlag.

WMlWb: *Wörterbuch der westmünsterländischen Mundart.* Piirainen, Elisabeth & Wilhelm Elling. 1992. Vreden: Heimatverein Vreden

WphWb: *Wörterbuch der westphälischen Mundart.* Woeste, Friedrich. 1882. Norden: Heinrich Soltau.

Appendix L: List of linguistic atlases

AADG: *Atlas zur Aussprache des deutschen Gebrauchsstandards.* Kleiner, Stefan. 2011. Unter Mitarbeit von Ralf Knöbl. Available at: http://prowiki.ids-mannheim.de/bin/view/AADG

AAS: *Atlas zur Aussprache des Schriftdeutschen in der Bundesrepublik Deutschland.* König, Werner. 1989. 2 volumes. Ismaning: Hueber Verlag

ACeM: *Atlas der Celler Mundart. Im Blickfelde der niedersächsischen Dialekte und deren Grenzgebiete.* Mehlem, Richard. 1967. Marburg: N.G. Elwert.

ADA: *Atlas zur deutschen Alltagssprache.* Elspaß, Stephan & Robert Möller, 2003. Available at: https://www.atlas-alltagssprache.de

ALA: *Atlas linguistique et ethnographique de l'Alsace.* Beyer, Ernest & Raymond Matzen. 1969–1984. 2 volumes. Paris: Centre National de la Recherche Scientifique.

ALLG: *Atlas linguistique et ethnographique de la Lorraine germanophone.* Philipp, Marte, Arlette Bothorel, & Guy Levieuge. 1977. Volume 1. Corps humain, maladies, animaux domestique. Paris: Centre National de la Recherche Scientifique.

KDSA: *Kleiner Deutscher Sprachatlas.* Dialektologisch bearbeitet von Werner H. Veith. Computativ bearbeitet von Wolfgang Putschke. Unter Mitarbeit von Lutz Hummel. 1984–1999. 4 volumes. Tübingen: Maz Niemeyer.

LATG: *Linguistic Atlas of Texas German.* Gilbert, Glenn G. 1972. Austin, TX: University of Texas Press.

LSA: *Luxemburgischer Sprachatlas. Laut- und Formenatlas.* Schmitt, Ludwig Erich (ed.). 1963. Marburg: N. G. Elwert.

MRhSA: *Mittelrheinischer Sprachatlas.* Bellmann, Günter, Joachim Herrgen & Jürgen Erich Schmidt. 1994–2002. 4 volumes. Tübingen: Max Niemeyer.

NOSA: *Norddeutscher Sprachatlas*. Elmentaler, Michael & Peter Rosenberg. 2015. Band 1 Regiolektale Sprachlagen. Hildesheim: Georg Olms.

SchlSA: *Schlesischer Sprachatlas*. Schmitt, Ludwig Erich (ed.) 1965–1967. 2 volumes. Marburg: N.G. Elwert.

SDA: *Sudetendeutscher Atlas*. Meynen, E. (ed.) 1954. Unter Mitarbeit von E. Bachmann, A. Hammerschmidt, K. Oberdorffer, H. Raschhofer, E. Schwarz, W. Weizsäcker. 1 volume. Munich: Verlag der Arbeitsgemeinschaft zur Wahrung sudetendeutscher Interessen.

SDSA: *Siebenbürgisch-Deutscher Sprachatlas*. Klein, Karl Kurt and Ludwig Erich Schmitt (ed.) 1961–1964. Auf Grund der Vorarbeiten von Richard Huss und Robert Csallner bearbeitet von Kurt Rein. 2 volumes. Marburg: N. G. Elwert.

SDS: *Sprachatlas der deutschen Schweiz*. Hotzenköcherle, Rudolf (ed.) 1962–1997. 8 volumes. Bern: Francke.

SBS: *Bayerischer Sprachatlas. Regionalteil 1. Sprachatlas von Bayerisch-Schwaben*. König, Werner & Hans Wellmann (eds.) 1996–2009. 14 volumes. Heidelberg: Universitätsverlag Winter.

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Subject index

Velar fronting in German dialects

Velar Fronting (VF) is the name for any synchronic or diachronic phonological process shifting the velar place of articulation to the palatal region of the vocal tract. A well-known case of VF in Standard German is the rule specifying that the fricative [x] assimilates to [ç] after front segments. VF also refers to the change from velar sounds like [ɣ k g ŋ] to palatals ([ʝ c ɟ ɲ]). The book provides a thorough investigation of VF in German dialects: Data are drawn from over 300 original sources for varieties that are (or were) spoken in Germany, Austria, Switzerland, and other countries.

VF differs geographically along three parameters: (A) triggers, (B) targets, and (C) outputs. VF triggers (=A) are typically defined according to vowel height: In some systems VF is induced only by high front vowels, in others by high and mid front vowels, and in yet others by high, mid, and low front vowels. Some varieties treat consonants ([r l n]) as triggers, while others do not. VF can be nonassimilatory, in which case the rule applies even in the context of back segments. In many varieties of German, VF targets (=B) consist of the two fricatives [x ɣ], but in other dialects the targets comprise [x] but not [ɣ]. In some places, VF affects not only [x ɣ], but also velar stops and the velar nasal. The output of VF (=C) is typically palatal [ç] (given the input [x]), but in many other places it is the alveolopalatal [ɕ].

A major theme is the way in which VF interacts with synchronic and diachronic changes creating or eliminating structures which can potentially undergo it or trigger it. In many dialects the relationship between velars ([x]) and palatals ([ç]) is transparent because velars only occur in the back vowel context and palatals only when adjacent to front sounds. In that type of system, independent processes can either feed VF (by creating additional structures which the latter can undergo), or they can bleed it (by eliminating potential structures to which VF could apply).

In other dialects, VF is opaque. In one opaque system, both velars ([x]) and palatals ([ç]) surface in the context of front segments. Thus, in addition to expected front vowel plus palatal sequences ([…iç…]), there are also unexpected ones consisting of front vowel plus velar ([…ix…]). In a second type of opaque system, velars and palatals are found in the context of back segments; hence, expected sequences such as […iç…] occur in addition to unexpected ones like […ɑç…].

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