



ADHD & READING COMPREHENSION

THE ROLE WORKING MEMORY PLAYS IN READING

STRUCTURE

1. ADHD and Working Memory

- Specific studies linking ADHD and a deficit in working memory

2. Working Memory and Reading Comprehension

- Studies where we see a disability in reading comprehension stemming from working memory

3. Specific ADHD Reading Comprehension Interventions

- Review on the certain interventions that have been studied and for those who have comprehension issues and ADHD

SO, WHY?

- If we know ADHD affects Working Memory, and Working Memory affects Reading Comprehension, we can make a case that ADHD has some affect on Reading Comprehension, including a co-morbid LD.
- ADHD is a personal topic, so I felt that it was important to look at
- Interestingly, there is some research on ADHD and working memory deficits, but not a lot on the ways in which ADHD affects reading comprehension specifically
- Mostly research into the interventions that can be used, not much into the actual phenomenon itself, its almost just assumed that ADHD affects working memory anymore

WORKING MEMORY

What is it?

- the ability to hold information in mind and use it to complete a task
- Differs from long and short term – both are passive, working memory is active, processing and storing
- Three types
 - Domain-general central executive (CE) – responsible for attention – specifically focusing, dividing attention, and providing an interface between short term (working) memory and long term memory
 - Phonological (PE) – storage and retrieval of oral
 - Visuospatial (VS) – non-verbal visual and spatial information.
- We use the visual-spatial when reading, to remember a sequence of events, or to remember what we previously read as we continue to read
- Think of it like the “post-it” notes of your brain

THE EFFECTS OF ADHD ON WORKING MEMORY

- A number of recent studies have shown that there is a impairment in working memory in children with ADHD (Martinussen et al. 2005; Willcutt et al. 2005; Brocki et al. 2008; Rapport et al. 2008)**
- But research has found that children with ADHD can hold (“maintain”) verbal information in the same manner as typically developing children;**
- ADHD have larger deficits in CE, then VS, then PH or CE>VS>PH**
- reveal that children are more likely to abandon tasks or “zone out” as the quantity of information to be processed exceeds their working memory capacities (Gathercole & Alloway 2008). Kane et al. (2007) provide further experimental evidence for a link between working memory and attentive behavior.**
- that attention is impaired to a similar extent in children with ADHD and typically developing children when task demands exceed their storage/ rehearsal capacities.**
- and reveal that working memory deficits appear to account for two of the primary behavioral symptoms (i.e., inattention and hyper- activity) driving clinical referrals for ADHD**

WORKING MEMORY AND READING COMPREHENSION

“When reading for meaning, readers need to integrate information from different sentences in a text and incorporate background knowledge and ideas (retrieved from long term memory) to make sense of details that are only implicitly mentioned. Readers must also monitor their understanding to identify when a necessary inference should be made, and make links between the events that occur within and episodes in a narrative. To engage in these processes and construct a situation model that is adequate and coherent representation of a text’s meaning, readers must maintain the just-read wording in working memory while concurrently processing the same or other information. This relevant information, either from the text or general knowledge, must be both available and accessible.”

Cain, K. (2010). *Reading Development and Difficulties*. West Sussex, United Kingdom: The British Psychological Society (BPS) Blackwell. pp. 108 - 109

SAMPLE INTERVENTIONS

-High novelty affects reading comprehension in ADHD

- Stories using more action words, less familiar characters, uncommon adjectives, and surprising story end changes produced better recall and comprehension in students with ADHD, while staying relatively flat among typical (or healthy) students
- Reading text from a computer screen helps (especially if it is double spaced)
 - Helps keep the next words separate, reduces attention issues
 - If reading on paper, single spaced is best (possibly due to the fact that double spaced printed documents seem lengthier)

TWA (Think Before Reading, Think While Reading, Think After Reading) taught using SRSD (explicit and systematic teaching, until they have been learned with a high degree of mastery) increases reading comprehension

INTERVENTIONS, ROUND 2

- Presenting text in colours or with different fonts works for non-repeated reading (for example, the literacy test)
- Highlighting text can work in some instances (presenting black text on a coloured background)

The quick brown fox jumped over the lazy dog.

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The quick brown fox jumped over the lazy dog.

STUDIES ON ADHD/ WORKING MEMORY

Kieffer, M.J., Vukovic, R.K., & Berry, D. Roles of attention shifting and inhibitory control in fourth-grade reading comprehension. *Reading Research Quarterly*, 48(4), 333 – 348.

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ADHD & READING DISABILITIES

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INTERVENTION STUDIES

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- Belfoire, P.J., Grskovic, J.A., Murphy, A.M., & Zentall, S. S. (199). The effects of antecedent color on reading for students with learning disabilities and co-occurring attention-deficit/hyperactivity disorder. *Journal of Learning Disabilities*, 29(4), 432 – 438.
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- Lorch, E.P., O’Neil, K., Berthiaume, K.S., Milich, R., Eastham, D, & Brooks, T. (2004). Story comprehensions and the impact of studying on recall in children with attention deficit hyperactivity disorder. *Journal of Clinical Child and Adolescent Psychology*, 33(3), 506 – 515.