RESOURCES
HOUSTON BRANCH OF THE INTERNATIONAL DYSLEXIA ASSOCIATION

FEATURES

• Dyslexia Basics
• Understanding the Special Education Process
• Early Indicators of Learning Disabilities in Preschool Children
• New Research ... Dyslexia Appears to Develop Before a Child Starts to Read.
• Working Memory Limitations in Mathematics Learning
• Two Poems Inspired by Dyslexia
• Dyslexia: Middle and High Schools Don’t Have to be a Nightmare
• Speech Recognition & Reading Instruction
• The Play of Children: Lessening Stress & Increasing Self-Control
• Anxiety in Children with Social Cognitive Difficulties

2012
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is a non-profit education foundation dedicated to the prevention of reading failure. To meet this challenge, we provide research-based professional development to educators, supply information and resources to families, and offer direct services to adult learners.

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- Licensed dyslexia therapists
- Authors of research papers in peer-reviewed journals, textbook chapters, and research-based reading curriculum
- Presenters at state, national and international conferences
- Consultants and contributors to U.S. Department of Education (Reading First), National Governors Association Early Childhood Task Force, Texas Teacher Reading Academies
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- M.Ed. in Reading and Writing in Houston
- Ongoing research

Contact Cathie Fisher, cfisher@neuhaus.org

Resources for Families

- Referrals to dyslexia interventionists
- What is dyslexia? information online
- Twice-monthly dyslexia information sessions

Contact Mary Yarus, myarus@neuhaus.org

Services to Adult Learners

- Reading and spelling classes for adults

Contact Mary North, mnorth@neuhaus.org

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I came across a quote by Ernest Hemingway the other day, “All my life I’ve looked at words as though I were seeing them for the first time.”

With three of my four children being dyslexic and having worked one-on-one with dyslexic children for the last ten years, I feel any one of them could have said this, but for very different reasons. What is a word? A word is everything. Words can make us laugh or cry; they can bring us comfort, joy, inspire or frighten, anger and sadden. Words allow us to communicate our feelings, wants and knowledge to each other. Yet for some, learning these words is extremely difficult. As parents and professionals, we are constantly searching for that magic “something” that might make a child’s educational life easier. What I wouldn’t have given in those early years to make my oldest son’s three hours of homework disappear so that he could play outside with his friends.

In 2002 a group of experts in our field developed a definition of dyslexia using scientific research in hopes of clarifying the term.

Dyslexia is a specific learning disability that is neurological in origin. It 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 the growth of vocabulary and background knowledge.

This definition was approved by the International Dyslexia Association and the National Institute of Child Health and Human Development. It is surprising that the word dyslexia still remains regularly unused in many educational settings; the term “specific learning disability” often takes its place. If we group all children with a “specific learning disability” together, we do them no favors. There are many reasons for reading failure; many are rooted in poor phonological skills, some are developmental, others comprehension, memory and on and on. Without using the word dyslexia, how can we hope to have our children classified and appropriately identified to receive the help that they need?

The International Dyslexia Association is a non-profit, scientific, and educational organization dedicated to the study and treatment of the learning disability, dyslexia as well as related language-based learning differences.” At the national level, IDA focuses on four essential areas: advocacy, information and referral, parent support and outreach and standards and practices. On the local level, the Houston Branch offers a multitude of events, conferences, and resources such as an annual college panel in January, an annual spring conference, an annual fall symposium, regional group events, website, local telephone helpline for information and referral services, scholarships funds for teachers and parents to attend our conferences and symposium, scholarship fund for educational diagnostic testing, this free Resource Directory and so on. We are very lucky to have an active Board of Directors and Advisory Council who volunteer their time to provide these services for the Houston community. As the new President of the branch, I am grateful for their knowledge and expertise across a spectrum of disciplines to help grow the branch to meet the needs of the people we serve.

Within the pages of this Resource Directory you will have at your disposal what dyslexia is and how to look for the early signs in young children, articles from speakers from the spring conference, and local sources. Keep this in a place where you can reference it often. Take an extra copy for your school counselor or principal. Share one with your neighbor.

If you have not joined the International Dyslexia Association, I would encourage you to do so there has never been a better time. As an advocate or professional in the field of dyslexia, this is the organization you want to be a part of. The information that is distributed in the quarterly publication of “Perspectives on Language and Literacy” is worth your membership alone.

We are very fortunate to live in one of the few states that has a dyslexia law. However, there is still much to be done, so that what is mandated at the state level can be implemented at the local level.

May 2012 be a year of words – words to increase our knowledge, words to bring us comfort, and words to live by.

Karene Groesbeck
President, HBIDA
New imaging research shows that the reduced brain activity associated with the onset of dyslexia appears to develop before, not after, a child starts to read.
Two Poems inspired by Dyslexia by Dr. E. Baxter M.D

Dyslexia: Middle and High Schools Don’t Have to be a Nightmare

Bringing Speech Recognition to Reading Instruction

The Play of Children: Lessening Stress and Increasing Self-Control

Anxiety in Children with Social Cognitive Difficulties

Just the Facts... A Parent’s Guide to Effective Instruction

Just the Facts... Spelling
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 dyslexic person 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, dyslexics 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 LD 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 who are very bright can be dyslexic. They are often capable or even gifted in areas that do not require strong language skills, such as art, computer science, design, drama, electronics, math, mechanics, music, physics, sales, and sports.

In addition, dyslexia runs in families; dyslexic parents are very likely to have children who are dyslexic. Some people are identified as dyslexic 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 dyslexics 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.

How is dyslexia diagnosed?

Schools may use a new process called Response to Intervention (RTI) to identify children with learning disabilities. Under an RTI model, schools provide those children not readily progressing with the acquisition of critical early literacy skills with intensive and individualized supplemental reading instruction. If a student’s learning does not accelerate enough with supplemental instruction to reach the established grade-level benchmarks, and other kinds of developmental disorders are ruled out, he or she may be identified as learning disabled in reading. The majority of students thus identified are likely dyslexic and they will probably qualify for special education services. Schools are encouraged to begin screening children in kindergarten to identify any child who exhibits the early signs of potential reading difficulties. In Texas, schools are required by law to do this.

For children and adults who do not go through this RTI process, an evaluation to formally diagnose dyslexia is needed. Such an evaluation traditionally has included 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 names. 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 dyslexic readers, 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 Testing for Dyslexia 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 dyslexic individuals “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 dyslexics 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 are dyslexic. 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 life-long condition. With proper help, many people with dyslexia can learn to read and write well. Early identification and treatment is the key to helping dyslexics 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. When students with dyslexia receive academic therapy outside of school, the therapist should work closely with classroom teachers, special education providers, and other school personnel.

Schools can implement academic accommodations and modifications to help dyslexic students 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 taped tests or allow dyslexic students to use alternative means of assessment. Students can benefit from listening to books on tape and using the computer for text reading programs and for writing.

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.
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 it 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.

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.

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 at an impartial due process hearing (see definitions below) that its evaluation is appropriate.

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.

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.

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.

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.

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.

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.

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 their 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.

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Is My Child Dyslexic?

Individuals with dyslexia have trouble with reading, writing, spelling and/or math even though they have the ability and have had opportunities to learn. Individuals with dyslexia can learn, but they often need specialized instruction to overcome the problem. Often these individuals, who have talented and productive minds, are said to have a language learning difference.

from THE INTERNATIONAL DYSLEXIA ASSOCIATION.
Common characteristics of dyslexia

Most of us have one or two of these characteristics. That does not mean that everyone has dyslexia. A person with dyslexia usually has several of these characteristics that persist over time and interfere with his or her learning.

**Oral language**
- Late learning to talk
- Difficulty pronouncing words
- Difficulty acquiring vocabulary or using age appropriate grammar
- Difficulty following directions
- Confusion with before/after, right/left, and so on
- Difficulty learning the alphabet, nursery rhymes, or songs
- Difficulty understanding concepts and relationships
- Difficulty with word retrieval or naming problems

**Written language**
- Misreading or omitting common short words
- “Stumbles” through longer words
- Poor reading comprehension during oral or silent reading, often because words are not accurately read
- Slow, laborious oral reading

**Reading**
- Difficulty learning to read
- Difficulty identifying or generating rhyming words, or counting syllables in words (phonological awareness)
- Difficulty with hearing and manipulating sounds in words (phonemic awareness)
- Difficulty distinguishing different sounds in words (phonological processing)
- Difficulty in learning the sounds of letters (phonics)
- Difficulty remembering names and shapes of letters, or naming letters rapidly
- Transposing the order of letters when reading or spelling

**Other common symptoms that occur with dyslexia**
- Difficulty naming colors, objects, and letters rapidly, in a sequence (RAN: rapid automatized naming)
- Weak memory for lists, directions, or facts
- Needs to see or hear concepts many times to learn them
- Distracted by visual or auditory stimuli
- Downward trend in achievement test scores or school performance
- Inconsistent school work
- Teacher says, “If only she would try harder,” or “He’s lazy.”
- Relatives may have similar problems
Common characteristics of other related learning disorders

Dysgraphia (Handwriting)
- Unsure of handedness
- Poor or slow handwriting
- Messy and unorganized papers
- Difficulty copying
- Poor fine motor skills
- Difficulty remembering the kinesthetic movements to form letters correctly

Dyscalculia (Math)
- Difficulty counting accurately
- May misread numbers
- Difficulty memorizing and retrieving math facts
- Difficulty copying math problems and organizing written work
- Many calculation errors
- Difficulty retaining math vocabulary and concepts

Dyspraxia (Motor skills)
- Difficulty planning and coordinating body movements
- Difficulty coordinating facial muscles to produce sounds

Executive Function/Organization
- Loses papers
- Poor sense of time
- Forgets homework
- Messy desk
- Overwhelmed by too much input
- Works slowly

If your child is having difficulties learning to read and you have noted several of these characteristics in your child, he or she may need to be evaluated for dyslexia or a related disorder.

What kind of instruction does my child need?

Dyslexia and other related learning disorders cannot be cured. Proper instruction promotes reading success and alleviates many difficulties associated with dyslexia. Instruction for individuals with reading and related learning disabilities should be:
• Intensive – given every day or very frequently for sufficient time.

• Explicit – component skills for reading, spelling, and writing are explained, directly taught, and modeled by the teacher. Children are discouraged from guessing at words.

