

# The regulation of negative emotions: Impact on brain activity

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Emotions play an important role in the lives of humans, and influence our behavior, thoughts, decisions, and interactions. The ability to regulate emotions is essential to both mental and physical well-being.

“Conversely, difficulties with emotion regulation have been postulated as a core mechanism underlying mood and anxiety disorders,” according to the authors of a new study published in *Biological Psychiatry* on March 15th. Thus, these researchers set out to further expand our understanding of the differential effects of emotion regulation strategies on the human brain.

Goldin and colleagues chose to compare two specific regulation strategies – cognitive reappraisal and expressive suppression – in the context of negative emotions. Dr. Philippe R. Goldin describes these approaches: Reappraisal is a “cognitive strategy that alters the meaning of a potentially upsetting situation [and has] been associated with decreased levels of negative emotion and increased well-being,” whereas suppression is a “behavioral strategy that involves inhibiting ongoing emotion-expressive behavior [and has] been associated with increased physiological responding and decreased well-being.” This suggests that cognitive regulation, such as reappraisal, may be more effective because it impacts the emotion-generative process earlier than a behavioral strategy, like suppression.

To examine the differences in these processes, the researchers recruited healthy women volunteers who viewed short video clips of either neutral

or negative (disgusting) stimuli and who were instructed to implement the differing emotion regulation strategies. While doing so, the women provided emotion experience ratings and their facial expressions were videotaped. In addition, their brain activity was measured with functional magnetic resonance imaging, which allowed the authors to compare which areas of the brain were activated under each condition.

The authors found that, while reappraisal reduced negative emotion experience and suppression reduced disgust facial expressions, they markedly differed in their impact on brain activity. Reappraisal resulted in rapid cognitive regulation-related prefrontal cortical activation and subsequent reduction of activation in two brain regions implicated in emotional experience, the amygdala and insula. In contrast, suppression resulted in a delayed component of prefrontal cortex activation related to volitional motor inhibition, but increased the activity of the amygdala and insula.

John H. Krystal, M.D., Editor of Biological Psychiatry and affiliated with both Yale University School of Medicine and the VA Connecticut Healthcare System, comments on the interest of these findings: “These data support the belief that response suppression ‘covers up’ stress response, so that people who use this approach remain in a state of heightened vulnerability to negative emotion, while reappraisal may be a more successful coping strategy.” Dr. Goldin adds, “This finding suggests that the efficacy of different emotion regulation strategies may be related to when they interrupt the emotion generative process. This sets the stage for understanding how to develop more effective forms of emotion regulation.”

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