

Biofeedback for your brain?

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There is new evidence that people can learn to control the activity of some brain regions when they get feedback signals provided by functional magnetic resonance brain imaging (fMRI).

Dr. Andrea Caria and colleagues used this specialized imaging technique during training sessions in three groups of healthy participants who were asked to assess visual emotional stimuli (negative or neutral pictures). The scientists were interested in the signals generated by the insula, a [brain](#) region implicated in emotion regulation. While performing the test, the investigators provided the subjects with specific, unspecific, or no feedback about the extent of the activation of the insula.

They found that the individuals who received specific feedback were able to successfully increase the activity of the insula and perceived the negative pictures as being more unpleasant. The reverse was also true, i.e., when the insula's level of activity was decreased, a reduced sensitivity to negative stimuli was observed.

The two other groups, who received unspecific or no feedback, were not able to enhance insula activity and showed no changes in subjective emotional responses.

The lead author, Dr. Andrea Caria, commented, "Our study demonstrates that voluntary control of emotionally important brain systems is possible. More importantly, after learning to voluntarily regulate the insula, the participants experienced emotionally negative material as more aversive than before training.

This means that individuals can modify their perception to aversive stimuli."

"This technique may provide a mechanism to obtain some measure of voluntary control over the activity of particular [brain regions](#), and thus mental processes, that are typically beyond our reach. It may open new avenues for cognitive and behavioral therapies," added Dr. John Krystal, Editor of *Biological Psychiatry*.

The authors agree, noting that their findings may be relevant for the development of novel approaches for the clinical treatment of emotional disorders such as antisocial behavior or social phobia which have shown hypoactivity and overactivity, respectively, in the insular region. However, more research is necessary before such treatments may become available.

More information: The article is "Volitional Control of Anterior Insula Activity Modulates the Response to Aversive Stimuli. A Real-Time Functional Magnetic Resonance Imaging Study" by Andrea Caria, et al. The article appears in *Biological Psychiatry*, Volume 68, Issue 5 (September 1, 2010)

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