1

BASIC INFORMATION ON DYSLEXIA

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Introduction

Knowledge about dyslexia continues to be updated and clarified. Research, better assessment tools, professional training, and availability of effective intervention programs all contribute to a positive outlook for today's students with dyslexia.

An understanding of both the diagnosis and the treatment of dyslexia will help parents and educators work together with students who have the disorder to maximize students' school success.

1.1 Clarifying the Terms *Dyslexia* and *Learning Disabilities*

Question: My fourth-grade child was diagnosed at school as having learning disabilities. He had great trouble learning the letters of the alphabet and their sounds when he was younger. Reading is a struggle. When he reads, it is slow and very frustrating for him. His spelling is so poor, it's hard to decipher what he writes. My friend told me it sounds like dyslexia. Could this be?

- The answer to the preceding question is yes. *Dyslexia* refers to a language-based learning disability in basic reading skills and spelling. The problems of children with dyslexia most commonly stem from difficulty in processing speech sounds within words and making the connection between sounds and written symbols—letters and patterns of letter combinations—that represent sounds in words.
- Most school districts throughout the United States typically do not use the term *dyslexia*. Some states, like Texas, now do.
- Under the Individuals with Disabilities Education Act (IDEA), the federal special education law, there are thirteen categories of disabilities. "Specific learning disabilities" is one of those categories. *Specific learning disabilities* (SLD) or *learning disabilities* (LD) are the terms typically used in schools.
- *Learning disabilities* is an umbrella term that describes specific problems with processing information and learning skills. Dyslexia is one of the disabilities that is included in *learning disabilities*.
- Dyslexia is the most common learning disability. Approximately 80 percent of students identified as having learning disabilities who qualify for special education have reading disabilities (dyslexia).

Definition of Dyslexia

The International Dyslexia Association (2008a) defines dyslexia as "a specific learning disability that is neurobiological 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 growth of vocabulary and background knowledge" (adopted by the board of the International Dyslexia Association, November 2002, and the National Institutes of Health, 2002).

Commonly Accepted Descriptions of Dyslexia

- *Dyslexia* is a Greek word meaning "poor language."
- Dyslexia is a language-based disorder that involves weaknesses in phonological awareness, word decoding, and the ability to do rapid naming (quickly name common items or symbols such as colors, numbers, and familiar objects) and quick recall.
- Dyslexia is a brain-based disorder that causes difficulty in using and processing linguistic (speech) and symbolic (letter) codes—that is, letter-sound correspondence.
- Primary characteristics of dyslexia include
  - Difficulty in decoding individual words
  - Slow, inaccurate oral reading—poor reading fluency
  - Spelling weaknesses

Often, dyslexia produces difficulties in other reading and language areas such as reading comprehension, vocabulary, and written language. Individuals with dyslexia exhibit these characteristics to varying degrees, but the characteristics frequently appear in some combination.

What Are Learning Disabilities?

The National Center for Learning Disabilities (NCLD, 2009) defines a learning disability (LD) as "a neurological disorder that affects the brain's ability to receive, process, store and respond to information. The term *learning disability* is used to describe the seeming unexplained difficulty a person of at least average intelligence has in acquiring basic academic skills. These skills are essential for success at school and work, and for coping with life in general. LD is not a single disorder. It is a term that refers to a group of disorders" (n.p.).

- Learning disabilities are neurologically based problems with processing information. These affect one or more processes of input (taking in), integrating (organizing, sequencing, remembering), and output (expression) of the information.
- The problems associated with learning disabilities interfere with one or more of the following: learning reading, writing, or math, and may affect a person's ability to speak, listen, reason, recall, or organize information.
- Children with learning disabilities have difficulties with learning and performing particular skills, and demonstrate underachievement in certain academic areas. For those with dyslexia, the particular skill deficits and underachievement are predominantly in reading and spelling.
- Learning disabilities (including dyslexia) are called hidden disabilities because they are not visible and are not physically obvious.
- Specific learning disabilities are unexpected in relation to a child's age and cognitive and academic abilities. One would not expect the problems the child is experiencing in learning, given his or her average or above-average intellect and other skills and abilities.

- There are school districts that, in practice, do not require average or above-average measured intelligence in order to be classified as learning disabled.
- Federal special education law (IDEA, 2004) defines a *specific learning disability* as "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. . . ."
- The law's definition also states that the term *specific learning disability* "does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage" (United States Code [20 U.S.C. §1401 (30)]).

1.2 Important Facts and General Information About Dyslexia

- Estimates of the number of people in the United States with dyslexia vary from 5 to 17 percent of the population.
- Approximately 3 to 4 percent of students in U.S. schools receive special education services for a reading disability. Far more children who have dyslexia do not receive special education.
- Dyslexia is not caused by
  - Poor parenting or lack of educational opportunities
  - Poor teaching or type of reading instruction
  - Environmental factors
  - Visual or hearing problems
  - Lack of motivation
- Dyslexia affects people all over the world.
- Dyslexia is a lifelong condition. However, intervention can have a very positive impact on a person's ability to read and write.
- Contrary to what many people believe, children with dyslexia do not see letters and words backward. Letter reversals (*b*/*d*, *p*/*q*), as well as errors in directionality and sequencing of letters within words (*was*/*saw*, *on*/*no*), are common in young children with and without dyslexia but may be symptomatic of dyslexia after the early grades.
- Dyslexia is found in both boys and girls in similar numbers, although it is more commonly diagnosed in boys.
- Many characteristics and areas of difficulty are commonly associated with dyslexia. (See Checklists 1.3 and 1.5.) However, each person has his or her own combination of strengths and weaknesses, and the areas of weakness may vary from mild to severe.

- Early identification and intervention (that is, when a child is in kindergarten through second grade) are most effective in preventing reading problems.
- Research shows that with appropriate early intervention, 75–90 percent of children who are at-risk readers can overcome many of their difficulties and increase their reading skills to an average level.
- Although early identification and intervention provide the greatest chances for success, most children with reading disabilities are not diagnosed until they are in the middle or upper elementary grades.
- Many children, teens, and adults with dyslexia go undiagnosed, particularly those with mild degrees of dyslexia. Many fall through the cracks of their school system and never receive the specialized instruction they need to build reading competency. Remediation is more difficult as a person gets older, when remediation must be more intensive in order to overcome years of reading failure. However, it is never too late to help almost anyone with dyslexia learn to read and improve skills.
- Students with dyslexia may have been evaluated at some point but did not meet the eligibility criteria at that time for special education and related services.
- Research tells us what type of instruction is necessary for students with dyslexia and what works best in teaching them to read. (See Checklist 1.10.)
- Dyslexia is not a developmental lag that will eventually go away. Waiting to intervene does not benefit a child.
- Children as young as four or five years old who are at risk for reading problems can be identified through reliable screening measures of phonological awareness and other language-based tasks. Once diagnosed, they can receive early intervention.

