

# What Part of Working Memory is not Working in ADHD? Short-Term Memory, the Central Executive and Effects of Reinforcement.

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Deficits in Working Memory (WM) are related to symptoms of Attention-Deficit/Hyperactivity Disorder (ADHD). In children with ADHD visuospatial WM is most impaired. WM is composed of Short-Term Memory (STM) and a Central Executive (CE). Therefore, deficits in either or both STM and the CE may account for WM impairments in children with ADHD. WM-component studies investigating this find deficits in both STM and the CE. However, recent studies show that not only cognitive deficits, but also motivational deficits give rise to the aberrant WM performance of children with ADHD. To date, the influence of these motivational deficits on the components of WM has not been investigated. This study examined the effects of a standard (feedback-only) and a high level of reinforcement (feedback + 10 euros) on the visuospatial WM-, visuospatial STM-, and the CE performance of 86 children with ADHD and 62 typically-developing controls. With standard reinforcement the STM, CE, and WM performance of children with ADHD was worse than that of controls. High reinforcement improved STM and WM performance more in children with ADHD than in controls, but was unable to normalize their performance. High reinforcement did not appear to improve the CE-related performance of children with ADHD and controls. Motivational deficits have a detrimental effect on both the visuospatial WM performance and the STM performance of children with ADHD. Aside from motivational deficits, both the visuospatial STM and the CE of children with ADHD are impaired, and give rise to their deficits in visuospatial WM.