Impact of ADHD on Learning

When compared with other childhood psychiatric problems, including depression, anxiety and disruptive behavior disorders, researchers (Barkley, 2006; Breslau et al., 2009) found that attention problems had the strongest impact on a child's future academic success.
Impact of ADHD on Learning (continued)

Children who have difficulty attending to classroom instruction may fail to acquire a wide array of academic skills and knowledge. Research has shown that children with ADHD are more likely to receive lower classroom grades and test scores in reading and math (DuPaul, Eckert & McGoey, 1997; Zentall, 1993).
Impact of ADHD on Learning (continued)

A recent study tracked 594 children diagnosed with ADHD from kindergarten through fifth grade and found that 60 percent who were prescribed stimulant medications performed better on standardized tests than their peers with ADHD who were not given medication. In fact, the children with ADHD who used medication were several months ahead of their nonmedicated ADHD peers in reading and math, which is significant because early progress in school is critical to ongoing academic success (Sheffler et al., 2009).
Differentiating Between RD and ADHD Reading Behaviors

Multiple studies have discovered that children with Reading Disabilities (RD) exhibit deficient phonemic and phonological awareness, characteristics not found in children with ADHD who are experiencing reading difficulties (Shankweiler et al., 1999; Hall et al., 1997). Wagner & Torgenson (1987) further established that children with ADHD do not experience difficulty with tasks of rapid naming at the same rate as children with RD. As a result, many experts believe that reading problems observed in children with ADHD are related to a unique set of cognitive impairment comprised mainly around difficulties with sustaining attention and executive function difficulties (Aaron et al., 2009).
Reading Disability (RD) and ADHD

Students with coexisting reading and attention problems demonstrate greater impairment on a variety of reading measures than children with either difficulty alone (Rabiner et al., 2008; Willcutt et al., 2001).
Furthermore, it has been shown that children with ADHD exhibit impaired executive function, and because executive function encompasses many of the cognitive skills required for learning, including the ability to shift efficiently from one mind-set to another, separate emotion from thought, execute goal-oriented behavior, and to process, store and retrieve information in an efficient manner, reading comprehension performance is often compromised (Barkley 2006; Tannock & Schachar, 1996; Pennington & Ozonoff, 1996).
Some experts believe children with ADHD, who are struggling with reading, do not have a comorbid reading disability. Instead, they believe the existence of a reciprocal relationship between attention and reading performance is the source of the difficulties (DuPaul & Stoner, 1994; Fergusson & Horwood, 1992). Yet, not all agree. Several researchers (Aaron et al., 2009; Purvis & Tannock, 2000) have uncovered separate but coexisting reading disabilities in children diagnosed with ADHD at a prevalence rate of up to 45%.
We don't use that word in this house!

“Do I hafta go outside to use it?”
Observed Reading Behaviors in Children with ADHD

- Omits words or phrases
- Skips lines
- Loses place in the text
- Reads very slowly, or very quickly; ignores punctuation
- Decodes unknown words based on initial consonant sound(s)
- Substitutes words with like meaning such as house for home
- Struggles to sequence events in a story
- Has difficulty recalling idea units from the text
- Often remembers only the beginning or ending of a story
- Experiences greater difficulty with inferential vs. literal comprehension
- Has difficulty identifying the main idea of a passage (saliency determination)
CONCLUSIONS OF RESEARCH STUDIES ON THE IMPACT OF ADHD ON READING
Children with ADHD often have difficulty sustaining attention, blocking out distractions of both an internal and external nature, understanding and organizing thought patterns, and recalling information while reading text (Zentall, 1993). As a result, children with ADHD often have difficulties remembering what they read. This weakness in comprehension is further compounded by poor strategy use (Levine, 2001).
Levine (2000) found that children with ADHD tend to display reading behaviors that are “...highly superficial, passive, and generally unfocused.” These children are more likely to guess at an unknown word rather than use acquired word attack skills. As a result, miscoding errors occur much more frequently than the child’s skill level dictates (Levine, 2000).
Brock and Knapp found that reading problems in children with ADHD are a result of difficulties with effortful processing, the ability to sustain attention under heavy cognitive demands. In their study (1996), children with ADHD who possessed average to above average decoding skills demonstrated impaired comprehension abilities, which could not be explained by a specific reading problem or a learning disability of some kind.
Cherkes-Julkowski, Stolzenberg, Hatzes and Madaus (1995) found that reading comprehension problems in children with ADHD can be linked to memory and storage capacity, and are therefore influenced by the length of what is being read. Their study showed that for children with ADHD, the longer the reading passage, the more limited their comprehension.

