

An introduction to working memory

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Learning objectives

- To understand what working memory is
- To understand how working memory contributes to many cognitive functions
- To understand why working memory is important for real life











Header image courtesy of Andreiana Yuvallos

* Disclaimer: views on butter quality are personal and foolishly not endorsed by the University of Bristol or funding agencies.

Definition of working memory

- Working memory is
 - the ability to hold information in mind
 - without sensory input
 - over a period of seconds
 - and manipulate it.

Working memory separates sensation from action

- With a complete absence of working memory, we could only respond to things that we are currently seeing or sensing. All behavior is reduced to a reflex.



Working memory is a fundamental building block of cognition

Example: Working memory in mental arithmetic

- $16 \times 23 = ?$
- Maintenance and manipulation of information

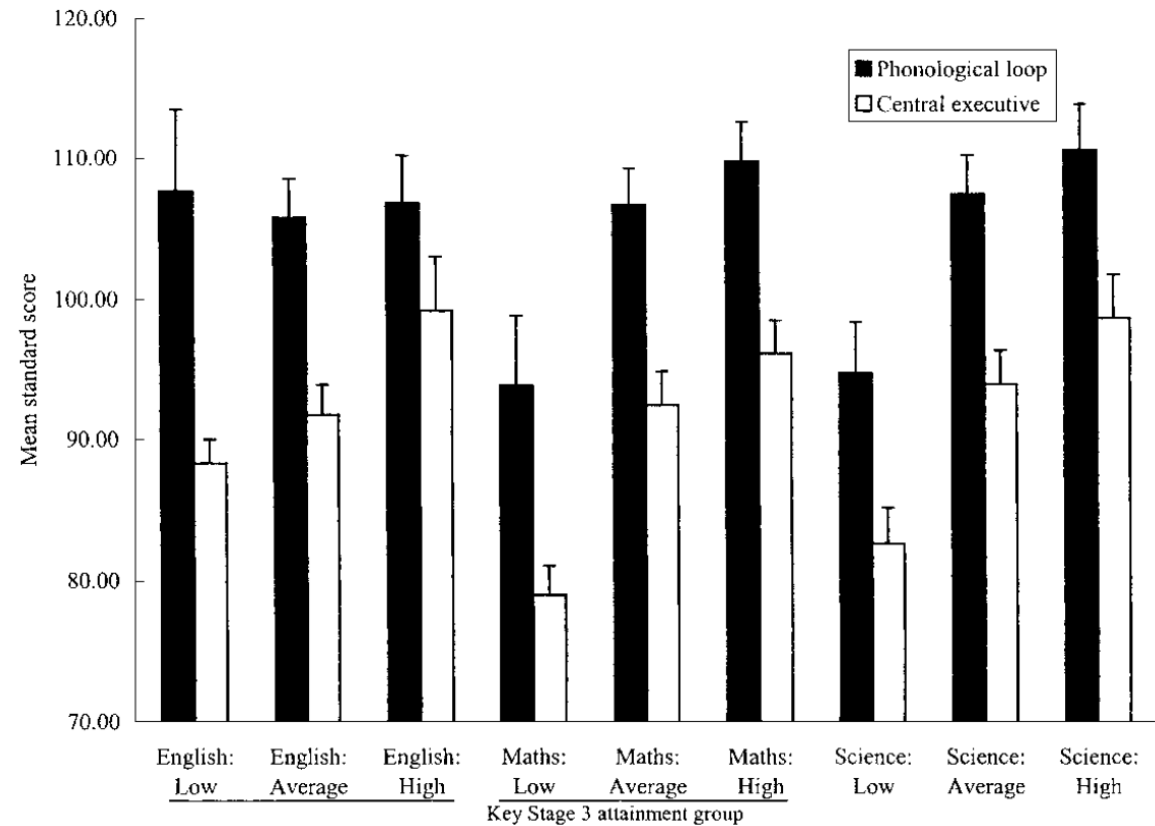
Example: Working memory is important for understanding and producing speech.