- Dyslexia and other learning disabilities may coexist with conditions or disorders, such as speech and language disorders or attention-deficit/hyperactivity disorder (ADHD), that require diagnosis and intervention. It is estimated that 20–40 percent of people with dyslexia also have ADHD.

Causes

- Dyslexia is an inherited neurological condition that often runs in families because there seems to be a genetic basis for this disorder. Between one-third and one-half of children with dyslexia have a family member with dyslexia. A parent or older family member may have never been diagnosed, but the existence of dyslexia can be inferred from a lifelong history of struggle with basic reading and spelling skills.
- Research indicates that dyslexia is the result of a brain difference in the "wiring" of the neural pathways and parts of the brain that are related to language functioning and reading.
- Researchers have found that people with dyslexia may use different and less efficient parts of the brain when doing reading tasks. (See Checklist 1.4.)

Risk Factors

Reading disabilities are associated with a number of problems and risk factors:

- Academic failure and dropping out of school. (Without appropriate intervention, youth and adults with dyslexia are at much higher risk than the rest of the population.)
- Unemployment

- Underemployment (holding a job that is below a person's capabilities or aspirations)
- Emotional or mental health issues, such as depression, related to frustration and low self-esteem
- Other learning or social problems
- Altercations with the law. (A high number of juvenile offenders and prison inmates—60 to 80 percent—have reading problems.)

1.3 Signs and Symptoms of Dyslexia

Because children vary in their development, parents and teachers are not always sure about signs that may indicate the possibility of dyslexia. Rather than looking at individual symptoms, parents and teachers need to look for clusters of symptoms that may indicate the need for an evaluation for dyslexia and other learning disabilities. Children should be watched from early childhood on; identification and intervention at any age is preferable to no treatment at all.

Early risk factors for dyslexia include the following:

Genetics

- Family history of learning disabilities (history of reading problems in parents or siblings)
- Being adopted. (Adopted children have higher rates of learning disabilities.)

Infancy

- Low birth weight; prematurity
- Low Apgar score
- Frequent ear infections that may have affected hearing

Symptoms that may indicate the existence of a learning disability such as dyslexia include difficulties with these:

Motor or Perceptual Skills

- Fine motor skills (using scissors) or gross motor skills (hopping)
- Drawing
- Copying from board or book to paper
- Pencil grip

- Directionality (left and right, up and down)
- Recognizing differences in similar-looking letters, numerals, and words

Language Skills

- Language or speech development
- Receptive language (understanding language)
- Expressive language (ability to communicate thoughts and needs using words)
- Understanding directions
- Use of correct grammar and syntax
- Listening comprehension
- Understanding metaphors, idioms, or words with multiple meanings
- Word retrieval (ability to quickly and accurately pull words from memory)
- Fluency when expressing ideas
- Vocabulary

Early Literacy or Pre-reading Skills

- Understanding that sounds make words
- Rhyming
- Identifying the beginning, middle, and ending sounds in spoken words
- Recognizing, blending, and separating individual sounds within words
- Letter recognition (lowercase and capital)
- Learning the corresponding sounds for letters
- Awareness that we read from left to right and top to bottom of page
- Ability to read and write child's own name

Reading

- Learning the sounds that correspond to letters and letter combinations
- Sounding out (decoding) words
- Differentiating between letters or words that look similar (*p* and *q*, *there* and *three*)
- Recognizing and remembering high frequency or sight words, words such as *said*, *they*, and *she*
- Accuracy (adding or omitting words or parts of words)
- Fluency (reading with ease, speed, and expression)
- Comprehension of text
- Maintaining place while reading

Writing

- Sequencing letters correctly within words
- Copying with accuracy
- Mechanics (correct use of capitalization and punctuation)
- Spelling
- Planning and organizing ideas for writing
- Expressing ideas in complete sentences
- Proofreading skills
- Legible handwriting and appropriate spacing of words
- Staying within the margins of a page and writing on the line
- Aligning numbers in columns when doing math problems

As children develop, symptoms may become more notable. With increased academic demands, problems tend to surface. Additional signs to look for include the following:

Preschool and Kindergarten

- Problems with pronouncing words correctly
- Delayed language and vocabulary development

- Difficulty in reciting the alphabet and days of the week sequentially
- Difficulty with quickly naming things (colors, shapes, familiar objects or animals) when shown pictures or objects
- Frustration with coloring, pasting, cutting with scissors

Grades 1–4

- Slowness in learning the connection between letters and sounds
- Letter reversals (*b*/*d*) and inversions (*u*/*n*)
- Lack of a systematic approach to sounding out words
- Difficulty in reading words (by sight and by decoding)
- Frustration with reading tasks
- Good comprehension of material that is read to the child as opposed to text that the child tries to read independently
- Problems with recalling facts
- Difficulty in learning math facts, especially multiplication tables
- Problems with math symbols (confuses signs of operation such as +, −)
- Problems with understanding time concepts (before, after; telling time)
- Problems in understanding directions

Grades 5–8

- Weak decoding skills; slowness in figuring out multisyllabic words
- Poor sight word vocabulary
- Difficulty in learning spelling strategies such as root words, affixes, spelling patterns

- Poor oral reading; lack of fluency
- Difficulty with word problems in math
- Problems with recalling facts
- Good self-expression orally, but not in writing

High School

- Poor spelling
- Poor written composition
- Avoidance of reading or writing assignments
- Incorrect reading of information
- Trouble with summarizing
- Poor memory skills
- Slow work speed
- Problems with organizing work and managing assignments
- Difficulty with performing in classes that have reading and writing demands
- Difficulty in learning a foreign language

See Checklist 1.5 for additional information on signs and symptoms of problems that are common in dyslexia and other learning disabilities.

1.4 Decades of Research: What We Now Know About Dyslexia

During the past twenty-five years, scientists in the field of reading have done extensive research on how children learn to read, who is at risk of developing reading problems, and interventions for those who struggle with reading. The findings have helped shed light on some causes of dyslexia and have helped define effective instruction and programs for preventing and remediating reading impairment. As researchers learn more about how the brain functions during the reading process, they develop a better understanding of differences in the brains of people with dyslexia. From these findings have come important guidelines for teaching reading effectively to children with dyslexia.

Research sponsored by the National Institute of Child Health and Development is the source of much of what we now understand about reading acquisition and reading disabilities. Recent research on dyslexia that is of particular interest to parents and educators is presented here. Additional information and resources can be found at the end of this section.

- There is a neurological basis for dyslexia. Dyslexia is a brain-based disorder.
- The Connecticut Longitudinal Study, led by Sally Shaywitz, was begun in 1978 in order to study how children learn to read. The researchers looked at both good and poor readers. Shaywitz (2003, p. 28), in her book *Overcoming Dyslexia*, noted that the study helped point out that "reading difficulties occur along a continuum," which is important to know in diagnosing children with dyslexia as well as delivering appropriate intervention services.
- Researchers now use a technology called *functional magnetic resonance imaging* (fMRI) in order to look at the brain at work (for example, while a subject performs a reading task). Research shows that the brain's left hemisphere is involved in most reading activity.

