



Master's Thesis
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Different Neural Networks for the Emotion Regulation of
Fear and Disgust?
– An Independent Component Analysis Approach –

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Abstract

Functional neuroimaging studies on cognitive emotion regulation have suggested a frontoparietal emotion regulation network that is recruited during the cognitive regulation of fear and disgust. However, fear and disgust are assumed to rely on distinct neural structures. The question arises whether the regulation of fear and the regulation of disgust recruit different subnetworks of the emotion regulation network or even completely distinct structures.

In this study, data from a previous functional magnetic resonance imaging experiment investigating the effects of deliberate cognitive emotion regulation on genetically predisposed emotional processing of fear- or disgust-evoking and neutral pictures were re-analysed with respect to the above-stated question, using a different analysis technique. Data from 39 healthy female participants were included in the new study and analysed irrespective of genotype.

Independent component analysis was used to extract non-overlapping, temporally coherent, spatially distributed patterns of brain activity, which are assumed to be the actual neural networks underlying the measured fMRI signal.

Twenty-two independent components were extracted from the signal among which ten components of interest were selected for further analyses. These components of interest included networks which were associated with the regulation of fear and the regulation of disgust.

Networks involved specifically in the regulation of one emotion but not in the regulation of the other were not identified and the overall results were inconclusive. Possible reasons are discussed and future directions are given.