

Computerized Training of Working Memory in Children with ADHD

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Working memory is the ability to keep information 'on line' (in mind) for a brief period of time, typically a few seconds. In daily life, we use working memory to remember plans or instructions of what to do next, for problem solving, and for controlling attention, or 'remembering what to attend to'.

During the last couple of years, it has become clear that a deficit in working memory is a key deficit, or endophenotype, in attention deficit/hyperactivity disorder (ADHD). Neurobiologically, the deficit could be related to altered function of the frontal lobe and the dopamine systems in the brain (for a review see Castellanos and Tannock, 2002; Martinussen et al., 2005).

Klingberg and collaborators at the Karolinska Institute in Stockholm, Sweden, have developed and tested a computerized method for training working memory. In two studies (Klingberg et al. 2002, Klingberg et al., 2005) children between 7-12 years with ADHD were included. These studies have shown that working memory can be improved by training, and that this decreases the symptoms of inattention with an effect size comparable to that of stimulant medication.

A separate study (Olsen et al, 2004) showed that training of working memory increases brain activity in frontal and parietal regions. This possibly indicates training-induced plasticity in the neural systems underlying working memory. Preliminary findings also indicate that the cortical D1-receptors could be involved in the training effect.

Training of working memory might thus be a non-pharmacological way to address the key cognitive function of ADHD and thereby significantly and sustainably reduce the inattentive symptoms of this disorder.

References

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