



Dyslexia Presentation - Child Development Network

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This handout is divided into two parts: Part One serves as a guide to the Oral presentation. Part Two is information that relates to the presentation but is more general in nature.

Note: Some of the following information has been collated and edited from research papers presented by the IDA, BDA, Yale University Reading Laboratory and the NICHD.

Let's Get Deep and Meaningful about

Dyslexia

Part One

Definitions and Meaning

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 growth of vocabulary and background knowledge

(Adopted by the IDA Board of Directors, Nov. 12, 2002. This Definition is also used by the National Institute of Child Health and Human Development (NICHD)).

Dyslexia is often referred to as a language based learning disability. It is the most common form of learning disability. Approximately 15-20% of the population has a learning disability and The National Institutes of Health (US) report that 60% to 80% of those with learning disabilities have problems with reading and language skills. Individuals with dyslexia usually have difficulty with either receptive oral language skills, expressive oral language skills, reading, spelling, or written expression.

Dyslexia varies in degrees of severity. The prognosis depends on the severity of the disability, specific patterns of strengths and weaknesses with the individual, and the appropriateness of the intervention. It is not a result of lack of motivation, sensory impairment, inadequate instruction, environmental opportunities, low intelligence, or

other limiting conditions. It is a condition which is neurologically based and often appears in families. Individuals with dyslexia respond successfully to timely and appropriate intervention.

Diagnostic Models

1. IQ:Performance Discrepancy Model
2. Phonological Processing Deficit Model
3. “Sea of Strengths” Model

Diagnostic Measurements

1. Diagnostic Tests
2. Survey Tests
3. Diagnostic Achievement Tests

Didactics of Multisensory Interventions

Research (**Lyon 1998 Torgensen 2002, Shaywitz 2002**) into the effectiveness of remedial literacy interventions has taken place over many years. Numerous programs aimed at remediating Dyslexics and others with specific reading delays and learning disorders have been scientifically analysed and tested. This extensive body of research has consistently shown that if a remedial literacy program is going to be effective than it must be based on at least seven fundamental principles.

That is the intervention must be:

- 1 Multisensory
- 2 Alphabetic and Graphophonemic
- 3 Direct, Explicit, Repetitive, Drill-like Instruction
- 4 One on One
- 5 High Intensity, High Frequency, Moderate Duration
- 6 Systematic and Cumulative
- 7 Goal Driven

Programs

1. Registered system (Barton, Hickey, Wilson, Alpha and Omega, The Sound Way, Reading Horizons, Lindamood (LIPS) etc)
2. Eclectic

Other Considerations

Multidisciplinary Treatment Plans

- Biomedical
- Paramedical
- Educational
- Institutional

Approaches

- By-pass
- Remediate
- Accommodate
- Remediate/Accommodate

Goal Setting

“SMART” Goals

Specific
Measurable
Achievable
Realistic
Time-based

Specific

- Instructional Goals determined by Diagnostic Achievement Testing

Measurable

- Use of Benchmark data to use comparatively on a tests retest basis

Achievable and Realistic

- Informal judgement about progress by the diagnostician based on the child’s intelligence, aptitude, self-esteem, social and family circumstances

Time based

- Set a time frame in which to accomplish goals

Part Two

Your Questions Answered.

Why is an evaluation important?

If you suspect dyslexia, it is important to have an evaluation to better understand the problem. Test results determine eligibility for special education services in various states, and they can also determine eligibility for accommodations in colleges and universities. They provide a basis for making educational recommendations and determine the baseline from which remediation programs will be evaluated.

At what age should an individual be tested for dyslexia?

Individuals may be tested for dyslexia at any age. Tests which are selected will vary according to the age of the individual. Young children may be tested for phonological processing, receptive and expressive language abilities, and the ability to make sound/symbol associations. When problems are found in these areas remediation can begin immediately. A diagnosis of dyslexia need not be made in order to offer early intervention in reading instruction.

Who is qualified to make the diagnosis of dyslexia?

Professionals who possess expertise in several disciplines are best qualified to make a diagnosis of dyslexia. The testing may be done by a single individual or by a team of specialists. A knowledge and background in psychology, reading, language and education is necessary. The tester must have knowledge of how individuals learn to read and why some people have trouble learning to read, and must also understand how to measure appropriate reading interventions is necessary to make recommendations.

What test is used to identify dyslexia?

There is no one single test which can be used to test for dyslexia. A battery of tests must be administered. Tests should be chosen on the basis of their measurement properties and their potential to address referral issues. Various tests may be used but the components of a good assessment should remain constant. Tests which measure expressive oral language, expressive written language, receptive oral language, receptive written language, intellectual functioning, cognitive processing, and educational achievement must be administered.

What should an evaluation include?

The expert evaluator will conduct a comprehensive assessment to determine whether the person's learning problems may be related to other disorders. Attention deficit hyperactivity disorder (ADHD), affective disorders (anxiety, depression), central auditory processing dysfunction, pervasive developmental disorders, and physical or sensory impairments are among the other causes of learning problems that a competent evaluator will consider in making the diagnosis of dyslexia.

