

Neurofeedback treatment in autism. Preliminary findings in behavioral, cognitive, and neurophysiological functioning

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Abstract

Effects of neurofeedback treatment were investigated in children with autism spectrum disorders (ASD). Sixty percent of the participants in the treatment group successfully reduced excessive theta power during neurofeedback treatment. Reduction of theta power was confirmed by pre- and post-QEEG measures. Parents of participants in the neurofeedback treatment group reported significant improvements in reciprocal social interactions and communication skills, relative to the parents of the control group. Set-shifting skills improved following neurofeedback treatment relative to the control group. The reduction of theta power is assumed to reflect modulation of activity in the anterior cingulate cortex (ACC), which is known to be involved in social and executive dysfunctions in autism.

<http://www.sciencedirect.com/science/article/pii/S175094670900110X>

Long-term effects of neurofeedback treatment in autism

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Abstract

Previously we demonstrated significant improvement of executive functions and social behavior in children with autism spectrum disorders (ASD) treated with 40 sessions of EEG neurofeedback in a nonrandomized waiting list control group design. In this paper we extend these findings by reporting the long-term results of neurofeedback treatment in the same group of children with ASD

after 12 months. The present study indicates maintenance of improvement of executive functions and social behavior after 12 months in comparison with the immediate outcomes. Neurofeedback mediated suppression of theta power is supposed to promote more flexible functioning of the brain by enhancing activation in the medial prefrontal cortex and improving flexibility of activation in the default mode network supporting the improvement of executive functions and theory of mind in ASD.

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Neurofeedback improves executive functioning in children with autism spectrum disorders

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Seven autistic children diagnosed with autism spectrum disorders (ASD) received a neurofeedback treatment that aimed to improve their level of executive control. Neurofeedback successfully reduced children's heightened theta/beta ratio by inhibiting theta activation and enhancing beta activation over sessions. Following treatment, children's executive capacities were found to have improved greatly relative to pre-treatment assessment on a range of executive function tasks. Additional improvements were found in children's social, communicative and typical behavior, relative to a waiting list control group. These findings suggest a basic executive function impairment in ASD that can be alleviated through specific neurofeedback treatment. Possible neural mechanisms that may underlie neurofeedback mediated improvement in executive functioning in autistic children are discussed.

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