RESOURCE DIRECTORY

HBIDA

HOUSTON BRANCH OF THE INTERNATIONAL DYSLEXIA ASSOCIATION

2019

Articles, Resource Materials
Education Opportunities
Professional Service Resources
& much more for families
living with Dyslexia

ABOUT IDA

The International Dyslexia Association (IDA) is a non-profit organization dedicated to helping individuals with dyslexia, their families and the communities that support them. IDA is the oldest organization dedicated to the study and treatment of dyslexia in the nation—founded in 1949 in memory of Dr. Samuel T. Orton, a distinguished neurologist. IDA membership consists of a variety of professionals in partnership with individuals with dyslexia and their families. IDA actively promotes effective teaching approaches and intervention strategies for the educational management of dyslexia. The organization and its branches do not recommend or endorse any specific speaker, school, instructional program or remedial method. Throughout IDA's rich history, our goal has been to provide the most comprehensive forum for parents, educators, and researchers to share their experiences, methods, and knowledge.

ABOUT HBIDA

THE HOUSTON BRANCH OF THE INTERNATIONAL DYSLEXIA ASSOCIATION (HBIDA) was founded in 1978 at a meeting among parents and teachers who were concerned for the education of children with language learning problems and wanted to create an organization to promote efforts to help those children.

HBIDA welcomes your participation in all of the many activities we sponsor. We encourage you to join The International Dyslexia Association (IDA) and participate with us in HBIDA as we work together to increase awareness and support for individuals with learning differences in the Gulf Coast area. We are a 501(c)(3) non-profit organization. The members of the HBIDA Board are all volunteers who bring a diversity of skills to the organization.

NANCY LAFEVERS AMBROSE SCHOLARSHIP FUND: SUPPORTING FAMILIES TO ACCESS DIAGNOSTIC SERVICES

The Nancy LaFevers Scholarship Fund serves to promote the appropriate diagnosis and treatment of dyslexia and related disorders by offering scholarships for diagnostic testing of children and adults, coordinated by the HBIDA scholarship committee and local diagnosticians. Donations to this fund fulfills Nancy's wish to enable diagnostic services for families who could not afford them otherwise.

HBIDA encourages all potential applicants to visit the HBIDA website for detailed information on the application process and further guidance: http://www.houstonida.org/scholarships/

HBIDA Objectives

- Increase community awareness of dyslexia
- Encourage the use of scientifically-based reading instruction for individuals identified with dyslexia
- Support educational and medical research on dyslexia

HBIDA Programs & Services

Spring Conference

Fall Symposium

College Panel

Parent Networking Group

Regional Group Events

Website and Social Media

SCHOLARSHIP FUND for teachers and parents to attend our conference and symposium in memory of John Lopez, D.D.S.

SCHOLARSHIP FUND for educational diagnostic testing for children in memory of Nancy LaFevers Ambroze

RESOURCE DIRECTORY of articles, helpful local and national organizations and websites, and local service providers

HELPLINE for information and referral services: 713.364.5177

SPEAKERS BUREAU OF PROFESSIONALS is available to present to your group about dyslexia.

Texas law (19 TAC §74.28) now requires that districts and charter schools must provide a parent education program for the parents/guardians of students with dyslexia and related disorders.

HBIDA
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www.houstonida.org

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HBIDA PRESIDENT'S LETTER

If you want to go quickly, go alone. If you want to go far, go together. —AFRICAN PROVERB

PEDIATRICIANS SHOULD BE VERY COMFORTABLE talking to parents about dyslexia and other learning disorders. They should be a primary contact for parents to direct them to appropriate resources, referrals, interventions, and work to improve parents understanding of learning challenges their child may be experiencing. There should be standard screening in place in all primary care offices to identify children with learning disorders at critical points in a child's development to ensure if a concern is raised parents can be made aware and move forward with accessible supports. Unfortunately, many parents of children with learning disorders are already aware that is not the world we currently live in...not yet at least. Despite knowing so much about dyslexia and its biological underpinnings the medical community itself still has more work to do.

In my three years of pediatric residency training I recall sitting with children who had to complete formal psychological testing that included cognitive and academic testing for learning concerns. Any further formal education in the realm of learning disorders was minimal at best. It's no surprise unfortunately that in a fast paced high acuity pediatric residency training program, dyslexia and other learning disorders were often overshadowed by the more critical diagnoses that are key to the immediate demands of daily patient care. Having the opportunity to interact with children with various special health care needs in my residency training fostered my desire to pursue further subspecialty training in Developmental and Behavioral Pediatrics. This additional fellowship training provided an in-depth look at the assessment of learning disorders and attention differences while also providing a comprehensive understanding of the neurobiology of these diagnoses. In addition, learning more about evidence based interventions to support these challenges provided me with additional tools to guide and direct parents to the best and most effective ways to support their children. The more I learned about dyslexia the more I realized how little I knew about learning disorders after completing my initial pediatric residency training. I completed my fellowship training and began searching for my first "real job" as a Developmental and Behavioral Pediatrician when I crossed paths with Dr. Danny Williamson. Although dyslexia and learning disorders are a critical component of Developmental and Behavioral Pediatrics I have only personally met a handful of Developmental Pediatricians who have taken a "deep dive" into learning disorders the way Dr. Williamson has. He is one of a kind. Working alongside Dr. Williamson and my talented colleagues at the Children's Learning Institute at UTHealth has been pivotal in ensuring patients are provided high quality evidence based care and guidance in the realm of dyslexia and learning disorders. Collaborating with patients, parents, therapists, teachers, and administrators locally has illustrated the critical role a supportive network has when promoting optimal care of children with dyslexia and related learning disorders.

The International Dyslexia Association's (IDA) mission is to create a future for all those who struggle with dyslexia and other related reading differences so that they can lead a more fulfilled, valued, and successful life while accessing the evidence based tools they need to meet their full potential. I have the good fortune of working with the Houston Branch of the International Dyslexia Association (HBIDA) for the past 5 years. The core of this organization lies in the shared commitment that brings our very talented board members, advisory members, volunteers, branch members and supporters to this cause. It is a blessing to witness firsthand how so many of our dedicated board and advisory members volunteer their limited free time to this organization to further our mission. Until everyone can read!

We recognize we each have a role to play. With ever constricting limitations placed on school districts and widening socioeconomic divides across communities, lasting change is needed. Change in our schools systems, our medical system, and in every community across racial, ethnic, financial and geographic boundaries. If you are a parent, an individual with dyslexia, a teacher, a therapist, a diagnostician, an administrator, a student, an employer, or advocate - join us. Join as a member of HBIDA and IDA. Attend one of our community events through our dynamic Parent Networking Group (PNG) or dyslexia simulations. Like and follow us on Facebook. Take advantage of learning opportunities and networking at our Spring Conference or Fall Symposium. Join our board!

A favorite African proverb of mine states, "If you want to go quickly, go alone. If you want to go far, go together." We have come a long way in understanding and recognizing the many facets of dyslexia but we still have a long way to go-together.

We look forward to seeing you soon.

ANSON J. KOSHY, M.D., M.B.E.
President

HOUSTON BRANCH OF THE
INTERNATIONAL DYSLEXIA ASSOCIATION

RESOURCE DIRECTORY

HBIDA

HOUSTON BRANCH OF THE INTERNATIONAL DYSLEXIA ASSOCIATION

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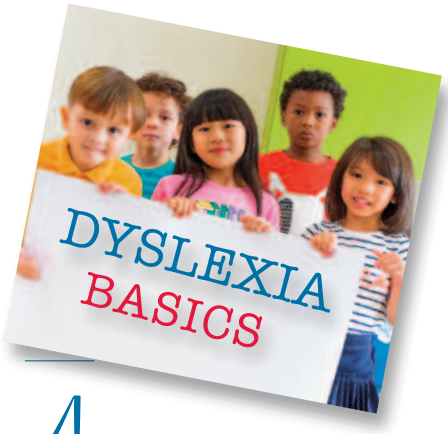

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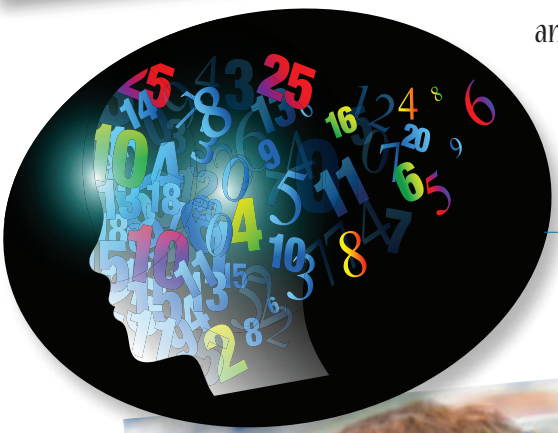

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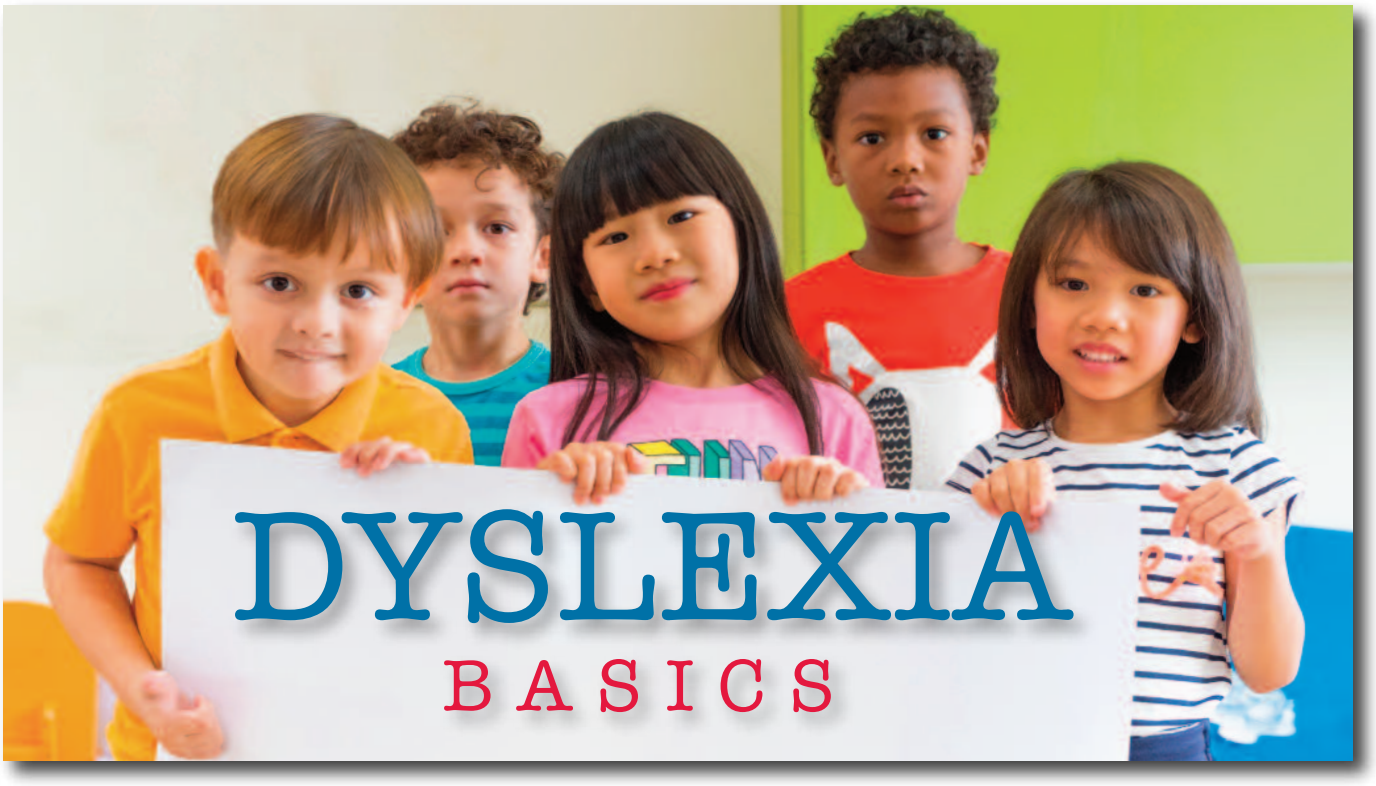
Decoding the Brain:
Imaging Studies of Dyslexia

HBIDA 23RD ANNUAL
SPRING CONFERENCE
SATURDAY, FEBRUARY 23, 2019



What is dyslexia?

Dyslexia is a language-based learning disability. Dyslexia refers to a cluster of symptoms, which result in people having difficulties with specific language skills, particularly reading. Students with dyslexia usually experience difficulties with other language skills such as spelling, writing, and pronouncing words. Dyslexia affects individuals throughout their lives; however, its impact can change at different stages in a person's life. It is referred to as a learning disability because dyslexia can make it very difficult for a student to succeed academically in the typical instructional environment, and in its more severe forms, will qualify a student for special education, special accommodations, or extra support services.

What causes dyslexia?

The exact causes of dyslexia are still not completely clear, but anatomical and brain imagery studies show differences in the way the brain of a person with dyslexia develops and functions. Moreover, most people with dyslexia have been found to have problems with identifying the separate speech sounds within a word and/or learning how letters represent those sounds, a key factor in their reading difficulties. Dyslexia is not due to either lack of intelligence or desire to learn; with appropriate teaching methods, students with dyslexia can learn successfully.

How widespread is dyslexia?

About 13–14% of the school population nationwide has a handicapping condition that qualifies them for special education. Current studies indicate that one half of all the students who qualify for special education are classified as having a learning disability (LD) (6–7%). About 85% of those students have a primary learning disability in reading and language processing. Nevertheless, many more people—perhaps as many as 15–20% of the population as a whole—have some of the symptoms of dyslexia, including slow or inaccurate reading, poor spelling, poor

writing, or mixing up similar words. Not all of these will qualify for special education, but they are likely to struggle with many aspects of academic learning and are likely to benefit from systematic, explicit, instruction in reading, writing, and language.

Dyslexia occurs in people of all backgrounds and intellectual levels. People with dyslexia can be very bright. They are often capable or even gifted in areas such as art, computer science, design, drama, electronics, math, mechanics, music, physics, sales, and sports.

In addition, dyslexia runs in families; parents with dyslexia are very likely to have children with dyslexia. For some people, their dyslexia is identified early in their lives, but for others, their dyslexia goes unidentified until they get older.

What are the effects of dyslexia?

The impact that dyslexia has is different for each person and depends on the severity of the condition and the effectiveness of instruction or remediation. The core difficulty is with word recognition and reading fluency, spelling, and writing. Some individuals with dyslexia manage to learn early reading and spelling tasks, especially with excellent instruction, but later experience their most debilitating problems when more complex language skills are required, such as grammar, understanding textbook material, and writing essays.

People with dyslexia can also have problems with spoken language, even after they have been exposed to good language models in their homes and good language instruction in school. They may find it difficult to express themselves clearly, or to fully comprehend what others mean when they speak. Such language problems are often difficult to recognize, but they can lead to major problems in school, in the workplace, and in relating to other people. The effects of dyslexia reach well beyond the classroom.

Dyslexia can also affect a person's self-image. Students with dyslexia often end up feeling "dumb" and less capable than they actually are. After experiencing a great deal of stress due to academic problems, a student may become discouraged about continuing in school.

Dyslexia is not due to either lack of intelligence or desire to learn.

How is dyslexia diagnosed?

Before referring a student for a comprehensive evaluation, a school or district may choose to track a student's progress with a brief screening test and identify whether the student is progressing at a "benchmark" level that predicts success in reading. If a student is below that benchmark (which is equivalent to about the 40th percentile nationally), the school may immediately deliver intensive and individualized supplemental reading instruction before determining whether the student needs a comprehensive evaluation that would lead to a designation of special education eligibility. Some students simply need more structured and systematic instruction to get back on track; they do not have learning disabilities. For those students and even for those with dyslexia, putting the emphasis on preventive or early intervention makes sense. There is no benefit to the child if special instruction is delayed for months while waiting for an involved testing process to occur. These practices of teaching first, and then determining who needs diagnostic testing based on response to instruction, are encouraged by federal policies known as Response to Intervention (RTI). Parents should know, however, that at any point they have the right to request a comprehensive evaluation under the IDEA law, whether or not the student is receiving instruction under an RTI model.

A comprehensive evaluation typically includes intellectual and academic achievement testing, as well as an assessment of the critical underlying language skills that are closely linked to dyslexia. These include receptive (listening) and expressive language skills, phonological skills including phonemic awareness, and also a

student's ability to rapidly name letters and numbers. A student's ability to read lists of words in isolation, as well as words in context, should also be assessed. If a profile emerges that is characteristic of readers with dyslexia, an individualized intervention plan should be developed, which should include appropriate accommodations, such as extended time. The testing can be conducted by trained school or outside specialists. *(See the Dyslexia Assessment Fact Sheet for more information.)*

What are the signs of dyslexia?

The problems displayed by individuals with dyslexia involve difficulties in acquiring and using written language. It is a myth that individuals with dyslexia "read backwards," although spelling can look quite jumbled at times because students have trouble remembering letter symbols for sounds and forming memories for words. Other problems experienced by people with dyslexia include the following:

- Learning to speak
- Learning letters and their sounds
- Organizing written and spoken language
- Memorizing number facts
- Reading quickly enough to comprehend
- Persisting with and comprehending longer reading assignments
- Spelling
- Learning a foreign language
- Correctly doing math operations

Not all students who have difficulties with these skills have dyslexia. Formal testing of reading, language, and writing skills is the only way to confirm a diagnosis of suspected dyslexia.

How is dyslexia treated?

Dyslexia is a lifelong condition. With proper help, many people with dyslexia can learn to read and write well. Early identification and treatment is the key to helping individuals with dyslexia achieve in school and in life. Most people with dyslexia need help from a teacher, tutor, or therapist specially trained in using a multisensory, structured language approach. It is important for these individuals to be taught by a systematic and explicit method that involves several senses (hearing, seeing, touching) at the same time. Many individuals with dyslexia need one-on-one help so that they can move forward at their own pace. In addition, students with dyslexia often need a great deal of structured practice and immediate, corrective feedback to develop automatic word recognition skills. For students with dyslexia, it is helpful if their outside academic therapists work closely with classroom teachers.

Schools can implement academic accommodations and modifications to help students with dyslexia succeed. For example, a student with dyslexia can be given extra time to complete tasks, help with taking notes, and work assignments that are modified appropriately. Teachers can give recorded tests or allow students with dyslexia to use alternative means of assessment. Students can benefit from listening to audiobooks and using text reading and word processing computer programs.

Students may also need help with emotional issues that sometimes arise as a consequence of difficulties in school. Mental health specialists can help students cope with their struggles.

What are the rights of a dyslexic person?

The Individuals with Disabilities Education Act 2004 (IDEA), Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) define the rights of students with dyslexia and other specific learning disabilities. These individuals are legally entitled to special services to help them overcome and accommodate their learning problems. Such services include education programs designed to meet the needs of these students. The Acts also protect people with dyslexia against unfair and illegal discrimination.

The International Dyslexia Association (IDA) thanks Louisa C. Moats, Ed.D., and Karen E. Dakin, M.Ed., for their assistance in the preparation of this fact sheet.

"promoting literacy through research, education and advocacy"™

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from THE PACER CENTER (2007)

Understanding the Special Education Process

How the Process Works

1. Parents, school personnel, students or others may make a request for evaluation. If you request an evaluation to determine whether your child has a disability and needs special education, the school district must complete a full and individual evaluation. If the school district refuses to conduct the evaluation, it must give you appropriate notice, and let you know your rights.

