Social Cognition, Emotion Perception, and Biological Movement

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INTRODUCTION

- The ability to express emotions to others is an important aspect of social communication and social cognitive functioning. However, little is known about the role of social ability and the expression of emotional states via body movement.
- In this study, we are specifically interested in examining associations between levels of social cognitive functioning and the ability to convey emotional states strictly via movement of the body.
- Based on past research, the circumplex model of affect (Figure 1) suggests that all emotional states are best understood along two dimensions: (1) valence and (2) arousal, with emotional valence referring to whether an emotional state is pleasant or unpleasant whereas emotional arousal refers to the alertness, or lack thereof, of the associated emotional state [3].
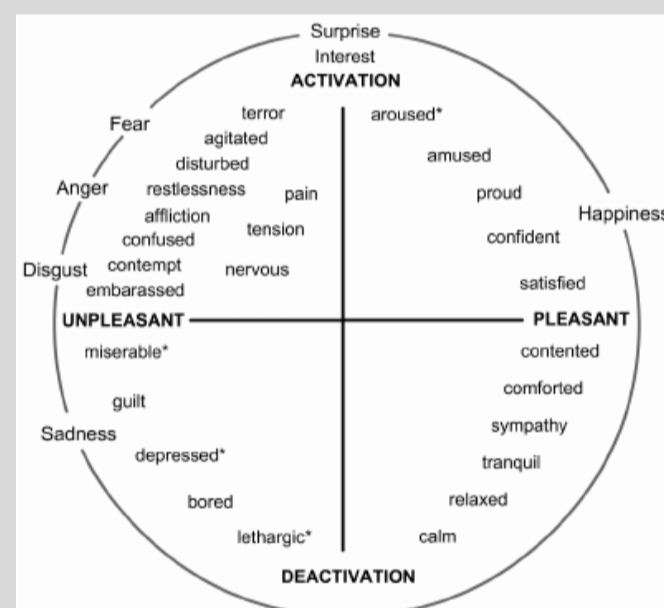

Figure 1. Visual Representation of Russel's Circumplex Model of Affect [1].

- Within this study, emphasis is placed on the emotions of fear, happiness, and anger. According to the model in Figure 1, fear and anger are characterized by high arousal and high valence. On the other hand, happiness is in the upper right quadrant and situated near the endpoint of the positive valence axis, suggesting it is a highly positive and mildly arousing emotion.

Hypotheses:

1. Social cognitive ability is related to the communication of actors' emotional states through movement.
2. Actors with higher levels of social cognition will receive valence and arousal ratings that are more congruent with the respective emotional expressions. For example, evaluating anger as a high-arousal and more negative emotion.
3. Arousal ratings will differ based upon raters' social cognitive functioning abilities.

METHODS AND MATERIALS

- Participants were recruited through online classes and given a link that led to the study on a Qualtrics format. Participants were all IUPUC students or faculty. In total, data was collected from 116 participants.
- Within the Qualtrics study, participants completed two social cognitive assessments: the Reading the Mind in the Eyes (RMET) test as well as the Autism Quotient (AQ).
- The participants viewed 75 point-light display (Figure 2) videos of fifteen actors that were recorded using Microsoft Kinect software. The PLD videos displayed actors enacting emotion states of happiness, anger, and fear through body movements. The participants were then asked to rate the actors on scales of arousal and valence on 7-point Likert scales.
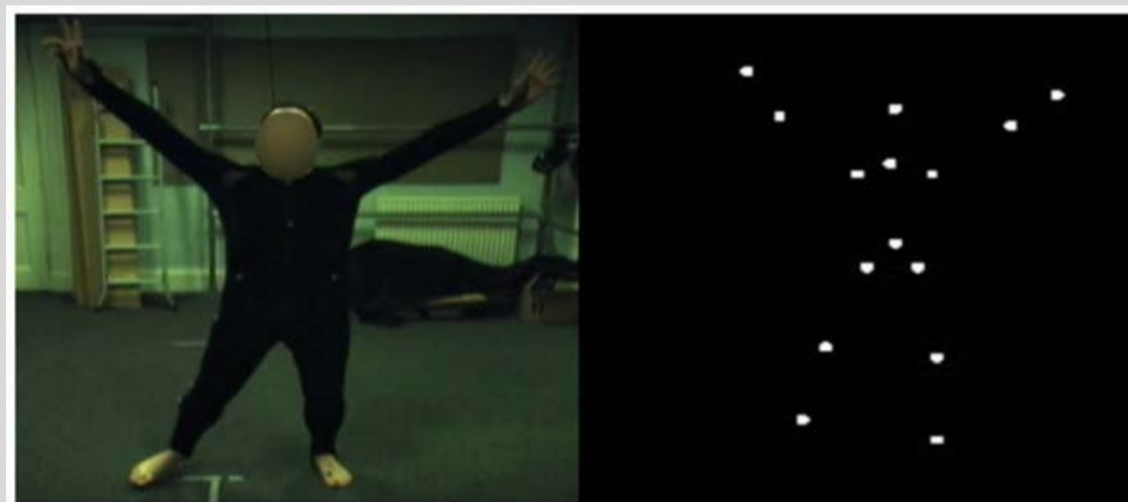