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The following elements should be included in an assessment for dyslexia:

1. A Developmental, medical, behavioral, academic and family history,
2. A Measure of general intellectual functioning
3. Information on cognitive processing (language, memory, auditory processing, visual processing, visual motor integration, reasoning abilities, and executive functioning),
4. Tests of specific oral language skills related to reading and writing success to include tests of phonological processing,
5. Educational tests to determine level of functioning in basic skill areas of reading, spelling, written language, and math -- testing in reading/writing should include the following measures:
 - single word decoding of both real and nonsense words
 - oral and silent reading in context (evaluate rate, fluency, comprehension and accuracy)
 - reading comprehension
 - dictated spelling test
 - written expression: sentence writing as well as story or essay writing
 - handwriting
6. A classroom observation, and a review of the language arts curriculum for the school-aged child to assess remediation programs which have been tried.

What happens after the evaluation?

Discuss the test results with the individual who did the testing. You should receive a written report consisting of both the test scores as well as an explanation of the results of the testing. Administered tests should be specified. The strengths and weaknesses of the individual should be explained and specific recommendations should be made. In the case of school-aged students, a team meeting should take place when the evaluation is completed. This meeting should include the student's teachers, parents, and individuals who did the testing. When there is a reading problem, the report should suggest recommendations for specific intervention techniques. This instruction should be provided by skilled teachers, specifically trained in structured language, multisensory programs.

Additional help to implement these strategies and recommendations can also be considered. If the testing was done in connection with a current professional problem, the report should include specific suggestions for modifications and accommodations related to job performance.

How long does testing take?

An average test battery will take approximately three hours. Sometimes it will be necessary to conduct the testing in more than one session, particularly in the case of a young child whose attention span is very short. The extent of the evaluation is based on clinical judgment.

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, people with dyslexia have been found to have problems with discriminating sounds within a word, a key factor in their reading difficulties. Dyslexia is not due to either lack of intelligence or a desire to learn; with appropriate teaching methods dyslexics can learn successfully.

How widespread is dyslexia?

Current studies suggest that 15-20% of the population has a reading disability. Of those, 85% has dyslexia. Dyslexia occurs in people of all backgrounds and intellectual levels. 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. People who are very bright can be dyslexic. They are often 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.

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 approaches of the remediation. The most common effects are problems with reading, spelling, and writing. Some dyslexics do not have much difficulty with early reading and spelling tasks but do experience great 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. 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.

What are the signs of dyslexia?

The problems displayed by individuals with dyslexia involve difficulties in acquiring and using language - reading and writing letters in the wrong order is just one manifestation of dyslexia and does not occur in all cases. Other problems experienced by dyslexics include:

- Learning to speak
- Organizing written and spoken language
- Learning letters and their sounds
- Memorizing number facts

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- Spelling
- Reading
- Learning a foreign language
- Correctly doing math operations

Not all students who have difficulties with these skills are dyslexic. Formal testing is the only way to confirm a diagnosis of suspected dyslexia.

Common Signs of Dyslexia: Pre-School Children

The difficulties noted below are often associated with dyslexia if they are unexpected for the individual's age, educational level, or cognitive abilities. A qualified diagnostician can test a person to determine if he or she is truly dyslexic.

- May talk later than most children.
- May have difficulty pronouncing words, i.e., "busgetti" for "spaghetti", "mawn lower" for "lawn mower".
- May be slow to add new vocabulary words.
- May be unable to recall the right word.
- May have difficulty with rhyming.
- May have trouble learning the alphabet, numbers, days of the week, colours, shapes, how to spell and write his or her name.
- May be unable to follow multi-step directions or routines.
- Fine motor skills may develop more slowly than in other children.
- May have difficulty telling and/or retelling a story in the correct sequence.
- Often has difficulty separating sounds in words and blending sounds to make words.

Common Signs of Dyslexia: 1st – 4th Grade Students

- May be slow to learn the connection between letters and sounds.
- Has difficulty decoding single words (reading single words in isolation).
- Has difficulty spelling phonetically.
- Makes consistent reading and spelling errors such as:
 - Letter reversals - "d" for "b" as in: "dog" for "bog"
 - Word reversals - "tip" for "pit"
 - Inversions - "m" for "w," "u" for "n"
 - Transpositions - "felt" for "left"
 - Substitutions - "house" for "home"
- May confuse small words - "at" for "to," "said" for "and," "does" for "goes."
- Relies on guessing and context.
- May have difficulty learning new vocabulary.
- May transpose number sequences and confuse arithmetic signs (+ - x / =).
- May have trouble remembering facts.
- May be slow to learn new skills; relies heavily on memorizing without understanding.

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- May have difficulty planning, organizing and managing time, materials and tasks.
- Often uses an awkward pencil grip (fist, thumb hooked over fingers, etc.).
- May have poor "fine motor" coordination.