Cherkes-Julkowski et al. (1995) also found that unmedicated children with ADHD earned significantly lower scores on measures of comprehension (based on scores taken from seven sentence passages).
Reading and ADHD  (continued)

Studies have shown that children with ADHD often omit words or phrases, as well as skip lines during the reading of a passage (Bremer & Stern, 1976). In a study by Zentall (1993), children with ADHD experienced reduced reading comprehension due to their propensity to skip over measurable amounts of text when reading.
McGee, Williams, Moffitt & Anderson (1989) found that reading comprehension problems in children with ADHD are attributed to poor developmental control. Their conclusion was based on the finding that children with ADHD displayed no specific neuropsychological deficits when compared to other children without the disorder.
In a study by Weiler, Bernstein, Bellinger and Waber (2009) children with ADHD demonstrated diminished visual processing speed that could not be attributed to inattention.
Zentall (1988) found that children with ADHD asked more non-related task questions than children without ADHD. They also exhibited excessive verbalizations involving exclamations, interruptions, and subject changes. This led Zentall to conclude children with ADHD are verbally impulsive, a finding replicated in a study by Burns (2003).
Comprehension difficulties observed in children with ADHD are often a result of working memory difficulties (Cherkes-Julkowski et al., 1995). Working memory is vital to the development of good reading comprehension, because it encompasses both storage and control functions (Shankweiler et al., 1999). It is working memory that enables a reader to hold and manipulate information during such post-reading tasks as retelling.

Similarly, Webster, Hall, Brown and Bolen (1996) found that ADHD disrupts a student’s ability to handle new and unfamiliar material for both short-term and long-term storage, a process closely reliant on working memory.
Reading and ADHD (continued)

Denckla & Rudel (1976), Levine, (2001), Zametkin & Rapoport (1987) and Zentall (1993) all assert that symptoms of executive dysfunction in children with ADHD lead to discernible reading difficulties. Examples of reading difficulties associated with impaired executive function include trouble recalling pertinent text information and the organization of thought patterns; both essential for good reading comprehension.
Outcomes and Intervention
Outcomes and Intervention

Rabiner & Malone (2004) demonstrated that attention problems moderate the impact of reading intervention. As a child’s level of attentional difficulties increased, the benefits associated with one-on-one tutoring diminished. In fact, as attention problems in the study’s subjects approached a moderate to severe range, differences in first grade reading achievement for intervention participants was insignificant.
Outcomes and Intervention (continued)

As a result, children with attention problems yielded diminished reading achievement scores (at the end of first grade), even after controlling for IQ, prior reading scores, and a variety of demographic factors. The results suggest that the combination of attention problems and early reading difficulties is likely to substantially diminish the benefits of traditional academic interventions such as tutoring (Rabiner et al., 2004).
Outcomes and Intervention  (continued)

For many children with ADHD, stimulant medication treatment and behavior management programs have been found to enhance rates of academic productivity and accuracy (Barkley, 1998). Results from the Multimodal Treatment Study for ADHD (MTA Cooperative Group, 1999) suggest that the combination of approaches may promote greater gains in reading achievement.
Research has shown that specialized instructional practices can promote academic success among children with attentional problems (DuPaul & Eckert, 1998).

Weiler et al. (2009) suggests that modulating the pace of instruction may be a more effective intervention for children with ADHD than implementing strategies that focus on improving attentiveness.
Tips for Improving Reading Abilities in Children with AD/HD
“I gotta give your reading of that story a rave review, Grandma.”
Tips for Improving Reading Abilities in Children with ADHD

Allow students to select his/her own reading materials (comic books, magazines, video game manuals, etc.).

Encourage your students to read aloud at home and at school. Make reading time fun by suggesting that the student read to a family pet, a younger sibling, a grandparent, the principal, guidance counselor, or a special teacher.

Play board games such as Junior Scrabble, Game of the States and Monopoly to increase exposure to text in a fun way.

Combine multi-sensory learning experiences and reading activities whenever possible.
Tips for Improving Reading Abilities in Children with ADHD (continued)

Encourage choral reading, echo reading and shared reading activities. These varied modes of reading are more likely to engage a student with ADHD.

Have students preview school related texts by reading along with the audio version of whatever text the student is reading in the classroom.

