

# How to regulate emotion? Neural networks for reappraisal and distraction.

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## Abstract

The regulation of emotion is vital for adaptive behavior in a social environment. Different strategies may be adopted to achieve successful emotion regulation, ranging from attentional control (e.g., distraction) to cognitive change (e.g., reappraisal). However, there is only scarce evidence comparing the different regulation strategies with respect to their neural mechanisms and their effects on emotional experience. We, therefore, directly compared reappraisal and distraction in a functional magnetic resonance imaging study with emotional pictures. In the distraction condition participants performed an arithmetic task, while they reinterpreted the emotional situation during reappraisal to downregulate emotional intensity. Both strategies were successful in reducing subjective emotional state ratings and lowered activity in the bilateral amygdala. Direct contrasts, however, showed a stronger decrease in amygdala activity for distraction when compared with reappraisal. While both strategies relied on common control areas in the medial and dorsolateral prefrontal and inferior parietal cortex, the orbitofrontal cortex was selectively activated for reappraisal. In contrast, the dorsal anterior cingulate and large clusters in the parietal cortex were active in the distraction condition. Functional connectivity patterns of the amygdala activation confirmed the roles of these specific activations for the 2 emotion regulation strategies.

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