Common Signs of Dyslexia: 5th - 8th Grade Students

- Is usually reading below grade level.
- May reverse letter sequences - "soiled" for "solid," "left" for "felt."
- May be slow to discern and to learn prefixes, suffixes, root words, and other reading and spelling strategies.
- May have difficulty spelling; spells same word differently on the same page.
- May avoid reading aloud.
- May have trouble with word problems in math.
- May write with difficulty with illegible handwriting; pencil grip is awkward, fist-like or tight.
- May avoid writing.
- May have difficulty with written composition.
- May have slow or poor recall of facts.
- May have difficulty with comprehension.
- May have trouble with non-literal language (idioms, jokes, proverbs, slang).
- May have difficulty with planning, organizing and managing time, materials and tasks

Common Signs of Dyslexia: High School and College Students

- May read very slowly with many inaccuracies.
- Continues to spell incorrectly, frequently spells the same word differently in a single piece of writing.
- May avoid reading and writing tasks.
- May have trouble summarizing and outlining.
- May have trouble answering open-ended questions on tests.
- May have difficulty learning a foreign language.
- May have poor memory skills.
- May work slowly.
- May pay too little attention to details or focus too much on them.
- May misread information.
- May have an inadequate vocabulary.
- May have an inadequate store of knowledge from previous reading.
- May have difficulty with planning, organizing and managing time, materials and tasks.

Common Signs of Dyslexia: Adults

- May hide reading problems.
- May spell poorly; relies on others to correct spelling.
- Avoids writing; may not be able to write.
- Often very competent in oral language.
- Relies on memory; may have an excellent memory.
- Often has good "people" skills.

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- Often is spatially talented; professions include, but are not limited, to engineers, architects, designers, artists and craftspeople, mathematicians, physicists, physicians (esp. surgeons and orthopedists), and dentists.
- May be very good at "reading" people (intuitive).
- In jobs is often working well below their intellectual capacity.
- May have difficulty with planning, organization and management of time, materials and tasks.
- Often entrepreneurs.

Dyslexia: Is It All In Your Mind?

Recent neurological research provides new insight into the mechanisms and etiology of developmental dyslexia, although there is still much to learn and discover. In this article, we will consider the latest neuroanatomical findings that may, in part, be responsible for the functional difficulties that challenge individuals with dyslexia. The conjecture explored here is that there is a disruption of the cerebral architecture during gestation that sets in motion a cascade of events resulting in reorganization of neuronal circuits and networks. This reorganized anatomical substrate is not optimally organized for language acquisition and does not flourish in the typical environment/education system. Learning difficulties may result depending on the severity and location of brain alterations, the neural plasticity of the system, available compensatory cognitive strategies, and environmental conditions.

Anatomical Differences

In 1979, Albert Galaburda and Thomas Kemper examined a brain removed during an autopsy from a 20-year-old man with dyslexia and reported that there were nerve cells in unusual parts of the cerebral cortex. Subsequent studies at the Dyslexia Research Laboratory at Beth Israel Hospital in Boston, MA, of four dyslexic males and three dyslexic females showed that in the males (less so in females) clusters of "ectopic" neurons are consistently seen in the outside layer of the cerebral neocortex. This layer usually is devoid of nerve cell bodies. Most ectopias were in the frontal and perisylvian language regions. Ectopias are produced before six months of gestation when there is a breach in the pial-gliar border which normally prevents neurons from migrating too far. Although female dyslexics had only a few ectopias, large numbers of gliotic regions representing areas of neuronal loss were present in the cortex.

Etiology of the Anatomical Changes

Ectopias result from the disruption of the developing cerebral cortex before neuronal migration ends at mid-gestation. The focal gliotic regions in female dyslexics may be the outcome of a similar pathological process acting during the third trimester of early postnatal period after neuronal migration is completed. An insult spanning the two periods could produce both ectopias and areas of neuronal loss. Because autoimmune disorders (work begun by the late Dr. Norman Geschwind in 1982) may be increased in individuals with dyslexia, it was suggested that maternal auto-antibodies might injure the developing brain during gestation, leading to the type of neuropathology seen in dyslexia. This view is not supported by work in experimental animal models.

Further, new findings in the human and in experimental models point to the importance of genetic factors. An exciting finding recently by Dr. Bruce Pennington and colleagues is that a region on chromosome 6 may be related to dyslexia. It is intriguing that this area contains many genes related to immune function.

How Might Anatomical Changes Affect Function?

Ectopias are densely and aberrantly connected with other brain areas. Thus, one result of ectopia formation is the alteration of brain organization. One such alteration in dyslexia is the lack of asymmetry in a language-related cortical region called the planum temporale, an auditory area that lies on the superior surface of the temporal lobe. In control subjects, the planum temporale is usually larger in the left hemisphere. However, the dyslexics discussed above showed symmetry of the region. Another change involves one subsystem (magnocellular system) of the visual pathway that may be functionally deficient in individuals with dyslexia (Livingstone, Galaburda, and colleagues). The visual processing disturbance could interfere with normal reading ability. Likewise, similar deficits in other sensory pathways, such as the auditory system (refer to the work of Paula Tallal), could interfere with the normal acquisitions of phonological skills. The visual and auditory systems both show related anatomical changes in organization and neuronal size. However, the functional meaning of these changes is not always clear. For example, Margaret B. Rawson and Thomas West both have emphasized that differences in brain organization sometimes may impart a processing advantage. Albert Einstein and Thomas Edison would undoubtedly concur.

Multisensory Teaching

What is meant by multisensory teaching?

Multisensory teaching is simultaneously visual, auditory, and kinesthetic-tactile to enhance memory and learning. Links are consistently made between the visual (*what we see*), auditory (*what we hear*), and kinesthetic-tactile (*what we feel*) pathways in learning to read and spell.

