

Discriminating between Attention Deficit Hyperactivity Disorder (ADHD) and Developmental Dyslexia: Differential Diagnosis and Interventions.

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Children often have “learning problems” for a number of reasons. It may be due to external factors such as stresses in their life (e.g., divorce; moves; being bullied) or it can be attributed to a specific Learning Disability such as Dyslexia. ADHD is a neurological disorder that can make school, learning, and homework completion very difficult. Many times, ADHD and Dyslexia are confused due to overlapping symptomatology. In reality, they are very separate, distinct life-long disorders that require different intervention. Even more confusing is that these disorders can occur together. The goal of this article is to help the reader begin the process of getting appropriate support for their child.

Treatment for these disorders are time consuming and require substantial resources. Nothing can be more frustrating for parents than to invest resources into an intervention that is ineffective or unnecessary. For example, if a child is misidentified with Dyslexia (but actually has ADHD), all the specialized tutoring in the world is not going to improve their attention (and may actually make things worse). At the same time, if a child has Dyslexia, but is treated for ADHD, they will continue to struggle with language processing, word finding, decoding, and comprehension. As a result, it is imperative that careful, comprehensive assessments be conducted to discriminate between these two disorders.

What is Attention Deficit Hyperactivity Disorder

ADHD is a neurological disorder that interferes with the ability to focus, concentrate, and inhibit behaviors. This is a developmental disorder that looks different across time. Children (and adults) who have this disorder can be described as highly impulsive, overly active individuals who have problems “thinking before acting.” This of course, results in a great number of hassles in their lives. As children enter a formalized educational environment, children with ADHD experience difficulties with attention and concentration. They are often very unorganized and forgetful. Individuals with ADHD often lose things and have problems completing homework or other projects. Many times, persons with ADHD will experience difficulties listening and processing other auditory information.

Children with ADHD experience more rejection by teachers and peers due to their poor school performance, over activity, and impulsive behaviors. This places them at risk for experiencing emotional and serious conduct problems as they enter adolescence. Without proper interventions, persons with ADHD are more likely to drop out of high school, have encounters with law enforcement officials, be involved with car accidents, and be involved in a teen pregnancy. Young adults with ADHD may experience vocational and relationship difficulties.

Young children often have problems regulating their behaviors and may seem to be in perpetual motion. As they mature, the symptoms of hyperactivity decrease and attentional problems become more prevalent. During adolescence, they may have problems “fitting in” socially and may encounter negative consequences associated with poor impulse control. As adults, persons with ADHD may have

problems sustaining employment, keeping their checking account balanced, and maintaining long-term relationships.

The DSM-IV-TR identifies three different subtypes of ADHD including Combined Type. However, recent research has identified two primary types of ADHD:

Combined Type: These are children who have problems with behavioral regulation as well as attention and concentration. Children with ADHD, Combined Type are often very difficult as toddlers. They are described as always being on the move or into things, as if “driven by a motor.” Children with this subtype often require close supervision and have problems playing quietly. They may also be highly impulsive to the point of taking risks that could be dangerous (e.g., darting away from parents in a busy parking lot). As they enter Kindergarten and 1st grades, they have problems adjusting to the rules and structure of the classroom. They have problems sitting, tend to disrupt lessons, frequently interrupt, and have problems sharing. These children are likely to be identified early in development due to the disruptive nature of their behaviors.

Inattentive Type: Children with Inattentive Type do not show the typical pattern of hyperactivity and poor impulse control early in development. Instead, children with Inattentive Type are frequently calm and have no problems adjusting behaviorally when introduced to a formal educational setting. Children with this subtype often have problems processing auditory information and may be more likely to have a Learning Disability. As school demands increase, they have problems keeping up due to poor attention and concentration. It often takes them an inordinate amount of time (e.g., 2 hours for 1 page of problems) to complete homework. Children with Inattentive Type often are not identified until later in development (e.g., 3rd or 4th grade) when work completion at school requires more self-motivation.

What causes ADHD?

In simple terms, persons with ADHD do not have enough of certain chemicals called neurotransmitters (norepinephrine; dopamine) for their brain to function appropriately. Neurotransmitters are the chemical signals that go between neurons through synapses. This system of communication is reliant on a strict pattern of operation. If the neurotransmitters are not working well, then problems relaying information will also happen. For instance, persons with ADHD may have more reuptake pumps (that are suppose to store excess neurotransmitters for later use) than people without ADHD. Recent research using FMRI shows that these deficits become pronounced when a person with ADHD attempts to focus or concentrate. The problem with ADHD is that there are certain balances between neurotransmitters and receptors. In ADHD, the particular name of the most notable neurotransmitter that is not working correctly is called dopamine. If dopamine is not working correctly (presumably because too much of it is being taken up from the synapse after the action potential leaves) then the major sub-parts of the limbic system and the basal ganglia fail to do their job properly. These problems result in deficits in executive functioning, namely attention and self-regulatory abilities.

