

Introduction

- Medial prefrontal cortex (mPFC) is the brain region most consistently associated with the self.¹
- Previous work in our lab using ERPs has shown that effects of self-relevance depend on the emotional valence of stimuli.^{2,3} For example, with a comprehension task, we found an ERP effect of a self-positivity bias⁴ between 300-500ms.
- Here we investigated whether emotional valence would affect the activation of mPFC as participants read two-sentence social vignettes.

Methods

- Participants (n = 17) read two-sentence scenarios in 2nd-person (self-relevant) or 3rd-person (other-relevant) with a neutral, pleasant, or unpleasant critical word (CW) in the second sentence.

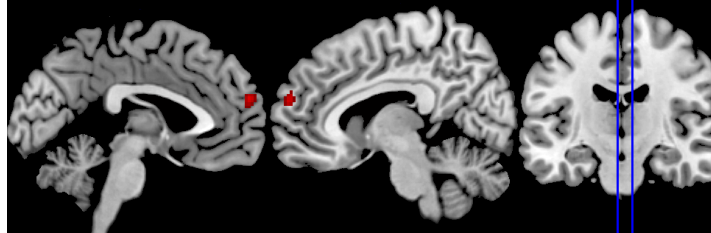
Other Condition	A man knocks on Sandra's hotel room door. She sees that he has a <u>tray/gift/gun</u> in his hand.
Self Condition	A man knocks on your hotel room door. You see that he has a <u>tray/gift/gun</u> in his hand.

- Task: Yes/No comprehension questions
- mPFC ROI from Denny et al.¹: $|x| < 25, y > 15, z > -5$ (MNI)



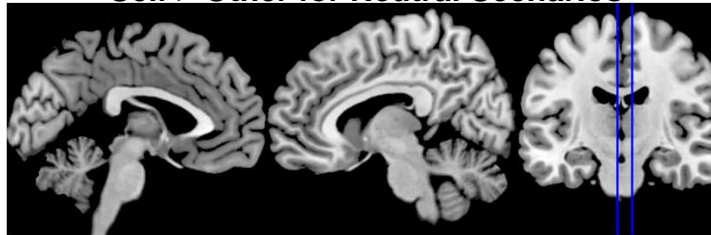
Results

Self-Relevance x Emotion Interaction



Threshold at $p < 0.001$ (uncorrected), cluster extent: $k > 100$.
mPFC activation $p < 0.05$ (FWE, small volume corrected).

Self > Other for Neutral Scenarios



Threshold at $p < 0.001$ (uncorrected), cluster extent: $k > 100$.
No significant activations (all $ps > .05$, FWE)

Self > Other for Positive Scenarios



Threshold at $p < 0.001$ (uncorrected), cluster extent: $k > 200$.
mPFC activation $p < 0.05$ (FWE, whole brain).

Self > Other for Negative Scenarios



Threshold at $p < 0.001$ (uncorrected), cluster extent: $k > 100$.
No significant activations (all $ps > .05$, FWE)

Discussion

- mPFC activation followed the same pattern as we previously saw in an ERP study of the self-positivity bias³: an effect of self-relevance for positive but not neutral or negative scenarios.
- One interpretation of the present results is that participants maximally engaged the mentalizing network when their self-relevant expectations about positive incoming information were confirmed by the input. This may have been less likely in both negative and neutral scenarios due to a self-positivity bias.⁴

References

1. Denny, B. T., Kober, H., Wager, T. D., & Ochsner, K. N. (2012). A Meta-analysis of functional neuroimaging studies of self- and other judgments reveals a spatial gradient for mentalizing in medial prefrontal cortex. *Journal of Cognitive Neuroscience*, 24(8), 1742-1752.
2. Fields, E. C., & Kuperberg, G. R. (2012). It's all about you: An ERP study of emotion and self-relevance in discourse. *NeuroImage*, 62(1), 562-574.
3. Fields, E. C., Carneiro de Lima, C., Natraj, R., Tusch, E., & Kuperberg, G. R. (2012). ERPs reveal effects of the self-positivity bias during online processing of social vignettes. *Psychophysiology*, 49(Suppl. 1), S89.
4. Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103(2), 193-210

CONTACT: Eric.Fields@tufts.edu

Acknowledgements: This research was supported by NIMH (R01 MH071635) and NARSAD (with the Sidney Baer Trust) to GK.