Margaret Byrd Rawson, a former President of The Orton Dyslexia Society (the precursor to The International Dyslexia Association), said it well:

"Dyslexic students need a different approach to learning language from that employed in most classrooms. They need to be taught, slowly and thoroughly, the basic elements of their language -- the sounds and the letters which represent them -- and how to put these together and take them apart. They have to have lots of practice in having their writing hands, eyes, ears, and voices working together for the conscious organization and retention of their learning."

Teachers who use this approach teach children to link the sounds of the letters with the written symbol. Children also link the sound and symbol with how it feels to form the letter or letters. As students learn a new letter or pattern (such as s or th), they carefully trace, copy, and write the letter(s) while saying the corresponding sound. The sound may be made by the teacher and the letter name(s) given by the student.

Students then read and spell words, phrases, and sentences using these patterns. Teachers and their students rely on all three pathways for learning rather than focusing on a "sight-word" or memory method, a "tracing method," or a "phonetic method" alone.

When and where was multisensory teaching introduced for children with dyslexia?

Dr. Samuel Torrey Orton and his colleagues began using multisensory techniques in the mid-1920's at the mobile mental health clinic he directed in Iowa. Orton was influenced by the kinesthetic method described by Grace Fernald and Helen Keller. He suggested that kinesthetic-tactile reinforcement of visual and auditory associations could correct the tendency of reversing letters and transposing the sequence of letters while reading and writing. Students who reverse b and d are taught to use consistent, different strokes in forming each letter. For example, students make the vertical line before drawing the circle in printing the letter b; they form the circle before drawing the vertical line in printing the letter d.

Anna Gillingham and Bessie Stillman based their original 1936 teaching manual for the "alphabetic method" on Dr. Orton's theories. They combined multisensory techniques with teaching the structure of written English, including the sounds (phonemes), meaning units (morphemes such as prefixes, suffixes, and roots) and common spelling rules. The phrase "Orton-Gillingham approach" refers to the structured, sequential, multisensory techniques established by Dr. Orton and Ms. Gillingham and their colleagues.

What is the rationale behind multisensory teaching?

Children with dyslexia often exhibit weaknesses in auditory and/or visual processing. They may have weak phonemic awareness, meaning they are unaware of the role sounds play in words. They have difficulty rhyming words, blending sounds to make words, or segmenting words into sounds. They may also have difficulty acquiring a sight vocabulary. That is, dyslexic children do not learn the sight words expected in the primary grades. In general, they do not pick up the alphabetic code or system. When taught by a multisensory approach, children have the advantage of learning alphabetic patterns and words by utilizing all three pathways. Orton suggested that teaching the "fundamentals of phonic association with letter forms both visually presented and reproduced in writing, until the correct associations were built up" would benefit students of all ages.

Is there solid evidence that multisensory teaching is effective for children with dyslexia?

There is a growing body of evidence supporting multisensory teaching. Current research, much of it supported by the National Institute of Child Health and Human Development (NICHD), converges on the efficacy of explicit structured language teaching for children with dyslexia. Young children in structured, sequential, multisensory intervention programs, who were also trained in phonemic awareness, made significant gains in decoding skills. These multisensory approaches used direct, explicit teaching of letter-sound relationships, syllable patterns, and meaning word

parts. Studies in clinical settings showed similar results for a wide range of ages and abilities.

Orton-Gillingham-Based and/or Multisensory Structured Language Approaches

The principles of instruction and content of a multisensory structured language program are essential for effective teaching methodologies. The International Dyslexia Association (IDA) actively promotes effective teaching approaches and related clinical educational intervention strategies for dyslexics.

CONTENT: What Is Taught

- **Phonology and Phonological Awareness:** Phonology is the study of sounds and how they work within their environment. A phoneme is the smallest unit of sound in a given language that can be recognized as being distinct from other sounds in the language. Phonological awareness is the understanding of the internal linguistic structure of words. An important aspect of phonological awareness is phonemic awareness or the ability to segment words into their component sounds.
- **Sound-Symbol Association:** This is the knowledge of the various sounds in the English language and their correspondence to the letters and combinations of letters which represent those sounds. Sound-symbol association must be taught (and mastered) in two directions: visual to auditory and auditory to visual. Additionally, students must master the blending of sounds and letters into words as well as the segmenting of whole words into the individual sounds.
- **Syllable Instruction:** A syllable is a unit of oral or written language with one vowel sound. Instruction must include teaching of the six basic syllable types in the English language: closed, vowel-consonant-e, open, consonant-le, r-controlled, and diphthong. Syllable division rules must be directly taught in relation to word structure.
- **Morphology:** Morphology is the study of how morphemes are combined from words. A morpheme is the smallest unit of meaning in the language. The curriculum must include the study of base words, roots, prefixes, and suffixes.
- **Syntax:** Syntax is the set of principles that dictate the sequence and function of words in a sentence in order to convey meaning. This includes grammar, sentence variation, and the mechanics of language.
- **Semantics:** Semantics is that aspect of language concerned with meaning. The curriculum (from the beginning) must include instruction in the comprehension of written language.

PRINCIPLES OF INSTRUCTION: How It Is Taught

- **Simultaneous, Multisensory (VAKT):** Teaching is done using all learning pathways in the brain (visual/auditory, kinesthetic-tactile) simultaneously in order to enhance memory and learning.
- **Systematic and Cumulative:** Multisensory language instruction requires that the organization of material follows the logical order of the language. The

sequence must begin with the easiest and most basic elements and progress methodically to more difficult material. Each step must also be based on those already learned. Concepts taught must be systematically reviewed to strengthen memory.