- In the brain's left hemisphere, three regions function together during the reading process.
  - In the front region, phonemes are processed.
  - The region of the brain behind the front region is involved in connecting sounds to the letters that represent them.
  - The third region is used to store words that have been read and learned so that they can later be recognized automatically, without needing to decode sound by sound.
- Brain imaging shows differences in brain activation among good readers compared with people with dyslexia. In good readers, the back of the brain is more activated than the front of the brain during reading.
- Skilled readers make more use of the region of the brain involved in the automatic recognition of words. In poor readers, this area appears to be underactivated, so that a person with dyslexia must work harder to decode each word.
- Researchers found that when people with dyslexia performed reading tasks, the lower front region of the brain was more activated, while the back of the brain was underactivated compared to people without dyslexia.
- In people with dyslexia, there is less activation in the region of the brain involved in the phonetic decoding of words.
- Fluent reading involves activation of the back part of the brain.
- A study by Bennett Shaywitz, Sally Shaywitz, and others (2002) looked at brain activation in children with and without dyslexia as they worked on reading skills such as saying names or sounds of letters, sounding out pseudo-words, and sounding out real words.
  - Children without dyslexia had more activation in areas of the brain that are typically involved in reading than did children with dyslexia.

  - Children who decoded words well had greater activation in areas of the left hemisphere that are important for reading than did those who had dyslexia.
- Teaching children phonological awareness skills as well as phonics and fluency strategies helps activate the region of the brain involved in automatic word recognition.
- Research has shown that instruction in phonemic awareness and reading skills that is intense, explicit, and systematic is considered to have an impact on helping to "rewire" the brain of a person with dyslexia.
- In evaluating instructional strategies that are effective in teaching reading, researchers concluded that teachers must use assorted strategies in order to meet the varied needs of students with dyslexia. Focusing on just one area of reading, one program, or one type of teaching is less effective in helping dyslexic students improve their reading skills.
- Children in kindergarten with weak skills in phonemic awareness are at greater risk for later reading problems than their peers.
- Early identification of dyslexia is important because the brains of young children are "much more plastic . . . and potentially more malleable for the rerouting of neural circuits" (Shaywitz, 2003).
- Scientists have identified genetic markers for dyslexia. Genetic causes are believed to be linked to about half of the risk for reading disabilities.
- Students with dyslexia commonly have problems with phonological awareness. They have difficulty segmenting words into individual phonemes. Students need direct instruction in order to develop these skills. Emphasis on this type of instruction helps to compensate for a main deficit in regard to reading ability.
- Children who are taught to distinguish the separate phonemes that make up words show growth in their reading skills.

- The National Reading Panel was formed in 1997 in order to review the research that had been done on teaching reading. The panel reviewed thousands of studies. Their recommendations, based on research conclusions about how reading should be taught, and found in their report of April 2000, included these findings:
  - Phonemic awareness and systematic phonics should be taught.
  - Guided oral reading is an effective strategy for increasing reading fluency. Children receive guidance and feedback as they read aloud. The goal is to train children to read efficiently and fluently.
  - Children need instruction in reading comprehension techniques and application of strategies so that they will be able to understand the material they read.

  More findings and recommendations from the National Reading Panel can be found at http://www.nichd.nih.gov/publications/nrp/smallbook.cfm, http://www.reading.org/downloads/resources/nrp_summary.pdf, and throughout the checklists in Section Two.
- Remedial work in reading with children who have dyslexia, using research-based programs, helps activate areas of the brain that are involved in reading. Training in reading skills can cause changes in how areas of the brain function.
- See Checklist 1.10 for a description of the criteria established by research to be effective in teaching children to read.

1.5 Other Common Problems

Children and adults with dyslexia often have other learning disabilities and weaknesses in addition to the core difficulties with phonological processing. It is common for people with dyslexia to have coexisting disorders (such as ADHD, dysgraphia, or speech-language problems) or other related problems (such as low self-esteem). Each individual has his or her own combination of strengths and weaknesses and to varying degrees. In addition to signs and symptoms described in Checklist 1.3, difficulties may exist in some of the following areas:

- *Memory:* the ability to hold information in mind long enough to work with it and act on it (working memory); the recall of information recently presented (short-term memory); and retrieving information that has been stored in long-term memory. Children with learning disabilities generally have memory problems to some degree (mild to severe), which can cause difficulty with the following:
  - Remembering words and names
  - Learning rote information by heart (facts or other data for a test)
  - Remembering reading reading and spelling words, especially phonetically irregular or "sight words" such as *was, said, because*. The child may approach these like new words each time they are seen.
  - Remembering and following through on teacher instructions
  - Keeping ideas in mind long enough to remember what one wants to say
  - Learning and being able to quickly recall math facts, particularly multiplication tables
  - Memorizing lines for a play or performance

  - Remembering to bring materials needed for homework and turn in assignments
  - Performing math problems that require juggling numbers and information mentally while working through problems
  - Written composition—holding ideas in mind long enough to manipulate them mentally and get them down on paper
- *Sequencing:* the ability to perceive and control a series of information. Children with learning disabilities often have problems with learning or recalling at an automatic level a sequence of letters, sounds, numbers, and other information. Students with this weakness may have difficulty with the following:
  - Reading words accurately with sounds in correct sequence
  - Following a series of verbal directions
  - Sequencing letters or syllables correctly in a word when spelling (for example, writing "gril" for "girl" or "aminal" for "animal")
  - Skip counting (3, 6, 9, 12)
  - Learning sequences such as the alphabet, months of the year, counting forward or backward
  - Confusing the order of events (for example, summarizing stories in the wrong order)
  - Learning phone numbers and series of numerals
  - Writing in sequence, for example, writing 319 instead of 931
  - Following procedures that involve a sequence of steps and directional order (for example, long division)
  - Writing letters and numbers without a model to refer to (recalling the sequence of pencil strokes needed to form letters or numerals correctly)

- *Executive functioning:* the management functions ("overseers") of the brain—self-directed actions individuals use to help maintain control of themselves and accomplish goal-directed behavior. Children and teens with developmental delays in executive functions often are developmentally immature in the following areas:
  - Self-management and self-regulation skills
  - Working memory
  - Time awareness and time management
  - Planning and organizing skills (particularly for long-term assignments and projects)
  - Ability to get started (activate) and begin tasks that are not intrinsically motivating
  - Ability to sustain the level of attention, effort, and motivation necessary to get through difficult tasks
  - Metacognition (monitoring one's own thinking processes and learning progress, and applying "fix-up" strategies when not doing well)
- *Processing speed:* the rate at which information is processed. Slower processing speed has nothing to do with intelligence. It is not that someone with this problem is a "slow learner," but that he or she processes information at a slower speed, which may cause difficulties with the following:
  - Automatic word recognition and reading fluency
  - Keeping up with the pace of instruction
  - Responding quickly to teacher questions
  - Following along in class discussions
  - Word retrieval (pulling up from memory the precise words one wants to use when speaking or writing)
  - Naming things rapidly and automatically
  - Completing work in a timely manner (class assignments and homework)