   You must give permission in writing for an initial (first-time) evaluation, and for any tests that are completed as part of a re-evaluation.

2. A team of qualified professionals and you will review the results of the evaluation, and determine if your child is eligible for special education services.

   If your child is not eligible, you will be appropriately notified and the process stops. However, you have a right to disagree with the results of the evaluation or the eligibility decision.

3. If you disagree with the results of an evaluation, you have a right to an Independent Educational Evaluation (IEE). Someone who does not work for the school district completes the IEE. The school district must pay for the IEE or show an impartial due process hearing (see definitions below) that its evaluation is appropriate.

4. If you and the school district agree that your child is eligible for services, you and the school staff will plan your child's Individualized Education Program (IEP) at an IEP team meeting. You are an equal member of this team. Some states may have a different name for the IEP team meeting.

5. The IEP lists any special services your child needs, including goals your child is expected to achieve in one year, and objectives or benchmarks to note progress. The team determines what services are in

the IEP as well as the location of those services and modifications. At times, the IEP and placement decisions will take place at one meeting. At other times, placement may be made at a separate meeting (usually called a placement meeting).

Placement for your child must be in the Least Restrictive Environment (LRE) appropriate to your child's needs. He or she will be placed in the regular classroom to receive services unless the IEP team determines that, even with special additional aids and services, the child cannot be successful there. You are part of any group that decides what services your child will receive and where they will be provided.

6. If you disagree with the IEP and/or the proposed placement, you should first try to work out an agreement with your child's IEP team. If you still disagree, you can use your due process rights.

7. If you agree with the IEP and placement, your child will receive the services that are written into the IEP. You will receive reports on your child's progress at least as often as parents are given reports on their children who do not have disabilities. You can request that the IEP team meet if reports show that changes need to be made in the IEP.

8. The IEP team meets at least once per year to discuss progress and write any new goals or services into the IEP. As a parent, you can agree or disagree with the proposed changes. If you disagree, you should do so in writing.

9. If you disagree with any changes in the IEP, your child will continue to receive the services listed in the previous IEP until you and school staff reach agreement. You should discuss your concerns with the other members of the IEP team. If you continue to disagree with the IEP, there are several things you can do, including asking for additional testing or an Independent Educational Evaluation (IEE), or resolving the disagreement using due process.

10. Your child will continue to receive special education services if the team agrees that the services are needed. A re-evaluation is completed at least once every three years to see if your child continues to be eligible for special education services, and what services he or she needs.

Key Terms

Due process protects the right of parents to have input into their child's educational program and to take steps to resolve disagreements. When parents and school districts disagree with one another, they may ask for an impartial hearing to resolve issues. Mediation must also be available.

Mediation is a meeting between parents and the school district with an impartial person, called a mediator, who helps both sides come to an agreement that each finds acceptable.

An **impartial due process** hearing is a meeting between parents and the school district where each side presents his position, and a hearing officer makes the decision about what is the appropriate educational program, based on requirements in law.

School districts must give parents a written copy of special education procedural safeguards. This document outlines the steps for due process hearings and mediation. A copy of their procedural safeguards must be given to parents once each year except that a copy also shall be given to them:

a. upon initial referral or parental request for evaluation;
b. upon the first occurrence of the filing of a complaint under subsection (b)(6); and
c. upon their request.

by FERNETTE EIDE, MD

Dyslexic Readers with Good Comprehension: Different from the Start

From Dr. Fumiko Hoeft and her laboratory and researchers at Tel Aviv University, comes this article from PLOS ONE:

"Brain basis of cognitive resilience: Prefrontal cortex predicts better reading comprehension in relation to decoding"

It's impossible to overstate the importance that Fumiko's research has had on the field; It was her basic research that established the connection between stealth dyslexics and what some refer to as 'garden-variety' dyslexics. Various arms of her work are also further characterizing the more uncommon (but no less important) individuals with specific reading comprehension disorder (good decoding, but weak reading comprehension skills). There are still educational leaders here in the US and abroad who like to lump these very different learners into a single bucket.

TAKE HOME POINTS

- Some have benefits at the start (as young as 5 years old, before children have started to read!) that can predict who will be able to read with good comprehension at the start although single word decoding may be effortful.

- These 'resilient' (or we might call stealth dyslexics) have more brain connectivity in a super power part of the brain known as the left dorsal lateral prefrontal cortex (DLPFC), an area associated with better memory, cognitive control, and fluid intelligence.

Fumiko's paper also has a little intriguing note that comments on preliminary findings at this point. It begins at the bottom of page 13: "Moreover, in a small and preliminary study reported in the S1 File, resilient dyslexics (i.e. those with poor decoding but with unexpectedly good reading comprehension) had greater left DLPFC gray matter volume compared to both groups of children matched for poor decoding (i.e. those with poor decoding, but no discrepancy) and those matched for good reading comprehension (i.e. those with good decoding, also without a discrepancy), providing further evidence that the left DLPFC uniquely contributes to this discrepancy..."

The paper continues to make the point that this boosted brain area may play a critical role in reading comprehension before a child becomes a proficient reader. The conclusion opens up a new perspective on dyslexic learners themselves as well as reading instruction.

For those who like to dig in deep with these basic neuroscience papers, there are potential sources of confusion based on the terminology used. For instance, Fumiko and her group use the term 'cognitive resilience' to distinguish it from 'emotional resilience.' Usually resilience is thought of in terms of the emotional type where stresses may come, but there is a flexibility to not cause it to break you. 'Cognitive resilience' is simply used here to indicated that a child or adult was resilient enough to gain good reading comprehension although individual word decoding may be weak. It is the magic trick of many dyslexics who seem to read every other word aloud incorrectly, but completely grasp the meaning of even the most challenging of texts.

Another potentially confusing terminology in this paper is the use of 'discrepancy' which really only means 'difference'. The discrepancy referred to in this paper refers to the difference between single word decoding and reading comprehension. It does not refer to 'ability-achievement discrepancy' which may be how their dyslexia was originally identified...the different between verbal IQ and reading.

I had a chance to catch up with Fumiko when she was on one of her many jaunts between San Francisco and Palo Alto. Her community is taking an

even greater leap as she becomes the Director of the Brain Imaging Center at the University of Connecticut in addition to a professorship in Psychology. Bay Area residents, don't despair, Fumiko will retain her appointment with UCSF.

In a recent interview, one of the take-home points of this recent report was summarized by **Dr. Smaedar Patael:**

"Our research findings suggest (the benefit of) new approaches that emphasize executive functions and working memory. If your child is entering first grade, practicing the alphabet may not be enough. Consider activities that require working memory, such as baking cakes and playing song and strategy games. These activities stimulate children's working memory and may in time foster their ability to comprehend texts well."

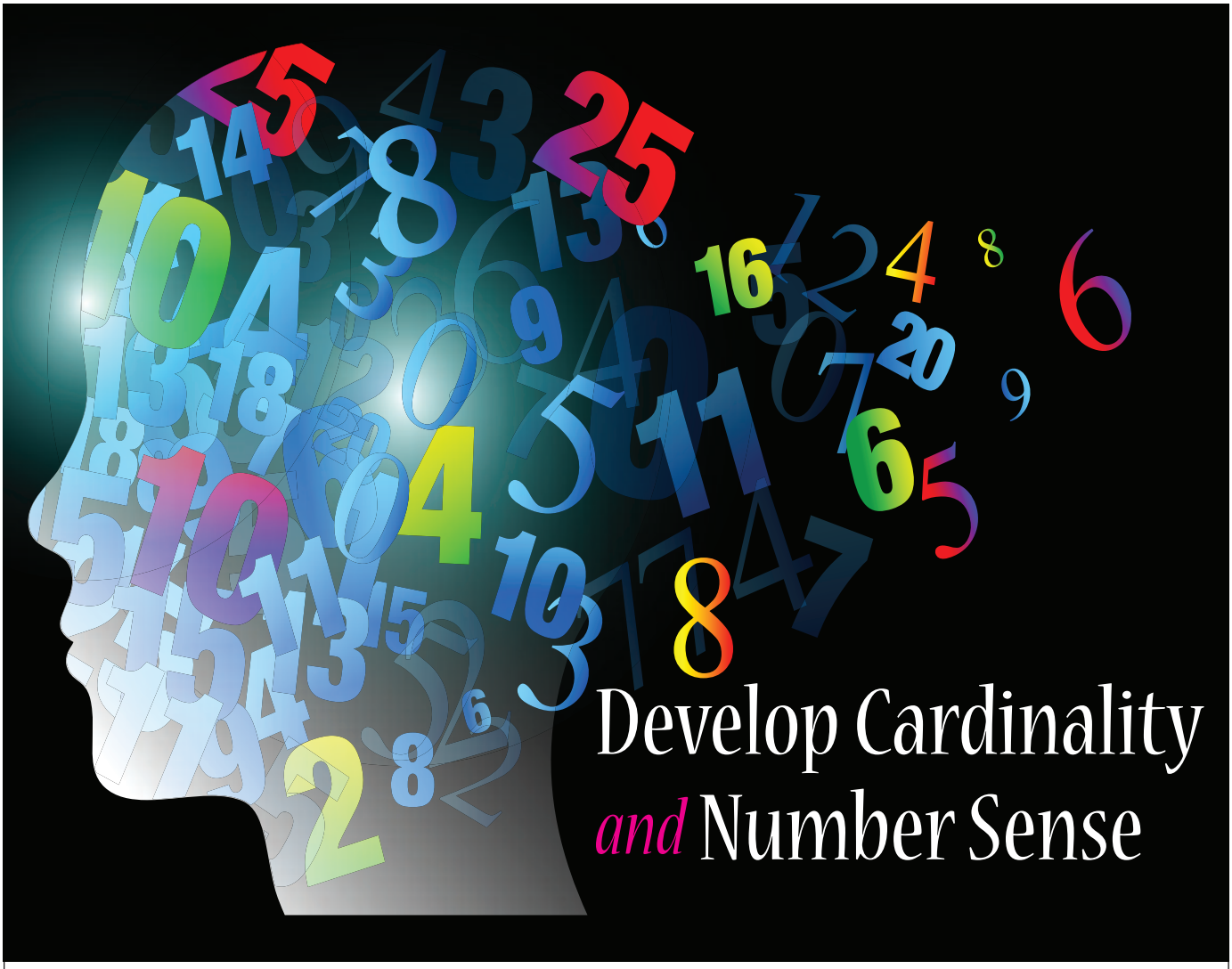
The importance of identifying stealth dyslexics who may be able to read with good silent comprehension, but still struggle with oral fluency and single word decoding is that **their educational needs are distinct from those with poor comprehension.**

In general, from our clinic, we often saw the following pattern:

	STEALTH DYSLEXICS	NON-STEALTH DYSLEXICS
Reading Fluency	**slow**	**slow**
Nonsense Words	**weak**	**weak**
Reading Comprehension	**strong**	**weak**
Processing Speed	**slow**	**slow**

It's important not only that stealth dyslexics not be subjected to interventions that they don't need, but also that they aren't passed over for accommodations that are appropriate.

Reprinted courtesy of *Dyslexic Advantage*
DYSLEXIC ADVANTAGE PREMIUM MAGAZINE, *August 2018, Issue 32*
A 501 (c)3 non-profit organization providing free resources including a monthly newsletter
https://www.dyslexicadvantage.org

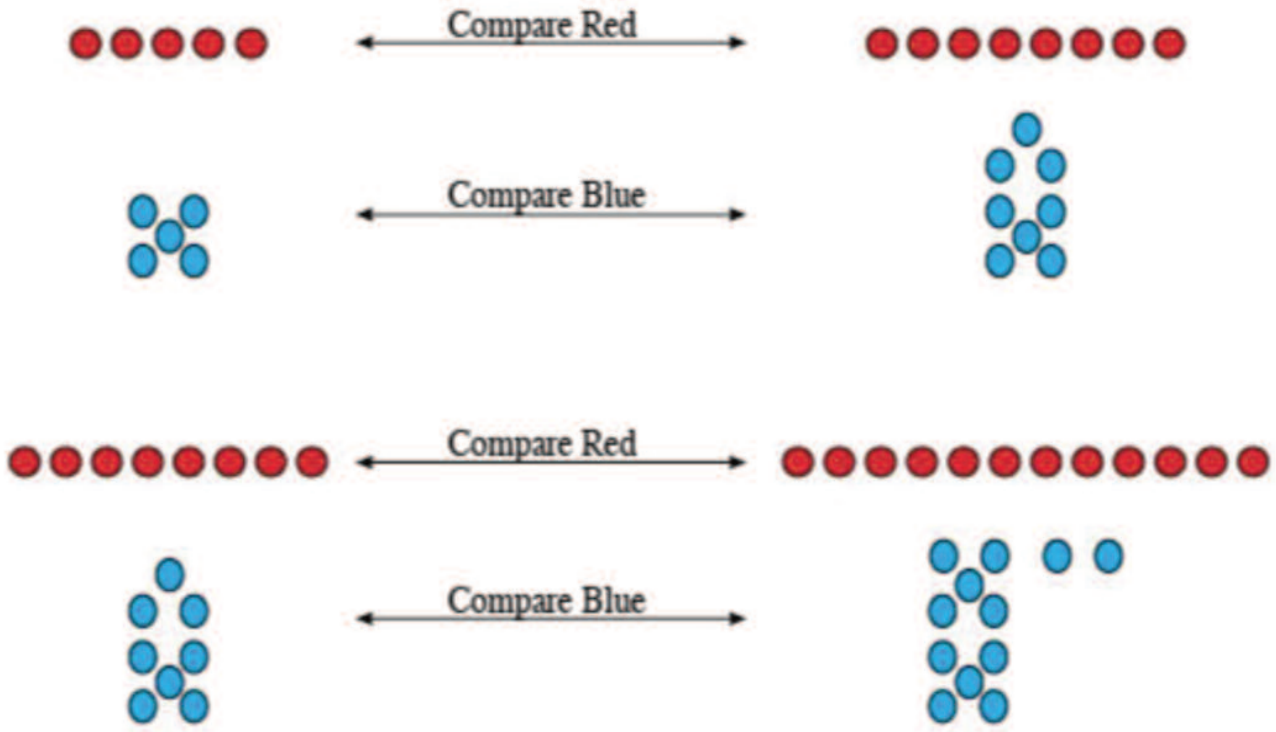


Develop Cardinality *and* Number Sense

A student who is confused by typical math instruction may excel when instructed in a way that always shows the big picture first, uses visual-spatial images, and directly examines how the parts are connected to the whole. This program is quite different from how most of us were taught math, and it is different from most modern curriculum approaches as well. Number sense is developed by establishing a robust understanding of quantities so that their values may be compared. The methodology to be presented enables such comparison by limiting demands on language processing, working memory, and executive function skills.

Learning and memory research tells us that multisensory integration is absolutely vital for children who have learning difficulties, as well as the best way to teach all students. Experiential, gross-motor activities provide a powerful approach to interact with recognizable whole-to-part visual models. Students develop language skills necessary to describe math concepts and relationships as they perceive and process them. In essence, students take patterns apart, then reassemble them while describing the process.

Number sense is developed through the process of assigning values to groups of objects and then making comparisons between these groups (Dehaene, S., 1996). Consistent graphic organizers that relate quantities to both 5 and 10 serve two vital purposes. They provide the structure necessary to establish one-to-one correspondences between numbers and discernible quantities, and they help students develop a relational understanding of the numbers 1 through 10 by facilitating their comparison. Subitization occurs with quantities larger than 4 when dots are arranged in canonical formations-perceived faster and more accurately than random arrays (Krajcsi et al. 2013). WoodinMath Icon arrangements use 10 as a gestalt, with numerosities 1 through 9 embedded as easily identifiable number form patterns that are subordinate to the structure of the 10. These dynamic visual models provide a way to extend the benefit of subitized efficiency to the base-ten system and multidigit computations.



In mathematics, numerosity is the ability to discriminate arrays of objects on the basis of the quantity of items presented—for example, being aware of that a quantity of two is different than a quantity of three. Cardinality of a set is a measure of the number of elements of the set derived from counting them. When counting the elements of a set, the student must tag each one with a unique number name in the standard order (1, 2, 3...). The last number name said tells the number of objects counted.

Rather than trying to establish cardinality by counting objects from part-to-whole in a linear fashion using language, consider the benefit realized by counting the elements of a recognized set from whole-to-part. For instance, envision counting a handful of cereal, piece-by-piece to determine the quantity: "one, two, three, four, five," and so on, versus counting a familiar quincunx (5) dot pattern of the cereal, acknowledging the whole five dots, and the subordinate patterns that are embedded in it- as it is decomposed.

From the five pattern, removing the center dot produces a recognizable square. Removing subsequent dots result in a triangle, line, then single dot. Whole-to-part processing models provide the ability to integrate parts within the context of a whole number to establish cardinality in a durable sense. Cardinality is derived by linking language to the structure of established numerosity.

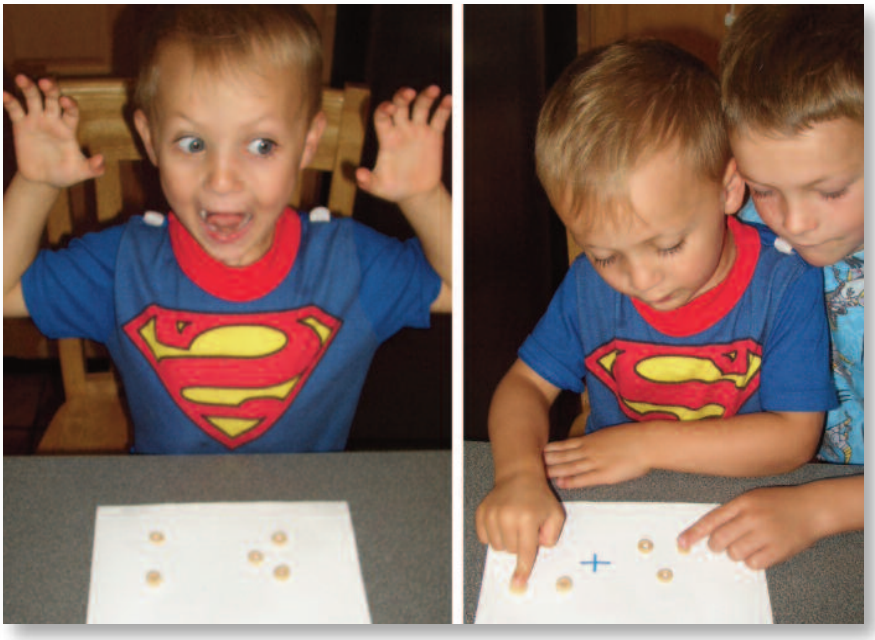
Part-to-Whole (Red) Versus Whole-to-Part (Blue) Structure

Whole-to-part processing models provide structure that can compensate for deficits in working memory, expressive language mechanisms, and executive function. Pictures or images of familiar items present a great deal of information within a bundled package, or gestalt. These visual models are useful in that they provide learners with a means of retaining information long enough to name, organize, and describe the component parts within the context of the whole. For example, when assembling a toy, some people are most efficient when they ignore the part-to-whole written directions. Instead, they choose to look at the picture of the completed toy on the front of the box and manipulate the components until they have matched the picture. After the toy has been assembled, these people may use episodic memory to document the assembly process.