• Systematic and cumulative – has a definite, logical sequence of concept introduction; concepts are ordered from simple to more complex; each new concept builds upon previously introduced concepts, with built in review to aid memory and retrieval.

• Structured – has step-by-step procedures for introducing, reviewing, and practicing concepts.

• Multisensory – links listening, speaking, reading, and writing together; involves movement and “hands on” learning.

Suggested Readings


The International Dyslexia Association thanks Suzanne Carreker for her assistance in the preparation of this fact sheet.

“Promoting literacy through research, education and advocacy”™

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Promoting Success: Early Indicators of Learning Disabilities in Preschool Children

Background
Approximately five percent of all children of school age in public schools in the United States are identified as having a learning disability and are receiving some form of educational support services (LD at a glance, n.d.). With so many school-aged children identified as having learning disabilities, it is important to consider how learning disabilities develop and impact young children. If we understand how learning difficulties manifest in young children, parents, teachers, and other professionals can pick up on early signs of difficulty and offer additional support as needed. This article summarizes the research on skills and behaviors that seem to be early indicators or precursors of learning disabilities in pre-kindergarten children (ages 3-5). Understanding these skills and behaviors will help us recognize children who may be experiencing difficulty so we can provide additional support placing the child on an early pathway for success.

Children may exhibit observable behavior patterns in early childhood that foreshadow learning disabilities (Lowenthal, 1998; Steele, 2004). Early intervention and educational support before children enter school may smooth the transition allowing them to be more successful in kindergarten and beyond. Although children may not be formally identified as having a learning disability until they reach school-age, quick and cost-effective screening measures could be used in preschool to recognize children who may be at risk for a learning disability (Satz & Fletcher, 1988). In a model such as Response to Intervention, screening occurs multiple times each year in order to determine whether children are making adequate progress on key skills, early literacy skills in particular (Coleman, Buyssse, & Neitzel, 2006). When parents, teachers, and other professionals are able to identify behaviors in pre-kindergarten-age children that indicate they might be struggling with learning, early intervention can be provided to respond to those needs. The skills and behaviors that contribute to academic success or to learning disabilities in young children have been identified through conceptual literature as well as research. Conceptual descriptions of precursors of learning disabilities include a wide variety of behaviors relating to deficits in language and literacy skills (Joshi, 2003), memory, social-emotional, self-regulation, and motor skills (Lowenthal, 1998). Catts and Hogan (2003) argue that developmental language impairment in early childhood is the most reliable sign of a potential reading problem, while others suggest that skills such as name-writing could be indicative of early literacy skills (Haney, 2002). Aspects of a child’s temperament, such as activity...
level and attention span, also may impact learning (Teglasi, Cohn, & Meshbesher, 2004).

Although relatively few research studies have specifically investigated early indicators of learning disabilities, many have contributed to the pool of knowledge by investigating predictors of achievement or academic skills and discussing the low end of the spectrum of skills and achievement as it relates to learning difficulty (e.g., Badian, 1982; Ellis & Large, 1987; Gilbertson & Bramlett, 1998). The skills and behaviors identified by researchers as early indicators of learning disabilities can be grouped into six general skill categories: language, literacy, early math, social-emotional, self-management, and perceptual motor. The skills identified give us an idea of which areas to focus on when screening and assessing young children in pre-kindergarten and the early school years.

Language Skills

Early language skills appear to be one of the most important contributors for future reading and academic success. Skills such as sound blending (e.g., c/a/t makes cat), rhyming, discrimination of beginning sounds, morphology (i.e., combining words, word stems, and affixes to express meaning), and speech comprehension have contributed to children’s reading skills and ability up to several years after initial assessment (Ellis & Large, 1987; Felton, 1992; Gilbertson & Bramlett, 1998; Olofsson & Niedersoe, 1999). Children’s vocabulary also has been identified as a predictor of reading skills (Ellis & Large, 1987; Olofsson & Niedersoe, 1999). Receptive language measures have been found to predict overall academic achievement (Agostin & Bain, 1997). Other studies identified Rapid Automatized Naming (RAN) of letters and objects as a predictor of reading skills (Blumsack, Lewandowski, & Waterman, 1997; O’Malley et al., 2002). Additionally, children at risk for disabilities have been shown to have lower phonological awareness skills than their peers who were not at risk (Most et al., 2000).

Early Literacy Skills

Early literacy skills also contribute to learning difficulty or disability. Phonological awareness and phonological processing skills have been found to play a role in reading ability or at risk status (Badian, 1994; Most et al., 2000). Other skills identified as predictors of reading ability or skills include letter sounds knowledge, discrimination of beginning sounds, phoneme awareness (e.g., understanding “cat” is made up of /c/, /a/, /t/), phoneme manipulation, printing letters, spelling, and sentence construction (Blumsack, Lewandowski, & Waterman, 1997; Ellis & Large, 1987; Felton, 1992; Gilbertson & Bramlett, 1998; Mann & Foy, 2003; Olofsson & Niedersoe, 1999). Additionally, children at risk for disabilities have been shown to have lower phonological awareness skills than their peers who were not at risk (Most et al., 2000).

Early Math Skills

A number of early math skills have been identified that contribute to future mathematical ability or disability as well. Children with math disabilities have exhibited deficits in numeric processing (Mazzocco & Thompson, 2005). These deficits can manifest themselves in observable ways, such as immature counting strategies or inability to read numerals. Additionally, the counting subtest in one study was identified as a predictor of reading ability (Badian, 1983).

Social Emotional Skills

Consistent with some of the conceptual descriptions of learning disabilities, research finds evidence that children at risk for and with disabilities exhibit some social-emotional difficulties. Most and colleagues (2000) found that children at risk for disabilities were less socially accepted by their peers and had a lower sense of coherence.
than their peers without disabilities. Additionally, work-related social skills, including participation in groups, appear to contribute to academic success (McClelland & Morrison, 2003; McClelland, Morrison, & Holmes, 2000). This suggests that children with disabilities or those who are at risk for disabilities may have difficulty with skills like cooperation.

**Self-Management Skills**

In addition to cooperation, the construct of work-related social skills includes many behaviors relating to self-management skills. Skills such as staying on task, organizing work materials, and listening and following directions also contribute to academic performance (McClelland & Morrison, 2003; McClelland, Morrison, & Holmes, 2000). Not surprisingly, self-control has also been found as a predictor of school success (Agostin & Bain, 1997). Additionally, the ability to maintain attention to a task has been identified as a discriminator between children with and without learning disabilities (Blumsack, Lewandowski, & Waterman, 1997). Again, the findings of these studies are consistent with conceptual descriptions of learning disabilities that take into account self-management skills that help children succeed in school (Lowenthal, 1998).

**Perceptual Motor Skills**

The final area in which skills that contribute to academic outcomes have been identified is perceptual motor. Skills such as working memory, visual analogical reasoning (i.e., visually comparing new and understood concepts in order to gain an understanding of the new concept), and visual memory appear to contribute to academic skills later (Agostin & Bain, 1997; Holopainen, Ahonen, & Lyytinen, 2001). Additionally, children classified as poor readers have been found to have deficits in visual memory (Badian, 1994). The ability to follow multi-step directions also has been identified as a discriminator between children with and without learning disabilities (Blumsack, Lewandowski, & Waterman, 1997). Finally, children identified as learning disabled have been shown to have deficits in perceptual discrimination (e.g., identifying speech sounds) and visual motor integration (e.g., hand-eye coordination) (O’Malley et al., 2002).

There is much evidence showing the contribution of language and early literacy skills to reading and academic outcomes and a growing body of evidence identifying the importance of social and adaptive contributions to aspects of life in a classroom for children’s success. The research summarized suggests that children may exhibit difficulty in one or more areas and that early assessment should look at the whole child.

**Conclusions and Recommendations**

The research described above provides evidence that it is possible to identify children who are at risk for learning disabilities or difficulties as young as pre-kindergarten. Evidence also supports the positive effects of early intervening to promote children’s school success. Ongoing screening and assessment is needed for teachers, parents, and specialists to recognize children who may show signs of struggle in the areas identified as early indicators of learning disabilities. Once areas of difficulty are recognized, targeted intervention responses may help prevent emerging problems from developing into learning disabilities. It is possible that early recognition of and response to children’s needs may have an immediate impact on the number of children referred for special education.

It is also evident that in order to effectively screen children for learning difficulties or emerging disabilities, we must know more about how learning disabilities develop and manifest in young children. The literature included in this article provides a foundation for understanding the early indicators of learning disabilities. However, longitudinal studies are necessary to understand the processes underlying the development of learning disabilities at various ages leading up to school entry. We must also learn more about the most effective strategies for intervening with young children to prevent learning difficulties from turning into learning disabilities.

Recognition of the early indicators of learning disabilities is important, however it is a “means” and not an “end.” The recognition of early indicators of learning disabilities becomes powerful only if parents and professionals use this knowledge appropriately by intervening early. When recognition of a child’s needs is combined with appropriate responses early, we cannot only prevent failure — we can promote success.

Margaret C. Gillis, Ph.D., is a Visiting Assistant Professor of early childhood education in the Department of Human Development and Family Studies at the University of North Carolina at Greensboro. Dr. Gillis is one of the developers of the Early Learning Observation and Rating Scale (ELORS), a tool designed to help parents and professionals recognize young children who may be at risk for learning disabilities.

REFERENCES


New imaging research shows that the reduced brain activity associated with the onset of dyslexia appears to develop before, not after, a child starts to read.

Key parts of the brain’s rear left hemisphere critical to language processing do not undergo activity changes as a consequence of dyslexia, the study suggests, but may instead be part of the cause.

The finding could ultimately help clinicians screen for at-risk children at an early pre-reading age, when interventions to reduce the severity of the condition might be most effective.
“We already knew that children and adults with a diagnosis of dyslexia show brain alterations within the left posterior—back—part of the brain,” said study co-author Nadine Gaab, an assistant professor of pediatrics in the neuroscience program at Harvard Medical School and Children’s Hospital Boston. "However, it was unclear whether these alterations are a result of dyslexia [that] show up after years of reading failure or whether they predate the reading onset," she noted.

"[Here] we could show that they predate reading onset,” Gaab said. “This suggests that children are either born with it or that it develops within the first few years of life.”

