

## ABSTRACT

Examining the Effects of a Multi-Component Neurocognitive Intervention for School-Aged Children with Co-Occurring ADHD and Reading Difficulties

by

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**Objective:** Children with attention deficit hyperactivity disorder (ADHD) frequently exhibit impairments in neurocognitive pathways (i.e., deficits in sustained attention, response inhibition, processing speed, working memory, and cognitive flexibility). There is also extensive support indicating that youth with co-occurring ADHD and reading difficulties share pathological pathways and exhibit deficits in executive functions. Neither behavioral nor pharmacological interventions have been able to fully address executive dysfunction and/or reading deficits in this population. Computerized neurocognitive training interventions have been explored as a treatment alternative for youth with pure ADHD and have demonstrated some merit. Conceptually, computerized neurocognitive training programs that target overlapping pathways may improve executive functioning, which may directly impact ADHD symptoms and reading.

**Methods:** A preliminary open clinical trial was conducted over the course of 3-4 months in a sample of 20 7-11 year-olds with all subtypes of ADHD with varying levels of reading difficulties to determine the following primary aims: 1.) To determine if a multicomponent neurocognitive intervention, ACTIVATE, improved executive functions (i.e., sustained attention, working memory, inhibition); 2.) To determine if ACTIVATE improved ADHD symptoms; 3.) To determine if ACTIVATE improved

reading outcomes; and 4.) To determine if there were differential rates of improvement in outcome variables (i.e., reading progress, executive functions and ADHD symptoms) for children with reading difficulties compared to those without reading difficulties.

**Results:** Positive significant bivariate correlations between decoding, sight word reading, and reading comprehension were identified; however, a relationship between ADHD deficits and reading severity was not found. Findings from 2 (group: reading impaired; reading non-impaired) x 2 (pre-ACTIVATE, post-ACTIVATE) mixed ANOVAs demonstrated a reduction of ADHD symptoms, improvements in some areas of executive functioning (planning, organizing, problem-solving and cognitive flexibility), and reading comprehension and sight word reading gains as a function of the ACTIVATE intervention.

**Conclusions:** Taken together, the preliminary findings for this study are encouraging. However, definitive conclusions cannot be drawn because this study consisted of an open uncontrolled evaluation with a small sample size. Extensive research is required to further evaluate potency, as well as appropriate target specification. Based on the results of this study, computerized neurocognitive training cannot be viewed as a substitute or supplement for gold standard treatments (i.e., pharmacological and/or behavioral interventions) for youth with ADHD.