- **Direct Instruction:** The inferential learning of any concept cannot be taken for granted. Multisensory language instruction requires the direct teaching of all concepts with continuous student-teacher interaction.
- **Diagnostic Teaching:** The teacher must be adept at prescriptive or individualized teaching. The teaching plan is based on careful and continuous assessment of the individual's needs. The content presented must be mastered to the degree of automaticity.
- **Synthetic and Analytic Instruction:** Multisensory, structured language programs include both synthetic and analytic instruction. Synthetic instruction presents the parts of the language and then teaches how the parts work together to form a whole. Analytic instruction presents the whole and teaches how this can be broken down into its component parts.

Spelling

How common are spelling difficulties?

Almost all people with developmental reading or language disabilities have great difficulty spelling. In the new definition of dyslexia, people with the condition known as dyslexia are noted to have "conspicuous" problems with spelling and writing. People can also have specific spelling disabilities - that is, they can be poor spellers, even though they are pretty good readers. These problems are very common, although no one has done an accurate estimate of the prevalence to date.

What causes people to be poor spellers?

Spelling problems, like reading problems, originate with language learning weaknesses. Spelling disability does not reflect a general "visual memory" problem but a more specific problem with awareness of and memory for language structure, including the letters in words. People who are poor spellers typically have trouble analyzing the sounds, syllables, and meaningful parts of words in both spoken language and written language. In addition, they often have trouble learning other types of symbolic codes such as math facts and math operation signs.

In the early grades, weaknesses in speech sound awareness (phoneme awareness) predict and are closely associated with poor spelling. In the later grades, difficulty understanding spelling rules, word structure and letter patterns are the hallmarks. The "visual memory" problems of poor spellers are specific to memory for letters and words, so a better term for poor spelling is orthographic memory problem. A person may be a very poor speller but a very good artist, navigator, or mechanic; those professions require a different kind of visual memory.

How do children learn to spell? Is invented spelling good or bad?

Spelling develops in a more or less predictable sequence. Children begin by writing strings of letters and symbols that do not represent the sounds in words. Next, they begin to write a few of the sounds in words that are easily detected; then, get better at "inventing" spellings by sound, using the letters they have learned. This stage, called phonetic spelling or temporary spelling, usually occurs in kindergarten or early first grade, before children learn to spell words correctly. At this crucial early stage, inventing spellings by sounds is an effective way of discovering the separate sounds that make up words. However, invented spellings should never replace the organized instruction that should begin about the middle of first grade. Dyslexic students have difficulty going through the stages of spelling development. Phonetic spelling (spelling by sounds rather than by the correct letters) is a desirable but brief stage of early spelling development. If a student has good phoneme awareness, that is, can segment all the sounds in a simple word, the student is much more likely to remember the "true" letters and letter combinations in the word. Whole word, or "sight" word learning, is also bolstered by good phoneme awareness.

Is our English spelling system predictable or unpredictable?

English is a pattern-based writing system that uses an alphabet to represent speech sounds. The English system of using letters for sounds is more complex than some languages such as Spanish but is nevertheless a predictable, learnable system. The English spelling system is complex because the spelling patterns come from Old English (Anglo-Saxon), from Latin and Greek, and from other modern languages. It is also complex because the regular patterns occur at several levels: the level of individual sounds, such as how we spell the sound /k/; the level of syllables, such as how we spell the syllables in the word ta-ble; and the level of meaningful parts (morphemes), such as how we spell the pieces of ac-com-mo-date.

Many of our odd spellings, words such as come, does, women, and they, are Anglo-Saxon words that have been with us such a long time that they are no longer pronounced the way they are spelled. Really odd words, those that do not conform to a pattern of sound-symbol, syllable, or structural patterns in English, are less than 5% of our vocabulary.

English is predictable over all, but several "layers" of language organization must be learned by those who would spell it well.

What methods of instruction are most effective?

A well designed program for students who do not learn easily will emphasize the sounds in the words, the letter combinations that usually spell those sounds, the spellings of six basic syllable types, and how the spelling rules of English work. Such a program would teach spelling patterns in a structured sequential way. At the more advanced levels, spelling instruction should focus on the meaningful parts of words: the prefixes, roots, suffixes, and grammatical endings that are often spelled consistently. Multisensory techniques, those that join listening, saying, looking, and writing in various combinations, and that consciously engage the student in feeling how the word is spoken and how it is written, are most successful. If word lists are

used they should emphasize the regular spellings for sounds and sound patterns. Special memorization techniques are necessary for the odd words that must be learned as wholes.

In summary, effective spelling instructions should emphasize these principles:

- Knowledge of sounds, letter-sound association, patterns, syllables, and meaningful parts;
- Multisensory practice;
- Systematic, cumulative study of patterns;
- Memorizing a few "sight" words at a time;
- Writing those words correctly many times;
- Using the words in personal writing.

Social and Emotional Problems Related to Dyslexia

By Michael Ryan, Ph.D.

When researchers first began to study specific developmental dyslexia, they noticed that social and emotional difficulties often accompanied this disorder.¹ Subsequently, however, these difficulties were neglected, and for some years, only the academic and cognitive aspects of dyslexia were studied.