- Writing (letter formation and handwriting, spelling, getting ideas on paper, written composition)

Motor Skills and Coordination

- *Gross motor skills:* skills that use the large muscles in one's arms and legs. Children with gross motor weaknesses often have difficulty with the following:
  - Running, skipping, jumping
  - Athletics
  - Physical coordination (clumsiness)
  - Rhythm and balance
  - Social situations. (Other children may reject them in play situations.)
- *Fine motor skills:* skills that use small muscles in the hands and fingers. Children with fine motor weaknesses often have difficulty with:
  - Buttoning, zipping
  - Holding and manipulating a pencil
  - Handwriting

Emotional Functioning

The academic and learning struggles that a child, teen, or adult with learning disabilities faces every day take an emotional toll. It is common for individuals with dyslexia to have problems with the following:

- Low self-esteem (see Checklist 3.5)
- Low tolerance for frustration
- Stress
- Anxiety

- Acting out. (Some children would rather appear "bad" in the eyes of their peers than "dumb.")

Common Coexisting Disorders

Many children with dyslexia have coexisting disorders that need additional intervention. Three common coexisting disorders are as follows:

- *Speech disorders.* Speech therapy can help remediate difficulties with:
  - Articulation (pronouncing sounds in words correctly)
  - Fluency (rate and rhythm of speech)
  - Voice (pitch, loudness, vocal quality)
- *Dysgraphia.* Dysgraphia is a writing disability characterized by poor handwriting and inconsistent spacing of words on the page, difficulty writing on and within the lines and margins, awkward pencil grip and letter formation, and inconsistencies (in size, use of uppercase and lowercase letters, print and cursive), often within a single word or sentence. The physical task of handwriting becomes tedious and frustrating for individuals with dysgraphia. Children with dysgraphia may benefit from occupational therapy or school accommodations.
- *Attention-deficit/hyperactivity disorder.* ADHD is characterized by significant, developmentally inappropriate degrees of inattention, impulsivity, and, in some cases, hyperactivity. Children with ADHD also have executive function deficits, which is a key factor that affects school performance. They often benefit from medical or behavioral intervention as well as school supports and accommodations.

Note: We have each authored a number of books and other resources on ADHD. Visit our Web sites at www.sandrarief.com and www.JudithSternEducationalConsultant.com.

1.6 Common Strengths and Positive Characteristics of People with Dyslexia

In spite of their difficulties, children and adults with dyslexia have many strengths and positive attributes. Knowing that accomplished, highly successful dyslexic adults work in every profession and inhabit every walk of life may motivate children with dyslexia to work hard to reach their goals.

- People with dyslexia may be gifted and talented in various areas—for example, music, arts, athletics, or intellectual pursuits.
- Dyslexic individuals may show special aptitude in visual-spatial thinking or three-dimensional awareness and in professions requiring those abilities (for example, design, architecture, engineering, photography).
- Individuals with dyslexia may have strong technical and mechanical aptitude.
- People with dyslexia may have had to put extra effort into learning and managing well in life; therefore, they may be accustomed to trying hard and fighting barriers in order to achieve success.

See Checklist 1.11 on dual exceptionalities for information on how to meet the needs of children who are gifted and have dyslexia or another disability.

A number of positive characteristics are found in people with dyslexia. Individuals with dyslexia may be

- Persistent
- Innovative
- Imaginative
- Creative
- Inquisitive

- Resourceful
- Resilient
- Inventive
- Good at seeing the big picture
- Problem solvers
- "Out of the box" thinkers with unique points of view
- Strong verbal communicators

1.7 Diagnosing Dyslexia

Determining whether a child or adult has dyslexia requires a formal evaluation (assessment) and diagnosis. This can be done privately through a qualified specialist. The school would provide an evaluation to determine if a child has a reading disability that requires special education and related services.

To be considered eligible for special education and related services in the public schools, students undergo a diagnostic process. Many public school systems are currently using a procedure called *Response to Intervention* to identify students with learning disabilities (see Checklists 5.3 and 5.4). When a student is found to have reading difficulties, intervention would be provided and monitored by the school. If after receiving ongoing intensive, research-based reading instruction at school, the student does not respond with improvement in reading skills, a diagnosis of specific learning disability (which includes dyslexia) may be made.

In young children, evaluating phonological processing has been found to be effective in determining who is at risk for reading and spelling problems. Students with deficits in phonological processing are seen as good candidates for intensive early intervention reading programs.

If a more complete profile of a student is needed, schools may decide to perform a psychoeducational evaluation by administering a full battery of tests. Or parents may hire a private professional to perform an evaluation outside of school.

The goal of this type of evaluation is to look closely at the various learning and cognitive issues that are present. A psychoeducational evaluation provides information about a child's strengths and weaknesses and helps determine whether other difficulties or disabilities exist (for example, other learning disabilities, attention deficit disorder, or emotional disorders). Information is collected from a variety of sources as well as from standardized testing administered individually to the child.

The advantage of this type of evaluation is that it enables parents and educators to look at the overall picture in trying to understand what a child needs in both learning and home environments. Parents and educators are then able to design an intervention plan that meets the specific needs of the student.

Evaluations for learning disabilities

- Are done by a school district to help determine eligibility for special education services through the public school system.
- Involve a team and are generally done by school psychologists and special educators, often with the involvement of speech-language pathologists and reading specialists, in the case of a school-based evaluation.
- Outside of school, may be done by professionals such as licensed psychologists, educational specialists, or mental health counselors. It is important that these professionals have knowledge of reading development and reading disorders, as well as expertise in administering assessments and interpreting assessment data in order to be able to diagnose dyslexia or other learning problems.
- Must use a variety of measures. There is no single test for dyslexia.
- Involve assessment of phonological processing, decoding, word recognition, and spelling skills, among other reading and writing measures.
- Are used to provide formal documentation for eligibility for specific school services as well as accommodations on future tests (such as the SAT).
- Can be performed at any age, preschool through adult.
- Include information provided by parents on family history, medical and developmental information, as well as observations and testing done by professionals.

- Include a review of school history—for example, records of frequent absences, reports of previous interventions, history of difficulty in learning early reading skills, and reports on the student's response to remedial intervention.
- Include a look at the child's language learning (listening and speaking skills).
- May require further evaluations to confirm or reject other issues that surface during the evaluation process (for example, vision, hearing, fine motor, emotional problems).
- Should be followed up with a written report to the student's parents.

