

Adhd and working memory on intelligence, reading ability, and peer relationships



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The Relationship Between ADHD and Working Memory on Intelligence, Reading Ability, and Peer Relationships

Introduction

The connection between working memory ability and children with ADHD has been a topic of interest in research for years. Important aspects of children's everyday lives, such as ability to form peer relationships, reading ability, and level of intelligence have been found to be affected by working memory ability. This study will combine the findings of other studies to build upon this research on how working memory abilities affect children with and without ADHD. In particular, this study will be multi-faceted and examine three measures: intelligence, reading ability, and social encoding. The goal is to have a better understanding of how the working memory of children with ADHD affects these measures. If it is found that working memory plays a factor in causing deficits in these measures, the findings from this study can be used to help create treatments based around improving working memory, which would in turn improve reading ability, social encoding skills, and intelligence. Future studies would be needed to examine the exact mechanisms in the brain and neural pathways behind working memory deficits and their effect on intelligence, reading ability, and social encoding.

Defining ADHD and Working Memory

ADHD is a chronic and heterogeneous neurodevelopmental disorder that includes attention difficulty, hyperactivity, and impulsiveness. ADHD is associated with impairments in academic, family, and peer functioning.

(Kofler & Spiegel 2019). A study in the Journal of the American Academy of
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Child and Adolescent Psychiatry found that the total spending on ADHD ranges from \$143 billion to \$266 billion a year (2009). Executive function (EF) deficits are frequently observed in individuals with ADHD and one of the most profound impairments is with working memory. Working memory is the active, top-down manipulation of the information held in one's short-term memory. Research has suggested that the deficits in intelligence observed in children with ADHD are due these impairments in higher order cognitive processes. This deficit in working memory can have a lasting impact on children that can follow them into their adult years. This deficit can be perceived as an indication of lower intelligence, which can result in the child having low self-esteem; consequently, academic achievement and relationships with others are negatively affected (Marusiak & Janzen 2005). The present study will assess the relationship between how working memory affects reading skills, intelligence, and social encoding skills.

Intelligence

Past research has shown that children with ADHD tend to score lower on standardized intelligence tests, in particular in the working memory measures. The Stanford-Binet Intelligence Scale is one of the most frequently administered intelligence tests for children. The SB-V exam assesses working memory with both verbal and nonverbal tasks. The present study will administer this test to assess the working memory abilities of children with ADHD (Marusiak & Janzen 2005).

Reading Ability

Reading problems are common among children with ADHD and have been found to show a strong level of covariation with underdeveloped working memory ability. Children with ADHD have been found to have more detriments in reading comprehension and speed. It has been found that reading difficulties seem to be a critical component in early underachievement leading to later behavioral issues. In this study, children will be given several passages to read aloud to the research assistant. They will be scored on accuracy of pronunciation as well as reading speed. Reading comprehension will also be measured; the research assistant will administer several questions to the child after reading to test for comprehension. This study will further build on the previous research to find out more about the role working memory plays in reading ability (Kofler & Spiegel 2019).

Peer Relations

Research in the area of friendships has shown that having close relationships with others is a major protective factor against an array of negative outcomes. Children with ADHD are known to have difficulty with peer relationships, which can lead to negative outcomes in various settings and aspects of life. The mechanisms that cause these children to have difficulties are not well known, but working memory is thought to play a role in this struggle with peers. This study will assess the relationship between working memory and the encoding of nonverbal social cues. Dual task methodology will be used. Dual task methodology is where individuals will take part in two tasks simultaneously while measuring their performance in both; in this study working memory and social encoding will be measured. The Profile of <https://assignbuster.com/adhd-and-working-memory-on-intelligence-reading-ability-and-peer-relationships/>

Nonverbal Sensitivity (PONS) is the task that will be used to measure nonverbal social cue encoding. The child friendly version of the PONS will be used; the task consists of a non-actor female portraying dynamic displays of face, body, and voice tone on video clips. The participant will judge the clips on social domains such as emotional tone and dominance (Hilton 2018)

Children with ADHD will score lower on the tasks measuring reading ability and intelligence compared to the control group. The children with ADHD will also show deficits in verbal and nonverbal social encoding skills, which is an indicator that they have issues with peer relationships.

Methods

For this study, a sample of 10 children with ADHD and a control group of 10 children without ADHD will be used. These children will be in the age range of 8-12 years old. Children will be recruited through the local school system; flyers will also be placed around town advertising the study and displaying the compensation. The compensation is a \$50 gift card given to the child and a \$20 gift card given to their parent. The main exclusion criteria for this experiment is the presence of other disorders that may interfere with working memory capacity. These include learning disorders, speech disorders, and other developmental disorders such as autism spectrum disorder. Prior serious head injury is also an exclusionary criteria.

The independent variable of the experiment is the presence of ADHD, which in the scope of this study is defined as having a documented diagnosis of ADHD from a licensed clinician. The dependent variable is working memory

ability, as well as the effect working memory has on the following measures: reading ability, peer relationships, and intelligence.

The materials needed will be computers for the computer-based memory tests as well as for the participants' parents to complete a questionnaire of psychological, behavioral, and social functioning about their child in a separate room. The Stanford-Binet Intelligence V and PONS will be administered on the computer.

The design of the experiment will consist of two groups, the experimental group, which is children with ADHD, and the control group, the children without ADHD. The experiment will have non-random selection.

The procedure for the experiment will be as follows. Participants' parents will complete a phone screen that is comprised of screening questions about inclusion/exclusion criteria and the Kiddie Schedule for Affective Disorders and Schizophrenia for School Aged Children (K-SADS) ADHD screening module to assess for ADHD diagnostic criteria. Documentation is also needed from the students' school showing an ADHD diagnosis. Once it is determined that their child qualifies as having an ADHD diagnosis (unless the child will be part of the control group), parents will be notified of the time and place of the study. Upon arrival, parents of the children will be instructed to enter a separate room and fill out a questionnaire regarding their child. Questions will ask about their child's performance in school, reading abilities and habits, and peer relationships. The children will be instructed to enter a different room where they will complete three computer-based tasks. The first will measure reading ability. Children will be given several passages to

read aloud to the research assistant. They will be scored on accuracy of pronunciation as well as reading speed. Reading comprehension will also be measured; the research assistant will administer several questions to the child after reading to test for comprehension. The second will be the Stanford-Binet Intelligence Scale V; this standardized intelligence test measures working memory. This task will be administered via computer. The third task, the PONS, will be taken on the computer and measures verbal and nonverbal social encoding skills. There will be a 10-minute break in between each task. Upon completing the tasks, the child and their parent will be awarded their compensation.

References

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