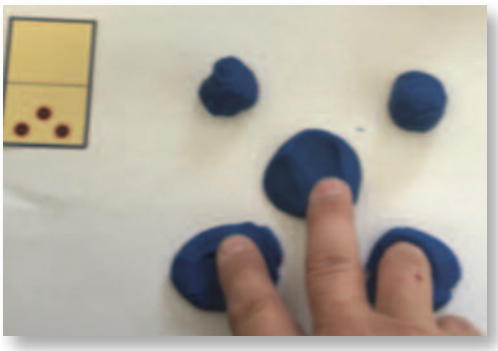
Naming the concrete visual features of diagrams promotes the students' ability to perceive, process, and store related verbal and visual information in an integrated manner that may be retrieved with greater accuracy and efficiency (Paivio, A., 2006). It is easier to acknowledge the elements of a recognizable whole than it is to create a whole from a large number of discrete elements. Graphic organizers that feature whole-to-part architecture can provide structure to mitigate the impact of cognitive limitations. When larger quantities are constructed from recognizable, subordinate, nested patterns it is easy to compare quantities. For instance, it is easy to see the X shape (five) within the six, and compare them (a difference of 1 red dot). A methodology based on this concept is powerful for all students—and for some, necessary.

The acquisition of multistep written production tasks is usually mediated with fine motor memory or language-based mechanisms (Ayres, A. J., 1979). Students with L.L.D. and sensory integration disorder are faced with a double deficit. These individuals are compromised by motor planning issues, as well as their difficulty with the naming and sequencing of language (Sokol, S.M., & McClosky, M., 1988). Working memory limitations also preclude students from sequencing multistep directions and processes. All of these students benefit from instructional methods that forge explicit relationships between motor planning, language-based mediation, and written output (Woodin, C., 2014).

Optimal graphic organizers offer a great deal of information in a simple, elegant manner, consistent with the law of pragnanz in that they present information in a manner that is regular, orderly, symmetrical, and simple (Koffka, K., 1935). Canonical patterns, like the "X-shaped" quincunx pattern are processed substantially faster than random, noncanonical patterns (Wender et. al, 2000). By relating their components within the scope of an organized gestalt or whole, they can be used as a vehicle for prompting a process by toggling focus from one component to another, or to the greater context of the whole. Additional benefit is achieved with the degree to which a graphic organizer relates to practical applications and connects to or relates other, similar diagrams.



People with visual processing limitations may often benefit from interacting with the graphic organizer spatially through tactile-kinesthetic activities. Touching visual patterns evokes an integrated visual-spatial connection necessary for accurate perception that is then stored accurately in memory. An established spatial appreciation for visual patterns of quantities can be used to establish cardinality, and thus promote number sense by enabling comparison between similar patterns.



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by JOAN SEDITA, M.A.
Founder of *Keys to Literacy*

Background Knowledge and Reading Comprehension Strategies

A recent article "Why American Students Haven't Gotten Better at Reading in 20 Years" in The Atlantic (Wexler, 2018)addressed the critical role that background knowledge plays in the ability to comprehend. The article subtitle was "Schools usually focus on teaching comprehension skills instead of general knowledge – even though education researchers know better."

The piece suggests that educators have treated comprehension as a set of skills, when in fact comprehension depends primarily on what readers already know. The article refers to a panel of literacy experts convened by officials who oversee the National Assessment of Educational Progress. As a member of the panel, Daniel Willingham, explained:

"Whether or not readers understand a text depends far more on how much background knowledge and vocabulary they have relating to the topic than on how much they've practiced comprehension skills. That's because writers leave out a lot of information that they assume readers will know. If they put all the information in, their writing would be tedious. But if readers can't supply the missing information, they will have a hard time making sense of the text."

Willingham and like-minded literacy experts posit that the best way to boost students' reading comprehension is to expand their knowledge and vocabulary by teaching them history, science, literature, and the arts, using curricula that guide kids through a logical sequence from one year to

the next. Willingham has been making this point for a long time. I first read a piece he wrote about this in 2006 "How Knowledge Helps" around the same time I read E.D. Hirsch's 2007 book "The Knowledge Deficit", in which Hirsch claims that the solution to improving reading comprehension is to teach a core set of content topics over the grades.

In another 2006 Willingham article, "The Usefulness of Brief Instruction in Reading Comprehension Strategies", Willingham made the case that, even though decades of research shows that teaching reading comprehension strategies is effective, he considered them a "bag of tricks that can indirectly improve comprehension" and called for less explicit instruction of comprehension strategies. He wrote a later article in 2014 "Can Reading Comprehension Be Taught?" that begins with this:

"In this commentary, we suggest that reading comprehension strategy instruction does not actually improve general-purpose comprehension skills. Rather, this strategy represents a bag of tricks that are useful and worth teaching, but are quickly l earned and require minimal practice."

Having spent many years successfully teaching comprehension strategies, especially to struggling readers, Willingham's 2006 piece took me aback. Since then, I have gained a better understanding of the complex factors that contribute to reading comprehension and have a greater appreciation for the role that background knowledge plays. However, I still believe that teaching general knowledge is not THE solution to reading comprehension deficits as Willingham and The Atlantic article claim.

Part of the issue has to do with how much inference is typically required during reading. As Willingham notes, writers leave out a lot of information that they assume readers will know. Here are some examples (from Oakhill and Cain, 2016):

Example 1:

Bobby was busy with his bucket and spade. The sandcastle was nearly complete. Then a huge wave crashed onto the shore. On seeing that his day's work has been ruined Bobby started to cry.

- Inference: Bobby was making a sandcastle.
- Background knowledge needed: a bucket and spade is used to make things out of sand at the beach
- Inference: The sandcastle was ruined by the wave
- Background knowledge needed: incoming tides cause waves to come onto the beach and flatten sand sculptures

Example 2:

Johnny carried a jug of water. He tripped on a step. Mom gave him a mop.

- Inference: Johnny spilled the water when he tripped.
- Background knowledge needed: experience with spills and the mess they make

These are very simple examples, but they show why reading comprehension is a dynamic interaction between the reader and the text. It is a process of simultaneously extracting and constructing meaning and most texts cannot be understood without contributions from readers, including background and "world" knowledge. Clearly, readers must have sufficient background knowledge in order to construct meaning through inferences, especially when reading academic, subject area text. But they ALSO need a set of meta-cognitive strategies to process and organize the information they are reading. That's where explicit instruction of strategies comes in. Tim Shanahan referenced The Atlantic article in a recent blog post (2018)although his position about the importance of background knowledge was more measured:

"Research has long shown the importance of knowledge in comprehension. If a reader knows much about a topic, his/her reading comprehension rises. Studies of what American kids (and adults) know about science, geography, economics, technology, and history suggest that Professor Willingham has a point. Our kids simply don't know enough. (There are great inequities in knowledge distribution, just as there is great inequality in reading attainment.)"

Shanahan points out that, in addition to devoting a significant amount of time to reading and writing instruction, it is important to provide time for reading about content to build background knowledge. Based on experience, I think the kind of "workbook"

activities that were commonly used in the 1970's through the 1990's to teach discreet comprehension "skills" (such as choosing the correct answer from four options for the main idea or a conclusion drawn) were not effective. Students did not apply these skills that they were practicing in isolation to real reading. That's why a long time ago I focused on training content teachers of all subjects to embed strategy instruction and guided practice into content learning using real content reading (see Sedita, 2003, The Key Comprehension Routine). Time and again I have seen very successful results, which is why I can't accept Willingham's conclusion that background knowledge is the main solution and comprehension strategy instruction should be minimal.

Reference:

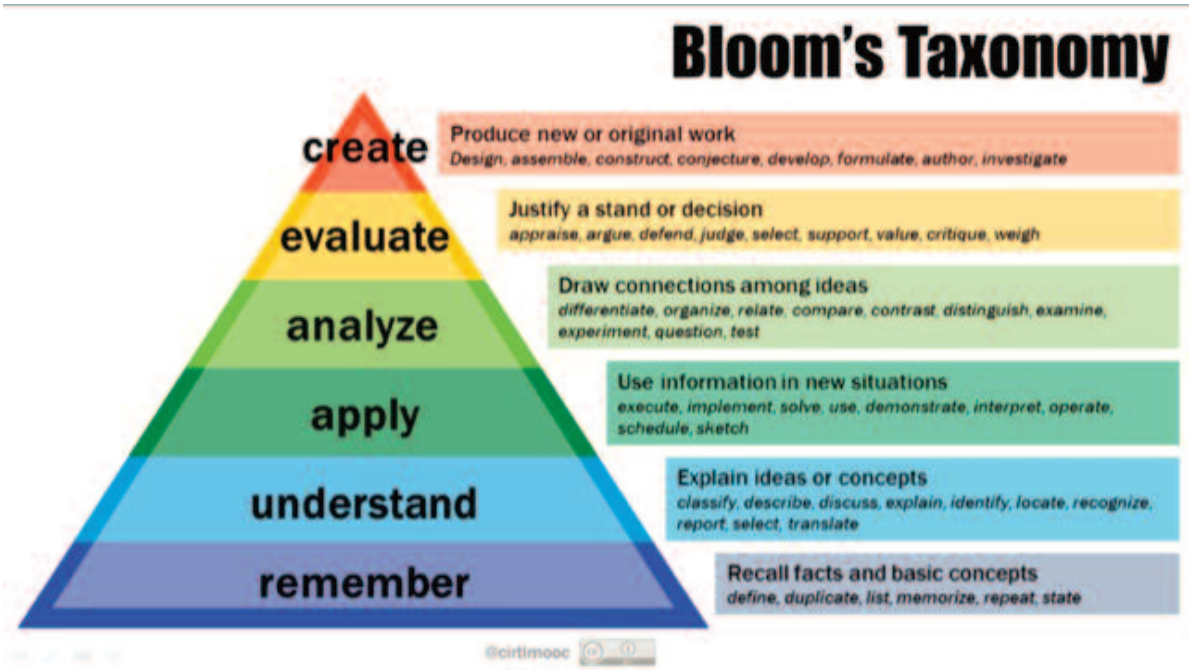
A good example of a comprehension strategy that helps students develop content background knowledge at the same as learning a strategy is teaching students to generating their own questions about what they are reading.

There is significant evidence that learning to generate questions while reading improves memory, integration and identification of main ideas, and overall comprehension (Rosenshine et al., 1996; National Reading Panel, 2000; Trabasso & Bouchard, 2002). Question generation is one of the four student strategy activities in The Key Comprehension Routine. You can take an online professional development workshop about how to teach question generation by going to the Keys to Literacy Teachable website.

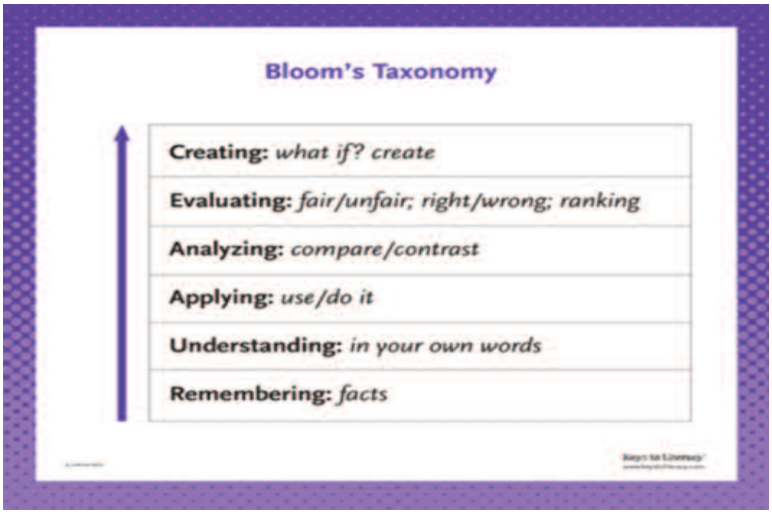
Good readers automatically engage in critical thinking by asking themselves questions to make sense of what they read. Students who have questions on their minds are really thinking critically, and the quality and level of the questions determine the depth of that thinking. However, the ability to generate questions does not come naturally to many students who are accustomed only to using who, what, where, and when questions that require relatively simple, factual information to answer.

Begin by Teaching a Continuum of Thinking

Factual questions are important, but students must also learn how to generate the kinds of questions that require them to go beyond readily available information if they are to engage in deeper critical thinking. Teachers should begin by teaching students that there are multiple levels of thinking that range from low-level remembering to high-level synthesizing and evaluating. At Keys to Literacy, we suggest using Bloom's Taxonomy (Bloom, 1956) to explicitly teach different levels of thinking. The chart below provides a brief description of the six levels of thinking represented in Bloom's Taxonomy.



The graphic below shows a poster available through Keys to Literacy that can be hung in the classroom as a reminder to students about the different levels of thinking.



Teach Question Terms

Some students are not able to generate or effectively answer questions, including those on standardized tests because they are not familiar with question terms. Thus, an important component of instruction for question generation is teaching question terms and phrases for prompts. A related scaffold for this is to provide a list (or hang a poster) of question terms and prompts that are typically associated with each level of thinking. The two handouts below can be downloaded from the free resources page at the Keys to Literacy website: www.keystoliteracy.com/free-resouces/ .
There is also a poster version available. www.keystoliteracy.com/store/

Question Terms

Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
Cite	Describe	Adapt	Analyze	Appraise	Assemble
Define	Discuss	Apply	Arrange	Assess	Compile
Find	Explain	Compute	Categorize	Choose	Compose
Give an example	Interpret	Demonstrate	Compare	Conclude	Concoct
Identify	Paraphrase	Dramatize	Contrast	Criticize	Construct
Label	Report	Draw	Deconstruct	Critique	Create
List	Restate in own words	Illustrate	Detect	Debate	Design
Locate	Retell	Implement	Dissect	Deduce	Develop
Match	Review	Interview	Distinguish	Defend	Devise
Name	Summarize	Make	Examine	Hypothesize	Formulate
Quote	Translate	Operate	Group	Judge	Generate
Recall		Practice	Inspect	Justify	Imagine
Recite		Role play	Integrate	Prioritize	Invent
Recognize		Sequence	Organize	Rank	Make
Retrieve		Solve	Probe	Rate	Originate
Show		Use	Research	Reject	Prepare
			Separate	Validate	Produce
			Sift		Set up
					What if?

Keys to Literacy
www.keystoliteracy.com

Question Prompts

Level	Prompts
Remembering	Where is... What did... Who was... When did... How many... Locate it in the story... Point to the...
Understanding	Tell me in your own words... What does it mean... Give me an example of... Describe what... What is the main idea of...
Applying	What would happen to you if... How would you solve the problem... If you were there, would you... Find information about...
Analyzing	What other ways could... What things are similar/different? What kind of person is... What things could not have happened in real life? What caused ___ to act the way she/he did?
Evaluating	Rank the events in order of importance. Which character would you most like to meet? Why? Select the best ... why is it the best? Was _____ good or bad? Why? Would you recommend this book? Why or why not?
Creating	What if... What would it be like if... What would have happened if... Tell/write a different ending... Use your imagination to draw a picture of... Pretend you are a... Design a...

adapted from *Checking for Understanding*, Fisher, D.B., and Frey, N. © 2007, ASCD, Alexandria,VA.

Classroom Examples

The examples below show questions at every level of Bloom's Taxonomy for different subject areas. At first, the teacher needs to model how to generate questions, then gradually release responsibility to students following this sequence:

1. Teach just one or two levels of questions at a time, starting with remembering and understanding.
2. Have students work in small groups to identify the level of thinking required to answer a set of sample questions provided by the teacher. Start with questions about familiar topics, then use questions about content reading.
3. Have students work in small groups to generate questions about a familiar topic.
4. Have students work in small groups to generate questions about content reading.
5. Have students work independently in class or for homework to generate their own questions.

Example: English Language Arts – questions from a novel

Remembering	What gift did Brian receive from his mother?
Understanding	Describe what happened when the plane crashed.
Applying	Have you ever been lost in the woods (or someplace else)? Share your experience with your group.
Analyzing	Compare and contrast Brian with Karana in *Island of the Blue Dolphins*.
Evaluating	Should Brian have told his father "the secret"? Justify your answer.
Creating	Create an alternate ending to the story.

Example: Mathematics – question from a textbook

Remembering	Sketch and label the three types of graphs.
Understanding	Describe the pattern of one of your graphs.
Applying	Compute a measure of center and describe what it means.
Analyzing	Arrange the data into a different display from the book and then compare and contrast its appearance.
Evaluating	Choose which graph best presents the data from the book. Explain why you chose this graph.
Creating	What would happen to the graph if the 10% of the top and bottom data were removed?

Example: Social Studies – questions from a short article

Remembering	Locate the name and the picture of Jean Francois's favorite animal.
Understanding	Explain why Jean Francois studied books about Egypt.
Applying	Write an interview with Jean Francois, asking him three questions about his discovery.
Analyzing	Contrast the Rosetta Stone with our alphabet.
Evaluating	Why is the hieroglyph for sandals a good symbol for Jean Francois? Justify your answer.
Creating	Create a hieroglyph to represent you.

Example: Science – questions from a short video

Remembering	List the steps of the water cycle.
Understanding	In your own words, tell what happens in the water cycle.
Applying	Illustrate the steps of the water cycle.
Analyzing	Assess how pollution affects water conservation.
Evaluating	Debate whether it is better to take a shower or a bath.
Creating	If you could only use one gallon of water a day, what would be the best way to use it?

ABOUT THE AUTHOR:

JOAN SEDITA is the founder of Keys to Literacy, a professional development organization based in MA. Since 1975, Joan has been a literacy educator and nationally recognized teacher trainer. She has authored numerous books, articles, and professional development programs. She worked for 23 years as a teacher and administrator at the Landmark School, a pioneer in the development of literacy intervention programs. Joan was a lead MA training for Reading First and a LETRS author and national trainer. Joan received her M.Ed. in Reading from Harvard University. She can be reached via email: joan@keystoliteracy.com

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The Dyslexia-Stress-Anxiety Connection

WHAT IS STRESS?

Stress is the reaction of the body and brain to situations that put us in harm's way. The stressor may be a physical threat (e.g., a baseball coming quickly toward you) or a psychological threat (e.g., a worry or fear that you will make a mistake delivering your lines in a play or write a passage that won't make sense to the reader). Stress, or more specifically, the stress response, is our body's attempt to keep us safe from harm. It's a biological and psychological response. When we're under stress, the chemistry of our body and our brain (and, therefore, our thinking) changes. A part of the brain called the amygdala does a great job learning what's dangerous, and it makes a connection between certain situations and negative outcomes.

HOW CAN STRESS BE GOOD AND BAD?

All human and non-human animals have the built-in capacity to react to stress. You may have heard of a "fight or flight" response. This means that when faced with a threat, we have two basic ways of protecting ourselves. We can run away (flee) or stand firm and try to overcome or subdue the threat (fight). When we have a sense that we can control or influence the outcome of a stressful event, the stress reaction works to our advantage and gets our body and brain ready to take on the challenge. That's good stress; at the most primitive level, it keeps us alive. It also allows us to return to a feeling of comfort and safety after we have been thrown off balance by some challenge.

On the other hand, bad stress occurs in a situation in which we feel we have little or no control of the outcome. We have a sense that no matter what we do, we'll be unable to make the stressor go away. Body and brain chemistry become over-reactive and get all out of balance. When that happens, it can give rise to another protective mechanism, to "freeze" (like a "deer in the headlights".) We can freeze physically (e.g., become immobilized), or we can freeze mentally (e.g., "shut down.") In these situations, the stressor wins and we lose because we're incapacitated by the perceived threat.

HOW DOES GOOD AND BAD STRESS WORK WITH DYSLEXIA?