Promote use of a text marker (index card, ruler, finger or reading strip) to help students better track when reading. Text markers provide increased visual focus on the print, which limits reading ahead behavior, as well as decreases the likelihood of the student losing his/her place. As a result, reading becomes more fluent and comprehension often improves.
More Tips for Improving Reading Abilities

If students are still struggling with decoding, their mental capacity and energies will be limited for comprehension. Struggling readers should therefore work with decodable readers whenever possible.
The slow, or gray, loris is about 16 inches long. It has a very short tail and thick, woolly, silver-gray fur. During the day, the slow loris sleeps in the fork of a tree. Nearly helpless on the ground, it rarely comes down from the treetops.
Many of the problems that children with ADHD experience during reading are linked to poor metacognition (Weiler et al., 2009; Levine, 2001; Robins, 1992). Children with ADHD must therefore be taught a myriad of self-monitoring strategies (before, during and after reading strategies) once decoding begins to become more automatic and the shift from learning to read versus reading to learn occurs.
Tips for Improving Reading Abilities in Children with ADHD (continued)

Provide students with a tool box of strategies to promote fix-ups when teacher or parent support is not available. One tool shown to be particularly helpful to children with ADHD (because of its visual nature and structure) is the graphic organizer. Graphic organizers allow students to learn new and unfamiliar material in a clear and visual way through the use of story mapping, schematic diagrams, and semantic mapping.
Instructional
Recommendations
“I’m for innovative teaching techniques providing they are identical to the techniques we’ve always used.”
Instructional Recommendations

Children with ADHD may require some form of specialized reading comprehension instruction. Programs such as Educators Publishing Service’s *Making Connections* (grades 1-6), *Making Connections Intervention* (grades 6-8) and SRA’s *Reading for Understanding* and *Reading for Information* all emphasize a systematic explicit approach to comprehension instruction in which students learn to reinforce skills and strategies in authentic reading situations.
<table>
<thead>
<tr>
<th>SKILLS</th>
<th>Book 1</th>
<th>Book 2</th>
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<th>Book 4</th>
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More Instructional Recommendations

Several researchers have shown that many of the reading problems children with ADHD experience can be linked to poor metacognition (Levine, 2001). Programs such as *Making Connections Intervention and Visualizing and Verbalizing* encourage the development of comprehension monitoring with such strategies as “think alouds”, the generating of self-questions and definitive text marking. These strategies can lead to a more interactive reading experience for students with ADHD resulting in a better understanding of the text for these readers.
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<th>SKILLS</th>
<th>LEVEL AQUA</th>
<th>LEVEL GOLD</th>
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<td>Recognizing Viewpoint: Persuasion</td>
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<td>Recognizing Viewpoint: Author's Perspective</td>
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<td>Synthesizing Information</td>
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<th>STRATEGIES</th>
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<td>Identify Text Structure</td>
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<td>Answer/Generate Questions</td>
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<td>Summarize</td>
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<td>Apply Multiple Strategies</td>
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More Instructional Recommendations

Mental imagery has been shown to improve comprehension. Yet, we know struggling readers do not instinctively make use of mental imagery as a comprehension strategy (Block & Pressley, 2002; Gambrell & Bales, 1986). Instead, they tend to focus on storing text details in memory, an area already identified as problematic for children with ADHD. Lindamood-Bell’s *Visualizing and Verbalizing for Language Comprehension and Thinking* program would be beneficial for students with ADHD as its been shown to improve comprehension (Truch, 2004) by teaching students to stimulate concept imagery while reading.
More Instructional Recommendations

Research has shown that children with learning difficulties benefit significantly from the use of graphic organizers (Dole, Sloan & Trathen, 1995; Bulgren & Scalon, 1998). Graphic organizers allow students to learn new and unfamiliar material in a clear and visual way using schematic diagrams and semantic mapping. *Making Connections Intervention* teaches students how to use and create graphic organizers. For example, in the *Practice the Skill* section that follows each story, graphic organizers are used to elicit a student’s response to the text, along with questions, vocabulary and writing activities.
Practice the Skill

**Cause and Effect**

1. Look at the first paragraph in the section What Is Karate? Fill in the missing effect.

   **Cause**
   
   In ancient Japan, people were not allowed to carry weapons.

   **Effect**

2. Write another cause and effect relationship from the text.

   **Cause**
   
   ____________________________
   ____________________________
   ____________________________

   **Effect**
   
   ____________________________
   ____________________________
   ____________________________

**Check Comprehension**

How can yoga help people with health problems?

____________________________
____________________________
____________________________

**Vocabulary**

Find the word *concentrate* on page 42. Write a sentence using this word.

