Attention-Deficit/Hyperactivity Disorder (ADHD) and Reading Abilities: A Comprehensive Review

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Abstract

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that is characterized by “a consistent pattern of inattention and/or hyperactivity/impulsivity symptoms that interferes with functioning in at least two domains” (DSM-V, 2013). While most studies link reading impairments to attention symptoms, Kagan’s (1965) seminal work documents a significant positive correlation between cognitive impulsivity and reading abilities in typically developing school-aged children (Kagan 1965). Moreover, extant research documents a relation between academic achievement impairments and ADHD-related cognitive impairments (i.e., executive functions). The purpose of this review is to examine ADHD-related reading abilities. We aim to outline the foundation for research on the relation between reading abilities and ADHD symptoms. We will examine both reading abilities broadly and examine specific reading-related processes (i.e., decoding comprehension and reading decoding). Moreover, we will examine the relation between impulsivity and reading abilities in school-aged children diagnosed with ADHD. Our goal is to understand the etiology (i.e., root cause) of impaired reading abilities in school-aged children diagnosed with ADHD. Clinical and research implications will be discussed.

Introduction

Approximately 5% of children are diagnosed with ADHD (American Psychiatric Association, 2013). Children with ADHD score 1.5 standard deviations lower than their typically-developing peers on standardized achievement tests (Barkley, 1998). ADHD is frequently co-morbid with reading problems (i.e., reading comprehension and fluency) (Kagan, 1965). ADHD symptoms are often found to be stronger predictors of reading difficulties than hyperactivity and inattention (Kagan, 1965). The findings suggest a strong relationship between inattention and reading ability in children diagnosed with ADHD (American Guidance Service, 2006).

Inattention:

Greven et al. (2011) studied the genetic correlation between ADHD symptoms and reading difficulties. They conducted a 2012 longitudinal study evaluating the genetic influence on the association between ADHD symptoms and reading difficulties. The sample included 131 children all of which completed a battery of tests to measure reading abilities (i.e., decoding comprehension, fluency, and decoding). The study implies children with ADHD are at risk of reading impairments (i.e., attention, hyperactivity/impulsivity) in both age groups. The study also supports the hypothesis that ADHD and reading difficulties are strongly correlated (Kagan, 1965). Furthermore, the study suggests that children with ADHD are at risk of reading impairments (i.e., attention, hyperactivity/impulsivity) (Kagan, 1965). The findings suggest a strong relationship between inattention and reading ability in children diagnosed with ADHD (American Guidance Service, 2006).

Literature Review

Inattention:

1. Greven et al. (2011) studied the genetic correlation between ADHD symptoms and reading difficulties.

2. Data from 7,000 twin pairs within two age groups 7-12 years. The study implies children with ADHD are at risk of reading impairments (i.e., attention, hyperactivity/impulsivity) in both age groups.

3. A higher heritability correlation was found between reading difficulties and inattentiveness (r=.31) than between reading difficulties and hyperactivity/impulsivity (r=.14).


5. Greven et al. conducted a 2012 longitudinal study evaluating the genetic influence on the association between ADHD symptoms and reading difficulties. The study implies children with ADHD are at risk of reading impairments (i.e., attention, hyperactivity/impulsivity) in both age groups.

6. The study also supports the hypothesis that ADHD and reading difficulties are strongly correlated (Kagan, 1965). Furthermore, the study suggests that children with ADHD are at risk of reading impairments (i.e., attention, hyperactivity/impulsivity) (Kagan, 1965). The findings suggest a strong relationship between inattention and reading ability in children diagnosed with ADHD (American Guidance Service, 2006).

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Proposed Research Questions

1. What is the relation between cognitive impulsivity (or ADHD symptoms) and reading problems?

2. Do reading problems (i.e., fluency, decoding) predict cognitive impulsivity in a clinical ADHD sample of school-aged children?

Proposed Methods

1. The study will include children between ages 8-12 who were referred to a clinical research laboratory for attention and learning problems.

2. The children’s reading performance will be correlated with their ADHD symptoms.

3. The following measures will be included in the study:
   - Kaufman Test of Educational Achievement – Third Edition (K-TEA-III)
   - Matching Unfamiliar Figures (MUFa); a measure of cognitive impulsivity
   - Continuous Performance Task (CPT); a commission errors
   - Teacher Report Form (TRF)

Preliminary Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADHD (n=15)</th>
<th>ADHD+RD (n=24)</th>
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<tbody>
<tr>
<td>Age</td>
<td>14.95</td>
<td>15.18</td>
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<tr>
<td>Vocabulary</td>
<td>11.77</td>
<td>10.29</td>
</tr>
<tr>
<td>Block Design</td>
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<td>13.73</td>
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<tr>
<td>WRAT3(S S) Reading</td>
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<td>R-ADHD-I Symptoms</td>
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<td>CTRS (Twore)</td>
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<td>40.08</td>
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<td>OCSM ADHD Teacher Report</td>
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<td>Teacher Impairment</td>
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<td>WRAV3(R-S) Reading</td>
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<td>93.96</td>
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<tr>
<td>Word Attack</td>
<td>103.97</td>
<td>93.02</td>
</tr>
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</table>

Table 2: Correlations Among Study Variables

1. Kagan’s 1965 research used a sample of typically-developing school-aged children attempts to find a link between cognitive impulsivity and reading abilities in children aged 7-12 years.

2. Kagan’s study implicates ADHD at risk of reading impairments (i.e., attention, hyperactivity/impulsivity) in both age groups. The study also supports the hypothesis that ADHD and reading difficulties are strongly correlated (Kagan, 1965). Furthermore, the study suggests that children with ADHD are at risk of reading impairments (i.e., attention, hyperactivity/impulsivity) (Kagan, 1965). The findings suggest a strong relationship between inattention and reading ability in children diagnosed with ADHD (American Guidance Service, 2006).

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Goals for Future Research

1. We aim to inform the development of impairment specific reading interventions for children diagnosed with ADHD.

2. We seek to provide specific reading interventions to children diagnosed with ADHD whose reading may be impaired on a foundational level (i.e., decoding).