Individuals with dyslexia are confronted regularly by tasks that are, either in reality or in their perception, extremely difficult for them. These tasks might be reading, spelling, or math. If they have experienced success at mastering this kind of task in the past, good stress helps them face the challenge with a sense of confidence, based on the belief that "I can do this kind of task." If, on the other hand, someone has met with repeated failure when attempting this or a similar task in the past, his or her body and brain may be working together to send out a chemical warning system that gets translated as "This is

going to be way too difficult for you! Retreat! Retreat!) That's bad stress in action. And remember, perception is everything! It doesn't matter if a teacher, a friend, or a spouse believes that you can do something; it's that you think you can do it that matters.

WHAT IS ANXIETY?

Anxiety comes in many forms. It can be situational (that is, specific to one kind or class of worry, like traveling or being in social situations). Individuals with dyslexia may experience marked anxiety in situations in which they feel they will make mistakes, be ridiculed, or made to feel foolish in front of others. Severe anxiety or fears are known as phobias.

When the anxiety is specific to or triggered by the demands of being with or interacting with people, and is characterized by a strong fear of being judged by others and of being embarrassed, it is known as social anxiety disorder (or social phobia). This fear can be so intense that it gets in the way of going to work or school or doing everyday activities. Children and adults with social phobia may worry about social events for weeks before they happen. For some people, social phobia is specific to certain situations, while others may feel anxious in a variety of social situations.

Anxiety can also be generalized (that is, a kind of free-floating sense of worry or impending trouble that doesn't seem to be specific to one trigger or event). In its more serious form, this is considered a psychiatric disorder known as generalized anxiety disorder (GAD). According to the National Institutes of Mental Health, GAD is diagnosed when a person worries excessively about a variety of everyday problems for at least 6 months. Generalized anxiety disorders affect about 3.1% American adults age 18 years and older (about 18%) in a given year, causing them to be filled with fearfulness and uncertainty. The average age of onset is 31 years old.

HOW IS ANXIETY DIFFERENT FROM STRESS?

Simply put, anxiety is a state of worry about what might be—as compared to stress, which is a reaction to what is. Both stress and anxiety trigger the same chemical reactions in the brain, which does a really good job remembering negative experiences. If you worry all the time about something bad happening to you, that puts you in a state of chronic stress. Individuals with dyslexia worry about reading, writing, and arithmetic much of the time. The irony is, the more they master, the more work they get. It's an unending cycle.

WHAT'S THE CONNECTION TO DYSLEXIA?

Stress and anxiety increase when we're in situations over which we have little or no control (a car going off the road, tripping on the stairs, reading in public). That's because many individuals do not fully understand the nature of their learning disability, and as a result, tend to blame themselves for their own difficulties. Years of self-doubt and self recrimination may erode a person's self-esteem, making them less able to tolerate the challenges of school, work, or social interactions and more stressed and anxious.

> All people, young and old, can experience overwhelming stress and exhibit signs of anxiety, but children, adolescents, and adults with dyslexia are particularly vulnerable.

Many individuals with dyslexia have experienced years of frustration and limited success, despite countless hours spent in special programs or working with specialists. Their progress may have been agonizingly slow and frustrating, rendering them emotionally fragile and vulnerable. Some have been subjected to excessive pressure to succeed (or excel) without the proper support or training. Others have been continuously compared to siblings, classmates, or co-workers, making them embarrassed, cautious, and defensive.

Individuals with dyslexia may have learned that being in the company of others places them at risk for making public mistakes and the inevitable negative reactions that may ensue. It makes sense, then, that many people with dyslexia have become withdrawn, sought the company of younger people, or become social isolates.

HOW CAN INDIVIDUALS WITH DYSLEXIA MOVE FROM DISTRESS TO DE-STRESS?

The DE-STRESS model that follows is a step-by-step guide for addressing stress, anxiety, and dyslexia.

- **Define:** Professionals working with the person need to analyze and understand the way dyslexia presents itself in that individual.

- **Educate:** Based on the information gleaned by the professionals above, the child or adult needs to be taught how dyslexia has an impact on his or her performance in school, workplace, or social situations.
- **Speculate:** This step involves encouraging individuals with dyslexia to look ahead and anticipate the problems they might encounter because of their condition as they face new challenges.
- **Teach:** It's important to teach children, adolescents, and adults developmentally appropriate strategies, techniques, and approaches that will maximize success and minimize frustration and failure. This involves actively teaching people how to recognize and manage stress, the skills of honest self-appraisal, and the ability to learn from and repair errors.
- **Reduce the Threat:** Educators and others involved need to create learning and social environments that reduce, remove, or neutralize the risk. This means giving students the chance to practice newly learned skills in a safe place. It also involves teaching people with dyslexia how to recognize and deactivate "stress triggers."
- **Exercise:** Regular and vigorous physical activity is known to enhance brainpower and reduce stress. So it is important to build in opportunities for exercise. This step also involves encouraging the person to drink plenty of water and eat a healthy diet.
- **Success:** Children and adults need abundant opportunities to display mastery and experience success. Providing these opportunities gives individuals with dyslexia a chance to learn how to replace the language of self-doubt with the language of success.
- **Strategize:** The child or adult should be encouraged to use what he or she has learned about minimizing and managing stress, and the relationship between stress and dyslexia, to plan for a future in which continued success is likely.

A little bit of stress is a good thing; it keeps us on our toes and gets us ready for the challenges that are a normal and helpful part of living in a complex world. Yoga, mindfulness activities, meditation, biofeedback, cognitive behavioral therapy (CBT), medication and exercise are among the many ways that individuals (with and without dyslexia) can conquer excessive or debilitating stress. For the individual with dyslexia, effectively managing and controlling stress must also involve learning more about the nature of the specific learning disability. Gaining an understanding of the daily impact of dyslexia and learning how to work through or around the dyslexia to gain a better sense of control over the environment, is the key to reducing stress and achieving greater success.

Competence instills confidence and competence leads to success. When children, adolescents, and adults are able to develop a sense of mastery over their environments (school, work, and social interactions), they develop a feeling of being in control of their own destiny. Control through competence is the best way to eradicate stress and anxiety.

SUGGESTED READINGS

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Minahan, J., & Rappaport, N. (2012). The Behavior code: A practical guide to understanding and teaching the most challenging students. Cambridge: Harvard Education Press.

The International Dyslexia Association (IDA) thanks Jerome J. Schultz, Ph.D., for his assistance in the preparation of this fact sheet. Dr. Schultz is a clinical neuropsychologist and lecturer on psychology in the Department of Psychiatry at Harvard Medical School.

Transitioning from High School to College

Help for Students with Learning Disabilities

An increasing number of students with learning and attention disorders plan to attend college, and that is great news! However, negotiating the process of taking standardized tests (possibly with accommodations), choosing the right colleges, and then navigating the application process can be overwhelming, even for the most organized student. Those who successfully gain acceptance to the schools of their choice are often frustrated to find that the accommodations they received in high school are not automatically granted in college. For students with learning disabilities (LD) making a successful transition to college is a multi-year process and a team effort that requires input from the student, parents, school personnel, and other professionals.

When is the best time to start planning the transition?

Federal regulation, Section 614(D)(I)(vii)(II), requires that "beginning at the age of 16 (or younger, if determined appropriate by the IEP Team), a statement of needed transition services for the child, including, when appropriate, a statement of the interagency responsibilities or any needed linkages," needs to be included in educational planning. The "statement of needed transition services" is a long-range plan to assist

students in their steps toward adult life. Some states require that these services begin even earlier when the child is age 14.

For the Individualized Education Program (IEP) to be most beneficial it should be an outcome-driven document, meaning that the goals set in the IEP should focus on exactly what the student plans to do when he or she graduates from high school. To do this effectively, the student's post-secondary goals should be delineated early, and it is, at least in part, the school's obligation to help the student secure the skills needed to achieve this goal.

The table below provides a timeline of activities that will to help students and their parents prepare for the transition from high school to college.

Grade Level	Activity/Task
Ninth and tenth	• Discuss options for after high school (for example, gap year, employment, vocational school, community college, or four-year university. • Develop self-advocacy skills. Make sure the student understands and can articulate his or her learning struggles and why accommodations are needed. Students should actively participate in IEP meetings and practice self-advocacy skills in those meetings. • Explain strengths and weaknesses to the student to develop his or her understanding for more effective self-advocacy.
Tenth	• Prepare for standardized testing (by the end of the year): ○ Apply for accommodations; and ○ Take test preparation course.
Eleventh	• Register for SAT or ACT. • Investigate colleges. • Make a list of criteria for selecting a college (for example, class size, availability of support services, and finances) with the help of parents and school personnel. • Encourage participation in extracurricular and leadership activities as well as community service. Admission counselors are looking for applicants who are actively engaged in their schools and communities. • Visit prospective schools (by spring).
Twelfth	• Eliminate some schools to shorten list of prospective of schools before applying. • Finalize applications by mid-November. (Support from parents and school personnel is very important at this stage. Students with organizational challenges may find it daunting to simultaneously secure letters of reference, write essays, and complete forms while also keeping up with regular academic demands.) • Communicate regularly with school administration to be certain that the student has the academic requirements needed to graduate from high school and apply to the colleges he or she wishes to attend.
Twelfth (summer after)	• Develop independent living skills (for example, refilling medications and doing laundry). • Communicate regularly with the appropriate office at the college of choice to secure accommodations prior to arriving in the fall. Once on campus, students will need to learn to access various resources and implement strategies such as maintaining a calendar, using the library, and becoming involved in study groups.
College years	• Plan and schedule carefully, monitor and modify the original plan for accommodations as necessary.

How can the student secure accommodations on standardized testing (SAT, ACT, and AP tests)?

Parents should contact the student's guidance counselor (or the person at the student's school that coordinates testing) at least several months before the student plans to take a standardized test. This person will need a copy of any school or outside psychological testing that the student has had completed. The counselor or coordinator will complete the appropriate paperwork, and the parents will have to sign an accommodation request form to be sent to the ACT or SAT College Board office.

How does the student prepare the documentation and test application when requesting accommodations on standardized tests?

Admissions testing policies and procedures vary and are updated from time to time, so the student and his or her parents are encouraged to go to the test's website and review the documentation policy statement for each test the student plans to take. In general, they will need to do the following:

- Make sure the documentation is current according to the guidelines put forth by the various testing entities. Shelf life of the documentation varies by diagnosis and testing entity, so check the various testing websites frequently for documentation requirements. Some students may not need to submit documentation and, in some cases, only an update, rather than a full evaluation, is required.

- If the student must update testing, be sure to share with the examiner a copy of the documentation requirements put forth by the different testing entities on their websites. Keep in mind that the documentation must provide a strong rationale for any disability- related accommodations.

- Plan well in advance. Accommodation requests are due months before the actual test date. If re-evaluation is needed, it may take weeks or months to complete, and once the test application is submitted, the review process can take six to eight weeks.

What services are typically available at college?

Colleges and universities offer several types of programs for students with LD, including:

- **Structured Programs** (SP)–comprehensive programs that may have additional costs associated with them. These services might include separate admission procedures, compulsory strategies, one-on-one tutoring, and student monitoring.

- **Coordinated Services** (CP)–services that are used as needed. These services are not comprehensive, they have less structure, and participation is voluntary.

- **Services** (S)–the least comprehensive services of the three categories. Students who require minimum accommodations, but find comfort in knowing services are available, might benefit from exploring colleges that provide these.

When should the student make contact with the college's office of support services?

Most students benefit from making contact with the coordinator or director of the disability services office in their junior year of high school. It gives the student time to learn the types of support the school offers and determine if the college or university can accommodate his or her needs.

May students use an IEP or 504 Plan when they attend college?

Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and amendments to that act in 2008 apply very differently at the college level than K–12.

The IEP and 504 Plan do not apply in the post-secondary school setting. Updated testing may be necessary for the coordinator in the office of support services at the college to review.

Testing for most post-secondary schools should be done when the student is at least 16 years old because schools want the "adult versions" of psychological tests, which can be administered when the student reaches age 16. The Association on Higher Education has proposed seven essential elements of documentation at the college level, and most schools, although not all, have adopted this or a similar list (see each college's website for specific documentation requirements):

1. Documentation is provided by a licensed or otherwise properly credentialed professional with appropriate training and experience.

2. Documentation contains a clear diagnostic statement that describes how the diagnosis was made, provides information about the functional impact of the disability, and details the prognosis.

3. Documentation may contain both formal and informal methods of evaluation. Formal, standardized assessment may include diagnostic criteria, methods and procedures, tests and dates of administration, and a clinical narrative. Informal methods might include, among other things, the history of accommodations, educational situations, and the extent of the disability's impact, but it should not be used solely to make a case for accommodations.

4. Documentation should contain information on how learning is currently affected. Currency of documentation, while important, should be flexible and will vary by institution and diagnosis.

5. Documentation should provide information on any expected or cyclical changes in the functional impact of the disability over time and context and any known or suspected environmental impacts.

6. Documentation should be comprehensive in that it includes a description of both current and past auxiliary aids, assistive devices, support services, and accommodations, including their effectiveness in the educational setting.

7. Documentation that includes recommendations from professionals with a history of working with the student is often useful for determining effective accommodations.

At the college level, it is the student's responsibility, rather than the school's, to initiate the process for services and accommodations, and accommodations are not retroactive. For these reasons, it is wise to
secure accommodations well before the first day of class of the freshman year.

What are the most basic accommodations offered by colleges and universities?

Most post-secondary schools provide students with LD with the minimum three accommodations: extra time on tests, testing in a quiet location, and access to a note taker. However, the logistics of how these accommodations are provided varies widely among schools. For example, at some colleges, students can take tests in a testing center with oversight by a proctor; whereas, at other colleges it is the professor's responsibility to oversee testing accommodations. At some schools, note takers are paid for their service and are, therefore, readily available; whereas, at other schools it is a volunteer position. In that case, if no student steps forward, no note taker is available. Again, inquiries about the implementation of accommodations should be sent directly to the college.

If a student has a language waiver in high school, can he or she also get one in college?

Success in securing a language waiver in college depends on where the child attends college and the types of services offered there. The support services office will review the student's updated psychological evaluation along with the reason(s) for the language waiver from the high school. If a college language waiver is being considered, the parents should inform the evaluator when seeking re-evaluation in case specific tests are required.

Should the student disclose a learning disability during the application process?

Deciding whether or not to disclose an LD is a highly personal choice. Many consultants agree that the value of disclosing depends on the severity of the disability, the comfort level of the parents and student with disclosure, the level of competitiveness of the college of choice, and the presence of any "compelling reason" to disclose. Compelling reasons might include abnormalities in the high-school transcript, such as an absence of foreign language credits, or requiring that the college have a highly specialized LD service program.

On a related note, although it used to be possible for colleges to determine if a student received accommodations based on the standardized test score report, that is no longer the case. Therefore, unless it is specifically disclosed by the student, parent, or a reference offered by the student, there is no way for colleges to know.

What should a student with a learning disability look for in a college?

Consider the student's individual needs and spend some time researching colleges before deciding on a college. In addition to standard considerations when looking at colleges (for example, in-state or out, scholarships, and tuition), also consider the following:

- **Level of Support:** Does the student need comprehensive LD services or minimal accommodations? Virtually all schools offer some support, but the more comprehensive the services that are being sought, the shorter the list of available schools.

- **Finances:** Many schools charge fees for LD services in addition to tuition. Be sure to check up front so there are no last minute surprises or disappointments.

- **Extracurricular:** Are extracurricular activities, such as playing sports or joining a sorority, important to the student? For many students, these activities are a vital part of their college experience that provide needed structure, accountability, and social support.

- **Class Size:** Many students with LD do better in smaller class sizes where the professors know their names, are available to talk after class, and answer e-mails.

- **Professors:** Who does the teaching? Large schools often staff classes with minimally- experienced graduate students who do not know the content area as well or do not have a wealth of experience to draw upon when teaching students with LD.

- **Housing Options:** Does the student need to live alone due to cognitive, emotional, or social challenges? Many schools do not have this option for freshmen and may require a request for a housing accommodation.

- **Medical Resources:** Is there access to medical care so the student can continue to receive prescription refills or other medical attention as necessary? Students often find it challenging to secure prescriptions, particularly for stimulant medication, in college for a variety of reasons (for example, they don't have a car to get to the pharmacy, or they don't have a local physician to write prescriptions), and, therefore, they stop taking the medication at the most academically demanding time of their lives. This problem can be avoided with some planning and forethought.

- **Transportation:** Will your student have access to a car? Students with LD often need to leave campus to pick up medications, attend doctor appointments, or join tutoring sessions. Many colleges do not allow first year students to have cars, but exceptions may be made in certain cases.

- **Faculty Attitude:** Are faculty members accepting of students with LD? The faculty's willingness to accommodate students with LD is critical to the student's success.

- **Course Load:** Can a student with LD take fewer hours per term and still be considered full time? This is an important consideration for health

insurance and financial aid, which often require full-time enrollment for benefits.

- **Course Training:** Have the counselors or learning specialists who work with students with LD received special training?
- **Graduation Rate:** Are students with LD allowed more time to complete graduation requirements? If they are not taking the same number of courses or credits per term as their peers, students with LD may take longer to graduate.
- **Parent Support:** Is there someone parents can contact if they have concerns during the academic year? College students are considered adults, so many schools have policies in place that prevent parents from accessing information about their children.

Attending college is often seen as a rite of passage for both students and parents. When searching for the right college or university, it is important that you and your child take into account the campus environment, class size, and the type of support services that are offered. One of the most important factors for success in college is identifying the best fit. With advanced planning and forethought, a capable student with LD can have a positive college experience and a bright future.

SUGGESTED READINGS

Kravets, M., & Wax, I. (2012). The K& W guide to college programs & services for students with learning disabilities or attention deficit/hyperactivity disorder (11th ed.). New York, NY: Random House.

Marie, R. P., & Law, C. C. (2012). Find the perfect college for you: 82 exceptional schools that fit your personality and learning style (2nd ed.). Belmont, CA: SuperCollege, LLC.

Seghers, L. (Ed.). (2007). Colleges for students with learning disabilities or AD/HD (8th ed.). Lawrenceville, NJ: Peterson's Nelnet.

HELPFUL WEBSITES

ACT disability testing services:actstudent.org/regist/disab

College Board accommodated testing (SAT and AP testing): student.collegeboard.org/services-for-students- with-disabilities

Peterson's is a leading provider of education information and advice: http://www.petersons.com/

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Texas Dyslexia Handbook Updates-2018

The purpose of The Dyslexia Handbook is to provide procedures for school districts, charter schools, campuses, teachers, students, and parents/guardians in early identification of, instruction for, and accommodations for students with dyslexia.

It's an exciting time for the dyslexia world in Texas! On November 11, 2018, the Texas State Board of Education approved revisions to the Dyslexia Handbook. The revised handbook contains numerous additions from the past handbook. It is important to note that there are no changes to the current procedures that were already mandated by the past handbook. The handbook revision provides the state and all its stakeholders with much needed clarifications on many different dyslexia-related topics, as well as additional procedures in response to recent legislation.

Let's start with what stayed the same. There are no changes to the definition of dyslexia, the common risk factors, the primary or secondary characteristics, the domains to assess, or the instructional components for dyslexia intervention. In looking at these sections of the handbook, one will notice there is additional content intended to provide clarification of current practices, but the general procedures themselves were not altered.

There are two new chapters included in the new handbook. The first of the new chapters is Chapter II-Screening. Within this chapter, screening is defined as "a universal measure administered to all students by qualified personnel to determine which students are at risk for dyslexia or reading difficulties and/or a related disorder." (p. 9) This chapter contains comprehensive guidance on the administration of screening instruments, components to be screened (See Figure 2.2), who may administer the screening instruments, and interpretation of screening data. The addition of this chapter not only helps to clarify the early screening requirement mandated by House Bill 1886, but it also communicates clearly the dedication and determination of the state of Texas to find and identify students early.

