

# The Promise of Working Memory Training for Improved Attention

by Sophia S. Genone, Ph.D.<sup>1</sup>

In a world where children are facing increasing academic demands at an earlier age, the ability to learn effectively is a valuable commodity. In their continual search to help boost student performance, teachers, pediatricians, and other professionals have long recognized the link between learning and attention, with the understanding that our ability to learn hinges on our capacity to adequately focus on a task. As we work to help children increase their chances of success, improving their concentration may help them beat the odds.

In studying the role of attention in learning, researchers have pinpointed working memory as a key piece of the puzzle. Working memory enables us to stay focused on a task by holding onto salient information long enough to accomplish a goal. It allows us to block out distractions in order to keep a phone number in mind, solve a multi-step math problems, and plan and pack for a trip. As one researcher, Torkel Klingberg, describes it in his recent book, *The Learning Brain: Memory and Brain Development in Children*, working memory is best conceptualized as a kind of “working attention.”

Working memory plays an important part in learning across age groups. Preschoolers, for example, rely on working memory to learn the alphabet and follow short instructions. In elementary school, it is working memory that helps students remember what they read, master basic arithmetic, and know how to respond appropriately when interacting with peers. For middle and high schoolers, working memory is instrumental in completing assignments independently, responding to social cues, organizing writing assignments effectively, and planning and studying for exams successfully. Throughout adulthood, working memory helps us to prioritize our responsibilities, meet deadlines, and manage interpersonal conflicts. It also helps offset the distractibility and forgetfulness that naturally increase as we age.

Research consistently shows that most people with attention deficits have working memory difficulties. With 9.5% of children age 4-17 diagnosed with attention deficit hyperactivity disorder (ADHD) in the United States each year according to the Centers for Disease Control and Prevention (2010), and 10-15% of all students having working memory deficits (Alloway et al., 2009) there is increasing interest in investigating the extent to which working memory can be improved. Building on the well recognized finding in neuroscience that the brain is “plastic,” a growing body of evidence suggests that it is in fact possible to increase attention by training working memory.

---

<sup>1</sup> **Sophia S. Genone, Ph.D., NCSP** is a Nationally Certified School Psychologist, PA Certified School Psychologist, CA Licensed Educational Psychologist, and Qualified Cogmed Coach. After working for years in public school settings, she now provides psychoeducational evaluations, counseling, and parent consultation services within the private practice of Margaret J. Kay, Ed.D. and Independent Educational Evaluators of America, LLC at 2818 Lititz Pike, Lancaster, PA 17601, (717) 569-6223. [www.MargaretKay.com](http://www.MargaretKay.com)

Based on the understanding that brain functioning is not fixed, and is better conceptualized as a muscle that can be strengthened with exercise, in 1999 Klingberg and associates developed a video-game like program known as Cogmed, to help train working memory. More than a decade later, a substantial and growing body of evidence now supports Cogmed as an effective program to help children, adolescents, and adults sustainably improve attention by enhancing working memory.

The Cogmed system, now applied in more than 30 countries and 10 languages, is a finely tuned computerized training program designed to strengthen working memory through intensive personalized practice. The difficulty of the program is adjusted in real time to the ability level of the participant to ensure they are appropriately challenged. The participant works at his or her maximum capacity five times per week for five weeks at 30 to 40 minutes per session (15 minutes for preschoolers) at home under the guidance of a qualified coach.

Through intensive Cogmed training, working memory has been shown to improve significantly in children not only with ADHD (Holmes, Gathercole, Place et al., 2008; Klingberg et al., 2005), but in children with generalized working memory deficits as well (Holmes, Gathercole, Dunning et al., 2008). Parents and teachers report gains in working memory, in addition to improved executive functioning, ADHD symptoms, and impulse control (Beck et al., 2010). As the effects of Cogmed generalize to behavior, many participants experience a significant decrease in inattention, and an increase in self-regulation and academic performance. Research has shown that 80% of participants experience lasting effects sustained up to a year (Pearson, 2012). With program compliance, Cogmed training is considered to complement, but not replace medication as a treatment option in cases of attention deficit.

Working memory, like most valuable skills, needs to be cultivated and strengthened through exercise and practice. The efforts made to improve this fundamental cognitive ability are likely to pay off in immeasurable ways, including an increased capacity for learning, problem solving, and most importantly -- staying connected to the task at hand in the present moment.