

Emotional valence modulates self vs. other activation in mPFC

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The region of the brain most consistently associated with self-related processing is the medial prefrontal cortex (mPFC). While the mPFC has been argued to be specialized for self-related processing, it has more often been seen as being part of a broader “mentalizing” network used for thinking about both the self and others. In previous work we examined the interaction of self-relevance and emotional valence using ERPs. These studies showed that an early indicator of semantic processing (the N400) is sensitive to positive expectations about the self and that self-relevance and valence can interact in complex ways to determine how attentional resources are allocated (as indexed by the late positive component). Building on this work, we were interested in how emotional valence would modulate the effect of self-relevance in mPFC, and we examined this question with functional MRI. We used two-sentence social vignettes in a 2 (Self-Relevance: self-relevant, other-relevant) x 3 (Emotion: positive, neutral, negative) design, e.g.: A man knocks on Sandra’s/your hotel room door. She/You see(s) that he has a tray/gift/gun in his hand. Results revealed an interaction effect: there was more mPFC activity to self-relevant than other-relevant positive scenarios, but no effect of self-relevance on neutral or negative scenarios. Interestingly, this is similar to the pattern we observed on the N400 component of the ERP. Thus one interpretation of the present fMRI results is that participants maximally engaged the mentalizing network when their self-relevant expectations about positive incoming information were confirmed by the input.