SELECTIVE NUCLEUS ACCUMBENS AND MEDIAL FRONTAL CORTEX ACTIVATION IN APPETITIVE PICTURE PROCESSING

Dean Sabatinelli, Francesco Versace, Vincent D. Costa, Margaret M. Bradley, & Peter J. Lang
(University of Florida, Center for the Study of Emotion and Attention)

Introduction

Past functional magnetic resonance imaging (fMRI) studies have identified enhanced visual cortical signal during emotionally arousing, relative to neutral picture perception. Here we focus on subcortical and anterior cortical involvement in affective picture perception, and explore the potential distinctions between appetitive and aversive stimuli.

Experimental

In one study, 22 subjects viewed a mixed series of 24 grayscale pictures, depicting erotic couples, neutral people, and mutilations, while whole-brain functional images were acquired every 3s on the University of Florida McKnight Brain Institute's 3T Siemens Allegra MR scanner. In a second study, 24 subjects viewed a series of 30 grayscale pictures, depicting erotic couples, romantic couples (clothed), neutral people, dental scenes, snakes, and human threat.

Results and Discussion

In study 1, structures showing greater signal during emotionally arousing, relative to neutral picture presentations included amygdala, caudate, lateral geniculate, anterior thalamus, anterior cingulate, and insula. Interestingly, activity in nucleus accumbens and medial frontal gyrus (MFG) showed selectively increased activation during erotic picture perception. In study 2, subcortical effects were consistent with the first sample; nucleus accumbens and MFG showed selectively increased activation to scenes of erotic and romantic couples. This effect was consistent across men and women, and was replicated in a third sample (n=13) of anxiety patients.

Conclusions

This effect was consistent across men and women, and was replicated in a third sample (n=13) of anxiety patients. These data suggest that while amygdala activation is increased during appetitive and aversive, relative to neutral picture processing, activity in nucleus accumbens and MFG is selectively increased during appetitive picture processing.

Acknowledgements: NIMH P50-072850.