- “The smallest of the URF's (URFA6L), a 207-nucleotide (nt) reading frame overlapping out of phase the NH2-terminal portion of the adenosinetriphosphatase (ATPase) subunit 6 gene has been identified as the animal equivalent of the recently discovered yeast H⁺-ATPase subunit 8 gene.”
- “~~The smallest of the URF's (URFA6L), a 207-nucleotide (nt) reading frame overlapping out of phase the NH2-terminal portion of the adenosinetriphosphatase (ATPase) subunit 6 gene~~ has been identified....”

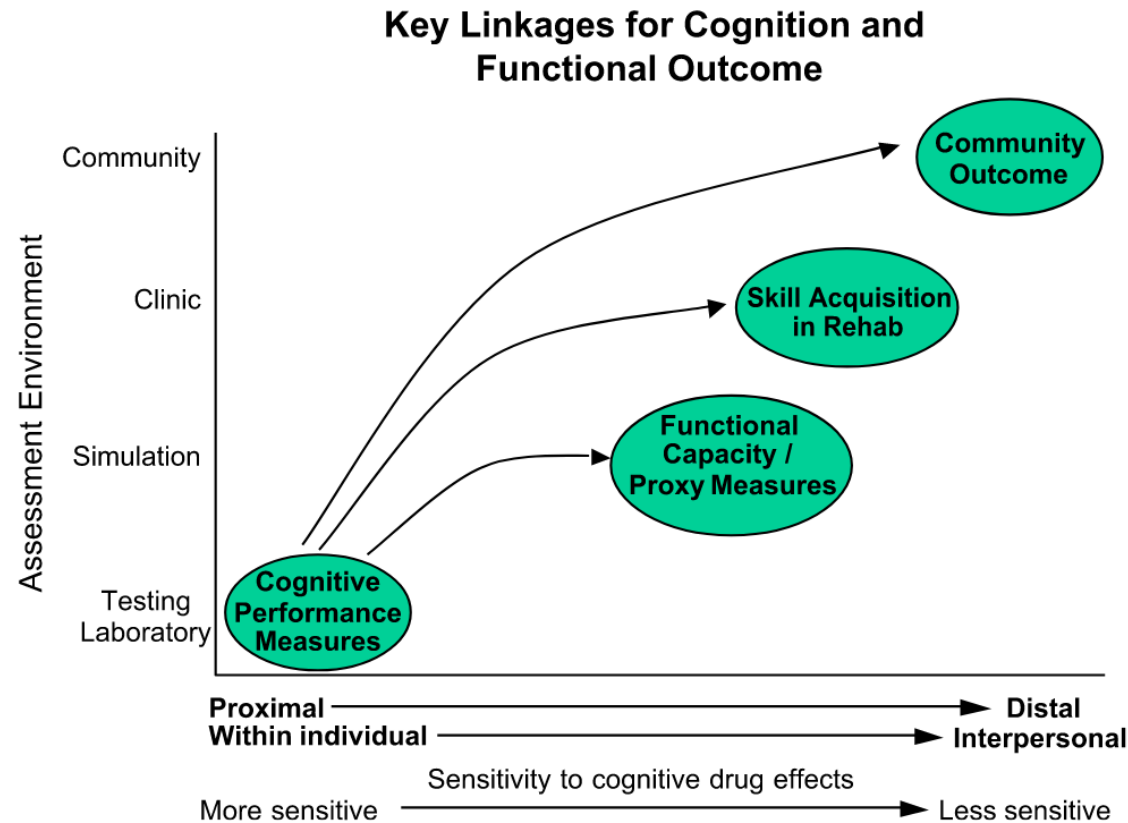
Working memory is important for real life

(1): predicting academic performance

- Increased working memory performance is associated with better test scores on mathematics, science & English



Working memory is important for real life (2): independent functioning in patients with schizophrenia



Reviewing learning objectives

- To understand what working memory is
 - Working memory is the ability to hold information in mind without sensory input over a period of seconds and manipulate it.
- To understand how working memory contributes to many cognitive functions
 - Many cognitive functions, including mental arithmetic and language require temporary storage and manipulation of information in mind (i.e. working memory)
- To learn some consequences of working memory breaking down
 - A complete working memory impairment would lead to us behaving entirely through reflexes
 - More subtle working memory impairments can have important consequences for academic success and, for some patients, the ability to function independently

Thank you!

- Contact me on Teams!