In Chapter III-Procedures for Evaluation and Identification of Students with Dyslexia, again, there is additional, clarifying information. One common theme of the new handbook is communicating clearly

the different pathways to dyslexia identification, as illustrated by the following verbiage from page 21, "...the identification of reading disabilities, including dyslexia, will follow one of two procedures. School districts and charter schools make decisions based on data and the unique needs of each student. School districts and charter schools may evaluate for dyslexia through either IDEA or Section 504."

Within Chapter III, there was added several valuable figures outlining the various considerations necessary when evaluating students whose first language is not English. There are figures on different types of orthographies and Characteristics of Dyslexia in English and Spanish. (p. 31) Another important figure in the handbook, which was revised from its previous version, is Figure 3.8, which provides the Pathways for the Identification and Provision of Instruction for Students with Dyslexia. (p. 35) This figure outlines the parallel pathways and delineates the processes.

Chapter IV- Critical Evidence-Based Components of Dyslexia Instruction, again, has no changes to the components or delivery of instruction, but it does provide clarification on what standard protocol dyslexia instruction is versus specially designed instruction. Standard protocol instruction essentially is the use of a program designed as a dyslexia intervention with a group of students. Specially designed instruction involves adapting the content, methodology, or delivery of instruction for a student. This would be done through special education.

Chapter V-Dysgraphia is the second new chapter in the handbook. This chapter is a welcomed and highly anticipated addition to the law. This chapter essentially outlines dysgraphia procedures in a similar fashion to the procedures given for dyslexia. In this chapter, the reader will find the characteristics of dysgraphia, assessment requirements, and instruction for these students.

Finally, there are some common themes that emerge from this latest incarnation of the handbook. First, training is explored in multiple sections of the handbook for different purposes, with the overall idea begin that we need to expand our vision of and provision for training all stakeholders on all areas of dyslexia from dyslexia basics to administering screeners to instructional best practices. Second, the pathways to dyslexia identification (IDEA or 504) and the services for dyslexia are clarified in multiple locations throughout the handbook. Third, parents, as stakeholders in the dyslexia journey of their children, should be informed and included at all levels. The handbook is clear that transparency is necessary and expected. The revisions to the Dyslexia Handbook encompass the commitment of the stakeholders in Texas and light the way to continuous improvement in identifying and serving students with this learning disability. The future of dyslexia in Texas is bright and getting brighter thanks in part to the guidance provided by this new legislation.

The Dyslexia Handbook, 2018 Update, Procedures Concerning Dyslexia and Related Disorders
https://www.esc4.net/Assets/r4-dyslexia-conf-2019-dyslexia-handbook-update-de.pdf

Figure 2.2. Criteria for English and Spanish Screening Instruments

Kindergarten	First Grade
• Phonological Awareness • Phonemic Awareness • Sound-Symbol Recognition • Letter Knowledge • Decoding Skills • Spelling • Listening Comprehension	• Phonological Awareness • Phonemic Awareness • Sound-Symbol Recognition • Letter Knowledge • Decoding Skills • Spelling • Reading Rate • Reading Accuracy • Listening Comprehension

Developmental Dyslexia

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INTRODUCTION

What is Developmental Dyslexia?

Unlike spoken language, available to humans for many thousands of years, written language is a recent (less than 6,000 years) cultural invention and has not been subjected to evolutionary pressure. As such, existing brain regions that subserve other functions, such as spoken language and object recognition, are utilized for reading acquisition, which occurs over a protracted period of time with formal schooling. However, for some children, learning to read is especially difficult.

> Developmental dyslexia is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge (Lyon, Shaywitz, & Shaywitz, 2003).

This is one of several research definitions of dyslexia and was developed by the International Dyslexia Association and endorsed by the US-based National Institute of Child Health and Human Development. Like most definitions, it emphasizes problems with decoding, a critical piece in research and diagnostic evaluation of dyslexia that is attributed to poor phonological awareness (PA). Comprehension of text can be impacted as a secondary consequence of poor decoding (this distinguishes dyslexia from specific language impairment, wherein poor language comprehension can directly lead to reading problems; see Nation, Cocksey, Taylor, & Bishop, 2010).

Dyslexia is the most prevalent learning disability. It affects 5–12% of the English-speaking population, and the incidence is two to three times higher in males than in females (Rutter et al., 2004). These rates are slightly lower for other languages and other writing systems (Brunswick, McDougall, & Davies, 2010), with reading being espetrun cially challenging in English, where the orthography is deep (the mapping between sound and print is not one-to-one; see Richlan, 2014). Dyslexia is highly heritable, with an estimated 30–50% chance of being passed from parent to child (Fisher & DeFries, 2002). Linkage and association studies have identified candidate genes and established relationships between genotypical variance and the dyslexia endophenotype (for review, see Scerri & Schulte-Körne, 2010). Because reading provides the key to learning almost all subject materials, reading failure can be a limiting factor in almost all of a child's academic learning experiences.

Skills That Support Typical Reading Acquisition are Impaired in Dyslexia

There is a rich behavioral literature describing normal reading acquisition (Ehri, 1999) and the skills that promote learning to read (Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004; Wagner & Torgesen, 1987). These include broad language skills such as expressive and receptive language, vocabulary, morphology, and syntax (Scarborough, 2005). Further, specific skills such as PA (Bradley & Bryant, 1983; Schatschneider et al., 2004) and orthographic awareness (Badian, 1994) have been shown to be critical to reading acquisition. Understanding the phonological code allows grapheme–phoneme mapping of unfamiliar words, and visual word form recognition aids in mapping orthography of familiar

words to the mental lexicon, together providing access to semantic representations. Good orthographic awareness, whereby words are recognized without decoding, leads to better reading fluency and, in turn, reading comprehension. PA refers to a "broad class of skills that involve attending to, thinking about, and intentionally manipulating the phonological aspects of spoken language" (Scarborough & Brady, 2002). PA, typically measured by sound manipulation at the phoneme level (e.g., phoneme deletion), predicts future reading acquisition in normal readers with a high degree of confidence (Schatschneider et al., 2004; Wagner & Torgesen, 1987) and is especially impaired in dyslexic readers (Lyon et al., 2003; Peterson & Pennington, 2012; Vellutino, Fletcher, Snowling, & Scanlon, 2004). These studies have also shown that two other measures of phonological processing, speeded lexical retrieval (rapid naming of letters and numbers) and verbal short-term memory, often have a moderating role in reading outcome in addition to PA.

It has become widely accepted that weak PA is the core deficit in dyslexia, causing reading impairment by interfering with the grapheme–phoneme mapping required for decoding. A causal role of poor PA in dyslexia has been demonstrated by a combination of evidence: (i) young children's PA skills predict later reading outcome; (ii) poorly developed PA skills are found in children with dyslexia as early as kindergarten and often prevail into adulthood; (iii) reading level-match design studies demonstrate that children with dyslexia have weaker PA than younger children matched on reading level; and (iv) interventions addressing these weaknesses in PA are largely successful in bringing about gains in decoding in individuals with dyslexia. Together, these have led to the theory that a phonological core deficit best describes the condition of dyslexia (McCardle, Scarborough, & Catts, 2001; Stanovich & Siegel, 1994). Although this account is not likely to represent the entire explanation of this reading disability (Peterson & Pennington, 2012; Scarborough, 2005), and although alternative theories exist, it is most relevant to the neurobiology of language and thus provides the framework for this chapter. For discussion of theoretical frameworks such as auditory temporal, motor timing, automaticity-based cerebellar, and visual magnocellular deficits, we refer the reader to other in-depth reviews (Ramus, 2004; Vellutino et al., 2004).

FUNCTIONAL ANATOMY OF READING

As described in detail in the present volume (Cathy Price and Karalyn Patterson) and elsewhere (Price, 2012), reading is supported by a network of regions in the left hemisphere, including ventral (occipitotemporal), dorsal (temporoparietal), and inferior frontal cortices (Figure 65.1). The occipitotemporal cortex (OTC) holds the so-called visual word form system (VWFS), specifically the "visual word form area" (VWFA), which is responsible for visual identification of words. Both the temporoparietal (TPC) and inferior frontal (IFC) cortices play a role in phonological and semantic processing of words, with IFC also involved in articulatory processes. These areas have all been shown to be altered in dyslexia (for review see Gabrieli, 2009; Pugh et al., 2001; Sandak, Mencl, Frost, & Pugh, 2004).

NEUROANATOMICAL BASES OF DYSLEXIA

A neuroanatomical basis of dyslexia was first discovered during postmortem examinations of gross anatomy of brains of adults who had dyslexia during their lifetime. Most notably, the asymmetry typically seen in the planum temporale, favoring the left

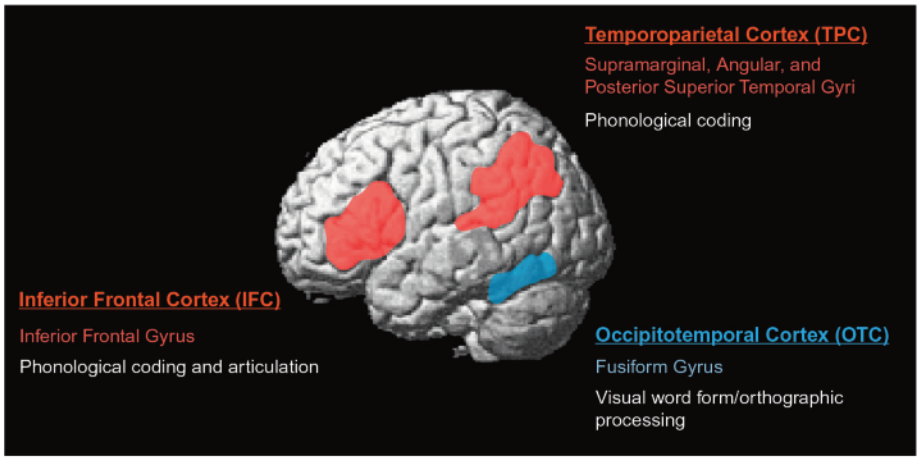

FIGURE 65.1 Schematic representation of brain regions involved in reading and reading-related processes.

hemisphere in size, was not found in the brains of these dyslexics (Galaburda & Kemper, 1979). The same investigators also discovered ectopias on the cortical surfaces of these brains, presumed to be a result of improper cortical migration (Galaburda, Sherman, Rosen, Aboitiz, & Geschwind, 1985), a finding that has received renewed interest in the context of dyslexia-associated genes involved in axonal guidance during development (Galaburda, LoTurco, Ramus, Fitch, & Rosen, 2006).

Manual tracing of magnetic resonance imaging (MRI) structural images later allowed for the replication of differences in the planum temporale *in vivo*, along with more general differences in TPC (Hynd, Semrud-Clikeman, Lorys, Novey, & Eliopulos, 1990; Larsen, Høien, Lundberg, & Ødegaard, 1990; Leonard et al., 2001). New observations were reported for the cerebellum (Eckert et al., 2003; Leonard et al., 2001) and inferior frontal gyrus (IFG) (Robichon, Levrier, Farnarier, & Habib, 2000). Not surprisingly, given the variability in measurement techniques, some reports conflicted. The advent of automated image processing techniques has enabled more quantitative and investigator-independent examinations of brain differences in dyslexia. Notably, voxel-based morphometry (VBM), using fully or semiautomated algorithms, has now been used in several studies of whole-brain gray matter volume (GMV) in adults and children (for recent review of details see Evans, Flowers, Napoliello, & Eden, 2014). These studies suggest that the most reliable differences in dyslexia are located in bilateral temporal lobe structures (inferior, middle, and superior gyri), inferior parietal lobes, and cerebellum. This has been confirmed by meta-analyses of existing VBM studies of GMV in dyslexia (Linkersdörfer, Lonnemann, Lindberg, Hasselhorn, & Fiebach, 2012; Richlan, Kronbichler, & Wimmer, 2013). For example, Richlan and colleagues (2013) found, as shown in Figure 65.2A, less GMV in right superior temporal gyrus (STG) and left superior temporal sulcus (STS).

VBM has also been used to examine white matter volume (WMV) anomalies in dyslexia, and less WMV has been found within left temporoparietal regions in dyslexic children (Eckert et al., 2005). Diffusion tensor imaging (DTI) studies have shown results of lesser fractional anisotropy (FA) in dyslexic individuals compared with controls, indicating differences in white matter integrity primarily in temporoparietal and frontal areas (Klingberg et al., 2000; for review see Vandermosten, Boets, Wouters, & Ghesquière, 2012). A meta-analysis of DTI studies in dyslexia localized the most common finding to a left temporoparietal region (Figure 65.2B) and used tractography to demonstrate that this region hosts the arcuate fasciculus (also referred to as superior longitudinal fasciculus) and the corona radiata (Vandermosten et al., 2012). Combined with related observations of correlations between FA values and reading skill in left temporoparietal tracts (Odegard, Farris, Ring, McColl, & Black, 2009), these findings suggest a loss of connections between temporoparietal and frontal areas and interruption of networks that subserve phonological processing (Boets, 2014).

NEUROFUNCTIONAL BASES OF DYSLEXIA

Early functional studies were limited to adults because they used xenon (Flowers, Wood, & Naylor, 1991) and positron emission tomography (PET) techniques (Gross-Glenn et al., 1991; Paulesu et al., 1996; Rumsey et al., 1992). Then, magnetoencelography (MEG) and functional magnetic resonance imaging (fMRI) became available in the 1990s and provided better temporal and spatial resolution, respectively, without the concern of radioactive tracers. Reading and its constituent components (phonology, orthography, and semantics) were examined using a range of overt and covert tasks, mostly using single word presentation. Despite variations in tasks and participants, a substantial corpus of publications from different countries achieved convergence in their findings of left hemisphere areas, including: (i) the inferior ventral visual stream, broadly referred to here as OTC; (ii) posterior dorsal TPC, including the posterior superior temporal gyrus (pSTG: within Wernicke's area), the angular gyrus (AG), supramarginal gyrus (SMG), and the inferior parietal lobule (IPL); and (iii) IFC, including IFG within Broca's area. For example, lower signals in dyslexic compared with control groups have been demonstrated in the left OTC (Cao, Bitan, Chou, Burman, & Booth, 2006; Georgiewa et al., 1999; Hu et al., 2010; Paulesu, 2001; Richlan et al., 2010; Shaywitz et al., 1998; Siok, Niu, Jin, Perfetti, & Tan, 2008; Van der Mark et al., 2009; Wimmer et al., 2010; see also Salmelin, Service, Kiesilä, Uutela, & Salonen, 1996) and the left TPC (Brunswick, McCrory, Price, Frith, & Frith, 1999; Cao et al., 2006; Eden et al., 2004; Georgiewa et al., 1999; Paulesu, 2001; Richlan et al., 2010; Shaywitz et al., 1998, 2003; Wimmer et al., 2010). OTC dysfunction has been interpreted in terms of problems with word form processing, whereas less TPC activity has been attributed to poor phonological processing (Pugh et al., 2001; Shaywitz et al., 1998). Findings in the IFG have conflicting results, with some studies reporting hypoactivation in dyslexics relative to controls (Eden et al., 2004; Siok et al., 2008) and others reporting hyperactivation (Shaywitz et al., 1998) or no differences (Paulesu, 2001; Paulesu et al., 1996).

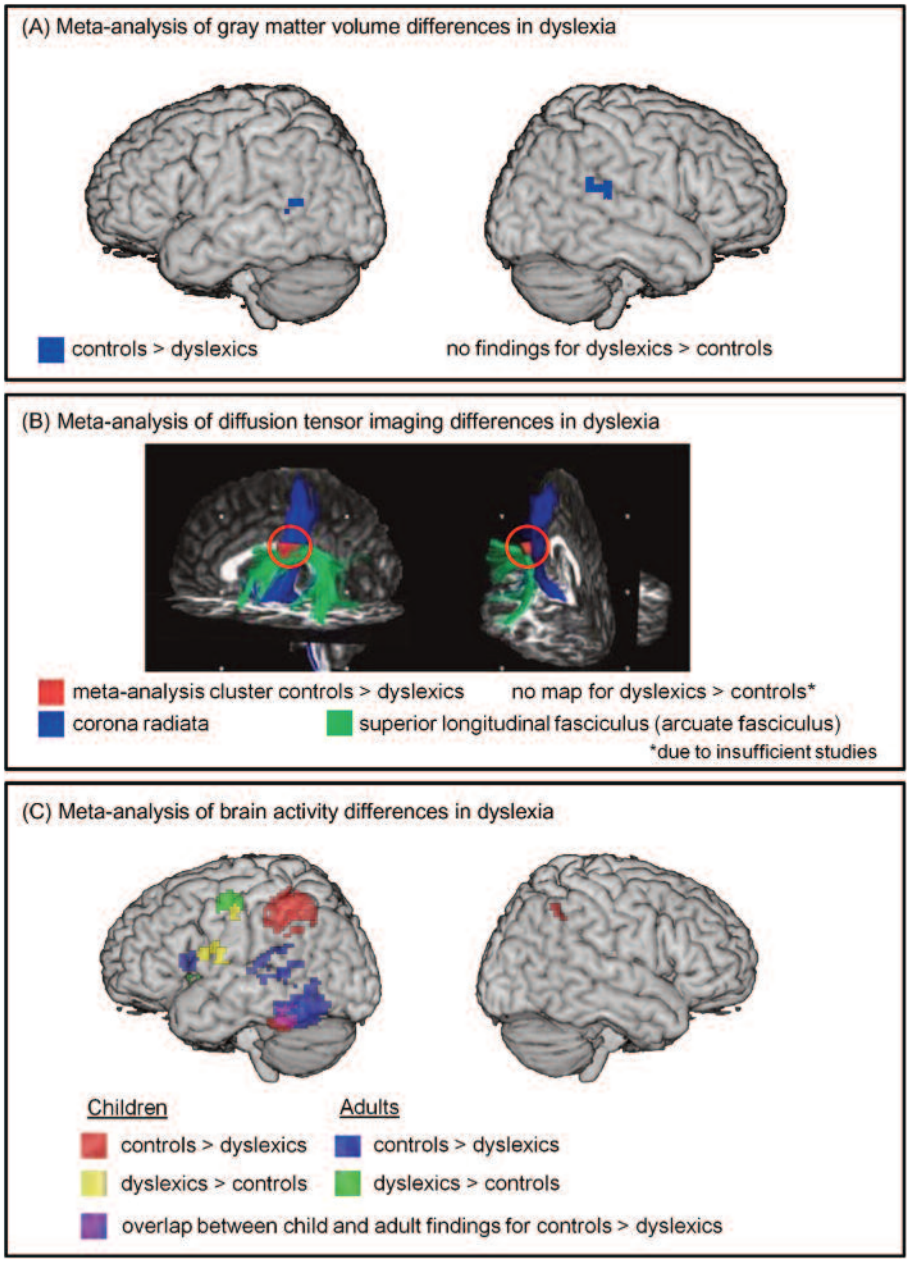

FIGURE 65.2 (A) Surface rendering of meta-analysis results for GMV differences in dyslexics versus controls (children and adults combined). Areas of less GMV in dyslexics are shown in blue; there were no findings for the reverse comparison. (B) Two angles of the same sagittal/horizontal view of an anatomical scan with superimposed three-dimensional fibretracking data (obtained from one representative adult control subject) through the left temporoparietal cluster identified in a meta-analysis (depicted in red: controls more than dyslexics; reverse comparison not conducted). The cluster contained fibers belonging to the corona radiata (blue) and to the superior longitudinal fasciculus/arcuate fasciculus (green). (C) Surface rendering of two meta-analyses results for brain activity differences in dyslexics versus controls (children and adults analyzed separately). Areas of less activity in children with dyslexia are shown in red, and areas of more activity are shown in yellow. Areas of less activity in adults with dyslexia are shown in blue, and areas of more activity are shown in green. The overlap between children and adults in areas of relatively less activity in dyslexics is shown in violet. *Adapted from (A) Richlan et al. (2013); (B) Vandermosten et al. (2012); (C) Richlan et al. (2011) with permission from the publisher.*

Meta-analyses have again captured the most salient observations (Linkersdörfer et al., 2012; Maisog, Einbinder, Flowers, Turkeltaub, & Eden, 2008; Richlan, Kronbichler, & Wimmer, 2011). Richlan and colleagues (2011) performed separate meta-analyses of dyslexic children and adults (Figure 65.2C). They found left IFG hypoactivation in adults but not in children with dyslexia (and hyperactivation in precentral/premotor regions for both children and adults) and TPC hypoactivation in pSTG in adults and in IPL in children, together suggesting a dynamic developmental course of dyslexia. Notably, hypoactivation of the left OTC was found in both children and adults, suggesting early alteration in this region.