The study, published in the Jan. 23 issue of the Proceedings of the National Academy of Sciences, focused on 36 healthy kindergarteners aged 5 and 6 years who had not begun to read.

Half of the children were at a high risk for developing dyslexia, as at least one of their immediate family members had been previously diagnosed with the disability. None of the children had difficulty with hearing or vision, and none had a history of either neurological or psychological illness.

After completing standard pre-reading language and vocabulary skills assessments, all of the children participated in a couple of audio-identification tasks. First, they were asked to listen to a male or female voice uttering a single word twice and then indicate if the two words sounded the same. Next, they listened to a pairing of words and were asked to indicate if the gender of the voice uttering each successive word was the same.

Throughout the testing, the children also underwent functional MRI (fMRI) to monitor their brain activity, with particular focus on two regions of the rear, left brain: the bilateral occipitotemporal and left temporoparietal areas. Both have previously been shown to have a role in dyslexia.

The results: Children in the at-risk group were found to have reduced brain activity in the two key brain areas, compared to their peers with similar age and IQ who did not have family risk factors.

In addition, the research team found that among at-risk pre-reading children there was no evidence of activity increases in key frontal lobe brain regions previously linked to dyslexia. This, they said, suggested that the brain’s method for trying to compensate for the problems associated with dyslexia does not appear to be set in motion until after children begin to read.

“Early identification of children at risk in kindergarten or even before then offers a chance to reduce the clinical, psychological and social implications of reading disability/dyslexia,” Gaab said. "Identifying early predictors will also help educators, parents and scientists to find ways to support the academic and cognitive development of children with reading disability/dyslexia and may also lead to strategies that will reduce the severity of reading disability.”

Guinevere Eden, director of the Center for the Study of Learning and a professor of pediatrics at Georgetown University in Washington, D.C., expressed enthusiasm for what she deemed to be ‘the first study of its kind.”

“The question has always been, are these physiological changes the result of dyslexia or are they there to begin with?” said Eden, who is also the immediate past-president of the International Dyslexia Association.

“And so what’s interesting about this study, is that by using non-invasive tools, they were able to find that the kind of differences that have been shown in older people with dyslexia are apparently already present in children at risk for dyslexia before they even begin to read,” Eden said.

“And that means they have found a physiological signature for a child who is likely at risk for dyslexia, which will be of great help in doing what everyone really wants to do: identifying and treating children with dyslexia as early as possible,” Eden added.

**SOURCES:** Nadine Gaab, Ph.D., assistant professor of pediatrics, Laboratories of Cognitive Neuroscience, Harvard Medical School and Children’s Hospital Boston; Guinevere Eden, D.Phil., director, Center for the Study of Learning, and professor of pediatrics, Georgetown University, Washington, D.C., and immediate past-president International Dyslexia Association; Jan. 23, 2012, Proceedings of the National Academy of Sciences

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Some school-age children struggle with mathematics, routinely experiencing difficulty in learning or remembering basic arithmetic facts and carrying out even the seemingly most elementary numerical operations (Berch & Mazzocco, 2007).

Such difficulties are compounded when students are expected to build upon these basics skills as they are introduced to increasingly abstract, mathematical content domains. Consider a letter published in the Washington Post written by a seventh-grade teacher not that long ago:

Many of the seventh graders I teach have a poor sense of numbers. They don’t understand that adding two numbers results in a larger number, that multiplication is repeated addition, that $5 \times 6$ is larger than $5 \times 4$ or that one quarter is smaller than one half. This lack of basic math facts detracts from their ability to focus on the more abstract operations required in math at a higher level” (Susan B. Sheridan, Washington Post, December 27, 2004).

What are the key factors contributing to this state of affairs? Is the problem due primarily to poor instruction, or is there something inherently difficult about learning even basic arithmetic because of the ways in which the developing child’s mind works?

Have we been able to trace the origins of extremely low math performance that would warrant the diagnosis of a mathematical learning disability?

And do effective remedial approaches exist for improving the mathematics achievement of such children?

As it turns out, definitive answers to these weighty questions still elude us. Nonetheless, progress is being made on a number of fronts, especially in the study of the fundamental cognitive processes that underlie mathematical thinking in general and those that are crucial for achieving proficiency in carrying out arithmetic calculations in particular. In this article, I will review what we have learned about the contributions of an especially important factor known as “working memory,” along with the difficulties which can arise for students who exhibit weaknesses if not...
outright deficits in the full complement of skills comprising this construct.

**Introduction to the Concept of Working Memory**

Precisely what do we mean when invoking the concept of working memory? As this cognitive construct actually encompasses several mental operations, definitions of working memory tend to vary considerably (Dowker, 2005; Shah & Miyake, 1999). Furthermore, although this concept seems comparatively straightforward at one level, it turns out to be much more complicated at another. Such a view is shared by many, including Susan Pickering, a leading researcher in this field who acknowledged that “The concept of working memory is both reassuringly simple and frustratingly complex” (2006, p. xvi).

As a consequence, it may prove instructive to present an example of how working memory can influence arithmetic problem solving before providing a definition. To begin with, consider the following quote taken from Lewis Carroll’s *Through the Looking-Glass* (1871) which Kaufman (2010) describes as “A working memory lapse in Wonderland” (p. 153): “‘And you do addition?’ the White Queen asked. ‘What’s one and one and one and one and one and one and one and one and one and one and one and one?’ ‘I don’t know,’ said Alice, ‘I lost count.’”

Although it is doubtful that Alice’s failure to solve this problem is attributable to a mathematical learning disability, the example illustrates nicely some of the key components of working memory depicted in Figure 1. That is, in order not to lose count when attempting to solve such a problem, an individual would have to: a) focus attention on each new addend as it is presented, b) manipulate the information by mentally adding the “ones,” and at the same time, c) selectively maintain some of the information (in this case, the most recent prior sum) in temporary mental storage, and d) complete all of these tasks within the span of a few seconds. In other words, working memory is probably best defined as a limited capacity system responsible for temporarily storing, maintaining, and mentally manipulating information over brief time periods to serve other ongoing cognitive activities and operations. In essence, it constitutes the mind’s workspace.

Getting back to the White Queen’s arithmetic problem, while adding single digits should be comparatively easy for most typically achieving seven-and-a-half-year-olds (Alice’s age), it is evident from this example that one can excessively tax working memory by requiring a learner to simultaneously attend, store, and mentally process a rather large amount of information (albeit elementary in some sense) within a relatively short period of time. As Susan Gathercole, another leading researcher in this field has pointed out, overloading this fragile mental workspace can lead to “complete and catastrophic loss of information from working memory” (Gathercole, 2008, p. 382).

> **... working memory is probably best defined as a limited capacity system responsible for temporarily storing, maintaining, and mentally manipulating information over brief time periods to serve other ongoing cognitive activities and operations.**

Obviously, no teacher would deliberately choose to overload his or her students’ working memory capacity. Nevertheless, mathematical information can sometimes be presented in a manner (e.g., orally or in textbooks) that inadvertently strains the processing capacity of students. Practitioners can learn to readily avoid these situations if they are furnished with some basic information about the nature of working memory, its limitations,

and the ways in which students can differ with respect to its constituent skills. Accordingly, the purpose of this article is to provide non-specialists with a succinct overview of the latest research on this topic, which I have organized in a way that will hopefully shed light on some of the most important questions pertaining to the role of working memory in learning school mathematics, including: What are the ways in which working memory’s component skills can be measured? How do limitations in working memory contribute to the development of mathematical learning difficulties and disabilities? And finally, what kinds of instructional interventions or remedial approaches are available for mitigating the detrimental effects of working memory limitations on mathematics achievement?

How Are Working Memory Skills Measured?

Children’s working memory skills are customarily assessed with a variety of what are referred to as “simple” and “complex” span tasks. Simple span tasks are used to measure the short-term storage capacity of two types of domain-specific representations: verbal and visuospatial. To appraise the former, a reading or listening span measure is usually employed that entails the recall of word or number sequences; when assessing the latter, either the recall of random block-tapping sequences or randomly filled cells in a visual matrix or grid is typically required.

In contrast, complex span tasks gauge domain-general, central attentional resources by imposing substantial demands both on mental storage and processing (Holmes, Gathercole, & Dunning, 2010). As I have described elsewhere (Berch, 2008), a particularly representative example of such a measure is the Backward Digit Span task in which a random string of number words is spoken by the examiner (e.g., saying “seven, two, five, eight...”), and the child must try to repeat the sequence in reverse order. Note that rather than simply having to recall the numbers in the same forward order (which is considered a measure of the short-term, verbal storage component per se), the backward span task requires that the child both store and maintain the forward order (i.e., verbal component) of the number words while simultaneously having to mentally manipulate this information to accurately recite the original sequence in the opposite order. It is this dynamic coordination and control of attention combined with the storing and manipulation of information in support of ongoing cognitive activities that I characterized earlier as being the sine qua non of working memory.

To carry out a comprehensive assessment of children’s working memory capacities, most researchers currently make use of one of two standardized batteries—the Working Memory Test Battery for Children (Pickering & Gathercole, 2001) or the Automated Working Memory Assessment (Alloway, 2007). As Holmes and her colleagues (2010) describe, each of these is comprised of several subtests, affording multiple assessments of different

<table>
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<th>Table 1: Principles of the Classroom-Based Working Memory Approach</th>
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<td><strong>Principles</strong></td>
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<tr>
<td>Recognize working memory failures</td>
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<tr>
<td>Monitor the child</td>
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<tr>
<td>Evaluate working memory loads</td>
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<tr>
<td>Reduce working memory loads</td>
</tr>
<tr>
<td>Repeat important information</td>
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<tr>
<td>Encourage use of memory aids</td>
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<tr>
<td>Develop the child’s own strategies</td>
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facets of working memory (e.g., central attentional resources as well as verbal and visuospatial short-term storage components). Additionally, these batteries permit the identification of children with poor working memory for their chronological age, based on existing norms.

