Behavioral economic insights explain a lifestyle relevant for type-2-diabetes prevention

Florian M. Karl^{a,b,*}, Rolf Holle^{a,b}, Annette Peters^{b,c}, Michael Laxy^{a,b}

^a Institute of Health Economics and Health Care Management, Helmholtz Zentrum München, GmbH, German Research Center for Environmental Health, Ingolstädter Landstr. 1, 85764 Neuherberg, Germany
^b German Center for Diabetes Research (DZD), Ingolstädter Landstr. 1, 85764 Neuherberg, Germany
^c Institute of Epidemiology II, Helmholtz Zentrum München, GmbH, German Research Center for Environmental Health, Ingolstädter Landstr. 1, 85764 Neuherberg, Germany

Background and Aims

- A healthy lifestyle is essential for the prevention and management of chronic diseases¹
- Time preference and status quo bias are behavioral economic phenomena assumed to be relevant to decision making in the health domain^{2,3}
- This study aims to investigate the association between these two phenomena and health behavior with real-life proxies

Methods

- Data**
- Cross-sectional population-based data were obtained from the German KORA S4 study (n = 4261) that was conducted from 1999-2001.
- Exposure Variables**
- Derivation of real-life proxies of status quo bias and time preference

Figure 1 Health insurance choice as a measure of status quo bias⁴

Figure 2 Overeating as a measure of time preference⁵

- Outcome Variables**
- Assessment of BMI by trained investigators
 - Self-reported information on:
 - Physical inactivity (< 1.5 h per week)
 - Unhealthy dietary behavior (scoring < 14 points in a questionnaire by the German Nutrition Society)
 - Smoking (ex- or current smoker)

- Statistical Analyses**
- Logistic regression analysis on overweight, physical inactivity, unhealthy diet and smoking
 - Stratification by age (≤ 54 vs. > 54 years of age)
 - Sensitivity analysis with age as a continuous variable

Table 1 Participant Characteristics

	Total	Time preference (nmiss = 117)			p	Status quo (nmiss = 1689)				p
		Low	Mod.	High		Very low	Low	Mod	High	
N	4261	1655	1953	536		266	1086	698	522	
Age (sd)	49.2 (13.9)	53.9	47.3	41.3	<0.001	37.8	49.0	48.1	60.2	<0.001
Gender (% female)	51.0	50.9	52.9	44.5	0.003	47.0	57.3	46.6	49.6	<0.001
Education					<0.001					<0.001
% Higher school	22.7	14.9	27.0	32.3		28.2	17.8	20.1	7.7	

Results

Figure 3 Regression results for relevant unhealthy behaviors

- Increased odds for overweight and physical inactivity with high and very high status quo bias
- Unhealthy diet is more likely in individuals with moderate and very high status quo bias
- Increased odds for overweight and an unhealthy diet in participants with moderate and high time preference
- Smoking is more likely in individuals with high time preference

Figure 4 Regression results for a sum score of relevant unhealthy behaviors

- Overall healthier behavior in individuals with higher status quo bias and with high time preference
- Physical inactivity only increased in individuals suffering from high status quo bias and ≤ 54 years of age
- Decreased smoking rates in participants with high status quo bias and > 54 years of age
- Increased smoking rates in participants with high time preference and > 54 years of age

Conclusion

- Status quo bias measurable on an individual level
- Direction and strength of association in status quo bias are highly dependent on domain and age
- Time Preference measured through overeating has domain spanning associations with smoking and therefore might be a valuable proxy measure of time preference in the health domain.

References

- World Health Organization: Global Report on Diabetes. 2016.
- Thorgeirsson T, Kawachi I: Behavioral economics: merging psychology and economics for lifestyle interventions. American journal of preventive medicine 2013, 44:185-189.
- Shuval K, Stoklosa M, Pachucki MC, Yaroch AL, Drope J, Harding M: Economic preferences and fast food consumption in US adults: Insights from behavioral economics. Prev Med 2016, 93:204-210.
- Afendulis CC, Sinaiko AD, Frank RG: Dominated choices and Medicare Advantage enrollment. Journal of economic behavior & organization 2015, 119:72-83.
- Appelhans BM, Woolf K, Pagoto SL, Schneider KL, Whited MC, Liebman R: Inhibiting food reward: delay discounting, food reward sensitivity, and palatable food intake in overweight and obese women. Obesity (Silver Spring) 2011, 19:2175-2182.

Acknowledgements

The authors are grateful for the critical comments on this work of Reiner Leidl and Lars Schwettmann. They improved the clarity and helped not to lose track in the complex field of (behavioral) health economics.