

# Two routes to the attribution of emotional reactions: emotion contagion versus cognitive perspective taking

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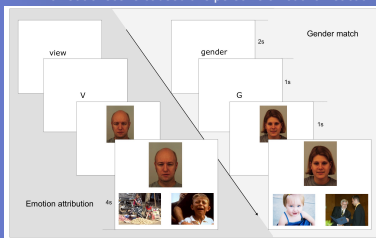


## INTRODUCTION

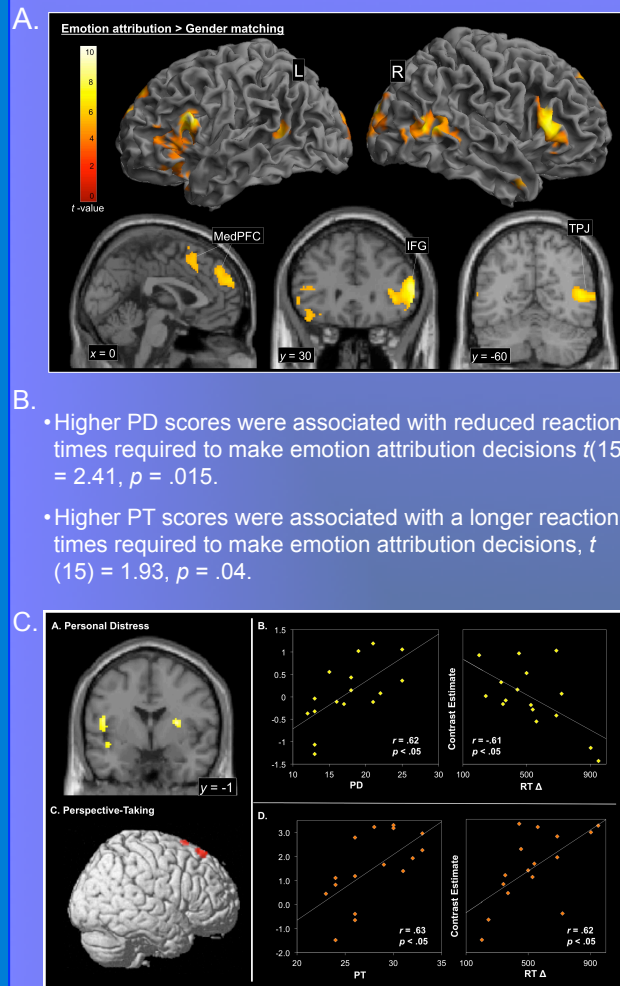
- How do people go about deciding the cause of another person's emotional reaction?
- Emotional attribution decisions likely rely on brain networks important for emotion recognition [1], empathy and theory of mind [2,3].
- Dual process theory for social-cognition [4], and more specifically for empathy and theory of mind, states that social decision making occurs through relatively, emotional/automatic and relatively cognitive/controlled processing routes [5].
- This study was designed to characterize the way that the brain makes emotional attribution decisions and to test a dual-process model for making emotion attribution decisions.
- **Hypotheses:** We predicted that emotion attribution decisions would rely on brain regions involved in empathy and theory of mind. Furthermore, we predicted that the tendency to experience emotion contagion would be associated with quicker emotion attribution decisions and greater anterior insula activity. Lastly, we predicted that the tendency to take on the perspective of others would be associated with longer emotion attribution decisions and greater prefrontal cortex activity.

## METHODS

- Participants: 16 healthy adults (9 females, mean age = 21.8 years).
- Interpersonal Reactivity Index: Personal Distress (PD) scale used to characterize emotion contagion and Perspective Taking (PT) scale used to characterize cognitive perspective taking [6].
- Emotion attribution task: Which social scene caused this person's emotional reaction?
- fMRI: 3T GE-Signa
  - TR = 2s, Flip = 90°
- Analysis: SPM8
  - ROIs
  - Anterior Insula
  - Prefrontal Cortex



## RESULTS



## CONCLUSIONS

- Emotion attribution decisions rely on a network of brain regions involved in empathy and theory of mind, that includes the medial prefrontal cortex (MedPFC), inferior frontal gyrus (IFG) and temporoparietal junction (TPJ).
- People more susceptible to emotion contagion process emotion attribution decisions through the anterior insula and tend to make emotion attribution decisions more quickly as compared to people less susceptible to emotion contagion.
- People who tend to take on the perspectives of other people process emotion attribution decisions through the prefrontal cortex and tend to make more delayed emotion attribution decisions as compared to people who do not tend to take on the perspectives of other people.
- Future directions: How do individual differences in PD and PT impact the accuracy of emotion attribution decisions?

## REFERENCES

- [1] Adolphs, R. (2002). Neural systems for recognizing emotion. *Current opinion in neurobiology*, 12, 169-177.
- [2] Spunt, R. P., & Lieberman, M. D. (2012). An integrative model of the neural systems supporting the comprehension of observed emotional behavior. *Neuroimage*, 59, 3050-3059.
- [3] Shamay-Tsoory, S. G. (2011). The neural bases for empathy. *Neuroscientist*, 17, 18-24.
- [4] Evans, J. S. B. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annu. Rev. Psychol.*, 59, 255-278.
- [5] Preston, S. D., & Hofelich, A. J. (2012). The many faces of empathy: Parsing empathic phenomena through a proximate, dynamic-systems view of representing the other in the self. *Emotion Review*, 4, 24-33.
- [6] Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *J Pers Soc Psychol*, 44, 113.

## SUPPORT

University of Georgia, Office of the Vice President for Research

## CONTACT

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