Another technique for identifying children with poor working memory is derived from ratings provided by a child’s teacher, a prominent example being the Working Memory Rating Scale (Alloway, Gathercole, & Kirkwood, 2008). This measure consists of approximately 20 statements of problem behaviors such as “She lost her place in a task with multiple steps” and “The child raised his hand but when called upon, he had forgotten his response.” Teachers rate how typical each of these behaviors is of a given child using a four-point scale. Although this technique affords a fast and efficient method for initial identification of working memory problems in a school setting (Holmes et al., 2010), it is probably best used as one component of a comprehensive evaluation by the school psychologist. Furthermore, if need be, teachers can choose to make supplementary, informal observations for guiding adjustments to their instructional approaches with particular children.

**How Do Working Memory Limitations Contribute to Mathematical Learning Difficulties?**

As noted earlier, measures of working memory are usually designed to assess one or more of three presumed subsystems comprising what is known as a multicomponent model: a domain-general, limited capacity central executive that governs the storage and temporary maintenance of information in two domain-specific representational subsystems—the phonological loop and visuospatial sketchpad—by means of attentional control (Baddeley, 1990, 1996; Baddeley & Hitch, 1974). To date, the vast majority of investigations aimed at determining particular relationships between various working memory skills and mathematics learning or performance have been based on this model.

Such relationships have been studied in children ranging from preschool age to adolescence, and for math skills extending from the very basic (e.g., numerical transcoding—writing an Arabic numerical in response to hearing a number word, counting, numerical magnitude comparison, and single-digit addition and subtraction) to more complex mathematical operations and content domains, such as multidigit arithmetic, rational numbers, and algebraic word problem solving. Furthermore, according to Raghubar, Barnes, and Hecht (2010), numerous other factors may influence and therefore complicate the interpretation of findings pertaining to the relations between working memory and math performance, including but not limited to skill level, language of instruction, how math problems are presented, the type of math skill at issue, whether that skill is just being acquired or has already been mastered, the type of working memory task administered, and the kinds of strategies that different-aged children operating at diverse skill levels may employ for a given task.

Consistent with this perspective, Geary and his colleagues (Meyer, Salimpoor, Wu, Geary, & Menon 2010) highlighted the importance of their findings that the contributions of particular components of working memory to individual differences in mathematics achievement can vary with grade level or the type of math content being assessed. More specifically, these researchers showed that the central executive and phonological loop play a more important role in facilitating mathematics performance for second graders, while the visuospatial sketchpad does so for third graders. Furthermore, they provide a compelling argument that this grade-level difference is attributable to instruction and practice rather than a developmental change in working memory capacity.

All this being said, earlier reviews of research on this topic (DeStefano & LeFevre, 2004; Swanson & Jerman, 2006) along with more recent ones (Geary, 2010; Raghubar et al., 2010) have yielded reasonably clear evidence of a generally strong association between working memory capacity and mathematics performance. Indeed, even the leading proponent of the view that the development of mathematical learning disabilities is attributable to a deficit in a domain-specific, inherited system for coding the number of objects in a set has recently acknowledged that the domain-general, central executive functions of working memory are at the very least associated (i.e., correlated) with arithmetic learning and performance (Butterworth, 2010). What is the nature of this relationship? As Geary (2010) concludes after reviewing the findings, the greater the capacity of the central executive, the better the performance both on cognitive mathematics tasks and math achievement tests (Bull, Espy, & Wiebe, 2008; Mazzocco & Kover, 2007; Passolunghi, Vercelloni, & Schadee, 2007). Furthermore, Geary notes that the phonological loop seems to be important for verbalizing numbers, as in counting (Krajewski & Schneider, 2009) and in solving math word problems (Swanson & Sachse-Lee, 2001).
Although studies have also shown that children with either math learning difficulties or disabilities exhibit deficits in all three working memory subsystems, Geary (2010) concludes that impairment in their central executive appears to be particularly troublesome (Bull, Johnston, & Roy, 1999; Swanson, 1993). However, Geary also observes that the interpretation of these findings is complicated by the fact that at least three purported subcomponents of the central executive (i.e., inhibition, updating, and attention shifting) have been found to influence math learning in different ways (Bull & Scerif, 2001; Murphy, Mazocco, Hanich, & Early, 2007; Passolunghi, Cornoldi, & De Liberto, 1999; Passolunghi & Siegel, 2004).

In summing up what researchers have learned about associations between working memory and math learning disabilities, Geary (2010) affirms that: “At this point, we can conclude that children with MLD have pervasive deficits across all of the working memory systems that have been assessed, but our understanding of the relations between specific components of working memory and specific mathematical cognition deficits is in its infancy” (p. 62).

What Kinds of Interventions or Remedial Approaches Exist for Improving Working Memory?

In a review of techniques used to date for mitigating the difficulties encountered by children who have poor working memory, Holmes and her colleagues (2010) grouped these under three main approaches: 1) a classroom-based intervention that consists of encouraging teachers to adapt their instructional approaches in ways that minimize working memory loads; 2) training designed to teach children to make use of memory strategies for improving the efficiency of working memory, and 3) training aimed directly at improving working memory through the use of an adaptive computerized program that involves repeated practice on working memory tasks.

The classroom-based intervention is founded on a set of seven principles that originated from both classroom practice and cognitive theory (Gathercole, 2008) and are summarized in Table 1. Recently, a research team carried out an evaluation over a one-year period of two forms of this intervention aimed at primary school children with poor working memory (Elliott, Gathercole, Alloway, Holmes, & Kirkwood, 2010). Although there was no evidence that the intervention programs directly improved either working memory or academic performance, the extent to which teachers implemented these seven principles was predictive of their students’ mathematical (and literacy) skills. Furthermore, teachers were reportedly very pleased about the ways in which the intervention had improved their own understanding and practice (which exemplifies the kind of mathematics knowledge enhancement that Murphy and her colleagues (this issue) promote for all teachers). Additional studies exploring how best to implement this kind of intervention are clearly warranted if we are to determine the optimal ways for practitioners to enhance children’s mathematics achievement through the strengthening of working memory skills.

. . . the extent to which teachers implemented these seven principles (of working memory intervention) was predictive of their students’ mathematical (and literacy) skills.

With respect to the strategy training approach, the kinds of memory strategies children have been taught to use include repetitively rehearsing information, generating sentences from words or making up stories based on them, or creating visual images of the information (Holmes et al., 2010). Strategy training incorporating all of these techniques was recently administered to children ranging in age from five to eight years old in two sessions per week over a six-to-eight-week period using a computerized adventure game (St. Clair-Thompson, Stevens, Hunt, & Bolder, 2010). Although training significantly enhanced both verbal short-term memory and working memory, there were no gains in visuospatial short-term memory. More relevant to the focus of this article, performance on a mental arithmetic task improved significantly. Furthermore, all of these gains were evidenced by children with poor working memory as well as those with average working memory. Nevertheless, no significant changes emerged on standardized assessments of arithmetic or other mathematical domains either immediately following training or five months afterward.

Finally, according to Holmes and her colleagues (2010), the most impressive gains in working memory obtained thus far have resulted from a direct training program developed originally for use with children with attention deficit hyperactivity disorder (ADHD; Klingberg et al., 2005; Klingberg, Forssberg, & Westerberg, 2002). Children undergoing this intensive training regimen participate in a variety of computerized tasks designed to repeatedly tax their working memory capacity (i.e., requiring simultaneous storage and manipulation of
begun to explore the most promising strategies that can be implemented to enhance the working memory skills most relevant for improving students’ mathematical learning and performance. Finally, I hope that the information provided here will be of some use to those of you who teach in identifying working memory limitations in your students, modifying the instructional environment to minimize extraneous or distracting information that might interfere with efficient selective attention, and designing strategies for enhancing your students’ working memory skills.

Daniel B. Berch, Ph.D., is a Professor of Educational Psychology and Applied Developmental Science at the University of Virginia’s Curry School of Education. He has authored assorted articles and book chapters on children’s numerical cognition and mathematical learning disabilities, and is senior editor of the book (co-edited by Dr. Michele Mazzocco), Why Is Math So Hard for Some Children? The Nature and Origins of Mathematical Learning Difficulties and Disabilities. Dr. Berch served on the National Mathematics Advisory Panel commissioned by President George W. Bush and is a member of the National Center for Learning Disabilities Professional Advisory Board.

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Can’t read.
Can’t spell
Can’t find
Right

Which hand
Is right?
Wrong?
Right!

Hard
To make
A sentence
Right

Hard
Not to be
Wrong
Right?

Dyslexia
Is even
Hard to spell
Right!

My Dyslexia allows more
Sensitivity
Of mistakes in others
Of missed grammar
Of wrong turns
And slow reading
In others

So
No laughing at others
With falls or stutters
My Dyslexia is
Sensitive
To others!

DR. DON BAXTER 8/11/11

DONALD E. BAXTER, M.D., an Orthopedic Surgeon in Houston, Texas, is internationally known for his original procedures and anatomical discoveries (Nerve of Baxter). He has been a clinical professor at University of Texas and Baylor Medical Schools, teacher of many well-known Orthopedic Foot and Ankle Surgeons, and visiting professor in 27 states and 10 countries. As the author of 40 peer review articles and two medical textbooks, Dr. Baxter has gone outside the box to overcome his dyslexia.
As a teacher, school counselor, and child and adolescent psychologist over the past 20 years, I have listened to the stories of hundreds of students. This article is designed to answer some of the questions that you may have from hearing these tales.

Adolescence tends to be a double-edged sword. It is great to be granted more independence, freedom, later curfews, and more time with friends. However, getting older also comes with its share of stressors: increased workload at school, busy schedules, and the importance of good grades. Having dyslexia helps with creativity and “out of the box thinking,” but it sure doesn’t help with getting all of the schoolwork done. Students are often bewildered and perplexed about scheduling of classes, dealing with teachers, and handling peer relationships. My answer to the perplexed, is always “Know and be true to yourself.” As a student with dyslexia, it is important to know yourself, where you want to go and how to get there.

The path of understanding begins with knowing yourself. To know yourself, you need many different experiences to help you figure out what you do well and what things are hard for you. School is just one part of life and one role that you play. To know yourself well, it is a good idea to understand yourself in different roles by participating in out-of-school activities like sports, clubs, volunteering, helping out at home and part-time jobs. This helps you to learn about your strengths and preferences. Understanding yourself this way will encourage you to stay focused on how school can help you prepare for activities that you may enjoy pursuing after high school. Owning and accepting your dyslexia makes it easier to explain to friends, teachers and employers.