Diagnosing Young Adults

Young adults and adults with slow or inaccurate reading fluency may benefit from an evaluation for dyslexia, even if they have never received a diagnosis. Young adults with dyslexia may perform adequately in higher education programs but still have an undiagnosed disability. Diagnosis at any age helps define appropriate forms of educational intervention and useful accommodations.

Understanding Scores on Standardized Testing Reports

Statistical tables are used to describe test scores. Scores are usually reported as *standard scores* and *percentile ranks*.

- A *standard score* shows the relative standing of a score on the bell curve (normal distribution).
- A standard score of 100 represents the statistical average, or *mean*.
- A difference of 15 standard scores or more between subtests or clusters of test items is known as *statistically significant difference*.
- A statistically significant difference means that areas of strength and weakness need to be explained further.

For example, if a child did well in all areas tested, but very poorly in only one area, this would call for a close look at that specific area. If a student did extremely well in math, but average in all other subjects tested, this might call for consideration of giftedness in math.

- A simple way of understanding the meaning of a standard score is by looking at its percentile rank equivalent.
- The percentile rank tells how well a child did on a test or cluster of tests.
- If a child scores at the mean (50th percentile), he or she has done better than 49 out of 100 peers on the test and worse than 50 out of 100 peers chosen at random from the exact peer group.
- Some reports use subtest standard scores that range from 1 to 19, with a mean of 10. In this case a difference of more than two subtest standard scores is statistically significant.

Typical examples of scores are shown in the following table. Each line represents the same score in different forms. For example: a child with a subtest score of 9 has a standard score of 95, at the 37th percentile. This child is doing better than 36 peers, and worse than 63 peers (100 – 37 = 63).

Subtest Standard Score or Scaled Score	Standard Score	Percentile Rank
6	80	9
7	85	16
8	90	25
9	95	37
10	100	50
11	105	63
12	110	75
13	115	84
14	120	90
15	125	95

Tests Used in Diagnosing Dyslexia

This section lists some of the tests that are commonly used in various areas.

Intelligence

Intelligence testing may be performed as part of an evaluation for dyslexia. However, intelligence testing is not currently required by most school systems in the diagnosis of dyslexia. A less formal measure than an intelligence test may be done by public school professionals to determine that a child has adequate cognitive skills. With the adoption of the Response to Intervention model (see Checklist 5.3), different criteria and assessment procedures are now being used by schools to determine eligibility for special education and related services.

A child's reading difficulties may arise for different reasons. For example, a child may have widespread difficulties with verbal thinking and reasoning. Intelligence tests are uniquely suited to uncover an overall problem with verbal and nonverbal abilities. They also can highlight areas of strength, which can be used to help form recommendations for effective remediation. If there is an overall deficit in intelligence, intervention may be different than if overall intelligence were high and the child's reading difficulties were related more to issues such as verbal comprehension, auditory memory, or phonological difficulties.

Intelligence tests generate standard scores, which used to be called *IQ scores*. Intelligence tests most commonly used by psychologists are

- WPPSI (Wechsler Preschool and Primary Scale of Intelligence)
- WISC-IV (Wechsler Intelligence Scale for Children) (ages 6–16)
- WAIS-IV (Wechsler Adult Intelligence Scale) (ages 16–90)

Early Screening

Early screening for the possibility of future reading problems or dyslexia provides an opportunity to closely monitor children's

development of reading skills, especially children who might be at risk for reading problems. Screening may determine whether further testing is warranted. Commonly used early screening tests include

- Early Reading Diagnostic Assessment, 2nd edition
- Predictive Assessment of Reading (PAR)
- Dynamic Indicators of Basic Early Literacy Skills (DIBELS)

Achievement and Learning Skills

The following tests are used to evaluate a broad range of skills. These tests contain subtests that examine academic achievement (for example, reading and spelling); memory; and phonological, language, and cognitive skills.

- Woodcock-Johnson Tests of Achievement III
- Woodcock-Johnson Tests of Cognitive Ability III
- Wechsler Individual Achievement Test II (WIAT-II)
- Wide Range Achievement Test IV (WRAT-4)
- Kaufman Test of Educational Achievement II (KTEA-II)

Vocabulary Knowledge

Vocabulary skills are an important component of a child's language and learning profile.

- Peabody Picture Vocabulary Test (PPVT)
- Test of Word Knowledge (TOWK)

Memory

Good memory is required for the acquisition and retention of many academic skills, such as recognizing sight words and remembering spelling rules.

- Wechsler Memory Scale III
- Wide Range Assessment of Memory and Learning, 2nd edition (ages 5–17)

Phonological Awareness
Weaknesses in phonological awareness are considered a major feature of dyslexia.

- Comprehensive Test of Phonological Processing (CTOPP)
- Phonological Awareness Test (PAT)

See Checklist 2.1 for other tests of phonological awareness.

Reading Skills
These tests look specifically at a child's reading skills and add further information to that provided by other comprehensive academic batteries.

- Gray Oral Reading Test 4 (GORT 4)
- Gray Silent Reading Test (GSRT)
- Test of Word Reading Efficiency (TOWRE)
- Woodcock Reading Mastery Test
- Nelson Denny Reading Test (grade 9–adult)

Visual-Motor Integration
Visual-motor tests are nonverbal. They measure skills that affect the development of writing.

- Bender Visual-Motor Gestalt Test, 2nd Edition
- Rey-Osterrieth Complex Figure Test
- Developmental Test of Visual-Motor Integration (VMI), 5th Edition

Oral Language
Assessing oral language is important in evaluating overall language functioning, as well as for comparison with a person's written language skills.

- Clinical Evaluation of Language Fundamentals
- Test of Language Development
- Test of Adolescent Language

Written Language

- Test of Written Language, 4th Edition (TOWL-4)

1.8 Research-Based Intervention Programs for Struggling Readers

Many commercial materials are available to help struggling readers, including programs and curriculum for students who need intensive reading intervention. Several programs are listed here, along with contact information. Additional literacy resources are listed at the end of Section Two.

Programs Based on the Orton-Gillingham Method

In the 1930s and 1940s, Samuel Orton and his associate Anna Gillingham developed their highly structured, systematic, multisensory approach to teaching individuals with dyslexia how to break the code of print in order to read and spell. This approach and subsequent variations of the Orton-Gillingham (O-G) method are the basis of many programs that are used in teaching students with dyslexia. The following programs are some of those that were influenced by the O-G method and supported by research:

Alphabetic Phonics, by Aylett Royall Cox, is a curriculum of multisensory instruction in phonemic awareness, reading, spelling, and handwriting at elementary and secondary levels. Available from Educators Publishing Service at www.epsbooks.com.

Barton Reading and Spelling System, by Susan Barton, is an individualized tutoring system and phonics intervention program for children and adults with dyslexia. Available at www.BartonReading.com.

Failure Free Reading Program, by Joseph Lockavitch, is an intervention program for low-performing readers in grades 1–12. The program's goal is to improve sight vocabulary, fluency, and comprehension skills. Available at www.failurefreeonline.com.