Fortunately, during the 1980s, researchers and clinicians began to focus on the social and emotional problems of dyslexia. Margaret Bruck, in her review of the research, offers two possible explanations for these problems:

- First, the social and emotional difficulties of dyslexia, "are part or a manifestation of the same disorder as is responsible for academic failure."²
- Second, Bruck suggests that because dyslexia puts the child at odds with his environment, he experiences great stress, which in turn creates many problems in social and emotional adjustment.

I believe that both hypotheses are correct. Some of the dyslexic's problems have biological causes, while others are reactions to the disability itself. This article will focus on the problems that are secondary to specific developmental dyslexia.

First, after discussing the factors that make dyslexia such a problem for children and adults, I will present a summary of the social and emotional reactions that can result from this disability. Finally, the article will offer some concrete suggestions to help dyslexics and their families. Neurologist Samuel Orton was one of the first to describe the emotional aspects of dyslexia. According to his research, the majority of dyslexic preschoolers are happy and well adjusted. Their emotional problems begin to develop when early reading instruction does not match their learning style. Over the years, the frustration mounts as classmates surpass the dyslexic student in reading skills.

Dyslexics' frustration often centers on their inability to meet expectations. Their parents and teachers see a bright, enthusiastic child who is not learning to read and

write. Time and again, dyslexics and their parents hear, "He's such a bright child; if only he would try harder." Ironically, no one knows exactly how hard the dyslexic is trying!

The pain of failing to meet other people's expectations is surpassed only by dyslexics' inability to achieve their goals. This is particularly true of those who develop perfectionistic expectations in order to deal with their anxiety. They grow up believing that it is "terrible" to make a mistake. However, their learning disability, almost by definition, means that these children will make many "careless" or "stupid" mistakes. This is extremely frustrating to them, as it makes them feel chronically inadequate.

The dyslexic frequently has problems with social relationships. These can be traced to several causes:

- Dyslexic children may be physically and socially immature in comparison to their peers. This can lead to a poor self-image and less peer acceptance.
- Dyslexics' social immaturity may make them awkward in social situations.
- Many dyslexics have difficulty reading social cues. They may be oblivious to the amount of personal distance necessary in social interactions or insensitive to other people's body language.
- Dyslexia often affects oral language functioning. Affected persons may have trouble finding the right words, may stammer, or may pause before answering direct questions. This puts them at a disadvantage as they enter adolescence, when language becomes more central to their relationships with peers.

My clinical observations lead me to believe that, just as dyslexics have difficulty remembering the sequence of letters or words, they may also have difficulty remembering the order of events. For example, let us look at a normal playground interaction between two children. A dyslexic child takes a toy that belongs to another child, who calls the dyslexic a name. The dyslexic then hits the other child. In relating the experience, the dyslexic child may reverse the sequence of events. He may remember that the other child called him a name, and he then took the toy and hit the other child.

This presents two major difficulties for the dyslexic child. First, it takes him longer to learn from his mistakes. Second, if an adult witnessed the events, and asks the dyslexic child what happened, the child seems to be lying.

Unfortunately, most interactions between children involve not three events, but 15 to 20. With his sequencing and memory problems, the dyslexic may relate a different sequence of events each time he tells the tale. Teachers, parents, and psychologists conclude that he is either psychotic or a pathological liar.

The inconsistencies of dyslexia produce great havoc in a child's life. There is a tremendous variability in the student's individual abilities. Although everyone has strengths and weaknesses, the dyslexic's are greatly exaggerated. Furthermore, the dyslexic's strengths and weaknesses may be closely related.

I once worked with a young adult who received a perfect score on the Graduate Record Exam in mathematics. He could do anything with numbers except remember

them. The graduate students he tutored in advanced statistics or calculus had great difficulty believing that he could not remember their telephone numbers.

These great variations produce a "roller coaster" effect for dyslexics. At times, they can accomplish tasks far beyond the abilities of their peers. At the next moment, they may be confronted with a task that they cannot accomplish. Many dyslexics call this "walking into black holes." To deal with these kinds of problems, dyslexics need a thorough understanding of their learning disability. This will help them predict both success and failure.

Dyslexics also perform erratically within tasks. That is, their errors are inconsistent. For example, I once asked a dyslexic adult to write a hundred-word essay on television violence. As one might expect, he misspelled the word "television" five times. However, he misspelled it a different way each time. This type of variation makes remediation more difficult.

Finally, dyslexics' performance varies from day to day. On some days, reading may come fairly easily. However, another day, they may be barely able to write their own name. This inconsistency is extremely confusing not only to the dyslexic, but also to others in his environment. Few other handicapping conditions are intermittent in nature. A child in a wheelchair remains there; in fact, if on some days the child can walk, most professionals would consider it a hysterical condition. However, for the dyslexic, performance fluctuates. This makes it extremely difficult for the individual to learn to compensate, because he or she cannot predict the intensity of the symptoms on a given day.

Anxiety is the most frequent emotional symptom reported by dyslexic adults. Dyslexics become fearful because of their constant frustration and confusion in school. These feelings are exacerbated by the inconsistencies of dyslexia. Because they cannot anticipate failure, entering new situations becomes extremely anxiety-provoking.

