

EMDR Therapy Mechanisms Explained by the Theory of Neural Cognition

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Abstract

Eye Movement Desensitization and Reprocessing (EMDR) is a therapy of choice for post-traumatic stress disorder (PTSD). The mechanism of EMDR therapy is still unknown but it is hypothesized to favor memory reconsolidation. A new learning occurs relieved from the emotional load. Based on the Theory of neural Cognition (TnC), we propose an explanation of this phenomenon that implicates hebbian synaptic plasticity, i.e., long-term potentiation (LTP) and long-term depression (LTD). The new learning is mediated by the bilateral alternating stimulations (BAS) that are essential to the EMDR therapy. These repeated BAS modify the neural traces of a traumatic memory through the incorporation of newly activated cortical columns. These activated columns form a sparse coding representation of the situation called the global state of activation (GSA). Some of these added cortical activities will eventually crystallize in a column's activation that is able to join the current GSA, making a new GSA, i.e., a stable network of activity. This process (trauma recall and BAS) is repeated several times, and each time, the activity of new columns is being added to the current GSA, until a GSA totally cleared of its emotional content is obtained. Each GSA is a stable network of activity which gets reinforced thanks to LTP. Each time, a lessened traumatic memory is experienced. These modifications end up with a shift from the amygdalae's involvement in the traumatic memory towards a more cognitive representation of the traumatic event, exempt from the previously associated strong negative feeling.

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Biography

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