Rapid Visual Processing and Spatial Working Memory improvement after QEEG-based Neurofeedback Training in ADHD Children Evidence from CANTAB

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Introduction: Studies assume executive dysfunctions such as poor performance in spatial working memory (SWM) and rapid visual processing (RVP) in ADHD children. Various electrophysiological techniques, including Quantitative electroencephalography (QEEG), point to the importance of a range of areas, predominantly the frontal and pre-frontal areas.

Objectives: This study investigated the effectiveness of neurofeedback training (NFT) on SWM and RVP performance in children with ADHD.

Method and Materials: In the framework of single subject study, six students (age range: 8-11 years) with a psychiatric diagnosis of ADHD were evaluated via the Cambridge Neuropsychological Test Automated Battery (CANTAB). RVP and SWM were assessed in baseline and after intervention (30 sessions NFT, 30 min per session). For measure the magnitude of treatment effect, the Effect size (ES) was calculated.

Results: The results showed considerable improvements in RVP and SWM performance with a large ES.

Conclusion: The effectiveness of NFT on two Executive functions (RVP and SWM) was investigated. Findings of this research would suggest that neurofeedback training can change neurocognitive performance in children with ADHD.

Keywords: Neurofeedback training, Cambridge Neuropsychological Test Automated Battery (CANTAB), Rapid visual processing, Spatial Working Memory, ADHD