Significant interest in the VWFS has influenced studies of dyslexia. This region is not only underactivated in dyslexia; specific patterns have also been uncovered using a region-of-interest (ROI) approach: whereas typically reading children and adults demonstrate a posterior-to-anterior gradient of increasing word selectivity in medial left OTC (i.e., relative signal increase for words compared with false font/symbol string stimuli along the posterior-to-anterior axis; Brem et al., 2006; Olulade, Flowers, Napoliello, & Eden, 2013; Van der Mark et al., 2009; Vinckier et al., 2007), this gradient is disrupted (Van der Mark et al., 2009) and fails to become tuned in the early phases of learning (Maurer et al., 2007) in children with dyslexia.

Functional connectivity has been used to better assess interregional correlations or cooperation between different brain areas in typical and dyslexic readers. Using PET and fMRI, respectively, two early investigations reported reduced connectivity between the AG and several sites, including the pSTG, ventral OTC, and early visual areas in dyslexics during phonological tasks (Horwitz, Rumsey, & Donohue, 1998; Pugh et al., 2000). Horwitz et al. (1998) also reported reduced AG connectivity with the IFG and cerebellum. There are several similar seed-based studies in adults, and disruption of connectivity has also been observed in children, with some (Cao, Bitan, & Booth, 2008) noting reduced connectivity between the ventral OTC and the IPL and others (Richards & Berninger, 2008) reporting abnormal connectivity between the left IFG and multiple bilateral brain regions. These studies and others (Van der Mark et al., 2011; Vourkas et al., 2011; see also Koyama et al., 2011, for resting-state connectivity) illustrate the complex nature of the reading process and the fact that dyslexia is associated with focal differences as well as disruptions of connections among regions.

The origin of these differences remains unknown. Several theories on the etiology and processes by which the phonological deficit might be operating have been put forward; these range from low-level perceptual problems to higher meta-cognitive dysfunction and are beyond the scope of this chapter (we refer the reader to specific studies and comprehensive reviews, e.g., Ahissar, 2007; Boets, 2014; Giraud & Ramus, 2013; Goswami, 2011, 2015; McArthur & Bishop, 2001; McNorgan, Randazzo-Wagner, & Booth, 2013). Multimodal brain imaging is proving a valuable tool for testing these theoretical frameworks. For example, using a multivoxel pattern analysis of fMRI data in adult dyslexics, Boets and colleagues (2013) found intact phonetic representations in bilateral auditory cortices but disrupted functional and anatomical connections between these regions and the left IFG, suggesting a problem of access. These findings echo earlier brain imaging reports of "disconnection" in dyslexia (Paulesu et al., 1996). As such, the search for the neurobiological basis for the phonological core deficit in dyslexia has expanded beyond the left TPC regions known to be engaged in phonological processing in typical readers to tracts that connect posterior to frontal brain regions.

Specifically, the developmental trajectory of the neural basis of dyslexia is still poorly understood. Given that reading is acquired over a protracted period of time and during development, it is likely that brain-based findings are going to be dynamic, sometimes presenting proximally and other times distally to the point of origin. For example, if normal reading acquisition is achieved by phonological assembly of novel words in left dorsal regions, with a shift to more automatic word recognition in OTC with increasing reading expertise, then dyslexia might represent failure to advance to the use of OTC due to disruption of dorsal TPC for phonological assembly (Pugh et al., 2001; Sandak et al., 2004). It could be that the OTC underactivity represents a primary deficit, as suggested by impaired OTC function in both children and adults (Richlan et al., 2011). However, the problem may not originate in cortex *per se*, but rather in abnormal connecting fibers preventing the normal development of skills subserved by the cortex that feeds into them (Boets, 2014). Hyperactivations (e.g., in left frontal as well as right hemisphere regions) have been interpreted as compensatory mechanisms to offset underactivity elsewhere (Pugh et al., 2001), but their role is not clear. Many of the findings depend on the age of participants, and together these factors indicate the need for longitudinal studies of dyslexia to shed light on the timing and etiology of these differences.

GENETIC AND PHYSIOLOGICAL MECHANISMS IN DYSLEXIA

Genetic linkage studies have found several loci that may be involved in dyslexia, and at some of these loci genetic variants associated with disease risk have been identified (Scerri & Schulte-Körne, 2010). Several genes in the *DYX2* (dyslexia susceptibility-2) locus on chromosome *6p22* have been associated with dyslexia (Eicher & Gruen, 2013), including *KIAA0319*, *TTRAP*, and *DCDC2*.

Some of these dyslexia-associated genes have been studied in knockout mice and have been found to be implicated in abnormal neuronal migration (Galaburda et al., 2006). A recent study suggests increased excitability and decreased temporal precision in action potential firing in neocortex of *DCDC2* knockout mice, implicating the *N*-methyl-D-aspartate (NMDA) receptor (Che, Girgenti, & Loturco, 2014).

In humans, magnetic resonance spectroscopy (MRS) has been used to identify which neurometabolites might be altered in dyslexia. *N*-acetyl-aspartate and choline were found to be abnormal in adults with dyslexia (Bruno, Lu, & Manis, 2013), and choline and glutamate were abnormal in children with dyslexia (Pugh et al., 2014). These reports highlight the connections between choline levels and abnormal white matter (dove-tailing with the described WMV and FA studies), as well as between increased glutamate and hyperexcitability at the level of the synapse (Pugh et al., 2014). More direct connections have been made between brain anatomy and dyslexia-associated genes. For example, Meda et al. (2008) investigated associations between *DCDC2* and GMV in typical readers and found that individuals heterozygous for the deletion,

compared with those homozygous for no deletion, had significantly higher GMV in brain regions related to reading/language and symbol decoding. Looking at white matter integrity, Darki, Peyrard-Janvid, Matsson, Kere, and Klingberg (2012) found that *DYX1C1*, *DCDC2*, and *KIAA0319* were significantly associated with WMV in the left temporoparietal region and that WMV was positively correlated with reading ability. In functional studies, participants with the *KIAA0319/TTRAP/THEM2* variants showed a reduced left-hemispheric asymmetry of the STS (Pinel et al., 2012), and Cope et al. (2012) found activity in several brain areas to be influenced by variants in the *DYX2* locus. Together these studies are beginning to reveal the possible connections between molecular mechanisms and behavior in dyslexia, as well as the brain's mediating role.

NEUROBIOLOGY OF READING INTERVENTIONS

Understanding the brain-based changes underlying successful reading intervention demonstrated by behavioral studies (Alexander & Slinger-Constant, 2004; Bradley & Bryant, 1983) provides insights into treatment mechanisms of dyslexia and, potentially, its etiology. Functional neuroimaging studies in children and adults have reported several regions of increased activation after reading intervention. These have often been discussed in terms of "compensation" versus "normalization" processes and in the context of language function, with some discussion on skills outside of language that might support reading. As summarized by Barquero, Davis, and Cutting (2014), areas of postintervention increases include bilateral inferior frontal, superior temporal, middle temporal, middle frontal, superior frontal, and postcentral gyri, as well as bilateral occipital cortex, IPL, thalami, and insulae. A meta-analysis of fMRI studies (also reported by Barquero et al. (2014)) sheds light on the most salient postintervention increases, namely left thalamus, right insula/IFG, left IFG, left middle occipital gyri, and right posterior cingulate (Figure 65.3). There are also studies examining anatomical changes after reading intervention in dyslexia, demonstrating GMV increases in children in left anterior fusiform gyrus/hippocampus and precuneus and right hemisphere hippocampus and cerebellum (Krafnick, Flowers, Napoliello, & Eden, 2011), and increased FA in left anterior centrum semiovale in adults (Keller & Just, 2009). These anatomical changes do not directly colocalize to the functional changes described, suggesting that the neurobiological mechanisms of reading remediation are complex. For example, even if the intervention involves training of phonological skills, the brain mechanisms underlying successful reading gains may rely on memory and other learning mechanisms. Further, the roles of participant age and the method of treatment in the neural correlates of reading intervention have yet to be fully explored.

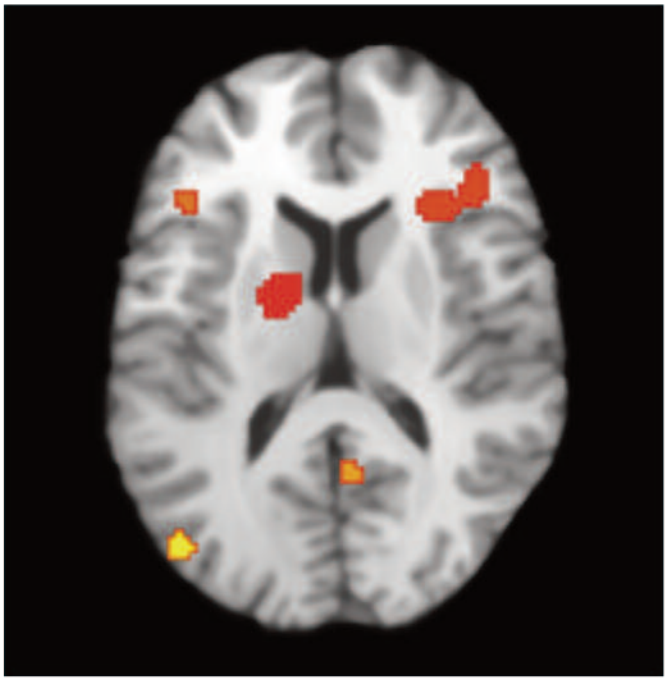

FIGURE 65.3 Axial view of meta-analysis results for brain activity increases in dyslexics after reading intervention: left middle occipital gyrus, thalamus, inferior frontal gyrus; right posterior cingulate and insula/inferior frontal gyrus. *From Barquero et al. (2014) with permission from the publisher.*

There is increasing interest in correlating success of reading acquisition with neurobiological measures. For example, adult compensated dyslexics followed from childhood were shown to have more activation in right superior frontal and middle temporal gyri and left anterior cingulate gyrus compared with persistently poor readers (Shaywitz et al., 2003). Some studies have compared postintervention brain activity in dyslexic children who showed a favorable behavioral response to intervention with activity in children who did not benefit from treatment (Davis et al., 2011; Odegard, Ring, Smith, Biggan, & Black, 2008). More activity in responders than in nonresponders was found by Odegard et al. (2008) in left IPL and in left STG by Davis et al. (2011).

Furthermore, neuroimaging data have been used to predict long-term outcomes of reading in typically reading (McNorgan, Alvarez, Bhullar, Gayda, & Booth, 2011) and dyslexic children (Hoeft et al., 2011). The latter study found that right IFG activation and right superior longitudinal fasciculus integrity at the beginning of the study predicted reading scores in dyslexics 2.5 years later. As such, brain-based predictive studies

bear important information on the mechanisms of successful treatment of dyslexia and also hold potential for contributing to the decision for a specific intervention strategy.

CAUSE VERSUS CONSEQUENCE?

A pressing question for the neurobiological bases of dyslexia is in regard to whether the findings that distinguish dyslexics from nondyslexics represent a cause or consequence of the disorder. Literate and illiterate adults differ in brain function (Dehaene et al., 2010) and anatomy, including brain regions known to be involved in dyslexia, such as the arcuate fasciculus (Thiebaut de Schotten, Cohen, Amemiya, Braga, & Dehaene, 2014), suggesting that reading acquisition results in significant learning-induced plasticity. Adults who were illiterate but then learned to read exhibit greater GMV in TPC compared with illiterate adults (Carreiras et al., 2009). Longitudinal studies of typical readers reveal widespread decrease in cortical thickness with age (Giedd et al., 1999), yet language regions in perisylvian cortex thicken (Sowell et al., 2004) in correlation with improvements in phonological skills (Lu et al., 2007). As such, it is possible that typical readers, as a consequence of learning to read, experience changes in brain anatomy and function that are not realized in dyslexic readers (who read less), leading to a relative difference that is the consequence, and not the cause, of dyslexia.

Therefore, brain imaging studies have implemented experimental designs that disambiguate those characteristics causal to dyslexia from those that are secondary or, in fact, the consequence of experience (or lack of experience). This question can be addressed by: (i) longitudinal studies of typical readers and children at risk for dyslexia (based on a family history or early signs of weaknesses in skills that support reading) and (ii) studies using the reading level-match design, where children with dyslexia are compared with younger typical readers who are matched on reading level (Goswami & Bryant, 1989). The noninvasive nature of fMRI and event-related potential (ERP) techniques has allowed pediatric studies to flourish, and brain imaging studies on the causal nature of dyslexia have begun to emerge. For example, Raschle, Chang, and Gaab (2011) report reduced GMV in left OTC, bilateral TPC, left fusiform gyrus, and right lingual regions in prereading children with, compared with children without, a family history of dyslexia (see Hosseini and colleagues, 2013, for similar work measuring network differences in surface area). The same group of children also showed less brain activity in bilateral OTC and left TPC (Raschle, Zuk, & Gaab, 2012). Interestingly, maternal history of reading disability is associated with smaller bilateral prefrontal and TPC GMV of 5- to 6-year-olds, and because these replicate for the left IPL on a measure of surface area but not cortical thickness, they are likely due to prenatal influences (Black et al., 2012). In studies of white matter structure, it has been shown that the volume and FA of the arcuate fasciculus is positively correlated with PA in children before they learn how to read (Saygin et al., 2013). The reading level-match design has also been applied: Hoeft et al. (2007) found left IPL GMV differences in dyslexia for both control group comparisons (age-matched and reading level-matched) in a study that used fMRI data to determine the ROIs for GMV analyses. However, using a whole-brain approach (as well as a follow-up analysis using ROIs), Krafnick, Flowers, Luetje, Napoliello, and Eden (2014) found that few GMV and none of the WMV differences identified between dyslexics and age-matched controls emerged when dyslexics were compared with controls matched on reading abilities. Also, the older controls (age-matched to the dyslexics) had more GMV than the younger controls in several of the areas identified as variant in the dyslexics when compared with age-matched controls, raising the possibility that not all differences can be attributed to dyslexia *per se*. Interestingly, in a sample of children eventually diagnosed with dyslexia, the structural abnormalities that preceded learning to read were found in early visual and auditory cortical areas and not in regions associated with reading (Clark et al., 2014). As such, the question remains whether anomalies in neural migration or synaptic activity affect brain anatomy and function directly or via reading experience.

IMPORTANT VARIABLES IN STUDIES OF DYSLEXIA

Due to the heterogeneity in dyslexia, researchers have attempted to identify subgroups. For example, Jednoróg, Gawron, Marchewka, Heim, and Grabowska (2014) have shown that cognitive subtypes of dyslexia are characterized by distinct patterns of GMV. This concept is also being applied to functional neuroimaging studies of reading intervention based on subtypes (Heim, Pape-Neumann, van Ermingen-Marbach, Brinkhaus, & Grande, 2014). Although the phonological deficit theory also dominates such studies, it must be noted again that there are criticisms of and theoretical alternatives to the phonological deficit theory, and careful consideration must be given to dyslexia in languages other than English (Brunswick et al., 2010), particularly those in which grapheme–phoneme mapping is more direct (orthographically transparent). A behavioral study of dyslexia in six

languages revealed that high orthographic complexity of a language exacerbates phoneme deletion and rapid naming problems in dyslexia (Landerl et al., 2013). In the case of German, where mapping between graphemes and phonemes is highly consistent, dyslexia is associated with poor reading speed and spelling, whereas phonological deficits have a lesser role (Wimmer & Schurz, 2010). It is also debated whether the demands of a logographic writing system such as Chinese result in brain-based differences that are specific to dyslexia in that orthography (Siok, Perfetti, Jin, & Tan, 2004) or not (Hu et al., 2010).

Because of higher prevalence of dyslexia in males, some studies are based on samples that are dominated by males, yet the results are generalized to both sexes with dyslexia. For example, less than 20% of the participants in the studies included in the meta-analysis by Linkersdörfer et al. (2012) were female. However, there is evidence to suggest sex-specific differences in brain anatomy in dyslexia, as illustrated by GMV differences in dyslexic females (children and adults) compared with controls that reside outside of the language regions typically reported in males with dyslexia (Evans et al., 2014). Differences in cortical thickness have been reported for girls but not boys in ventral OTC (Altarelli et al., 2013), and altered asymmetry (rightward) of the planum temporale surface area in dyslexic boys but not girls (Altarelli et al., 2014). Given the sexual dimorphism in the general population for brain anatomy (Good et al., 2001) and brain function underlying language, including phonological processing (Shaywitz et al., 1995), these findings may call for sex-specific models of dyslexia and, at least, highlight the need to include more females in dyslexia research.

Another understudied group includes those of low socioeconomic status (SES). This has recently been addressed in a study showing that the differences observed in both OTC and STG in dyslexia exist independently of SES (Monzalvo, Fluss, Billard, Dehaene, & Dehaene-Lambertz, 2012), even though SES is associated with differences in GMV (but not WMV) in areas relevant to language (Jednoróg et al., 2012). Together, these and other variables will continue to play an increasingly important role in studies of the brain bases of dyslexia.

CONCLUSION

Building on decades of behavioral work, brain imaging has provided a neurobiological basis for understanding reading and dyslexia. Consistent with the predominant phonological core deficit theory of dyslexia, anatomical and functional studies have revealed differences in left temporoparietal, inferior frontal, and ventral occipitotemporal cortices, together with disruptions of their connections. This work has been integrated with efforts in reading intervention, predictors of reading outcome, dyslexia-associated genes, and neurometabolites. Studies conducted at different ages suggest an age-dependent neurobiological profile of dyslexia. Although this is captured by current putative neurocognitive developmental models of dyslexia, longitudinal investigations in young children are ultimately needed to ascertain how these differences behave over time (e.g., a given anomaly may be a different manifestation of an earlier anomaly) and to determine which differences are attributed to dyslexia *per se* (rather than altered reading experience) using methods that capture the neurodevelopmental origin of these. Further, diversity of writing systems and orthographic depth is likely to play a modulating role, suggesting that beyond the universal aspects of dyslexia, orthography-specific aspects of reading disability will need to be integrated into neurobiological models (Richlan, 2014).