Make a list of your strengths, and treasure them!
Write a speech that you can memorize that explains what dyslexia is and how you deal with it if you need to describe it to others.

First, set yourself a goal! It is important to be involved in your IEP meetings. At first, setting goals and making plans may seem challenging, however, the more that you observe others setting goals and following plans, the more that you will learn about the process. Many students need direct instruction from a counselor or psychologist in planning skills along with support from parents, teachers or coaches.

Once you have a plan in place, begin taking the steps necessary to achieve your goal. It’s important to communicate your plan with others in order to ensure you have the support you’ll need.

Finally, take action and review and monitor your progress! Here’s a personal story of one student’s success:

My name is Elizabeth. I learned how to take charge of my IEP because my mom, my special education teacher and my counselor helped me. In middle school we all talked, and we decided together that it was time for me to learn steps that would help me become more independent. I knew that this would help me, because I looked forward to being an architect when I graduated. My counselor said, “You, know your mom won’t be able to go to college with you.” She was smiling when she said that. It sounded like she was joking when she said that, but I realized then that I needed to be more independent so that I could handle myself. By high school I had learned a lot of things that helped me take charge. I sent out invitations to my IEP meetings to my teachers and parents. At the meetings, I would discuss my progress in each subject. I talked about things that were hard for me. My parents and teachers would share their records of my progress. I was so happy with myself. I could talk about my reading skills and how hard it sometimes seemed. They would remind me that I had made a good choice with architecture as this would allow me to display my special talents and creativity in drawing and organizing things spatially. Thank you mom and my special teachers for helping me be independent by helping me build my own skill set!

— ELIZABETH

DR. CADENHEAD is a Psychologist in the Houston area that specializes in counseling and evaluation for children and adolescents from age 18 months to 21 years of age. Her practice focuses on issues around Attention Deficit Hyperactivity Disorder, Anxiety, Depression, Trauma, Asperger’s Disorder, Adoption and Developmental Transitions. http://anurturinghome.com/index.html

So now you have a plan of action. What will you do now? Here is a sample plan for you to use. Good Luck!

<table>
<thead>
<tr>
<th>I Need to Know Myself</th>
<th>I Need to Know How to Plan Ahead</th>
<th>I Need to Know how to Express My Needs</th>
<th>I Need to Know how to Listen and Learn from Others</th>
<th>I Need to Know how to Monitor my Progress and Adjust my Goals when Necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is my preferred learning style</td>
<td>Develop a planning system to keep track of important dates in the future (when is my term paper due)</td>
<td>Do I express my needs in a calm way</td>
<td>Can I wait my turn to speak</td>
<td>Do I write out my goals on a daily, weekly, monthly basis</td>
</tr>
<tr>
<td>What are my learning strengths/weaknesses</td>
<td>Keep track of recurring obligations (when is my tutoring session)</td>
<td>Do I wait for others to decide for me</td>
<td>Do I value others’ opinions</td>
<td>Do I go back and check to see what I have accomplished</td>
</tr>
<tr>
<td>Learn about things that you like to do or might enjoy by volunteering, part-time jobs, observing others</td>
<td>Keep track of specific things you need to accomplish in the day</td>
<td>Do I yell at others to get what I want</td>
<td>Do I know how to reflect on what others say</td>
<td>Do I go back and reset my goals if necessary</td>
</tr>
<tr>
<td>Get a calendar and use it</td>
<td>Record academic and social obligations</td>
<td>Make out a daily/weekly/monthly/early calendar of obligations</td>
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28 HOUSTON BRANCH OF THE INTERNATIONAL DYSLLEXIA ASSOCIATION
Bringing Speech Recognition to Reading Instruction

by Marilyn Jager Adams

AS EVERYONE WHO FOLLOWS SUCH THINGS KNOWS, U.S. students, as a group, do not read very well. Yet, if you are among those who have read about this—indeed, if you are among those who are reading this Commentary, then you (and most of your friends, neighbors, relatives, and colleagues) are very likely a member of that subset of Americans I would term the “hyper-educated.”

By “hyper-educated,” I do not mean extraordinarily highly educated, though many are. By “hyper-educated,” I mean that you accept that becoming educated is part of the fabric of life; you never questioned that your children would be educated, and you raised them accordingly from the start. In fact, most of the children of hyper-educated Americans read quite well; that is good. Not so good, however, is a resulting tendency for too many of the hyper-educated to think of children with reading difficulties as the exception.

To the contrary, among U.S. students, it is good readers who are the exception. As documented yet again by the recently released National Assessment of Educational Progress, or NAEP, report on reading for 2011, only one in three U.S. students is able to read and understand grade-level material. Still worse, this statistic holds across school grades and has barely budged over as many years as NAEP has tracked it. Moreover, the degree of the literacy deficit is tightly correlated with

the extent to which children depend on school (as distinct from home) for their formal education. The irony, of course, is that the fundamental mission of public schooling is to offer educational opportunity-
including laying the foundation for reading well-to all children, regardless of what their homes might offer.

Toward this end, I have what some would call an unconventional idea for improving American children’s reading skills; specifically, embracing the use of voice-recognition software in our nation’s classrooms. It is a solution that will take the support of the “hyper-educated” so, please, hear me out.

It is not that our schools are performing more poorly than in years gone by, but that they have never been very good at teaching kids to read. Today’s students don’t read worse than those of yesteryear, but they read no better, either. The problem is that, today, the literacy demands for a productive, self-sufficient life have increased dramatically. Both individually and collectively, both socially and economically, the future of our country depends vitally on the education of its people.

Nor is it that we haven’t tried to fix this situation. As a recent example, the goal of the federal Reading First initiative was to make sure that all children would leave the primary grades having securely learned and understood the alphabetic basics. Coming at the problem from the other direction, the Common Core State Standards Initiative is centered on ensuring guidance and practice with more sophisticated and informative texts.

Both of these initiatives are important and well-founded, but there is also a lot that must happen in between the two. For students to grapple productively with the intellectual challenges of complex texts, they must first gain the ability to read with fluency and ongoing comprehension. It is with this intermediate challenge that most of our students fall by the wayside. In view of this, this intermediate reading period is where I chose to concentrate in a report released recently on technology for developing children’s language and literacy. I wrote the report for the Joan Ganz Cooney Center at Sesame Workshop with the support of the William and Flora Hewlett Foundation.

To most, it is obvious that learning to recognize printed words involves skills and practice specific to the written domain. Yet, this is equally true of the vocabulary, grammar, background knowledge, and modes of thought that characterize text. On every dimension, the comprehension requirements of written language are more demanding, less forgiving, and in many ways qualitatively different from those that characterize oral-language situations. And two overarching factors make this situation still tougher: The first is that, because the knowledge and skills required for reading and understanding written language are specific to written language, their acquisition can come about only through experience in reading and understanding written language. The second is that what has not been understood cannot be learned.

It follows that unless and until children can read and understand texts on their own, they need support and instruction to help them through the task. The obvious reason for providing such help is so students gain from the text at hand. The more important reason is so they will be better able to manage the next text on their own.

As I argue in the report, the real crux of the reading problem lies not with the teachers, the parents, the students, television, the Web, or any of the usual culprits to which blame is often passed. The problem instead is that the individual support required for helping children learn to read is way beyond the capacity of the traditional classroom. Children learn
remarkably quickly given the opportunity, but again, one cannot learn what one does not understand. No matter how she tries, the classroom teacher cannot give each of her 20 or so students the individual support on which learning to read depends.

With this issue in mind, the specific recommendation in the report is that our country get serious about developing speech-recognition-based reading software for our schools. This is not a pie-in-the-sky proposal. Today, people around the world, using dozens of languages, depend on automatic speech recognition for telephone call-routing and directory assistance. It is widely employed in dictation and information capture in the defense, health-care, and legal sectors. It is used for captioning live television so we can watch our favorite games in noisy sports bars, and by unnamed agencies for transcribing suspicious communications. It is used by people to talk to their computers and mobile devices, for example, while browsing the Web, creating voice commands, and managing their bookmarks. People use automatic speech recognition to issue commands to their cell phones and, in reverse, to ask their cell phones to transcribe their voice mail and send written copies to their email. They also use it to talk to their TVs, their music players, their cars, and their navigation systems. And, of course, speech recognition is very hot in the gaming industry.

In other words, automatic speech recognition is a technology that is mature and even commonplace in industry after industry, with the salient exception of where it is needed most: education. Whatever the economic or social value of the applications mentioned above, most pale in comparison to the potential of speech recognition as it could and should be used to help people learn to read and read to learn.

Given “ears,” the computer can listen to students as they read, offering help or prompting further thought at just the right moments, while making records of their progress and difficulties in the background. Such technology, in other words, could provide the individualized, one-on-one, interactive support and guidance on which becoming a reader so integrally depends.

In their potential for providing ample, affordable, effective reading support to every child, I believe that speech recognition-based reading applications should be a priority. Were we to redirect just a fraction of the time, genius, and creativity now devoted to developing ever more seductive ways for us to play games, to watch unwelcome ads, and otherwise to waste our time with our mobile devices and computers, we could do this. But until we somehow convince the hyper-educated to support such innovation, it will not happen.

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http://joanganzcooneycenter.org/upload_kits/jgcc_tech_for_language_and_literacy.pdf

(The report’s underwriter, the Hewlett Foundation, also provides grant support to Education Week.)
IN MY DISCUSSIONS WITH PARENTS AND TEACHERS
I increasingly hear an observation that should not
come as a revelation to anyone who interacts on
a regular basis with children, namely, that today’s
kids seem more stressed than those in previous
generations. This is not to minimize the reality that
children in the past were anxious, but rather that
in today’s world there appears to be a greater
prevalence of kids who are stressed out. Perhaps of
even greater concern is that this phenomenon is
becoming evident in younger and younger children.
In my travels it is not unusual for parents and
educators to express concern about the noticeable
worries that burden kindergarten age kids.

When I consult with schools one of my favorite
activities in addition to presenting during the day
with teachers and in the evening with parents is to
spend time observing classrooms and chatting with
students. I have been very impressed by the openness
of students of all ages to share their feelings and
thoughts with me. I frequently ask students about
their experiences at school and what advice they
would like me to offer their teachers and parents.
While I am not surprised by recommendations to
improve the quality of food in the cafeteria or to tell
parents not to nag about homework, I have listened
to kindergartners and first graders voice genuine
worry about getting good grades or getting into a
so-called good college. These comments are striking
coming from five and six-year-olds!