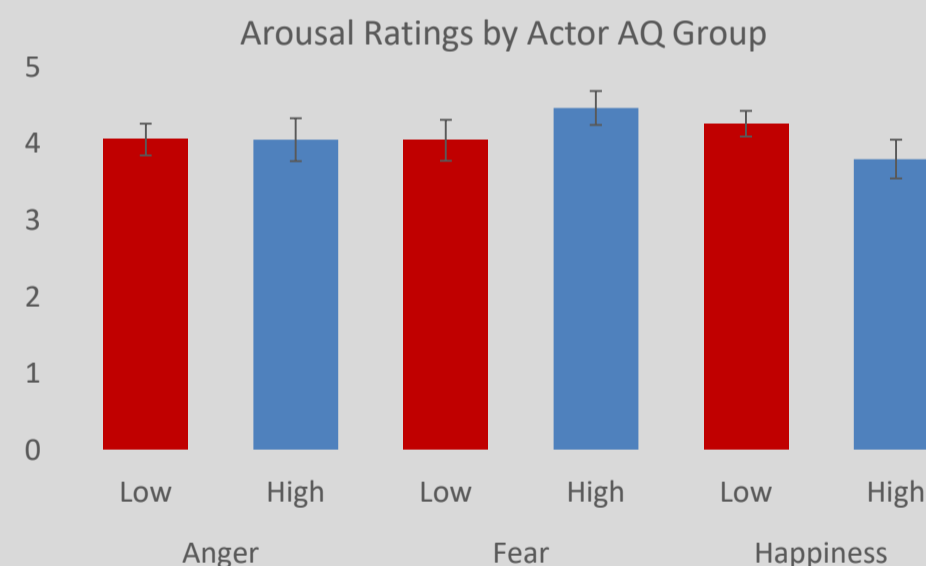Figure 2. An example of a point light display [2].

RESULTS

Figure 3. Mean valence and arousal ratings across 3 emotion expressions for actors. Conditions were not significant.

Figure 4. Rater anger valence mean plotted against the RMET, a social cognitive assessment. p= 0.04 and r=-0.19

Figure 5. Rater anger arousal mean plotted against the RMET, a social cognitive assessment. p= 0.08 and r=0.16

DISCUSSION

- Hypotheses 1 and 2 were not supported; as it was found that social cognitive assessments taken by the actors were found to not correlate with valence and arousal ratings given by the participants for the emotional states conveyed by the actors.
- Hypothesis 3 was partially supported by the results. The participants' social cognitive assessment scores were correlated with their arousal and valence mean ratings for the actors, particularly for the negative emotion of anger (see Figure 4 and 5). Individuals that scored higher on social cognitive functioning perceived anger expressions as more arousing, compared to raters who scored low on social cognitive functioning (see Fig. 5).
- Future areas of study related to this research can explore anger as an emotion and its relation to autism spectrum disorder, which is a disorder characterized by deficits in social cognitive functioning.
- Possible limitations within our study could have been due to the smaller sample size of our actors (N=15), which could have been why Hypotheses 1 and 2 were null. A larger sample size may remove this bias.

SELECTED REFERENCES

1) Posner, J., Russel, J.A., & Peterson, B.S. (2005). The circumplex model of affect: an integrative approach to affective neuroscience, cognitive development, and psychopathology. Development and psychopathology, 17(3), 715-734. http://doi.org/101.1017/S0954579405050340
2) Ross, L., Paddy G., & Polson M.H. (2012). Developmental changes in emotion recognition from full-light and point-light displays of body movement. *Peer-reviewed open access scientific journal.* 7. e44815. 10.1371/journal.pone.0044815.
3) Russell, J. (1980). A circumplex model of affect. *Journal of personality and social psychology.* 39. 1161-1178. 10.1037/h0077714.