Herman Method, by Renee Herman, is a remedial program for struggling readers in grades 3–12. The curriculum encompasses decoding, spelling skills, sight word recognition, and comprehension skills. Available from Sopris West Educational Services, a Cambium Learning Company, at www.store.cambiumlearning.com and from Lexia Learning Systems at www.lexialearning.com.

Institute for Multisensory Education (IMSE) offers a revised and expanded approach based on the Orton-Gillingham method of reading instruction. IMSE programs provide training in phonemic awareness, phonics, vocabulary development, fluency, and comprehension strategies. Available at www.ortongillingham.com.

PhonoGraphix is a multisensory reading and spelling program based on phonemic awareness and alphabetic code knowledge. Instruction begins at age four or five, when children are learning to read. The program is also intended for struggling readers in grades 1–5 and for those diagnosed with a reading disability. Available from Read America, Inc., at www.readamerica.net.

Project Read, by Mary Lee Enfield and Victoria Greene, has three strands: decoding, reading comprehension, and written expression. This program is for children and adolescents in general and in special education. Available from Project Read by Language Circle Enterprises at www.projectread.com.

Slingerland Multisensory Structured Language Instructional Approach, by Beth Slingerland, is an adaptation of the O-G method, designed to teach dyslexic students integrated skills of speaking, reading, writing, and spelling. This is an approach, not a specific program, that can be used by individuals of all ages from primary grades through adult. All language arts skills—oral expression, decoding, reading comprehension, spelling, and written

expression—are taught through integrated, multisensory instruction. Available from Slingerland Institute for Literacy at www.slingerland.org.

Spalding Method, by Romalda B. Spalding, is a total language arts approach for teaching students from preschool through eighth grade (general and special education) phonological awareness, phonics, fluency, vocabulary, comprehension, and handwriting. Available from Spalding Education International at www.spalding.org.

Wilson Reading System, by Barbara Wilson, designed for students in grades 2–12, is a complete curriculum for teaching decoding and spelling, beginning with phoneme segmentation. Instruction includes sight word instruction, fluency, vocabulary, oral expressive language, and comprehension. Available from Wilson Language Training at www.wilsonlanguage.com.

Other Research-Based Programs

The programs in this list have been validated by research as effective interventions for struggling readers.

Corrective Reading, by Gary Johnson and Zig Engleman, provides intensive intervention for children in grades 4–12 who read below grade level (general or special education). The program is designed to improve decoding, fluency, and comprehension through scripted lessons and direct instruction. Available from SRA/McGraw-Hill at www.sra4kids.com.

Language! The Comprehensive Literacy Curriculum, by Jane Fell Green, is designed to build the reading, writing, and other language skills of students in grades 3–12 who are struggling readers, writers, speakers, and spellers. Available from Sopris West Educational Services,

a Cambium Learning Company, at http://store.cambiumlearning.com or www.sopriswest.com.

Lindamood-Bell programs, by Patricia Lindamood, Phyllis Lindamood, and Nanci Bell, are designed to teach children and adults with dyslexia to read, spell, comprehend language, and express themselves. The Lindamood Phoneme Sequencing® (LiPS) Program trains children to be aware of different speech sounds (phonemes) and identify each according to the position of the lips, teeth, and tongue in making the sound (for example, /p/ /b/ are called *lip poppers* and /t/, /d/ are called *tip tappers*). Available from Lindamood-Bell Learning Process at www.lindamoodbell.com.

PALS Reading (Peer Assisted Learning Strategies), by Doug Fuchs and Lynn Fuchs, is a structured whole-classroom reading program for preschool through twelfth grade. The focus in preschool is on letter names, letter sounds, first-sound identification, and phonological awareness. In kindergarten, children practice letter-sound correspondence, decoding, phonological awareness, and sight words. First-grade PALS Reading emphasizes decoding and reading fluently. In grades 2–6, activities build fluency and comprehension. High school PALS Reading is similar. Available from Vanderbilt Kennedy Center for Research on Human Development at http://kc.vanderbilt.edu/pals/.

Quick Reads, by Elfrieda Hiebert, is designed to improve reading fluency and has comprehension, vocabulary, and background knowledge elements. The program, for students in grades 2–4, consists of short informational texts that are read quickly for meaning. Each level sequentially develops reading rate. Texts are designed so that they can be read in one minute. Available at http://quickreads.org.

Read Naturally, by Candyce Ihnot, is a fluency development program for individuals of all ages and abilities that

uses teacher modeling, repeated readings, and monitoring of progress. Students choose from stories at their assigned level and listen as a proficient reader models correct reading. They then read the story with a timer until they reach a predetermined goal for their rate. Students chart their own progress. Available at www.readnaturally.com.

Reading Mastery, by Siegfried Engelmann and colleagues, comes in two versions: *Reading Mastery Classic,* levels I and II, for grades K–3, and *Reading Mastery Plus*, an integrated reading and language program for grades K–6. This program of direct instruction is designed for children at high risk for reading problems. Teachers follow a scripted lesson plan that breaks concepts into smaller subskills. Available from Science Research Associates (SRA) at www.sraonline.com or www.sra4kids.com.

REWARDS (Reading Excellence: Word Attack and **Rate Development Strategies),** by Anita Archer, Mary Gleason, and Vicky Vachon, is designed as an intense intervention for students in grades 4–12 who are not accurate or fluent oral readers. The intermediate program is for grades 4–6, and the secondary program is for grades 6–12. Students learn strategies for decoding long words and increasing fluency, particularly in content-area passages. Available from Sopris West Educational Services, a Cambium Learning Company, at http://store.cambiumlearning.com.

Sounds Sensible and **SPIRE,** by Sheila Clark-Edmands, are two programs for at-risk or struggling readers.

- *Sounds Sensible,* for children in preschool through first grade, provides direct instruction and activities in phonological awareness and beginning phonics. *SPIRE*, for students in preschool through eighth grade, is a multisensory program that incorporates total language instruction—phonological awareness, phonics, fluency,

vocabulary, spelling, handwriting, and comprehension. Available from Educators Publishing Service at www.epsbooks.com.

Soar to Success, by David Cooper and David Chard, is a K–8 intensive reading intervention program that includes assessment and progress monitoring. Goals for grades 3–8 include accelerating reading ability and helping students apply comprehension and decoding strategies. Available from Houghton Mifflin at www.eduplace.com/intervention/soar/.

Spell Read, developed by Kay McPhee, is a one-year small-group reading intervention program that focuses on phonological automaticity and reading fluency, vocabulary instruction, and opportunities for writing. It is administered in grades 2–12 in daily pull-out programs led by specially trained teachers. Available from Kaplan at www.kaplank12.com.

