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ADHD and Working Memory

Working memory is part of executive function. Working memory refers to a “mental workspace” where information is stored and used for a short time. “A short time” means just a few seconds.

When we need to do something that takes sustained effort, working memory helps us to:

- control attention
- resist distraction

Working memory is different from short-term memory:

- Short-term memory involves storing information for a short time and then repeating it. For example, we use short-term memory when we hear and repeat a telephone number.
- Working memory involves storing and manipulating or changing the information to reach a goal. For example, to do mental addition, a child must read or hear the numbers, hold them in mind, and add them to get the answer. When playing a card game, a child must keep track of who just played and what he needs to do next based on the changing situation in the game.

Working memory can only hold a certain amount of information. If children need to keep a large amount of information in mind while working on a task, they may make more mistakes

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Working memory weaknesses are linked to:

- ADHD
- learning disabilities
- problems with spoken language

Working memory and attention

Working memory and the ability to control attention are linked:

- People who do poorly on tests of working memory also do poorly on tests of attention control.
- When people are asked to do something that puts high demands on working memory, they find it harder to ignore distracting information.

The “Cocktail Party Phenomenon”

The “Cocktail Party Phenomenon” is an example of the link between working memory and attention control. In a recent study, researchers asked people to:

- repeat a message that they heard in one ear
- ignore irrelevant information (their name) that they heard at the same time in the other ear

People with lower working memory scores were three times more likely to hear their name, the message they were supposed to be “tuning out.” This suggests that people with poor working memory have trouble controlling their attention when they are distracted.

Working memory and ADHD

Children with ADHD have weaknesses in working memory. These weaknesses may be moderate to severe.

Compared to their peers without ADHD, children with ADHD do worse on verbal and non-verbal working memory tasks. These weaknesses cannot be explained by reading disorders or other disorders.

Recent studies show that working memory weaknesses are more strongly related to inattention than to hyperactivity/impulsivity. This means that children with the Inattentive or Combined subtype of ADHD may have more trouble with tasks that need working memory.

In children with and without ADHD, working memory problems are linked to:

- behaviour problems
- academic problems

This suggests that even small weaknesses in working memory can make it harder for a child to do well in school.

Also, children whose kindergarten teachers felt they were at risk for literacy and numeracy weaknesses score lower on tests of working memory and executive function. Teachers also said they showed more behaviour and attention problems than other children. These findings suggest that there is a very early association between working memory, executive function, behaviour, and academic achievement.

Medication for ADHD does not address working memory weaknesses. Children with ADHD may need extra support at home and at school to help them compensate for poor working memory, even if they are taking medication for ADHD.

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