____________________________
____________________________
____________________________
Text 1: Changing San Francisco

BEFORE READING

Skill Focus
Invite students to discuss the order in which things happen in their daily lives, (their morning routine, days of the week, seasons) As they talk, prompt them to use signal words and phrases that will show up in the text such as in, at this time, by, and today. Tell students that the order in which things happen both in their daily lives and in the texts they read is called a sequence. Explain that signal words help make the order of events clear.

Background Knowledge
Explain to students that they will be reading a text about the city of San Francisco, California. Ask them what they know about San Francisco. Then ask them what they know about how a city grows and changes as time passes. Encourage them to discuss how housing and transportation may change.

Text Structure and Purpose
Have students open their books to page 4. Point out the definition of sequencing at the top of the page. Read it aloud to students as they follow along in their books. Explain that this text tells about how San Francisco developed over time.

Then point out that
• the first paragraph tells about the earliest, or first, thing that happened in the development of San Francisco.
• the next paragraphs go in time order, each telling about one event in San Francisco’s development. You may want to ask students to predict whether the last paragraph will be about San Francisco’s past or present.
• each event is explained with supporting details; remind students that the supporting details tell how, when, where, why, how much, or how many.
Text Features
Read the title and focus question aloud to students as they follow along. Direct them to keep the question in mind; explain that you will refer back to it later.
Discuss the illustrations with students and ask them to describe the differences between the drawing and the photograph. (The drawing looks like a picture of early San Francisco, and the photograph looks like modern San Francisco.) Ask them how they think these two pictures show something about the development of San Francisco.

DURING READING
Comprehension Monitoring/Question Generating
First Reading
Read the text aloud to students as they follow along in their books. As you read, model how to circle words, phrases, or sentences that may be challenging. Use the Teacher Support for Comprehension Monitoring on pages 132–133 to help you identify likely trouble spots. Discuss any words students don’t understand. Then think aloud as you generate questions about content of the text.

Vocabulary
Model how to use vocabulary strategies to determine the meaning of some words.
- Show students how to use context clues to find the meaning of the word bustling:
  “Bustling... what does that word mean? San Francisco was described as busy and fast-growing in paragraph 2, so maybe the word bustling in paragraph 3 means ‘busy and fast-paced.’”
- Use word structure clues to figure out multistory: “I know the prefix multi means ‘many’ because a multiple-choice test has many choices for an answer. And I know that a building, a story is a floor. So a multistory building must be a ‘building with many floors.’”

Find ELL support for vocabulary on page 27.

Phrases and Sentences
Model how to generate questions to help identify a potential trouble spot in paragraphs 2 and 3. Say: “In the second paragraph it says ‘In just two years’ but there’s no date. Can I figure out exactly when that was? In the paragraph above it says 1848. If I add two years to that I get the year 1850. The events in this paragraph must have happened in 1850.”
AFTER READING

Reread for Fluency
Ask students to think about how people’s voices sound in a TV commercial. Discuss how people’s voices sound different when they want to sell you something. Assign pairs of students to alternate reading this ad in their best “commercial” voices. Remind them to monitor each other for accuracy and appropriate expression.

Find ELL support for fluency below.

Graphic Organizers and Question Answering
Point to the first activity on page 48. Explain to students that they can get a better understanding of the facts and opinions in a text if they put them in separate lists. Then point to words and phrases in the text like “smiling” and “like no other.” Ask students why describing words like these signal opinions. (Things I think or thinking may not be attractive to someone else.)

Summarizing
Remind students that summarizing helps readers say in a few sentences what a whole text is about. Model using the marked pages to create two written summaries of the text: one of the facts and one of the opinions. Say: “The first fact I underlined is ‘Water is one of earth’s most precious resources.’ This tells why Aqua Haven is such an important idea. I’m going to include it in my summary.” Repeat, highlighting opinions. Call on a volunteer to read the finished summaries aloud.

ELL Support
Skill Focus Share print examples of facts and opinions with students. Use car ads or other newspaper sales supplements. Work together to identify facts and opinions.

Fluency Before students read, model reading in a persuasive voice. Let students practice their “advertising voice.” Monitor the speed and tone of their reading as necessary.
More Instructional Recommendations

Students with ADHD benefit when multiple opportunities to practice newly learned strategies are provided. To promote optimal engagement with the text, high interest narrative and informational text should be used. Student books such as EPS’s *Reading Comprehension in the Varied Subject Matter, Claims to Fame*, and *Reasoning and Reading* offer reading comprehension passages in such subject areas as social studies, science, literature, mathematics, philosophy and the arts.
For more information about the programs mentioned in this presentation please visit these websites:

www.epsbooks.com
www.lblp.com
www.mcgraw-hill.com
Thank You!

Mary Beth Burns, Ed.D.

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