

A guide to: Working Memory

What is working memory?

The term 'working memory' is used to describe the ability we have to hold in mind and mentally manipulate information over short periods of time, for example mental arithmetic. Without working memory, we would not be able to carry out tasks in everyday life such as remembering a new telephone number, a PIN number, web address whilst looking for a pen and paper to write it down.

Other everyday tasks that use our working memory include:

- Following spoken directions such as 'Go straight over at the roundabout, take the second left and the building is on the right opposite the church'.
- Calculating how much the bill will be at the supermarket checkout for the items in the basket.
- Remembering the unfamiliar foreign name of a person who has just been introduced to you for long enough to enable you to introduce them to someone else.

There is a personal limit to working memory, with each individual having a relatively fixed capacity that varies between people. So, a particular activity may be well within the capacity of one person but exceed that of another. Working memory capacity also increases with age during childhood. Young children typically have very small capacities that increase gradually until teenage years, when adult capacities are reached. Differences in working memory capacity between different children of the same age can be very large indeed.

Typically, children with poor working memory:

- Are well-adjusted socially
- Are reserved in group activities in the classroom, rarely volunteering answers and sometimes not answering direct questions
- Behave as though they have not paid attention, for example forgetting part or all of instructions or messages, or not seeing tasks through to completion.
- Frequently lose their place in complicated tasks that they may eventually abandon
- Forget the content of messages and instructions
- Make poor academic progress during the school years, particularly in the areas of reading and mathematics
- Are considered by their teachers to have short attention spans and also to be easily distracted

The following factors can influence working memory capacity:

- **Distraction:** an unrelated thought springing to mind, or an interruption such as the telephone ringing or someone speaking to us, can be sufficient to divert attention. T
- **Overloading:** trying to hold in mind too much information. For example, verbal directions with 5 or more steps.

- Demanding: engaging in activities that require difficult mental processing such as applying the rules of multiplication during mental arithmetic, reduce the amount of space in working memory to store information.

General Advice

There is plenty that can be done to enhance learning in children with working memory problems. The approach aims to alleviate the disruptive consequences on learning of excessive working memory loads.

Recognise working memory failures.

- Incomplete recall, such as forgetting some or all of the words in a sentence, or of a sequence of words
- Failing to follow instructions, including remembering only part of a sequence of instructions or forgetting some content.
- Place-keeping errors, for example, repeating and/or skipping letters and words during sentence writing, missing out large chunks of a task
- Task abandonment-the child gives up a task completely

If the child has forgotten crucial information:

- Repeat information as required
- Break down tasks and instructions into smaller components to minimise memory load
- Encourage the child to request information when required

How can teachers help?

Whether related to reading, mathematics, science or other areas of the curriculum, classroom activities impose considerable burdens on working memory. Activities often require the child to hold some information (for example, a sentence to be written down) while doing something that for them is mentally challenging (such as spelling the individual words in the sentence). As a result, the children may not get the learning benefit of successfully completing an activity, and this slows down their rates of learning.

- Writing a sentence down from memory while. Although to skilled writers this seems like an easy task, children with poor working memory capacities find this extremely difficult and often skip or repeat words and letters as they lose their place in this demanding mental activity.
- Following lengthy sequence of instructions. As a consequence, the child will often not engage properly with the normal pace of ongoing classroom activities. It often appears that the child has not paid attention, when in fact they have simply forgotten what it is they have to do.

How can parents help?

Working memory capacity varies between individuals, and we often use strategies in everyday life to reduce the demands on working memory such as writing key information down. Supporting your child to develop and use strategies that work for them is really important. Ensuring that your child is supported according to their current need is important especially during school assessments.

Want to find out more?

Visit www.rcslt.org for more information on working memory.

Contact us www.integratedtreatments.co.uk for more information about the support we can offer.