THE ROLE OF WORKING MEMORY

DR MARTHA BURNS

WWW.LEARNFASTHQ.COM

INTRODUCTION

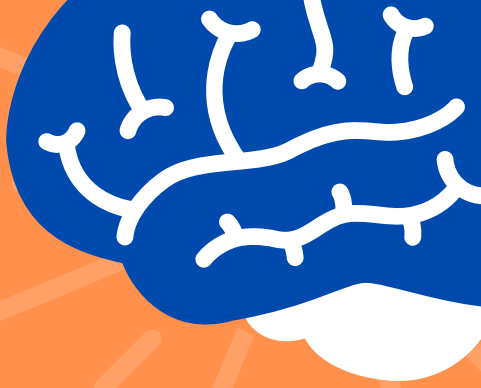
This e-Book is deliberately short. It's written in response to numerous requests from parents and teachers for an easy to read explanation of working memory and its role in learning.

There are lots of articles on the web and numerous books you can buy which explain working memory in detail. So before you take the time to sort through all the offerings on the web or to select/buy and read a book that might, or might not, answer the questions you have about working memory, this short eBook can be somewhere to start.

Just about everyone has had the experience of going grocery shopping with a small list of purchases in their mind, only to forget one or more of them upon arriving at the store. Similarly, we all have left one room to retrieve something from another room, forgetting what we are after before we have even arrived.

Holding information in mind

The ability to hold information in mind for a few minutes to a few hours is called working memory. It is essential for everything from language learning in children to following a book chapter from beginning to end. Working memory was first defined by Alan Baddeley and Graham Hitch in 1974. It is a form of memory that may distinguish humans from many other animals (with the exception of several primates). Working memory, commonly referred to as short term memory, allows a person to hold on to information for a period of time (minutes or perhaps hours) long enough to do something new with the information, like take notes or solve a problem.



WORKING MEMORY EXAMPLES

A typical situation in which we rely on working memory is watching an informational program on television, like a segment on a news program, and discussing it later with a friend.

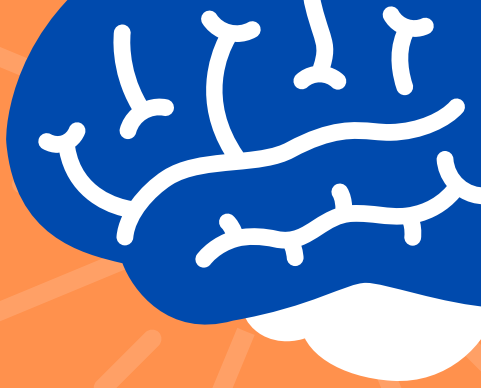
Other examples of tasks that require good working memory in adults include taking notes during a lecture or paraphrasing information we hear or read about.

We may forget about the specific news event later in the week, but for a period of time we "keep it in mind," thinking about it and perhaps talking about it with others. Each time we share the information with another person or think about it ourselves, we select details that interest us and alter them slightly to keep them interesting to us.

WORKING MEMORY AND ATTENTION

Alan Baddeley elaborated on the original concept of working memory in 1992, noting that unlike other kinds of short-term memory (such as rote repetition), working memory requires us to focus and maintain our attention on the task at hand. To keep our attentional focus, we must be goal-directed, ignoring distractions that might interfere with goal attainment. Baddeley stressed the importance of the "central executive" system for maintaining attentional focus in working memory tasks.

WORKING MEMORY IS ESSENTIAL FOR LEARNING LANGUAGE



For children, working memory is essential for learning language. Unlike vision, where we can often study an image as long as we need to, everything we hear occurs in time. The speech signal moves very quickly: an average sentence is about 14 seconds long, an average single syllable word lasts only a quarter of a second, and the average consonant sound may last only 1/12 of a second.

We are all made aware of how fleeting the speech signal is when someone is talking to us and we become distracted, which consequently requires us to ask the speaker to repeat what was just said.

In that way, speech is like a billboard that appears briefly in our peripheral vision as we travel at 55 miles per hour along a highway. If we are not paying specific attention in that instant to that part of the road, we will miss it, or only retain small bits of the message on the billboard. In a similar way, information we hear leaves us as soon as it arrives. We are not able to hold it in view like a drawing or photograph, or study it like a person's face, so we must keep the information in our mind.

IMPROVING WORKING MEMORY

For some adults, improving working memory can be as simple as:

- Getting more sleep
- Exercising more
- Learning to avoid distractions

There are also some things a parent can do to help a child who may be showing signs of working memory problems. They include:

- Playing games with your child, like cards, that use working memory
- Asking your child to repeat instructions back to you.

However for children whose working memory is weak enough to significantly impact learning, more help may be needed.

Fortunately, the brain is a malleable structure and cognitive skills like working memory can be improved by strengthening key learning pathways in the brain (working memory is one of four cognitive skills rapidly strengthened by the Fast ForWord program).

The truth is, we live in an exciting time. Scientists are learning more all the time about how cognitive skills like working memory operate. We can look forward to these discoveries yielding more insights and tools that we'll be able to use to optimise learning throughout our lives.

If you would like to speak to someone about how Fast ForWord can help your child or student with their working memory please email us at info@learnfastgroup.com.au

ABOUT LEARNFAST

LearnFast was established to bring neuroscience programs to students in the home setting, in schools and in professional clinics.

We are driven by the desire to help as many children as possible overcome learning and reading difficulties. We are passionate about helping every child achieve their potential. This is reflected in everything we do, from the people we hire, to the way the programs are implemented.