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References for this article are listed at the end of the following pdf: Eden et al., chapter in Neurobiology_of_Language_2015.pdf> available at: Neurobiology of Language. DOI: http://dx.doi.org/10.1016/B978-0-12-407794-2.00065-1

Apps and Other Resources for the iPad that Promote Reading Skills

The 21st-century learner has access to applications and other technology resources that can enhance their educational experience. With these assistive technologies at their fingertips, there are more ways than ever for students to find help with academic struggles. These innovative and engaging tools are particularly beneficial for students with dyslexia. Assistive technology can aid in the areas of phonemic awareness, alphabetic principle, written expression, spelling, and reading comprehension. Additionally, employing technology tools can help boost confidence and increase executive functioning skills. These tools help learners find new ways of approaching challenges and broaden the pathways of success for students with dyslexia.

Phonics:

Phonics Awareness (bugbrained.com) Phonics Awareness is an app that teaches your child how to segment and blend sounds and use vowels. *Free*

Starfall (starfall.com) The website offers a range of activities from specific letter-sound practice all the way up to practicing reading short stories. *Free*

Alphabetic Principle:

Bob Books (bobbooks.com) Simple illustration brings magic to your kids. It will catch their attention in a fun, entertaining and educational way and help them to learn how to read. Bob Books #1 and #2 available. *Each version $2.99*

Handwriting:

Letter School—Block Letters (Letterschool.com) This is for younger children. It contains upper and lower case and numbers and allows kids to practice essential skills. Lite version available. *Full version $6.99*

Kids Writing Pad is a basic large lined writing pad useful for practicing numbers and letters to make sure you draw them appropriately. It has a middle dotted line between two solid lines like most primary school paper so you can practice having the appropriate parts of the letters or numbers in the right areas. You can choose the color of your pencil or use an eraser, or touch the big eraser to erase the entire page. *$0.99*

Spelling:

Build a Word Express (Atreks.com) Learn to spell sight words, long vowel and short vowel words (700+ words and an option to create your own spelling words with your own voice). *The base game is free with options to upgrade.*

Simplex Spelling HD (pyxwise.com) This program focuses on teaching the Dolch Sight Words, which make up 50%-75% of all printed text (this includes the most common words in the English language such as 'the', 'and', 'of', etc). It is designed to help emergent readers build a strong foundation in spelling and reading skills. The complete word list contains over 260 words and can be found on their website. Lite version available. *Full Version- $4.99*

Chicktionary (shockwave.com) Unscramble a roost full of letters and create as many words as possible. Each chicken bears a letter. Touch them to spell out a word, then watch as the word appears below them. CHICKTIONARY COOP is the next generation of

the award-winning CHICKTIONARY word game named as a Top 25 iPad app for kids by TIME and a top iPhone and iPad app for grade-schoolers by MSNBC, Mashable, and Tecca. *Free -$6.99*

Comprehension:

Brain Pop (brainpop.com) Watch a free educational movie everyday and then test your new knowledge with an interactive quiz. For an optional in-app subscription you have access to over 750 videos in any academic areas. All videos are close-captioned so it is easy to follow along. *Free- $1.99 month*

Meet Millie (/www.milliewashere.com/) Millie Was Here is a fun and furry book app series designed for little fingers (but you'll watch too). Kids can listen to the story, read along, play games, hunt for stickers, and more. They'll think they're playing a game. You'll know they're reading a book. *Free*

Read Theory (readtheory.org) This website has a simple sign up, after which students take a short diagnostic test that places them at a grade level. Then, they read passages and answer comprehension questions on their level. Students receive immediate feedback with explanations after each passage answered. Passages range from 1st-12th grade level. *Free*.

Written Expression:

Inspiration Maps (inspiration.com/inspmaps) This program is filled with multiple tasks. You can brainstorm and visualize ideas with maps and diagrams. Organize your thoughts and ideas. Make sense of concepts and projects. Build critical thinking and reasoning skills. Organize yourself for studying by building study and note taking skills. Free - $9.99

Explain Everything (explaineverything.com) Explain Everything is an easy-to-use design tool that lets you annotate, animate, and narrate explanations and presentations. You can create dynamic interactive lessons, activities, assessments, and tutorials using Explain Everything's flexible and inte- grated design. Use Explain Everything as an interactive whiteboard using the iPad2 video display. Explain Everything records on-screen drawing, annotation, object movement and captures audio via the iPad microphone. Import Photos, PDF, PPT, and Keynote from Dropbox, Evernote, Email, iPad, photo roll and iPad2 camera. *Free-$14.99*

Shake-A-Phrase (shakeaphrase.com) Shake your iPhone/iPad to create a new silly sentence every time. Tap on the words to see the definitions. Perfect for learning in the classroom or on the go, this educational app features over 2000 words and definitions in 5 colorful and engaging themes - animals, fairytale, monsters, and sports. *$1.99*

Reading Alternatives:

Speak it! (Future-apps.net) This is a text to speech app. Copy any document, web page, PDF file then paste them into Speak it! It will read it back to you with the highest quality sound available. *$1.99*

Writing Alternatives:

Dragon Dictation (nuance.com/dragon/dragon-anywhere.html) Dragon Dictation is an easy-to-use voice recognition application powered by Dragon NaturallySpeaking that allows you to easily speak and instantly see your text content for everything from email messages to blog posts on your iPad™, iPhone™ or iPod touch™. *First week free then $14.99 monthly*

Felt Board (softwaresmoothie.com) Upon entering this application, users will immediately get a craft like feeling as every aspect of this educational app is created with felt. Use your fine motor and hand-eye coordination skills to develop amazing stories as you tap, drag, drop, pinch and zoom pieces into a scene. Felt Board for iPad is a very user friendly application for children young and old. It is an application that encourages all learning styles as children can work collaboratively or independently. *$2.99*

Sock Puppets (Smithmicro.com) Sock Puppets lets you create your own puppet shows in seconds, then share them on Facebook and YouTube with just a few taps. Just add puppets, props, scenery, and backgrounds to start creating. Hit the record button and the puppets will automatically lip-sync to your voice. *Free-$3.99*

Tapikeo (tapikeo.com) Tapikeo allows you and your children to easily and quickly create your own audio-enabled picture books, storyboards, visual schedules, memory aids, audio flashcards, and more using a versatile grid style layout.

Create engaging combinations of your own photographs and narration for pre-reading children to enjoy independently, or watch the imagination of your older children soar with this unique method of creative expression. *$3.99*

Notetaking:

Evernote (www.evernote.com) This app allows users to take notes in an innovative way. Users are able to organize their notes into different notebooks and can add pictures, sound, and set alarms to remind them to study. It is synced to your phone, tablet, and computer. *Free*

Quizlet (www.quizlet.com) Users can create digital flashcards as a study tool with Quizlet. Users can also add in images and sound recordings to enhance their flashcards. Once created, users can review with games and different tests until they master information. *Free*

Notability (gingerlabs.com) Integrates handwriting with PDF annotation, typing, recording and organizing so notes can be taken anyway you want. $9.99

My Homework (myhomeworkapp.com) Tracks your home work, test, project and lessons. Get reminded when an assignment is due. Supports time, block and period based schedules. Can sync to any device. Teachers can create an account and students can automatically be in sync with their teacher with one touch. *Free*

Teacher Supportive Apps:

Kahoot (www.getkahoot.com) Using the Kahoot dashboard, teachers can create unique and interactive games to review content with their students. The highly engaging format and easy-to-use platform transforms the classroom. *Free*

Quizalize (www.quizalize.com) The Quizalize website allows teachers to create fun games on any topic. Students can then play them individual games in class or teachers can assign it for homework. As a bonus, teachers can import information directly from Quizlet. *Free*

Flocabulary (www.flocabulary.com) The Flocabulary website offers hundreds of videos on a variety of topics, including Language Arts, Math, Science, Social Studies, and Vocabulary. The videos include companion activities to complement each lesson. In addi- tion, they are all close-captioned for easy viewing. *$120/year for a subscription*

Nearpod (www.nearpod.com) Using Nearpod, users can create slideshow presentations with interactive activities, web-sites, and videos. While presenting, the slideshow can be synced across all devices in the classroom. *Free*

Sound Literacy (3DLiteracy.com) If you are using any Orton-Gillingham program, this app will make perfect sense. This app was designed with opened ended possibilities. This one is well worth the price of *$9.99 with in app purchase*.

Socrative App for teachers and Students (go to YouTube for instructions) Great way for a teacher to give a short T/F, multiple answer or short answer quiz. Quoted from their website, "Socrative is a smart student response system that empowers teachers to engage their classrooms through a series of educational exercises and games via smart phones, laptops, and tablets." Works well and could transform the use of "Clickers" in every school! *Free*

iTunes U- iTunes U has lots of curriculum material created by educators categorized by subject area, submitting institution, and grade level. All the material is vetted through the submitting organizations, mostly Colleges, Universities and K-12 Education groups. There is a Beyond Campus area that also has materials from museums, libraries (think Library of Congress!), and other educationally minded organizations. Best of all, all material is available for *free*.

Executive Functioning

Alarmed (iTunes store) This app is great to help students remember important dates and times. The app allows you to set up repeat scheduling, pop up notifications, and customized alarms. The best part is the "nag" feature, which will have the alarm go off every minute until the task is complete. *Free*

Vocabulary

Vocabulary Spelling City (spellingcity.com) Over 42,000 spelling words with customizable sentences and definitions. A real person says each word and sentence. This app also has free home pages for teachers and parents to save lists, and has teacher training videos. There are free printable handwriting worksheets. Ten games are on the iPad and there are over twenty- games on the internet. This app is only for use with VocabularySpellingCity Premium Members, which can be purchased on their website. *Membership is $34.95 annually*.

Marie's Words (www.marieswords.com) This vocabulary program uses flashcards that combine full color, engaging drawings with 550 of the most common SAT words. Each flashcard has the definition, synonyms, and antonyms on the front and a coordinated drawing on the back. This program is ideal for a variety of learners. *$19.95 for the complete set*

Written Expression

Snaptype (www.snaptypeapp.com/) A huge help for students who struggling with writing, Snaptype allows users to take a picture of any document. Using the app, they can type directly on to the worksheet, preventing any handwriting struggles. Additionally, they can send the completed worksheets to their teachers directly within the app. It also stores all the documents, helping with organization. *Options available for free-$4.99*

Learning Ally (www.learningally.org) Learning Ally is a collection of human-narrated audiobooks, literature, and textbooks. The program offers over 80,000 audiobooks, making it ideal for students with reading challenges. *Educators should note that TEA has provided funding for public schools to access accounts for eligible students for free. $135 a year*

APPS TO PROMOTE READING SKILLS

WebOutLoud (iTunes store) This innovative app is ideal for struggling readers. The app will read the content of any website to the user. *Free*

Behavior Support

Classcraft (www.classcraft.com) Classcraft is an innovative behavior management system where students create an avatar. After the avatar is created, students earn XP based on positive behaviors. This combines video games and behavior management. *Free*

Class Dojo (www.classdojo.com) Class Dojo allows the user to track positive and negative behaviors in their classroom. The behaviors are fully customizable and the interface is very user-friendly. Data can also be shared with parents with the touch of a button. *Free*

Casper Focus (www.jamf.com) This app allows the user to "lock" a student in to various apps. This prevents them from getting off-task and not following directions. The app allows you to do this remotely. *Pricing on Website*

Remote Access:

Splashtop 2 (Splashtop.com) Splashtop 2 is the easiest way to access all of your content from your computer from any device from anywhere. *Right now it is on sale for $2.99 to install, but there is a monthly fee of $.99*

Math:

Dragon Box (dragonboxapp.com) This is the first real Algebra game for iPads. The idea was to create a game that children experience that is actually fun, but where they also would be able to solve mathematical equations. $5.99

iAllowance (Jumpgapsoftware.com) Allows you to manage your child's finances and teach him or her about saving and spending money. Whether you want to set up a weekly allowance or pay out a special reward. Support for multiple children, unlimited banks, chores and you can email & print reports. *Free - $3.99*

Science:

Touch Physics (gamez4touch.com) -Touch physics models real physics. Play your own music and change the laws of physics. This app resumes where you last left off and shake to reset. It is very addictive. *Free*

NASA App (nasa.gov) Current NASA information. Over 150,000 images with the latest news and stories. It has launch information and countdown clocks. *Free*

The Elements (touchpress.com) The Elements: A Visual Exploration is a beautiful interactive iPad book. It preserves the lush look and beautifully composed pages of the best-selling hardcover edition, but adds an astonishing new dimension to the material. Examine over 500 3D objects from all sides by spinning the images. Compare the properties of every element in beautiful detail. $9.99

Google Earth (earth.google.com) Take a virtual journey to any location in the world. Explore 3D buildings, imagery, and terrain. Find cities, places and local businesses. *Free*

Miscellaneous:

Common Core Standards (masteryconnect.com) - View the Common Core Standards in one convenient app. It is a great reference for students, parents, and teachers for understanding the core standards. You can quickly find the standards by subject, grade and domain. *Free*

Dyslexia (nessy.com) Short video of what it is like being Dyslexic, with tips for parents and teachers. *Free*

Dyslexie Font (www.dyslexiefont.com) This font was created by someone with Dyslexia to help improve his own reading ability. After finding success with it, he decided to offer it to others in hopes that it could help them too. The font has nine main features, including bigger opening and slanted letters. *Free*

Mad Libs (madlibs.com) Based on the original Mad Libs books. This app works on building grammar. Use your voice recognition to enter your funny silly words. Share your stories on Facebook, Twitter, or email. *Free*

Stack the States/ Countries (dan-russell-pinson.com/my-games/) This is a great educational app that helps you learn the 50 states the easy way. Watch the states actually come to life in this colorful and dynamic game!

As you learn state capitals, shapes, geographic locations and more, you can actually click, move and drop the animated states anywhere on the screen. $.99

THE BOOK NOOK

Promoting Executive Function in the Classroom

By: Lynn Meltzer

Accessible and practical, this book helps teachers incorporate executive function processes—such as planning, organizing, prioritizing, and self-checking—into the classroom curriculum. Chapters provide effective strategies for optimizing what K–12 students learn with easy-to-implement assessment tools, teaching techniques and activities, and planning aids.

Writing Matters: Developing Sentence Skills in Students of All Ages

By: William Van Cleave

This spiral-bound manual contains structured steps for teaching written expression on the sentence level. Also included are numerous examples and sample activities and assignments. Two companion consumable workbooks are available: *Sentence Sense, Level A* and *Sentence Sense, Level B*.

Multiplication and Division Facts for the Whole-to Part, Visual Learner

By: Christopher Woodin, Ed.M.

Students need multiplication facts to multiply and divide multidigit numbers and perform fraction operations. These facts need to be organized through a relational context so that they may be ordered and compared. Learn to provide students with a way to store, access, and express multiplication and division facts through multimodal activities that utilize visual and kinesthetic processing. The techniques presented support various learning styles and culminate in the ability to learn, compare, and express math facts in an accurate and fluent manner.

Overcoming Dyslexia: A New and Complete Science-Based Program for Reading Problems at any Level

By: Sally Shaywitz, M.D.

Suitable for parents as well as teachers, this comprehensive, up-to-date, and practical book yet to help us understand, identify, and overcome the reading problems that plague American children today.

THE BOOK NOOK

Learning, Skill Acquisition, Reading, and Dyslexia (Annals of the New York Academy of Sciences)

By: Guinevere Edin (Editor) and Lynn Flowers (Editor)

This volume, based on the 25th Rodin Remediation Conference, presents and assesses recent scientific discoveries regarding the etiology and treatment of dyslexia. The 2006 conference program emphasized the role of skill acquisition and learning, a rapidly developing field of neuroscience research, which provides a useful perspective for the study of reading.

It's So Much Work to be Your Friend: Helping the Child with Learning Disabilities Find Social Success

By: Richard Lavoie and Michele Reiner

As parents and teachers know, every learning disability has a social component. This book provides practical, expert advice on helping learning-disabled children achieve social success.

Basic Facts About Dyslexia and Other Reading Problems By:

By: Louisa Cook Moats & Karen E. Dakin

An excellent reference for teachers, this essential resource defines dyslexia and illustrates, with real-life examples, how to recognize dyslexia and other reading problems at various stages of development, from preschool to adulthood.

School Struggles: A Guide to Your Shut-Down Learner

By: Dr. Richard Selznick

School Struggles is Dr. Richard Selznick's follow-up to the acclaimed The Shut-Down Learner. School Struggles talks about the common themes facing children and their academic challenges every day. The practical, down-to-earth tone and helpful, easily applicable tools make this book a great support for parents staying awake at night worrying about their child's learning and school experience.

The Dyslexic Advantage: Unlocking the Hidden Potential of the Dyslexic Brain

By: Brock L. Eide, M.D. and Fernette F. Eide, M.D.

In this groundbreaking book, Brock and Fernette Eide explain how 20 percent of people-individuals with dyslexia share a unique learning style that can create advantages in a classroom, at a job, or at home. Using their combined expertise in neurology and education, the authors show how these individuals not only perceive the written word differently but may also excel at spatial reasoning, see insightful connections that others simply miss, understand the world in stories, and display amazing creativity.

The Many Faces of Dyslexia

By: Margaret Byrd Rawson

A selection of the writings of Margaret B. Rawson, a pioneer in the field of dyslexia, and editor emeritus of IDA. Mrs. Rawson has inspired several generations of professionals, parents, and students through her lectures, papers, and teacher- training sessions dealing with language and its meaning in our lives.

The Dyslexia Empowerment Plan

By: Ben Foss

An excellent resource for parents, this book is a blueprint for renewing your child's confidence and love of learning—identifying and building on your child's strengths, best practices for accommodations, the latest technologies, and simple ways to secure your child's legal rights.

Leaders, Visionaries and Dreamers: Extraordinary People with Dyslexia and Other Learning Disabilities

Paul J. Gerber (Editor), Marshall H. Raskind (Editor)

This book is an in-depth look at 12 incredible people with LD and dyslexia whose lives are characterized by major accomplishments and contributions that they have made in their respective fields as well as on the contemporary American scene. These men and women are from a variety of fields—arts and literature, science, politics and sports.

Nowhere to Hide: Why Kids with ADHD and LD Hate School and What We Can Do About It

By: Jerome J. Schultz, Ph.D

Now available in audio format at Learning Ally

In his latest book, Dr. Schultz examines how stress, brought on by ADHD and LD, negatively impacts learning and behavior. Leveraging over 30 years of experience in neuropsychology and education, Schultz presents parents and teachers with practical and understandable strategies that effectively reduce this stress and give their children a better home and school life.

THE BOOK NOOK: *Young People's Books Focusing on Dyslexia*

Close to Famous
By: Joan Bauer

Plucky twelve-year-old Foster McFee is not going to let her inability to read keep her from reaching her goal of having her own television cooking show. In fact, her ambitions engage everyone around her, including an unlikely reading tutor who forces her to confront the vulnerability she is trying to keep hidden.

Got Dyslexia?
By: Heather Pritchard

Matthew has trouble reading because of something called dyslexia. When he learns he's getting a new teacher, he's a little nervous. Will Mrs. Hanke be the teacher Matthew needs? Can Matthew finally believe that he can do well and have fun in school?

Eli: The Boy Who Hated to Write, 2nd Edition
By: Regina G. Richards, M.A. and Eli I. Richards; foreword by Richard D. Lavoie

The Adventures of Everyday Geniuses: Mrs Gorski, I think I have the Wiggle Fidgets
By: Barbara Esham

Eleven
By: Patricia Riley Giff

Sam, a talented boy who can't read, is trying to discover his true identity through written documents. This action-packed psychological mystery is both suspenseful and touching.