Research-Validated Intervention Software

Earobics is reading intervention software supported by multimedia materials and student-guided activities. Interactive games provide individualized, explicit instruction in all areas of reading for students in preschool to third grade. The program automatically adjusts according to a student's strengths and weaknesses. Progress monitoring is included. There are two versions: *Foundations* for children in preschool through first grade, and *Connections* for students in second and third grade and for other struggling readers. Available at www.earobics.com.

Fast ForWord, by Paula Tallal and David Merzenich, is a software program designed to train the ability to hear phonemes (speech sounds) at increasingly faster speeds over six to eight weeks. It is not a reading intervention program

but may benefit development and strengthening of language processing skills. Available from Scientific Learning Company at http://www.scilearn.com/.

Headsprout Early Reading is a supplemental online reading program for children in preschool through second grade who are at the beginning stages of learning to read. The program provides individualized instruction through interactive activities. Available at www.headsprout.com.

Lexia Reading is a software program that provides intensive, structured practice that builds reading skills at different levels, covering Early Reading (preschool through first grade), Primary Reading (preschool through third grade), and Strategies for Older Students (sixth through twelfth grade). The program includes a management system with reporting features. Available from Lexia Learning Systems at www.lexialearning.com.

Read 180, by Ted Hasselbring, Kate Kinsella, and Kevin Feldman, is a multimedia instructional software program that provides intensive, differentiated practice in reading, writing, and vocabulary skills. The program analyzes, tracks, and reports on student accuracy. Available from Scholastic at http://teacher.scholastic.com/products/read180.

Read, Write, & Type! is a systematic reading and writing software program for six- to eight-year-olds who are just learning to read and for older children who are struggling readers and writers. The program teaches awareness of English phonemes (speech sounds) and the ability to associate each phoneme with a letter or pair of letters and finger strokes on a keyboard. The program also tracks student progress. Available at www.readwritetype.com or www.talkingfingers.com.

Waterford Early Reading Program, by Waterford Institute, a multiple-year program of instruction for children in

preschool through second grade, provides individualized, self-paced instruction as well as reports. The program uses classroom lessons and take-home materials that are tailored to each student's reading level in order to promote reading, writing, and typing, as well as other language and literacy skills. Available at www.waterfordearlylearning.org.

Wiggleworks is interactive multimedia software that helps students in preschool through third grade develop reading, writing, listening, and speaking skills by presenting interactive books with reading support. The software provides instruction in phonemic awareness, phonics, vocabulary, comprehension, and writing activities. Available from Scholastic at www.scholastic.com.

A number of reading programs have been evaluated, including several from this checklist. See the following resources for more information.

- The Florida Center for Reading Research reports on supplemental intervention reading programs, comprehensive intervention reading programs, and Tier 3 Response to Intervention programs.

  www.fcrr.org
- U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse

  http://ies.ed.gov/ncee/wwc/reports/
- John Hopkins University, Best Evidence Encyclopedia

  www.bestevidence.org
- Oregon Reading First Center: Review of Supplemental and Intervention Programs

  http://oregonreadingfirst.uoregon.edu/inst_curr_review_si.html

1.9 What Children with Dyslexia Need from Parents and Teachers

- Hope and optimism about the future and their ability to achieve their goals
- Belief in them
- Ongoing support, encouragement, and advocacy
- Determination to do what it takes to help them succeed
- Expert teachers who are knowledgeable and skilled in teaching students with reading disabilities and use of research-based instructional methods
- Accommodations and modifications to enable success in the general education curriculum
- Strong efforts to prevent problems (for example, early identification of needs and appropriate interventions)
- The necessary degree and intensity of remediation to build skills and accelerate academic achievement
- Flexibility and willingness to make necessary adaptations
- Knowledge about dyslexia (what it is and is not) and awareness of strategies and interventions that are proven to help
- Willingness to take advantage of available resources (books, training, conferences, Web sites) to obtain current information and support
- Programs that fit their individual needs, so that they are not forced to try to fit into existing programs that are inappropriate to their needs
- Reminders, when they are frustrated, that they have many strengths and talents and that their difficulties are not due to a lack of intelligence
- Assistance in building confidence and self-esteem
- Avoidance of words that cause humiliation, embarrassment, or hurt (such as *lazy, unmotivated, careless*)

- Efforts to nurture, develop, and utilize their strengths, interests, and talents
- Numerous opportunities to participate in activities that match their interests or talents (for example, art, music, theater, athletics)
- Ability to gently let go when they show the willingness and ability to handle something independently
- Close communication and teamwork (between home and school, as well as with tutors, therapists, or other service providers)

1.10 Key Instructional Components and Interventions for Students with Dyslexia

Students with signs and symptoms of dyslexia should have an appropriate evaluation in order to assess their phonological processing, literacy skills, and other learning strengths and weaknesses. Early diagnosis and intervention are always the most beneficial as there is greater opportunity to provide the help and instruction needed for children to develop their skills, and prevent many problems in learning to read and write. However, at any age or grade, a student can learn when provided with effective, well-designed instruction and materials. Students with dyslexia need specific kinds of instruction in order to maximize their learning.

Key Elements of Instructional Design for Students with Dyslexia

- *Direct and explicit:* Each skill, rule of language, and strategy for reading and spelling words must be taught clearly and directly, without assuming that the student has even the most basic foundational skills or background knowledge about the English written language. Elements of direct instruction include
  - Introducing one new skill or focus of instruction at a time
  - Specific procedures for introducing, practicing, and reviewing skills
  - Explicit teacher modeling
  - A high degree of guided practice in which the teacher frequently checks for students' understanding
  - Providing immediate corrective feedback

- Ongoing review and checking for retention and mastery of previously taught skills
- Reteaching as needed
- Independent practice
- Active student engagement throughout the lesson

- *Systematic and structured:* Students with dyslexia typically have gaps in their understanding of how the English written language system works. They need to be taught a systematic scope and sequence (coverage and organization) of skills, starting at a beginning level to ensure mastery of foundational skills and filling in holes in a student's repertoire of skills. Each lesson gradually builds on previously taught skills or concepts, and students are moved along at an appropriate individual pace.

  An example of a systematic scope and sequence of reading skills for early instruction would be teaching

  - Single consonants before two- and three-letter consonant blends
  - One vowel at a time—for example, introducing *short a* words first, and progressing through reading and spelling one-syllable words with all the short vowels
  - Phonetically regular short-vowel words before phonetically regular long-vowel words—for example, *hat, mad* before *hate, made*
  - One new syllable pattern or type at a time—for example, *r*-controlled syllables (bird, hurt), double vowel syllables (team, road)
  - Phonetically regular words before irregular words
  - One-syllable words before multisyllabic words

  Instruction is organized in a manner that

  - Enables the learner to see patterns and regularities in order to make connections

- Minimizes confusion
- Teaches skills and small amounts of new information in steps, each step building on the prior one
- Provides frequent review and practice

- *Multisensory:* Regardless of the program used, teaching children with dyslexia requires the use of multisensory techniques, which make learning more memorable. Students with dyslexia usually learn best when instruction incorporates some combination of auditory, visual, and tactile-kinesthetic input as well as many opportunities to practice.

