Developing a Framework for Emotion Recognition from Complex, Abstract Whole-Body Movements

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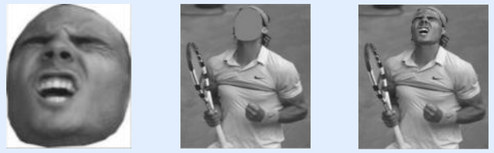
Background

A sophisticated framework for detecting emotion from facial expressions is beginning to emerge.

It is not well understood how emotional information is conveyed through whole-body movements.

The body may provide more salient emotional cues than the face (Aviezer et al., 2012).



Classical dance *(def.):* the 'performance of abstract whole-body movements designed to induce an emotional state in the observer'.

Dance is an ideal tool to explore how the human body in motion can transmit emotional information

Prior Dance Research

- Dancers can more accurately identify the emotional content of whole-body movements *(Christensen et al., 2016; Christensen et al., 2019)*.
- Dancers and non-dancers use different visual processing strategies when observing another in motion *(Stevens, 2010).*

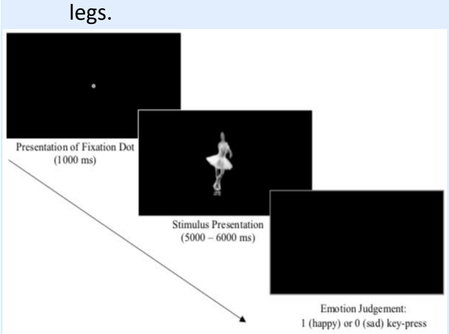
Task

Participants

16 Non-Dancers, 16 Amateur Ballet Dancers, 7 Professional Ballet Dancers

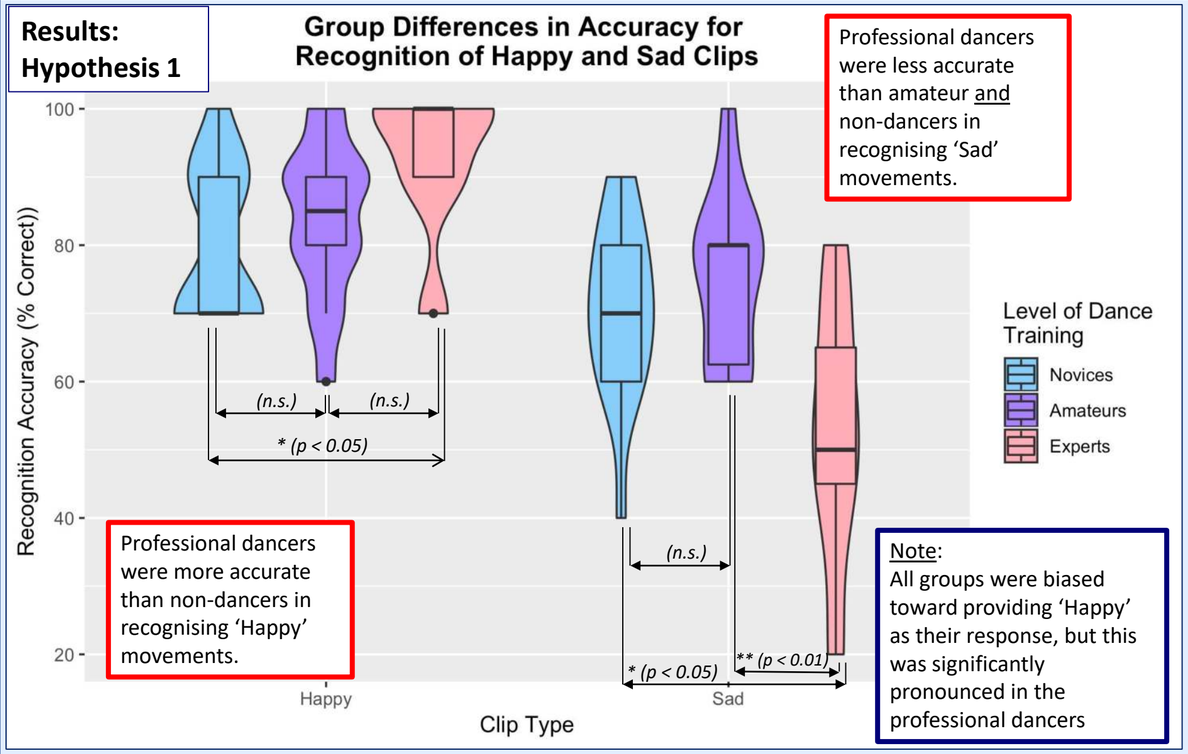
Procedure

- Forced-choice emotion recognition task
- Eye-movements were recorded during the task
- Saccade and Fixation data captured using EyeLink Desktop-Mounted Software
- Dynamic regions-of-interest were manually created (frame-by-frame) around the head, arms, torso and legs.