Anxiety causes human beings to avoid whatever frightens them. The dyslexic is no exception. However, many teachers and parents misinterpret this avoidance behavior as laziness. In fact, the dyslexic's hesitancy to participate in school activities such as homework is related more to anxiety and confusion than to apathy.

Many of the problems caused by dyslexia occur out of frustration with school or social situations. Social scientists have frequently observed that frustration produces anger. This can be clearly seen in many dyslexics.

The obvious target of the dyslexic's anger would be schools and teachers. However, it is also common for the dyslexic to vent his anger on his parents. Mothers are particularly likely to feel the dyslexic's wrath. Often, the child sits on his anger during school to the point of being extremely passive. However, once he is in the safe environment of home, these very powerful feelings erupt and are often directed toward the mother. Ironically, it is the child's trust of the mother that allows him to vent his anger. However, this becomes very frustrating and confusing to the parent who is desperately trying to help her child.

This anger is particularly evident in adolescents. By its very nature, dyslexia causes children to become more dependent on the adults in their environment. They need extra tutoring and help with their homework.

As youngsters reach adolescence, society expects them to become independent. The tension between the expectation of independence and the child's learned dependence causes great internal conflicts. The adolescent dyslexic uses his anger to break away from those people on which he feels so dependent.

Because of these factors, it may be difficult for parents to help their teenage dyslexic. Instead, peer tutoring or a concerned young adult may be better able to intervene and help the child. The dyslexic's self-esteem appears to be extremely vulnerable to frustration and anxiety. According to Erik Erickson, during the first years of school, every child must resolve the conflicts between a positive self-image and feelings of inferiority. If children succeed in school, they will develop positive feelings about themselves and believe that they can succeed in life. If children meet failure and frustration, they learn that they are inferior to others, and that their efforts make very little difference. Instead of feeling powerful and productive, they learn that their environment acts upon them. They feel powerless and incompetent.

Researchers have learned that when typical learners succeed, they credit their own efforts for their success. When they fail, they tell themselves to try harder. However, when the dyslexic succeeds, he is likely to attribute his success to luck. When he fails, he simply sees himself as stupid.

Research also suggests that these feelings of inferiority develop by the age of ten. After this age, it becomes extremely difficult to help the child develop a positive self-image. This is a powerful argument for early intervention.

Depression

Depression is also a frequent complication in dyslexia. Although most dyslexics are not depressed, children with this kind of learning disability are at higher risk for intense feelings of sorrow and pain. Perhaps because of their low self-esteem, dyslexics are afraid to turn their anger toward their environment and instead turn it toward themselves.

However, depressed children and adolescents often have different symptoms than do depressed adults. The depressed child is unlikely to be lethargic or to talk about feeling sad. Instead, he or she may become more active or misbehave to cover up the painful feelings. In the case of masked depression, the child may not seem obviously unhappy. However, both children and adults who are depressed tend to have three similar characteristics:

- First, they tend to have negative thoughts about themselves, i.e., a negative self-image.
- Second, they tend to view the world negatively. They are less likely to enjoy the positive experiences in their life. This makes it difficult for them to have fun.

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- Finally, most depressed youngsters have great trouble imagining anything positive about the future. The depressed dyslexic not only experiences great pain in his present experiences, but also foresees a life of continuing failure.

Like any handicapping condition, dyslexia has a tremendous impact on the child's family. However, because dyslexia is an invisible handicap, these effects are often overlooked.

Dyslexia affects the family in a variety of ways. One of the most obvious is sibling rivalry. Non-dyslexic children often feel jealous of the dyslexic child, who gets the majority of the parents' attention, time, and money. Ironically, the dyslexic child does not want this attention. This increases the chances that he or she will act negatively against the achieving children in the family.

Specific developmental dyslexia runs in families. This means that one or both of the child's parents may have had similar school problems. When faced with a child who is having school problems, dyslexic parents can react in one of two ways. They may deny the existence of dyslexia and believe if the child would just buckle down, he or she could succeed. Or, the parents may relive their failures and frustrations through their child's school experience. This brings back powerful and terrifying emotions, which can interfere with the adult's parenting skills.

During the past 18 years, I have interviewed many dyslexic adults. Some have learned to deal successfully with their learning problems, while others have not. My experiences suggest that in addition to factors such as intelligence and socio-economic status, other things affect the dyslexic's chances for success.

First, early in the child's life, someone has been extremely supportive and encouraging. Second, the young dyslexic found an area in which he or she could succeed. Finally, successful dyslexics appear to have developed a commitment to helping others.

Both teachers and parents need to offer consistent, ongoing encouragement and support. However, one rarely hears about this very important way to help youngsters. I believe encouragement involves at least four elements. First, listening to children's feelings. Anxiety, anger, and depression are daily companions for dyslexics. However, their language problems often make it difficult for them to express their feelings. Therefore, adults must help them learn to talk about their feelings.

Teachers and parents must reward effort, not just "the product." For the dyslexic, grades should be less important than progress.

When confronting unacceptable behavior, adults must not inadvertently discourage the dyslexic child. Words such as "lazy" or "incorrigible" can seriously damage the child's self-image. Finally, it is important to help students set realistic goals for themselves. Most dyslexic students set perfectionistic and unattainable goals. By helping the child set an attainable goal, teachers can change the cycle of failure.