What is Developmental Dyslexia?

Developmental Dyslexia is a language processing disorder that interferes with making the transition from spoken language (inherent ability) to reading written text (man-made process). Children with this condition have a strong family history of reading problems and fail to develop phonic skills as they enter

preschool and kindergarten environments. As a result, they often rely heavily on visual cues to help compensate for their reading problems. Research using FMRI has identified the "neural signature" (lower brain activation in the occipito-temporal area of the brain) responsible for reading difficulties. Students may show a discrepancy between their intellectual abilities and reading skills. Children with Developmental Dyslexia often have highly developed visual-memory skills that allows them compensate for their language processing difficulties. Approximately 24% of children who have Dyslexia also experience difficulties with ADHD.

There are many early indicators for young children with Dyslexia. These children may have chronic ear infections that interfere with the acquisition of speech. Parents often report that their child did not begin talking until bi-lateral tubes were surgically placed. Children often have subtle language problems including articulation, word confusion, or delays with phrase speech. Many times, these children do not show interest in reading activities or fail to pick up on the sounds of letters when they enter preschool or kindergarten. As they are exposed to more complex reading materials, they fail to develop effective decoding skills and tend to "visually memorize" words. They experience increased difficulties with reading activities as they are exposed to more complex academic tasks and the reading demands exceeds their abilities to cope.

One of the primary challenges for practitioners is to discriminate between ADHD and Dyslexia. As stated earlier, these two disorders have many common characteristics:

Symptoms	ADHD	Dyslexia
Hyperactivity:	X	
Poor self-control/impulsivity:	X	
Highly distractible:	X	
Problems adjusting to the rules of school:	X	
Inattentiveness:	X	
Frequently interrupts/problems waiting:	X	
Listening problems:	X	X
Behavioral problems early in development:	X	
Problems processing auditory information:	X	X
Poor reading comprehension:	X	X
Word finding problems:		X
History of language problems:		X
Slow reading speed:	X	X
Writing problems:	X	X
Difficulties completing homework	X	X
Afraid to read aloud:		X
Problems decoding words:		X
Early rhyming problems		X
Failure to learn letters:		X
Poor phonological processing		X
Slow processing speed:	X	X
Problems with retention:	X	X

In general, children with Dyslexia do not exhibit the behavioral excesses such as hyperactivity and impulsivity that are commonly associated with ADHD. They have no difficulties adjusting the rules and

structure of school, but may have a history of language problems. At the same time, children with both conditions struggle with processing auditory information, retention, and listening. They typically show slow reading fluency as well as poor comprehension of written text. Many times, writing is very difficult for both groups since it represents a very boring task that requires complex language skills (e.g., spelling; sentence structure; fine motor-regulation).

Discriminating between ADHD and Dyslexia required a comprehensive Psycho-educational assessment that involves the following assessment procedures:

- Conduct an interview to gain important information regarding developmental history, past and present school adjustment, and grades. Reviewing records and samples of a student's work is also important.
- Cognitive assessment to assess verbal comprehension, processing speed, working memory, visual-spatial skills, and thinking abilities.
- Continuous Performance Test to assess the ability to sustain attention and concentration.
- Tests of Phonological Processing to assess verbal memory as well as word finding skills.
- Academic tests to assess decoding, encoding, reading fluency, reading comprehension, spelling, and writing.
- Social, Emotional, Behavioral Assessments to determine if a child's problems are greater than what would be expected for their age. Also, it is important to determine if there are other problems (e.g., anxiety; depression; social problems) that are interfering with school performance.
- It is important to gain information about a student's performance in more than one environment.

Interventions for ADHD:

- **Medication.** Research has shown that medication is often an effective treatment for ADHD. There are a number of medications that treat ADHD. These include both stimulant (e.g., Adderall; Concerta; Vyvance) and non-stimulant alternatives (e.g., Strattera; Wellbutrin). Many children do well with few side effects from ADHD medications. Other children are unable to tolerate medication and may require an alternative treatment approach.
- **Behavior modification** has been found to be effective for children with ADHD. Research has found that behavior modification along with medication results in more substantial and long term gains in learning compensatory skills. Children with ADHD require more frequent, potent rewards than other children. As a result, it is important for children with ADHD to have a very simple, daily, visual reward system. Punishment is typically not as effective. As a result, parents should use short term, immediate consequences.
- **Education.** It is imperative that teachers and parents become educated on the special challenges of ADHD. There are numerous resources. It is important that these resources be "research based." Stay away from experimental approaches that sound too good to be true! Here is a list of a few good resources:

Barkley, R. A. (2000). Taking charge of ADHD. Guilford Press/New York.