Trials:
(N= 20)
- 10 'Happy'
- 10 'Sad'
- All 5-6s in duration
- 2 Blocks
- Random Presentation of Happy and Sad (5 each per block)

Results: Hypothesis 1

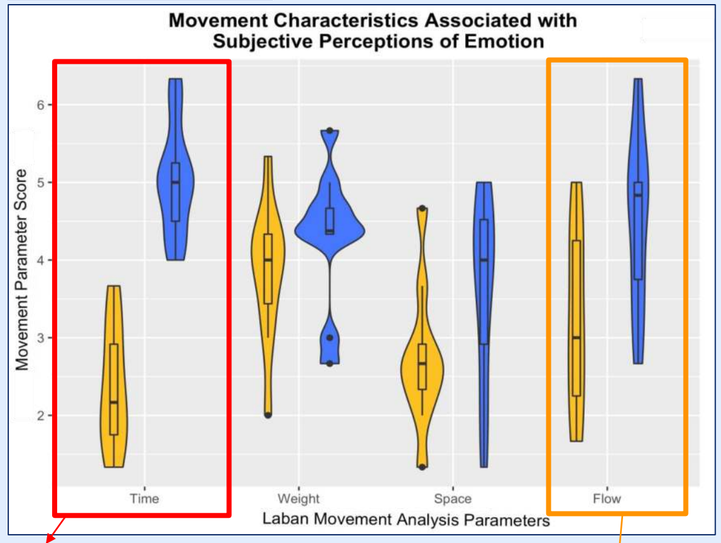


Professional dancers were less accurate than amateur and non-dancers in recognising 'Sad' movements.

Professional dancers were more accurate than non-dancers in recognising 'Happy' movements.

Note:
All groups were biased toward providing 'Happy' as their response, but this was significantly pronounced in the professional dancers

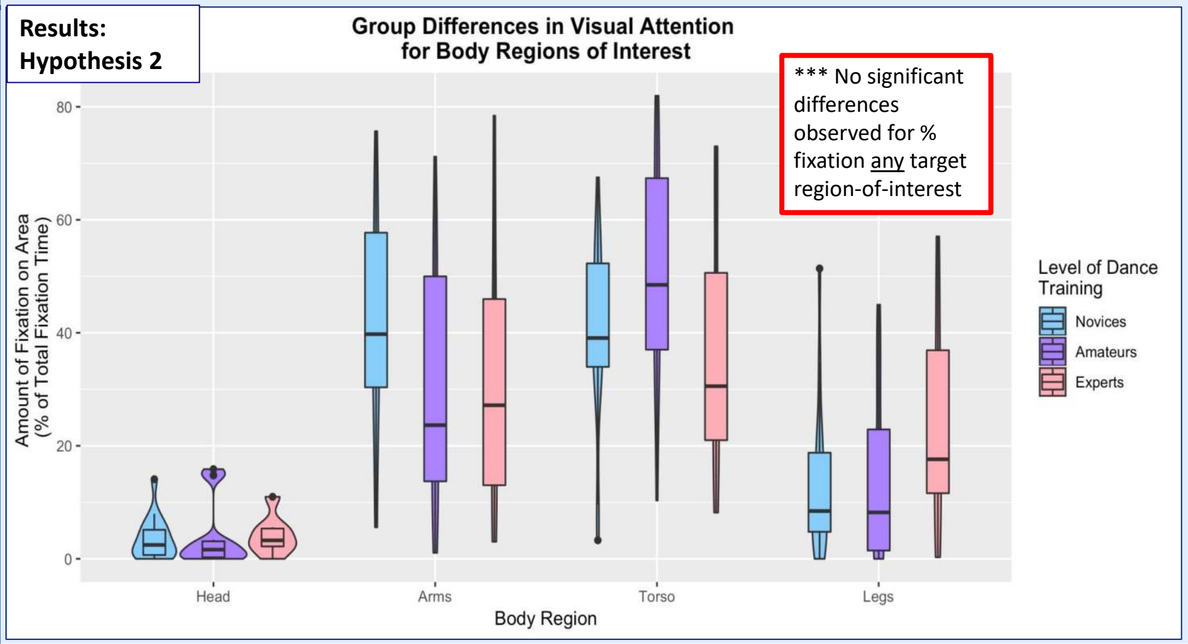
Exploratory Analysis:



Speed of movement was the only significant predictor of emotion perceived by observers (p< 0.0001).

After Bonferroni corrections, fluidity of motion was no longer a significant predictor of perceived emotion (p=0.02).

Results: Hypothesis 2



*** No significant differences observed for % fixation any target region-of-interest

TAKE HOME MESSAGES

1. **Professional** dancers were **best** at recognising '**Happy**' movements but **worst** at recognising the '**Sad**' clips
   - ➢ Likely the result of largest **bias** toward providing the 'Happy' response
2. There were **no differences** between groups for amount of fixation on any region of interest
   - ➢ All groups adopted a **holistic** visual-processing strategy
3. **Speed** of movement plays a significant role in the emotion perceived from whole-body human movement

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