Even more important, the child needs to recognize and rejoice in his or her successes. To do so, he or she needs to achieve success in some area of life. In some cases, the

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dyslexic's strengths are obvious, and many dyslexics' self-esteem has been salvaged by prowess in athletics, art, or mechanics. However, the dyslexic's strengths are often more subtle and obtuse. Parents and teachers need to find ways to relate the child's interests to the demands of real life.

Finally, many successful dyslexic adults deal with their own pain by reaching out to others. They may do volunteer work for charities or churches, or choose vocations that require empathy and a social conscience. These experiences help dyslexics feel more positive about themselves and deal more effectively with their pain and frustration. Many opportunities exist in our schools, homes, and churches for dyslexics to help others. One important area is peer tutoring. If dyslexic students do well in math or science, they can be asked to tutor a classmate who is struggling. Perhaps that student can reciprocate as a reader for the dyslexic student. Tutoring younger children, especially other dyslexics, can be a positive experience for everyone involved.

Helping dyslexics feel better about themselves and deal effectively with their feelings is a complex task.

First, teachers must understand the cognitive and affective problems caused by dyslexia. Then they must design strategies that will help the dyslexic, like every other child, to find joy and success in academics and personal relationships.

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Assistive Terminology used for Diagnosing Dyslexia

Because Dyslexia varies in degrees of severity and presents with idiosyncratic patterns of strengths and weaknesses it is sometimes useful to use additional more explicit terms that will help further elucidate the subject's condition. This is particularly useful for those who are interpreting biomedical, psychometric and linguistic data with a view to the construction of practical literacy interventions.

The following terms are diagnostically associated with Dyslexia and a correct application of such means that the diagnostician has an enhanced ability to accurately describe the subject's difficulty. Some terms can be used interchangeably although should not be done so within the same report.

It should be kept in mind that Dyslexia is a clinical diagnosis based on a thoughtful synthesis of information from the subject's personal and family history from observations of her/his speaking and reading and from tests of perception, reading and language. As in other conditions in medicine, the history is the most critical component and is afforded the most respect.

Generally there are three categories of terms that are used to qualify Dyslexia. These terms are not generally considered as discrete disorders and are not presented as such in the literature.

They are:

1. Perceptual Based Dyslexia

This includes Visual Perception and Auditory perception and Mixed perception. It means that the aetiology as revealed by the testing suggest that the main problems stem from dysfunctional perception. In a visual sense this means that the parvocellular and magnocellular pathways, the function of the lateral geniculate nucleus or the core function of the visual cortex is interfering with the movement and exchange of visual information. Essentially this means that the problem lies in the visual system and is considered a problem of connectivity between the lateral geniculate cortex and the primary visual cortex... There are a number of visual perception tests available that will give indicators as to whether the child is experiencing problems due to dysfunction in this area.

The appropriate terms that help the diagnostician to convey this type of information are:

Eidesia: This refers to the ability to maintain a vivid and detailed mental picture of something previously seen, as a page of a text, an illustration, etc. That is; the ability to picture. An eidetic image is clearer and more accurate than a memory image. It may be projected like an afterimage, but it remains constant to permit the subject to examine different parts of it. Researchers suggest that this ability is inhibited by a dysfunctional visual system as opposed to a processing problem elsewhere in the language system of the brain.

Dysphonesia: This refers to dysfunction of auditory pathways. It remains an area of contention among researchers. Some suggest that the auditory system including the vestibular system has a significant role to play. Other say that it is still impossible to determine the role of the vestibular system and believe that the difficulties recorded by clinicians and attributed to auditory perception are in fact phonological processing problems occurring elsewhere in the language system in the brain. However, given that Dyslexia is a clinical diagnosis based upon the synthesis of information this term is used by clinicians to generally convey the fact that the subject is having more problems with the sound system of English rather than visual processing.

2. Phonological Processing

This refers to the ability to recognize and use all sizes of sound units, such as words, syllables, and phonemes. It is a neurologically definable part of the language system. Test such as the LAC, Quil, PAL and others that involve phoneme identification, isolation and manipulation are very useful in determining whether the subject has this problem. Phonological processing problems can coexist with perceptual and orthographic problems as well as be mutually exclusive.

The appropriate terminology is generally *Phonological Dyslexia* or sometimes *Phonological Processing based Dyslexia*.

3. Orthographic Processing

Orthographic processing refers to the processing of letters. In particular it refers to the ability to attend to and process multi-letter units and permissible letter patterns in words. This is particularly noticeable with subjects who only spell phonetically and have difficulty with phonetically unfair words. Orthographic problems also include syntactic and semantic processing and should not be limited to mere graphic confusions. Again, the neurology of the orthographic system has been documented and it has nothing to do with visual perception and should not be confused with issues relative to memory.

The appropriate terminology is generally *Orthographic Dyslexia* or sometimes *Orthographic Processing based Dyslexia or Dysorthographia*.

4. Mixed Conditions

In some cases it is obvious that the subject has problems stemming from more than one area. Thus it is helpful if the diagnostician use compounded terminology to express the mixed nature of the difficulty. In other cases it is unclear whether the dyslexia is perceptually based or whether it is more to do with the neurology of the language system. In this case it is unwise to speculate and the simple diagnosis of Dyslexia is best.