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# Functional MRI changes before and after onset of reported emotions.

[Prohovnik I](#), [Skudlarski P](#), [Fulbright RK](#), [Gore JC](#), [Wexler BE](#).

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Department of Diagnostic Radiology, Yale University School of Medicine, New Haven, CT, USA. Isak.Prohovnik@mssm.edu

## Abstract

The social nature of emotion is evident in the importance of facial and vocal displays in emotion-related behavior. This is the first brain-imaging study to use simulated face-to-face social interactions to evoke emotional responses and to compare valence-related activations before and after subjective onset of emotional response. Videotapes were prepared with actresses who described happy or unhappy experiences. Functional magnetic resonance imaging (fMRI) at 1.5 T was used to acquire BOLD images in 21 healthy young adults before, after, and during viewing of the happy and sad tapes. Subjects pushed buttons to indicate the onset of subjective emotional responses. Group data were analyzed by a bootstrap randomization method after anatomical normalization. Significant activation was detected in frontal and sensory regions prior to the reported onset of emotional response, and this activity showed a marked decrease after the report of conscious emotional experience. Significant differences between happy and sad conditions were evident in multiple brain regions both before and after the reported onset of emotional response, including the middle and superior temporal gyri, the middle frontal gyrus, the caudate, and the hippocampus. Socially relevant emotional stimulation is feasible and evokes robust responses. The neural correlates of the evoked emotion are multiple, widely distributed, and inclusive of areas important in many cognitive tasks. Positive and negative emotional responses include activation of common and distinctive brain regions.

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