Rief, S (1993). How to reach and teach ADD/ADHD children. Applied Research/New York.

Giler, J. Z. (2000). Socially ADDept: A manual for parents of children with ADHD and/or learning disabilities. CES/Santa Barbara.

Hartman, T. (2000). ADHD: Help your family at home, school and work. Underwood/Grass Valley.

Barkley, R.A. (2001). Attention Deficit Hyperactivity Disorder: A handbook for diagnosis and treatment, 2nd Ed. Guilford/New York.

Pera, G. & Barkley, R.A. (2008). Is It You, Me, or Adult A.D.D.? Stopping the Roller Coaster When Someone You Love Has Attention Deficit Disorder. Guilford/New York.

- **School accommodations and other interventions:** it is often necessary for educational teams to develop a 504 plan that allows modifications in the classroom setting and curriculum that will facilitate learning.
- **Tutoring programs:** Homework issues are a major stressor for parents and children. Many times, parents are unable to assume a teacher role and become the “homework police.” This results in increased conflicts at home and a deterioration of quality family time. Many times, it is necessary to provide children with after school tutoring to help them “get organized” and complete homework.
- **Study habits and routines:** It is important for children with ADHD to do homework at the same time and place each day. Setting up consistent study habits will help children initiate work. Study time should not exceed 1 hour a day for Elementary and Middle School students. It will also be important for children with ADHD to place all of their needed things in a central location prior to bedtime to prevent forgetting or losing critical materials.
- **Teaching skills:** Children with ADHD often exhibit anger control problems or anxiety related issues. Cognitive-Behavioral Therapy can be useful when teaching children how to cope with negative thoughts or how to respond to triggers. Many times, children with ADHD benefit from learning “stop and think” strategies to improve their coping skills and ability to deal with daily triggers.
- **Cogmed** is a computerized training that improves attentional functioning. This is a 6 week program that targets working memory. Recent double blind studies have found that this program to be an effective treatment for children who struggle with attention and concentration. Cogmed is available at The Therapy Center or at www.workingmemorysolutions.com.

Interventions for Developmental Dyslexia:

Specialized Tutoring: Research has found that children diagnosed with Dyslexia respond best to a multi-sensory approach to reading that has a strong emphasis on phonological processing. Children need to learn the rules governing letter(s) to sound associations when reading. Most agree that interventions that are based on the Orton-Gillingham approach are most effective for children with Dyslexia. The acquisition of new skills is based primarily on the frequency a student has to respond to materials. As a result, children with Dyslexia require one to one or small group instruction on a daily basis for an extended time in order to learn effective decoding skills. It is important to evaluate the effectiveness of these interventions by first establishing a baseline of skills and then

completing periodic assessments to evaluate progress. The most comprehensive resource regarding the identification and treatment of Dyslexia can be found at: Shaywitz, Sally (2003). Overcoming dyslexia. Knopf/New York.

School Accommodations: Children with Dyslexia often require a number of reasonable accommodations in order to maximize their potential and be successful within the school setting. They often perform better when they hear material as opposed to reading text. As a result, they may benefit from the use of Books on Tape (www.booksontape.com). Test performance can be enhanced by having test questions read to children with Dyslexia. Writing is often the most complex and difficult academic task for children with Dyslexia. As a result, they should be encouraged to become efficient with keyboarding skills as they enter higher grades. Often, the use of a laptop and word processing can facilitate their school performance. Many times, students respond best to using a voice recognition system such as Dragon NaturallySpeaking systems (www.Nuance.com). Finally, children with Dyslexia often benefit from extended time on standardized tests.

Home Interventions: It is important to teach children with Dyslexia effective study habits. They should be encouraged to study at the same time and place each day. It will be important to make learning fun. This may include developing a reward system to encourage work completion.

Earobics is a computerized teaching program that can improve phonological processing at home. This can be found at: www.earobics.com.

It is important to encourage students to read for pleasure by exploring “high interest/low vocabulary” books that are within their instructional range (e.g., the level at which they read with 98% to 100% accuracy). These series have more mature topics and illustrations for older students.

It is often helpful to engage in “read aloud” activities with your child using reading materials that are within their instructional range. These activities have been found to increase reading fluency as well as reading comprehension. For more information regarding read aloud strategies and improving reading comprehension, refer to:

Hickman, P. & Pollard-Durodola, S. D. (2009). *Dynamic read-aloud strategies for English Learners: Building language & literacy for primary grades*.

Carlisle, J. F. & Rice, M.S. (2002). Improving reading comprehension: Research based principles and practices. York Press