Some teachers wonder if they may be contributing
unintentionally to the angst of young children. A
kindergarten teacher told me, “All we talk about in
the teachers’ lounge is preparing kids for state-wide
tests. We feel that how our students do on these tests
is a reflection of our teaching. Some of my colleagues
teaching second and third grade have half-kiddingly
couraged me to begin to prepare the kids in
kindergarten to take tests so that their job will be easier when kids reach their classes. If you visit my class you would probably think I was teaching first-grade given the emphasis on academics. It seems we’re teaching academic material at younger ages at the expense of kids playing and having fun.”

I thought of this teacher’s remarks as well as similar observations while reading two articles, one in The Boston Globe titled “Pressure-Cooker Kindergarten’ by Patti Hartigan, the other in The New York Times titled “Can the Right Kinds of Play Teach Self-Control?” by Paul Tough. Both articles question the movement away from play towards academics in young children. (Readers may wish to read my November, 2006 article that addresses the importance of play in nurturing children’s emotional and cognitive growth.)

“Children Learning that They Are Dumb”

The Globe article examines the pressure felt by kindergarten children, noting, “Increasingly in schools across Massachusetts and the United States, little children are being asked to perform academic tasks, including test taking, that early childhood researchers agree are developmentally inappropriate, even potentially damaging. If children don’t meet certain requirements, they are deemed ‘not proficient.’ Frequently, children are screened before school begins, and some are labeled inadequate before they walk through the door...There is a growing disconnect between what the research says is best for children—a classroom free of pressure—and what’s actually going on in school.”

Renowned psychologist David Elkind, author of the bestselling The Hurried Child as well as Miseducation and The Power of Play, concurs that this disconnect exists, expressing that when children are required to engage in academic material at too early an age, they are basically being told that they are failures. Elkind offers a powerful comment. “We are sending too many children to school to learn that they are dumb. They are not dumb. They are just not there developmentally.”

I agree with Elkind’s perspective. Lest anyone misunderstand, I am not suggesting that if young children display developmental lags they should not be provided with services. I am a strong advocate of early intervention programs to facilitate the progress of children with documented developmental problems. However, early intervention does not imply trying to stuff information into children who are not ready to assimilate that information. Rather, intensive early intervention programs are effective when they are carefully administered to strengthen those skills in children that are significantly delayed.

Evidence for the Disconnect

Both The Boston Globe and The New York Times articles cite a recent report released by the nonprofit advocacy group Alliance for Childhood. The report, ‘Crisis in the Kindergarten: Why Children Need to Play in Schools,” examined the findings of nine studies of public school classrooms in the United States. Hartigan, referring to the report notes, “Kindergartners in the studies spent four to six times as much of the school day being drilled in literacy and math as they did playing. Recess has been truncated or has disappeared entirely in some schools, a double whammy, since children are stressed out by the demands and also deprived of their major stress reliever. The report cites study after study showing increasing stress, aggression, and other behavior problems, and even breakdowns.:

(I addressed the importance of having regularly scheduled physical activity in schools in my September, 2008 article, in which I highlighted the excellent book Spark by psychiatrist John Ratey.)

In his New York Times piece, Tough also quotes the Alliance for Childhood report. “Kindergarten has ceased to be a garden of delight and has become a place of stress and distress. There is too much testing and too little free time and kids are being forced to try to read before they are ready.” Tough notes that the authors of the report advocate an increase of “unstructured play” in kindergarten. “If kids are allowed to develop at their own paces, they will be happier and healthier and less stressed out. And there will still be plenty of time later on to learn how to read.”

Different Perspectives about Play

Many educators might be skeptical about the long-term benefits of a heavy reliance on “unstructured play,” arguing that little, if any, learning will transpire. Similar to most debates about educational practices, one must be careful not to adhere to extreme positions. To set up a dichotomy in which play...
and learning are cast as polar opposites is to blind oneself to the ways in which each can enrich the other. I believe that play activities provide many opportunities for learning and that learning is enhanced when the environment is characterized by fun and play.

Interestingly, some developmental experts believe that creating and applying a more structured form of play might bridge any seeming gap between play and learning. For example, Deborah Leong and Elena Bodrova in Denver have devoted their attention to developing systematic programs of play to nurture self-control in young children, a topic of great interest to me, having co-authored with my friend and colleague Dr. Sam Goldstein Raising a Self-Disciplined Child. As we discuss in our book, the emergence of self-regulation is a key skill that impacts on all areas of a child’s development.

Tough notes in his article that during the past 15 years Leong and Bodrova have drawn upon the teachings of famed Russian psychologist Lev Vygotsky and created a curriculum for prekindergarten and kindergarten students called Tools of the Mind. The program is now being used to teach 18,000 prekindergarten and kindergarten students in 12 states around the country.

Vygotsky envisioned as a major goal of preschool education learning to think before one acts and believed that play could serve as a vehicle through which to accomplish this goal. Tough writes, “At the heart of the Tools of the Mind methodology is a simple but surprising idea: that the key to developing self-regulation is play, and lots of it. But not just any play. The necessary ingredient is what Leong and Bodrova call ‘mature dramatic play’: complex, extended make-believe scenarios, involving multiple children and lasting for hours, even days. If you want to succeed in school and life, they say, you first need to spend hour after hour dressing up in firefighter hats and wedding gowns, cooking make-believe hamburgers and pouring nonexistent tea, doing the hard, serious work of playing pretend.”

As I read “the hard, serious work of playing pretend,” I could not help wondering if this was an oxymoron. How could words such as “hard” and “serious” be affixed to a description of play? Yet, as I reflected upon this seeming contradiction my thoughts drifted to the application of play in therapy, in which difficult themes in a child’s life are addressed in the context of fantasy and imagination.

Having used play and storytelling in many of my therapeutic endeavors reminded me that the concept of play embraced a wide continuum of activities.

Unlike several other psychologists of his time, Vygotsky believed that imaginary play was not an immature form of expression, but rather a more powerful predictor of future academic success than a child’s vocabulary, counting skills, or knowledge of the alphabet.

Tough elaborates that according to Vygotsky “dramatic play was the training ground where children learned to regulate themselves...To Vygotsky dramatic play was the arena where children’s actions were most tightly restricted. When a young boy is acting out the role of a daddy making breakfast, he is limited by all the rules of daddy-ness. Some of those limitations come from his playmates: if he starts acting like a baby (or a policeman or a dinosaur) in the middle of making breakfast, the other children will be sure to steer him back to the eggs and bacon. But even beyond that explicit peer pressure, Vygotsky would say the child is guided by the basic principles of play. Make-believe isn’t as stimulating and satisfying—it simply isn’t as much fun—if you don’t stick to your role. And when children follow the rules of make-believe and push one another to follow those rules, he said, they develop important habits of self-control.”

Tough continues, “There are not yet firm experimental data that prove that Tools of the Mind works. But two early studies begun in the late 1990s in Denver showed some promising results.” One study found that after being exposed to the program for a year, young children performed significantly better than a similar group on basic measures of literacy. Another study found that students in the Tough for Minds program consistently scored higher on tests requiring “executive functioning,” a concept that includes the ability to plan and organize, to think before one acts, to display self-control.

For some, the Tools of the Mind approach may be interpreted as casting play in a rigid format that appears to be anything but play. This view may be reinforced by other activities in the program such as “coaching” preschool children on dramatic play called Make Believe Play Practice. The latter involves the teacher guiding children through the mechanics of pretending such as comforting a crying baby doll and asking what one should do when the baby is distressed. In addition, children “review” their play
activities with their teacher on a weekly basis. Such exercises are theorized to encourage children to reflect on different behaviors and in the process to develop self-control.

Some may question whether “coached play” is deserving of the label of play. Some may argue that while the program facilitates the development of self-regulation, it presents play as an academic task, robbing it of the qualities of fun and enjoyment advocated by Elkind and the authors of the Alliance for Childhood report.

Tough observes, “The most lasting effect of the Tools of the Mind studies may be to challenge some of the basic ideas about the boundary between work and play. Today, play is seen by most teachers and education scholars as a break from hard work or a reward for positive behaviors, not a place to work on cognitive skills. But in the Tools of the Mind classrooms that distinction disappears: work looks a lot like play, and play is treated more like work.”

There are child development specialists such as Angela Duckworth, a psychologist on the faculty of the University of Pennsylvania, who appreciate the complexity of the relationship between work and play. Duckworth is a leading researcher in the area of teaching children self-control.

Tough interviewed Duckworth about the tenuous boundaries between work and play. She answered, ‘We often think of play as relaxing and doing what we want to do. Maybe it’s an American thing: We work really hard, and then we go on vacation and have fun. But in fact, very few truly pleasurable moments come from complete hedonism. What Tools of the Mind does—and maybe what we all need to do—is to blur the line a bit between what is work and what is play. Just because something is effortful and difficult and involves some amount of constraint doesn’t mean it can’t be fun.”

Duckworth’s observations returned me once again to the theme of play in therapy. As a clinician I am acutely aware that a delicate balance is necessary when engaging in therapeutic play. I recognize that children need to feel free and safe to initiate play and fantasy activities without their experiencing me as being too directive or too intrusive. Yet, I also appreciate there are times when the play of children affords me opportunities to enter their world, to raise questions within the play, and to use their play to facilitate the learning of new skills. For example, there are features of the “Creative Characters” storytelling technique I developed for children (please see my February, 2009 article for a description of “Creative Characters”) that are directed by the therapist. In refining “Creative Characters” I learned to move non-intrusively between different levels of structure, always guided by the goal of assisting children to cope more effectively with the many challenges they confront on a daily basis.

A Concluding Thought

I began this article by questioning the practice of attempting to teach children academic material before they were ready to assimilate this material, thereby leaving them vulnerable and stressed, and in some cases as Elkind emphasizes, wondering whether they are “dumb.” Instead, I focused on the importance of play, emphasizing that play should be conceptualized as existing along a continuum from unstructured to structured. Within the boundaries of this ever changing, dynamic continuum, play can provide an avenue through which to create a safe and stimulating environment in which cognitive and emotional development can flourish. In such an environment children are likely to invite us into their world of play and allow us to serve as guides as they learn more about themselves and their world, gaining a sense of confidence and mastery that will last throughout their lives.