Hank Zipzer: The World's Greatest Underachiever
By: Joan Bauer

A series by Henry Winkler & Lin Oliver

The Lightning Thief
One in a series by Rick Riordan, whose son has dyslexia and ADHD

Trapped: A Novel
By: Judy Spurr

School is difficult for Jamie—dyslexia not only makes coursework a challenge, but he is often bullied at school. Spurr, a former reading teacher, enters the real-life, day-to-day struggles of kids with dyslexia and shows how friendships and perseverance can change a life. The book, written for middle-schoolers, will also help parents learn something of both the academic and social challenges kids face.

Author
By: Helen Lester

An inspirational true story of a girl, Helen Lester, who has trouble writing even something as simple as a grocery list yet becomes a teacher and then a celebrated children's book author.

Tacky the Penguin
By: Helen Lester; illustrated by Lynn M. Musinger

This delightful tale of an odd penguin who doesn't fit in with the perfect penguins in his colony is well suited to budding out- of-the-box thinkers who often do things differently from their peers. Note: A Read-Along Book/CD combo is also available.

It's Called Dyslexia
By: Jennifer Moore-Mallinos; illustrated by Nuria Roca

Whoever said that learning to read and write is easy? The little girl in this story is unhappy and she no longer enjoys school. After she discovers that dyslexia is the reason for her trouble, she begins to understand that with extra practice and help from others, she will begin to read and write correctly. At the same time, she also discovers a hidden talent she never knew existed!

Thank You, Mr. Falker
By: Patricia Polacco

"This story is truly autobiographical. It is about my own struggle with not being able to read. This story honors the teacher that took the time to see a child that was drowning and needed help…Mr. Falker, my hero, my teacher,… " —Patricia Polacco

The Alphabet War: A Story About Dyslexia
By: Diane Burton Robb and Gail Piazza

"Adam's experience will inspire and encourage many youngsters who find themselves in similar predicaments. Equally important, the book sounds an alarm for educators and parents." —Booklist

My Name is Brain
By: Jeanne Betancourt

It's a new school year and Brian is hoping to have a much better academic year. He's still joking with his friends, and makes them laugh especially hard when he writes his name on the board as "Brain." With tutoring and the help of his teacher, Brian starts to see his potential and himself in a whole new light.

Two-Minute Drill: Mike Lupica's Comeback Kids
By: Mike Lupica

Teaming up brings new opportunities for the class brain and the class jock.

Chris and Scott may seem like an odd couple, but they team up when Scott figures out how to help Chris with his reading problem, while Chris helps him with his football; and both boys end up winners, especially hard when he writes his name on the board as "Brain." With tutoring and the help of his teacher, Brian starts to see his potential and himself in a whole new light.

WEBSITES

DYSLEXIA

International Dyslexia Association-Houston Branch
713-364-5177 **houstonida.org**
HBIDA provides two programs per year for teachers, professionals, and parents, a free Resource Directory annually, email for information and referral services, and a Speakers Bureau of professionals available to present to groups about dyslexia.

International Dyslexia Association
dyslexiaida.org
Dyslexia Self-Assessment test: https://dyslexiaida.org/dyslexia-test/

Academic Language Therapy Association (ALTA)
(972) 233-9107
altaread.org
Referrals to Certified Academic Language Therapists; information about dyslexia.

Region 10 Education Service Center
972-348-1410
800-232-3030 ext. 1410
State Dyslexia Coordinator
region10.org/dyslexia/
Texas Dyslexia Law Handbook, accommodations and resources

Neuhaus Education Center
713-664-7676
neuhaus.org
Teacher and Parent education, on-line classes, adult literacy classes

Parent Networking Group (PNG) www.houstonida.org

PRESCHOOL AND ADULT RESOURCES

Get Ready to Read **getreadytoread.org**

TECHNOLOGY

Learning Ally
Formerly Recording for the Blind and Dyslexic **learningally.org**

Texas State Library – "Talking Books Program" **tsl.state.tx.us/tbp**

LEGAL

Disability Rights Texas
disabilityrightstx.org
Advocating for people with disabilities in Texas

The Arc of Greater Houston
713-957-1600
Advocating for inclusion; classes for parents, and information

Dyslexia and Related Disorders Handbook
region10.org/dyslexia/

National Center for Learning Disabilities
ncld.org

US Dept. of Education Office of Special Education and Rehabilitative Services
800-872-5327
www2.ed.gov/about/offices/list/osers/osep/index.html

Wrights Law
wrightslaw.com
Workshops and information on federal special education law
www.wrightslaw.com/law/ocr/sec504.guide.ocr.2016.pdf

ATTENTION DEFICIT HYPERACTIVITY DISORDER

Attention Deficit Disorder Association, Southern Region, ADDA-SR
adda-sr.org **281-897-0982**

LEARNING DISABILITIES

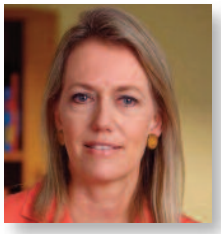
Learning Disabilities Association of Texas
ldatx.org
Annual Texas conference, information

LD online
ldonline.org
Website with articles and resources

HBIDA 23nd ANNUAL CONFERENCE

Decoding the Brain:
Imaging Studies of Dyslexia

Dr. Guinevere Eden, Keynote Speaker



Keynote Speaker:

Dr. Guinevere Eden

"Decoding the Brain:
Imaging Studies of Dyslexia"

Guinevere Eden is a Professor in the Department of Pediatrics and Director of the Center for the Study of Learning (CSL) at Georgetown University. Her research focuses on the brain bases of developmental dyslexia. Dr. Eden's work is supported by the National Institutes of Health and the National Science Foundation. She has served on the editorial boards of the Annals of Dyslexia, Dyslexia, Brain and Language, Developmental Cognitive Neuroscience and Human Brain Mapping (Associate Editor).

Dr. Eden has served as president of the International Dyslexia Association (IDA), and IDA induced her into their Hall of Honor and named her a Norman Geschwind Memorial Lecturer. Dr. Eden provided testimony on dyslexia at full committee hearings by (i) the U.S. House of Representatives' Committee on Science, Space, and Technology in 2014; and (ii) by the U.S. Senate's Committee on Health, Education, Labor, and Pensions in 2016.

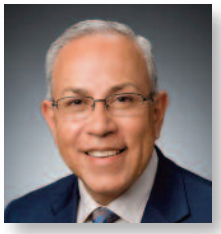
Break-Out Sessions

Renee Attaway, MS, CCC-SLP

"Zooming In: Strategies for Concrete Learners"

Renee Attaway provides workshops and trainings throughout North America as a member of the Social Thinking Training and Speakers' Collaborative. She is a speech language pathologist from Houston, TX. With over 14 years of experience in the Social Thinking® methodology, Renee runs a private practice, Social Concepts, offering individual and group social cognitive therapy. In addition, she works as the Speech Pathology Coordinator at Advance, an adult independent-living, immersion program and serves as a social learning consultant for the Parish School. She founded the Social Learning Program at The Parish School, as well as summer camps focusing on social learning. These camps include Camp Social Superheroes for 8-12 year old children and Camp Connect for teens. She currently directs both camps.

www.socialthinking.com



Antonio Fierro, Ed.D.

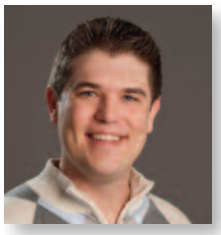
"From Traditional Word
Walls to Sound/Spelling Walls"

Dr. Fierro is a Texas State Teacher of the Year and currently a member of the national cohort of LETRS instructors, led by Dr. Louisa Moats, with twenty-five years in the field of education.

Shonda Guthrie, M.Ed., LDT, CALT

"From Syllables to Success:
Strategies for Reading Words Beyond
'Sounding It Out'"

Shonda uses her undergraduate degrees in Education and her nationally-recognized Dyslexia Therapist licenses to serve students who struggle in reading as well as to develop teachers. The motivation to work with teachers comes from the research that shows the correlation between student performance and teacher preparation. Shonda's goal is to provide onsite training to teachers in the field of reading that will lead to better performance of their students. Her professional passions include focusing on the early grades where reading acquisition is crucial as well as equipping teachers who work with older students reading below the grade level expectation. Shonda has a 10 and 12-year-old of her own, so her love for teaching reading is practiced at home as well as in the work place.



Evan Weinberger

"Executive Functioning Skills"

Evan is the President and Founder of Staying Ahead of the Game! LLC - an academic coaching company that helps children and young adults to succeed in academia and beyond.

Christopher Woodin, Ed.M.

Part 1: Best Graphic Organizers
to Teach Math Facts and Procedures and

Part 2: Characteristics of Language
Based Instruction within Math Classes

Christopher Woodin is a specialist in the fields of mathematics and learning disabilities. Chris has developed innovative, research-based methods for teaching about numbers and learning basic math skills. His methods mitigate language demands through whole-to-part, multimodal strategies that help students express, relate, store, and retrieve information efficiently. A graduate of Middlebury College and Harvard Graduate School of Education, he has taught for over 30 years at Landmark School in Massachusetts where he holds the Ammerman Chair of Mathematics. He is the author of The Landmark Method of Teaching Arithmetic (1995), and Multiplication and Division Facts for the Part-to-Whole Learner (2013), in addition to several journal articles. He served on the Massachusetts Department of Education's Mathematics 2011 Curriculum Framework Panel and teaches graduate-level education courses. Christopher Woodin was the 1997 Massachusetts Learning Disabilities Association (LDA) Samuel Kirk Educator of the Year. He has presented at numerous international LDA and International Dyslexia Association (IDA) conferences and led math workshops to audiences across the country.

SAVE THE DATE!

HBIDA
Fall 2019 Symposium
September 28, 2019

JUNIOR LEAGUE OF HOUSTON

Details to to be announced.

Carter Crain, J.D.
Recipient of the 2019 Nancy LaFevers Community Service Award

The Nancy LaFevers Community Service Award was founded to recognize Branch members who make outstanding contributions for students with dyslexia and related language learning differences in our community. This prestigious award was established in 2006 in memory of Nancy LaFevers Ambroze, a highly respected speech and language pathologist, who believed in early diagnosis and remediation of dyslexia.

This year, the Houston Branch of the International Dyslexia Association is proud to honor Carter Crain, J.D. as recipient of the 2019 Nancy LaFevers Community Service Award in recognition of his exemplary dedication, advocacy and contributions in the field of dyslexia.

Carter's story:

"I grew up in Houston. My first job after graduating from Berkeley was six years as a crap dealer and pit boss in Lake Tahoe. I then moved back to Houston where I was a cabinet maker and contractor for ten years. Much more important than my new occupation was that I married Marianne. I became a lawyer and worked at National Convenience Stores, Inc. for about six years. My primary duties were employment law and contracts. When it was bought by Diamond Shamrock and moved to San Antonio, I became a solo practitioner representing mainly teachers who were disciplined by school districts around Houston and parents of disabled students who thought they were not getting appropriate services from their school.

My good friend Graham Neuhaus got me involved in HBIDA. When I joined the board of the Houston Branch, I met Cathy Lorino. Cathy was the consummate lady at all times. She tolerated everyone's shortcomings (especially mine) and was always encouraging to all of us volunteers. She continually advanced the interests of HBIDA and children reading. Her death last November was a terrible loss for all of us.

I retired about ten years ago, but continue to volunteer, having learned its value from Cathy. Four years ago, Marianne and I moved to paradise - Hunt, Texas. I am on the Hunt ISD school board, am president of the Kerr County Central Appraisal District and worked at Kerrville's St Peter's Episcopal Church Vacation Bible School herding 35 three and four-year olds from class to class. I am now a Sunday School teacher for the same age children. I am also a mentor at Hunt ISD and at Ingram ISD."

Carter Crain, J.D. will be honored at the 2019 Spring Conference luncheon for his achievements and commitment to improving the lives of others.

The Nancy LaFevers Community Service Award was founded to recognize Branch members who made outstanding contributions for students with dyslexia and related language learning differences in our community. This prestigious award was established in 2006 in memory of Nancy LaFevers Ambroze, a highly respected speech and language pathologist, who believed in early diagnosis and remediation of dyslexia.

THE PARISH SCHOOL

Don't Just Grow. Thrive!

The Parish School educates children ages 2-12 who have communication delays and learning differences.

- Nationally recognized independent school
- Small, 1:5 faculty/student ratio
- Highly qualified, master's level educators and therapists
- Beautiful, 17-acre wooded campus
- Financial assistance available
- Onsite pediatric therapy clinic
- Serving greater Houston since 1983
- Summer camp held each June

Applications accepted year-round; schedule a tour today!

11001 Hammerly Blvd. | Houston, Texas 77043 | 713.467.4696 | www.parishschool.org

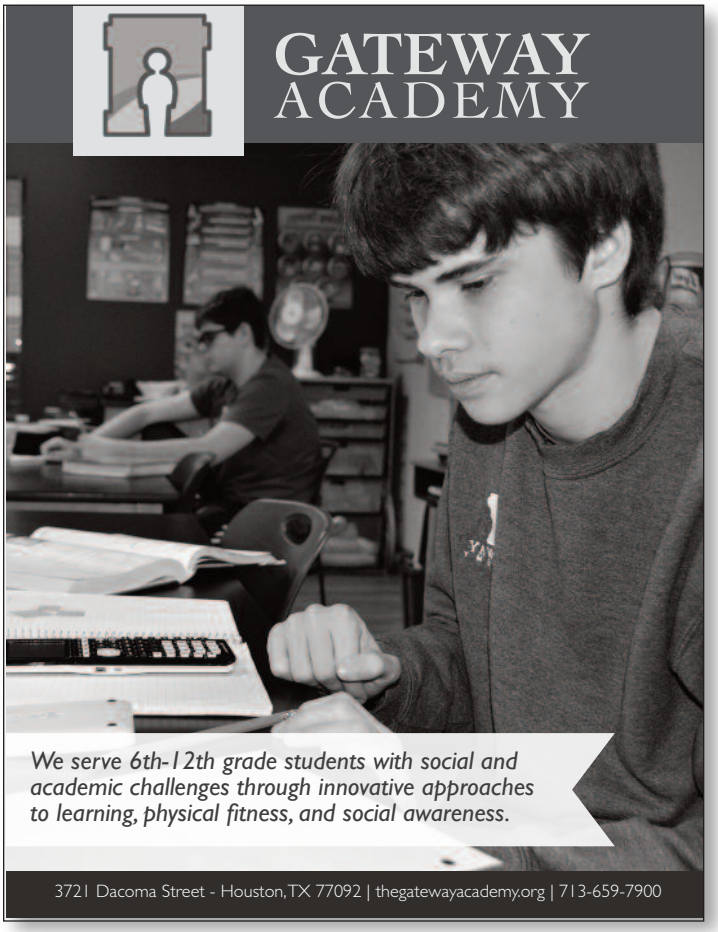
The Carruth Center provides developmental assessments and therapeutic services for children

- Neuropsychological developmental testing (appointments within 2-4 weeks from contact)
- Therapeutic evaluations
- Speech-language therapy (Spanish/English)
- Occupational therapy
- Music therapy
- Mental health services
- Physical therapy

THE CARRUTH CENTER
AT THE PARISH SCHOOL

Located on The Parish School's campus, therapists are experienced in working with children who have ADHD, apraxia, autism, expressive/receptive language disorder, dyslexia, anxiety, sensory processing disorder, and other special needs.

11001 Hammerly Blvd. | Houston, Texas 77043 | 713.935.9088 | www.carruthcenter.org



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www.houstonslrc.com

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Tel 713-960-6660

SANDY COLT

LICENSED DYSLEXIA THERAPIST
CERTIFIED ACADEMIC
LANGUAGE THERAPIST

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Houston, Texas 77079
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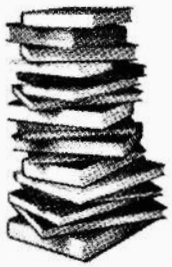
mfcolt@gmail.com



Monica L. Keogh, M.Ed., CALT, LDT
Teaching Neuhaus Basic Language Skills
Dyslexia and Reading Therapy
DIBELS Next Mentor

713 397 9107
keoghmjl@yahoo.com

6227 Cheena Drive
Houston, TX 77096

HBIDA LOCAL TELEPHONE HELPLINE

for information and referral services:

713.364.5177

or

email: HoustonBIDA@gmail.com

HBIDA RESOURCE – a resource directory published annually by the Houston Branch of the International Dyslexia Association.

For information or additional copies of HBIDA RESOURCE contact: houstonida@gmail.com

TO ADVERTISE WITH US CONTACT:
http://www.houstonida.org/hbida-publications/advertise-with-us/

EDITOR: Monica L. Keogh, M.Ed., CALT, LDT

GRAPHIC DESIGN: Sharon Tooley Design

2019 HBIDA SERVICE PROVIDER DIRECTORY

EDUCATIONAL SERVICES

ASSESSMENT & COUNSELING & THERAPY

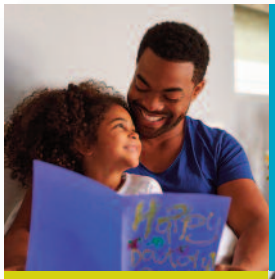
SCHOOLS & TEACHER TRAINING

Houston Branch IDA Parent Networking Group

Meet up with other Houston area parents and share what you are experiencing as you learn about dyslexia, its effect upon your child, and your challenges in advocating for your child in school. Casual morning coffees, reserved luncheon seating at the Fall Symposium and Spring Conference, access to IDA publications, as well as member discounts are all included in your parent IDA membership. As a parent IDA member, you are automatically enrolled in the Houston Chapter of IDA, as well as the chapter's PNG. We look forward to seeing you at events coming up in 2019! Watch for updates on HBIDA social media and your email.

Join PNG in 2019!

January 26	Morning Coffee Pura Coffee 9:00-10:30 am
February 23	Spring Conference PNG luncheon table
April 13	Morning Coffee TBD
September 28	Fall Symposium PNG luncheon table
October 29	Karbach HBIDA Dyslexia Awareness Fundraiser OktoberFest



Neuhaus Education Center

WE HELP DISTRICTS

WE HELP EDUCATORS

WE HELP FAMILIES

WE HELP ADULT LEARNERS

WE KNOW READING

Founded in 1980, Neuhaus Education Center is a 501 (c) (3) educational foundation dedicated to promoting reading success for all. Neuhaus provides evidence-based training and support to teachers, supplies information and resources to families, and offers direct literacy services to adult learners.

Neuhaus has more than 38 years of experience in research, instruction and teacher training in the areas of dyslexia and related reading disabilities. We also have evidence-based, independently verified professional learning programs designed specifically for teachers of children from economically disadvantaged families.

Neuhaus meets the standards of the International Dyslexia Association and is accredited by the International Multisensory Structured Language Education Council. Our professional staff members are certified by the Academic Language Therapy Association.

What We Offer Districts or Campuses:

- Customized, comprehensive and sustainable school transformation
- Diagnostic analysis and data review
- Teacher professional learning
- Leadership development
- Literacy coaching
- Family engagement

What We Offer Educators:

- Classes online, in-house, or on-site
- Complimentary web-based resources
- Dyslexia Specialist Program

What We Offer Families:

- Referrals to dyslexia interventionists
- Information about dyslexia and related disorders
- Twice-monthly information sessions

What We Offer Adult Learners:

- Reading and spelling classes for adults
- Neuhaus Academy – a web-based literacy program

neuhaus
EDUCATION CENTER

Neuhaus Education Center
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Bellaire, Texas 77401

T 713.664.7676
F 713.664.4744

neuhaus.org
neuhausacademy.org