  Following are some examples of multisensory approaches for teaching the letter *s* (the sound and the symbol):

  - The letter *s* is presented as a snake drawn in the shape of the letter *s*. This technique gives a memory clue for the shape of the letter and the beginning sound of *snake*.
  - Students are asked to look in the mirror while making the /s/ sound, which is like a snake hissing (sssssss). Attention is focused on the mouth and tongue position while saying the sound.
  - The teacher points out that /z/ and /s/ have the same mouth and tongue position, but /z/ is voiced, meaning that vibration can be felt when placing one's hand over the vocal chords. The /s/ is unvoiced; no vibration is felt in vocal chords when making the /s/ sound.
  - Students are shown a hand signal for a slithering snake as a prompt for making the /s/ sound: making a fist with one hand and sticking out the thumb (like a snake's tongue). Next, students make the hand motion of the snake slithering up and down with its tongue out while hissing the sssssssss sound.

- Students practice tracing the letter *s*, writing it multiple times in various textures, making the hand motion of the snake while saying sssssss.

See the resource *Alphabet Learning Center Activities Kit* (Fetzer & Rief, 2000) for more teaching activities using this method.

What Students with Dyslexia Need to Be Taught

- *Phonemic awareness:* the sound structure of our language—how to recognize, manipulate, blend, and segment individual speech sounds in words. (See Checklist 2.1.)
- *Phonics and decoding skills:* the correspondence of graphemes (letters) and phonemes (sounds); how to analyze unknown words through sounding out and other strategies. (See Checklists 2.2 and 2.3.)
- *Components of language:* vocabulary, word usage, prefixes, suffixes, and other parts of words that carry meaning (morphemes). (See Checklists 2.3 and 2.6.)
- *Fluency:* how to read words automatically. (See Checklists 2.5 and 3.6.)
- *Comprehension strategies:* how to derive meaning from text. (See Checklists 2.7, 3.6, and 4.8.)
- *Spelling skills and strategies:* using their sounding-out skills and word structure awareness to encode or put words they want to use in printed form. (See Checklists 2.4 and 2.8.)
- *Metacognitive strategies:* awareness of their own learning processes—for example, how they learn best; when, where, and how to use specific strategies. (See Checklists 2.7, 2.10, 2.11, 2.12, 3.8, and 4.7.)

Teaching Reading and Writing to Dyslexic Students Requires

- Research-validated curriculum (see Checklist 1.8) that
  - Uses a multisensory, structured approach
  - Is taught directly and explicitly
  - Is structured, systematic, sequential, and cumulative
- Intensity of instruction that is greater than that needed for students without learning problems, including
  - Sufficient time provided for direct skill and strategy instruction
  - Student practice with immediate corrective feedback and reinforcement
  - Instruction provided either one on one or in small groups of students of the same skill level
- Ongoing assessment (informal and formal) and careful monitoring of progress. (Assessment results should guide instruction.)
- New skill sets and concepts that are broken into small, clear steps and repeatedly practiced

1.11 Dual or Multiple Exceptionalities (Gifted and Dyslexic)

Twice exceptional or *dual exceptional* (also referred to as *2e*) students are those who are gifted and also have a disability such as dyslexia or another learning disability, ADHD, or Asperger's syndrome. Some children with dyslexia have multiple exceptionalities. For example, they are gifted, dyslexic, and have ADHD. These children have both very high potential in one or more areas and significant learning challenges in others. A twice exceptional student might, for example, be very advanced in math and well below grade level in reading. Due to lack of awareness, understanding, and appropriate diagnosis, students with dual exceptionalities may fall through the cracks and not receive appropriate services.

Gifted Students

- The federal government's educational definition of gifted and talented students are those "who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities" (No Child Left Behind Act, Pub. L. No. 107-110, Title IX, Part A, Definitions 22 [2002]; 7802, 20 U.S.C. 22 [2004]).
- States and districts vary in their criteria for identifying gifted students and how to deliver special services, programs, and activities to children meeting eligibility criteria.

Special Challenges for Twice Exceptional Students

- *Being misunderstood.* Disorders such as dyslexia or ADHD are not related to one's intelligence. Someone may be highly intelligent yet have significant learning difficulties. Because they

are bright, their underachievement is unfairly attributed to their being lazy, unmotivated, or apathetic.

- *Emotional issues*. Twice exceptional students may be at risk for anxiety or low self-esteem that arises from the frustration of coping with their learning challenges and trying to live up to high expectations (often their own) to excel academically.
- *Being identified as gifted*. Twice exceptional students' disability may mask their giftedness. They may not be evaluated because average academic performance prevents them from being considered candidates for programs for the gifted. Others may be evaluated but not identified as gifted because of poor test-taking skills.
- *Having their disorder diagnosed and treated*. Many gifted children use their intelligence to compensate for their learning difficulties. They may go years without being diagnosed (sometimes into adulthood). Their giftedness masks their disability, but compensating for their disability on their own may take an emotional toll.
- *Receiving appropriate educational programming or services*. Twice exceptional students may not receive the intellectually challenging curriculum or enrichment they need. They are also far less likely to be found eligible for special education programs, related services, or accommodations, particularly when they compensate and perform at grade level.

What Twice Exceptional Students Need

- Proper evaluation and diagnosis
- Enriching experiences beyond the basic school curriculum
- Acceleration in areas of strength (being allowed to move quickly through basic content curriculum that they have already mastered, providing extra time to work on challenging projects of interest)

- A mentor to encourage and guide them
- Teamwork among school and district staff and parents who are working to meet their unique educational needs
- Opportunities to develop their strengths and interests
- The same opportunities that other gifted students receive
- Accommodations for their special needs. (They may be successful in programs for the gifted and advanced placement classes if they are given supports and accommodations, such as assistive technology.)
- Advocacy by parents and teachers

Tips for Parents and Teachers of Twice Exceptional Students

- Be alert to signs of dual or multiple exceptionalities; don't be thrown off by highly discrepant abilities.
- Share observations with each other. Refer students for appropriate diagnostic assessments.
- Seek opportunities to nurture students' talents and showcase their strengths.
- Provide assistance when needed, even though twice exceptional students may have the intellectual ability to do good work.
- Address emotional and self-esteem issues that arise; provide encouragement and support. (See Checklist 3.5.)
- For more information on this topic, investigate these resources:
  - *Twice Exceptional Newsletter* (Glen Ellyn Media)
    www.2enewsletter.com
  - Uniquely Gifted Resources for Gifted Children with Special Needs
    www.uniquelygifted.org

- Smart Kids with Learning Disabilities
  www.smartkidswithld.org
- Association for the Education of Gifted Underachieving Students
  www.aegus1.org

Resources

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