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Everyone experiences anxiety to some degree. Most of us worry about anything from money, our work, school performance, relationships, our families, and more. However, the majority of us can function successfully in our daily lives even with this anxiety; we can operate in our jobs or school days, and we can interact successfully with others despite our anxiety. But so many children with anxiety cannot do this. They experience anxiety to an excessive degree, often because they believe the worst will occur, and they believe they won’t be able to cope with it.

Anxiety is common in children who have social cognitive difficulties. Many of the children have more of a “world” anxiety related to noises, certain objects, storms, the dark, or other forms of environmental occurrences. On the other hand, for children who are more socially aware and have more advanced language skills, “social” anxiety can be very common. With this type of anxiety, children experience worries when it comes to interacting with the people in their environments or in entering settings where they feel less comfortable. For this type of anxiety, social cognitive therapy must be paired with anxiety strategies to help children gain the skills to interact more successfully in their world.

When “social” anxiety occurs in children, there is often a “spiral of social failure”. This has been described by Michelle Garcia Winner, founder of Social Thinking®. In this spiral effect, children react to a social expectation (of interacting or going into an uncomfortable setting) by doubting their ability, making excuses, self-defeating comments, negative emotions, and avoidance, which then reinforces that they can’t cope with the anxiety. As a result, they feel that they “can’t do it”, which
again causes them to doubt and go through the spiral process again with the next social expectation.

Different behaviors reveal anxiety in children. Children show anxiety often by refusing to talk, showing excessive shyness, not participating fully in activities, becoming upset or overly sad, avoiding certain activities or objects, or fidgeting. It is also quite common for an individual to demonstrate controlling behaviors in an attempt to ensure predictability and reduce their anxiety about the activity or environment. At times this can lead to rigidity (although rigidity can also occur for other reasons). When a child is considered “rigid”, they will essentially demand sameness in their routines, environments or activities. They must have control over their environment and find it very difficult to compromise or change their ideas or plans to interact successfully in the world around them.

However, children can display anxiety through behaviors that are not as easy to decipher. Some children talk excessively, become silly or socially “unexpected” (or inappropriate), become overly competitive, or crave perfectionism—meaning their product of homework, work, or performance has to be “perfect”.

Although helping children to reduce anxiety and function more successfully in their environments can be complex and challenging, there are numerous effective strategies. In nearly any approach, therapy typically begins by helping children to identify their anxiety. This involves helping them find words to label their specific worries. For example, “I am worried because we are going on a plane trip”, “I am worried because the fire alarm is going off”, or “I am worried about going to this slumber party”. It is important to observe how anxiety affects their body. Helping the child to label how anxiety affects their entire body and emotions (i.e. upset stomach, tense body, headache, anger in their brain) can help them to more quickly identify anxiety in the future and even “catch it” before it becomes too extreme.

Next, therapy focuses on encouraging children to specifically identify what it is they are worried will happen. This is an important component to help them begin to understand realistic worries, since most of their worries are actually “worse case scenarios”. After they have identified exactly what they are afraid will happen (i.e. “the plane will crash”, “the building will burn”, “I will fail and get an F”, or “I will lose all my friends”), they can then begin to explore those worries. In Helping Your Anxious Child, Dr. Ronald Rapee describes this as “detective thinking”. He encourages children to label how likely their worry is to occur, find alternative explanations for their worry, and choose the most realistic explanation for what they are worried will happen. In this common, practical approach, Dr. Rapee also encourages parents to try “stepladders” to break down their fears (i.e., sleeping in the dark, going to a slumber party, or flying on a plane) into small manageable steps. Children are guided to try each “step” and receive rewards and reinforcements for each step of progress. Each step progresses toward the end goal of independently doing what they are afraid of doing.

All of the strategies for anxiety therapy include the key component of helping children learn to cope with their worries. The ownership for attempting the strategies is placed on the child as the adults guide and support them in their attempts. This piece is critical as children must have the confidence to believe they are able to cope with anxiety. This confidence is not encouraged if adults in their world “do it for them” or if they are allowed to avoid their fears. Allowing avoidance or letting adults complete the strategies or take care of the fears reinforces to students that they cannot cope with their worries and this results in more anxiety.

Strategies to help children learn to cope with anxiety are incredibly beneficial and empower them to interact with other people and their environments.

RESOURCES:
Helping Your Anxious Child by Ronald Rapee
When My Worries Get Too Big by Kari Dunn Buron
What to Do When I Worry Too Much by Dawn Huebner
Perfectionism by Miriam Adderholt and Jan Goldberg
Thinking About You Thinking About Me by Michelle Garcia Winner (www.socialthinking.com)

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www.parishschool.org/cur_social_thinking.html
A PARENT'S GUIDE TO EFFECTIVE INSTRUCTION

Reading problems are the most common type of academic underachievement. Especially for students with dyslexia, learning to read and write can be exceedingly difficult. Dyslexia and related reading and language difficulties are the result of neurobiological variations, but they can be treated with effective instruction.

Effective instruction is instruction that is tied to student needs, as determined by diagnostic testing and evaluation. It is instruction delivered by knowledgeable and skilled individuals in a step-by-step fashion that leads to the achievement of desired outcomes or goals by targeting a student’s relative strengths and strengthening his or her relative weaknesses. Effective instruction also requires the ongoing monitoring of student progress to determine the ultimate course and duration of the instruction.

The earlier your child receives effective instruction the better, but people with dyslexia and related disorders can be helped at any age. Even for students with severe and persistent dyslexia who need specialized instruction outside of the regular class, competent intervention from a specialist can lessen the impact of the problem and help the student overcome and manage the most debilitating difficulties (See the International Dyslexia Association’s Knowledge and Practice Standards for Teachers of Reading, pages 1-2, at www.interdys.org/standards.htm).

What Is Effective Instruction?

Effective instruction employs instructional approaches that have been studied and tested by experts in the field of education. These researchers have found that students benefit the most from instructional approaches that are explicit, systematic, cumulative, and multisensory. They integrate the teaching of listening, speaking, reading, spelling, vocabulary, fluency, handwriting, and written expression. These approaches also emphasize the structure of language: phonology, orthography, morphology, syntax, and semantics.

Effective teaching of oral language, reading, and written expression to students with dyslexia also requires teachers with expert knowledge, skills, and abilities. They must understand how language skills are acquired, how reading skills are developed, and that there are individual differences in how students learn. In addition, these teachers need teaching experiences supervised by experts, often referred to as...

Just the Facts...
Information provided by The International DYSLEXIA Association®
practicum experiences, to ensure that they learn to use these instructional approaches effectively. Teaching reading really is rocket science (Moats, 1999). So, it’s important to make sure that your child has a teacher who is prepared to do this challenging work.

How Do Educators Develop and Implement Effective Instruction?

Research over the last three decades has provided a vast knowledge base that informs both our ability to identify students at risk and to effectively plan their instruction (Spear-Swerling, 2010). The International Dyslexia Association’s Knowledge and Practice Standards for Teachers of Reading (IDA, 2010; www.interdys.org/standards.htm) clearly define the knowledge, skills, and abilities needed to competently teach students with dyslexia and related reading and language disorders. The standards are divided into two broad sections: Section I: Knowledge and Practice Standards and Section II: Guidelines Pertaining to Supervised Practice of Teachers of Students with Documented Reading Disabilities or Dyslexia Who Work in School, Clinical, or Private Practice Settings. Section I includes standards for content knowledge and teaching skills needed for application of the content knowledge and practice standards at two levels: Level I expectations for teachers and Level II expectations for specialists.

Instructional approaches and programs may differ in specific techniques and materials, but those found to be most effective include structured, explicit, systematic, cumulative instruction designed to promote understanding, memory, recall, and use of spoken and written language. Effective instruction integrates multiple components that focus on phonological processing skills, phonics and word analysis, spelling, word recognition, oral reading fluency, grammar and syntax, text comprehension, writing, and study skills.

REFERENCES

International Dyslexia Association (2010). Knowledge and Practice Standards for Teachers of Reading (www.interdys.org/standards.htm).


The International Dyslexia Association (IDA) thanks Nancy Cushen White, Ed.D., for her assistance in the preparation of this fact sheet.
HOW COMMON ARE SPELLING DIFFICULTIES? Spelling is difficult for many people, but there is much less research on spelling than there is on reading to tell us just how many people spell poorly or believe they spell poorly. Less is known about spelling competence in the general population than is known about reading achievement because there is no national test for spelling and many states do not test students' spelling skills.

Almost all people with dyslexia, however, struggle with spelling and face serious obstacles in learning to cope with this aspect of their learning disability. The definition of dyslexia (see Fact Sheet on Definition) notes that individuals with dyslexia have “conspicuous problems” with spelling and writing, in spite of being capable in other areas and having a normal amount of classroom instruction. Many individuals with dyslexia learn to read fairly well, but difficulties with spelling (and handwriting) tend to persist throughout life, requiring instruction, accommodations, task modifications, and understanding from those who teach or work with the individual.

What causes spelling problems?

One common but mistaken belief is that spelling problems stem from a poor visual memory for the sequences of letters in words. Recent research, however, shows that a general kind of visual memory plays a relatively minor role in learning to spell. Spelling problems, like reading problems, originate with language learning weaknesses. Therefore, spelling reversals of easily confused letters such as b and d, or sequences of letters, such as wnet for went are manifestations of underlying language learning weaknesses rather than of a visually based problem. Most of us know individuals who have excellent visual memories for pictures, color schemes, design elements, mechanical drawings, maps, and landscape features, for example, but who spell poorly. The kind of visual memory necessary for spelling is closely “wired in” to the language processing networks in the brain.

Poor spellers have trouble remembering the letters in words because they have trouble noticing, remembering, and recalling the features of language that those letters represent. Most commonly, poor spellers have weaknesses in underlying language skills including the ability to analyze and remember the individual sounds (phonemes) in the words, such as the sounds associated with j, ch, or v, the syllables, such as la, mem, pos and the meaningful parts (morphemes) of longer words, such as sub-, -pect, or -able. These weaknesses may be detected in the use of both spoken language and written language; thus, these weaknesses may be detected when someone speaks and writes.

Like other aspects of dyslexia and reading achievement, spelling ability is influenced by inherited traits. It is true that some of us were born to be better
spellers than others, but it is also true that poor spellers can be helped with good instruction and accommodations.

**Diagnosis of spelling problems**

If dyslexia is suspected, and the student is at the kindergarten or first-grade level, simple tests of phoneme awareness and letter naming can predict later spelling problems, just as they predict later reading problems. If a student is struggling to remember spelling words, a standardized test of spelling achievement with current national norms should be given to quantify just how serious the problem is. In addition, a spelling diagnostic test should be given to identify which sounds, syllable patterns, or meaningful parts the student does not understand or remember. A spelling diagnostic test, such as a developmental spelling inventory, will tell a teacher exactly which consonant, vowel, syllable, and word spellings the student must be taught. Third, the student should be tested on his or her knowledge of the most commonly used words in English that are necessary for writing, as these, too, should be emphasized in instruction.

**How do children learn to spell?**

Children gradually develop insights into how words are represented with letters in preschool, kindergarten, and first grade. This process moves ahead much more quickly (and successfully) if instruction in sounds and letters is systematic, explicit, and structured. Spelling of whole words is facilitated when the child understands that words are made up of separate speech sounds and that letters represent those sounds. As knowledge of that principle increases, children also notice patterns in the way letters are used, and they notice recurring sequences of letters that form syllables, word endings, word roots, prefixes, and suffixes. Memories for whole words are formed much faster and recalled much more easily when children have a sense of language structure and receive ample practice writing the words.

**Inventive spelling** or spelling words the way they sound is common in preschool and kindergarten children and is a desirable step in understanding how we use letters to spell. However, inventive spelling is not sufficient for students to learn all of the conventions and patterns of Standard English writing. Encouraging students, beyond the beginning of first grade, to invent their spellings or to ignore correct spelling is not constructive. Is the English spelling system predictable or unpredictable?

**The English spelling system is not crazy or unpredictable.**

It can be taught as a system that makes sense. Nearly 50% of English words are predictable based on sound-letter correspondences alone (e.g., slap, pitch, boy). An additional 37% of the more common words are almost predictable except for one sound (e.g., knit and boat). Other information, such as the language from which a word came (e.g., Old English, Latin, Greek, or French) and word meaning, also helps explain the spellings of words. Only 4% of English words are truly irregular and may have to be learned through whole word methods, such as tracing and saying the letters while the word is being memorized. Thus, it is possible to approach spelling instruction with confidence that the system by and large makes sense—an encouraging observation for students who have great difficulty forming memories for words.

**What are the implications for teaching?**

Spelling instruction that explores word structure, word origin, and word meaning is the most effective, even though students with dyslexia may still struggle with word
recall. Emphasizing memorization by asking students to close their eyes and imagine the words, or asking them to write words multiple times until they “stick” are only useful after students are helped to understand why a word is spelled the way it is. Students who have learned the connections between speech sounds and written symbols, who perceive the recurring letter patterns in English syllables, and who know about meaningful word parts are better at remembering whole words.

Classroom spelling programs should be organized to teach a progression of regular spelling patterns. After first grade, spelling instruction should follow and complement decoding instruction for reading. Children should be able to read the words in their spelling lesson; most learners can read many more words than they can spell.

Understanding correspondences between sounds and letters comes first. For example, before spelling a word, students can orally take the sounds of the word apart. Then, they can recall the letters that spell those sounds. Next, patterns such as the six basic syllable types of English should be taught because they represent vowel sounds in predictable ways. Third, students should be taught a few basic rules for adding endings to words, such as when letters should be doubled, when y is changed to i, and when the silent e is dropped.

A few irregular words should be practiced daily (e.g., come, they, their, who). Tracing and saying the letters, building the words with letter tiles, copying and writing in sentences, all help build memories for irregular words. Students may be able to handle only a few new words at a time, and they may need many opportunities to write words accurately and with supervision before they can remember them. As words are learned, exercises to build fluency, such as word and sentence dictations, are helpful. Having students keep a list of their own particular “spelling demons” for reference supports the development of proofreading ability and aids mastery of the spelling of those challenging words.

It is important that students learn to spell words for writing and not just for spelling tests. Transfer to spelling in everyday writing is essential. It helps if the student is taught to use a proofreading procedure that involves checking for one element at a time, such as punctuation, capitalization, spelling, sentence structure, and organization.

Computer spellcheckers are not helpful unless the student has already achieved basic spelling skill, at about a fifth-grade level, and unless the student receives other proofreading help. Spellcheckers do not identify all errors.

Important accommodations and task modifications for dyslexic students include the following:

- grading written work primarily on content,
- writing correct spellings over incorrect ones and limiting rewrites to a reasonable amount,
- providing proofreading assistance,
- encouraging students to dictate their thoughts before writing and giving them the spellings of key content words to use in writing,
allowing students in intermediate grades and higher to type exams and papers or to use a voice-translation device on a computer,

• encouraging students to hand in early drafts of research papers and essays to allow for revision before grading.

REFERENCES


The International Dyslexia Association (IDA) thanks Louisa Cook Moats, Ed.D., for her assistance in the preparation of this fact sheet.

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THE AWARDS COMMITTEE FOR THE NANCY LAFEVERS COMMUNITY SERVICE AWARD has selected the award recipient for 2012 to be Lenox Reed. Lenox was chosen for her many contributions to the Houston Branch, the community, and IDA. She came to Houston after she had been trained in Alphabetic Phonics at the Lucas Waites Center at Scottish Rite Hospital in Dallas, Texas. Her first student was Will Noel, who was diagnosed as mildly dyslexic. As her young family grew, she continued to work with other students who are now adults.

In the late 1970’s she joined other enlightened Houstonians who were exploring why students struggled with reading and how they could be taught to read. This group of luminaries in the field of dyslexia founded in 1978 the Houston Branch of The Orton Society now known as IDA. Lenox was the branch’s first vice president and Oscar Neuhaus was president. The Houston Branch was chartered in 1980. When Oscar Neuhaus died suddenly in March 1980, his friends obtained a grant to found Neuhaus Education Center which would provide professional development in Alphabetic Phonics to teachers of students with dyslexia. Their other possible choice was to fund a fire station in his honor but his desire to have a teacher education center won out. Lenox was Neuhaus’ first executive director.

The Center set up in borrowed space and Lenox began visiting speech/language pathologists, teachers, and others and encouraging them to take Alphabetic Phonics. Peggy Engman and Nancy LaFevers were among those early students. Nancy often said that when she took the AP training at Neuhaus she had found the key to teaching students with dyslexia how to read—the piece that was missing from other programs. She became a steadfast supporter of Neuhaus.

Nancy served actively on the Houston Branch board and was part of the team that planned and executed the 1995 Orton Society National Conference in Houston along with Will Noel, Suzanne Carreker, Ann Neyland, Carolyn Wickerham, and many others. When Nancy died suddenly in 2006, the Houston Branch was planning a luncheon to honor her, but instead instituted the Community Service Award in her name with Nancy as the first recipient. Her memorial service was held at Neuhaus at the request of her husband Jerry Ambrose and memorial gifts in Nancy’s name funded the Houston Branch diagnostic testing scholarships that she had expressed as one of her wishes.

Lenox dedicated her life to Neuhaus as Executive Director but continued her tremendous involvement with IDA at the local and national level, serving on many IDA committees and as a member of the IDA Board of Directors. She continues to support IDA and the Houston Branch. When Lenox was asked if she would accept the award, she said she was greatly honored but also expressed how many others were deserving of this award. After serving the dyslexic community for all her adult life, Lenox is very deserving of recognition in the Houston area, especially the award named for Nancy LaFevers. Their lives and service to the community were entwined over many years. Our special thanks and gratitude to Lenox for her service to IDA, HBIDA, and the greater Houston Community.

Lenox will receive the award at the March 3, 2012 conference luncheon.
Thank You Jim!

The Houston Branch of The International Dyslexia Association thanks Jim Carter for his dedication and service as president of HBIDA for the past four years.
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### ADVOCATES

- Adda-SR 59
- Brazos Valley IDA 57

### EDUCATIONAL SERVICES

- APP Educational Consulting 59
- Janis Block, M.Ed. 58
- Debbie Meinwald
- Reading Specialists of Katy 58

### ASSESSMENT & COUNSELING

- Lyn Armstrong, OTR 58
- Michelle Beard, Ph.D., PLLC 52
- Bonnie Brookshire, Ph.D 56
- Lyle Cadenhead, Ph.D., MBA, LSSP/LPC 48
- The Carruth Center 54
- Clinic for Academic Therapy 58
- Dan L. Duncan Children’s Neurodevelopmental Clinic 48
- Elizabeth Sledden Dybell, Ph.D., P.C. 50
- Peggy Wyatt Engman, M.S., CCC/SLP 58
- Aaron Fink, M.D., P.A. 58
- Kahn Educational Group 57
- Teresa A. Langford, Ed. D. 56
- Muriel Meicler, Ph.D. 53
- Speech & Language Remediation Center 56
Polly Gardner
Speech and Language Services 59
Speech Language Learning 59
Robert J. Strudler Diagnostic & Remediation Center 58
Texas Children’s Hospital,
Speech, Language & Learning Center 52
Elaine Whitley,
Educational Success advisors 59
Wilkenfeld
Speech • Language • Learning Center 56

SCHOOLS & TEACHER TRAINING

Brehm Preparatory School 49
Briarwood School 53
Crossroads School 54
Gow School 50
Options
Transitions to Independence 49
Landmark School 55
Making Math Real 57
Neuhaus Education Center 58
INSIDE FRONT COVER
The Parish School 54
School for Young Children 58
School of the Woods 54
Special Schools Coalition 55
Wilson Language Training 51
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PROFESSIONAL REFERRAL FOR SERVICE DATABASE
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FOR MEMBERSHIP INFORMATION:
Visit www.interdys.org and click the “Join IDA” link or call 1-800-ABCD123 x405

IDA Receives “Best in America” Recognition
The International Dyslexia Association has been awarded the ‘Best in America’ seal from Independent Charities of America, a distinction awarded to less than one percent of charities. IDA was recognized for making the most efficient use of donations, ensuring contributions are making an impact on all struggling readers, their families and the professionals who serve them.