

## NASET LD Report #3

# Characteristics of Children with Learning Disabilities

Children with learning disabilities are a heterogeneous group. These children are a diverse group of individuals, exhibiting potential difficulties in many different areas. For example, one child with a learning disability may experience significant reading problems, while another may experience no reading problems whatsoever, but has significant difficulties with written expression.

Learning disabilities may also be mild, moderate, or severe. Students differ too, in their coping skills. According to Bowe (2005), “some learn to adjust to LD so well that they ‘pass’ as not having a disability, while others struggle throughout their lives to even do ‘simple’ things. Despite these differences, LD always begins in childhood and always is a life-long condition” (p. 71).

Over the years, parents, educators, and other professionals have identified a wide variety of characteristics associated with learning disabilities (Gargiulo, 2004). One of the earliest profiles, developed by Clements (1966), includes the following ten frequently cited attributes:

- Hyperactivity
- Impulsivity
- Perceptual-motor impairments
- Disorders of memory and thinking
- Emotional lability
- Academic difficulties
- Coordination problems
- Language deficits
- Disorders of attention
- Equivocal neurological signs

Almost 35 years later, Lerner (2000) identified nine learning and behavioral characteristics of individuals with learning disabilities:

- Disorders of attention
- Reading difficulties
- Poor motor abilities
- Written language difficulties
- Oral language difficulties
- Social skills deficits
- Psychological process deficits
- Quantitative disorders
- Information processing problems

According to Gargiulo (2004), not all students with learning disabilities will exhibit these characteristics, and many pupils who demonstrate these same behaviors are quite successful in the classroom. As Smith (1979) observes, it is the quantity, intensity, and duration of the behaviors that lead to the problems in school and elsewhere.

The focus of this LD Report will be to discuss the most commonly seen characteristics of children with learning disabilities. In almost all cases, a single student will not have deficits in all areas. Understanding the characteristics of children with learning disabilities is absolutely essential as a future educator in developing prereferral interventions, in making appropriate referrals, and in identifying effective adaptations and intervention strategies (Smith et al., 2004).

## **Academic Achievement Deficits**

Children with learning disabilities often struggle with various areas of academic performance. During the elementary school years, a discrepancy between ability and achievement begins to emerge in students with learning disabilities. Often puzzling to teachers, these students seem to have strengths similar to their peers in several areas, but their rate of learning is unexpectedly slower (Smith et al., 2004). These problems usually persist from the primary grades through the end of formal schooling, including college (Bradshaw, 2001).

Academic deficits for children with learning disabilities normally fall into the following areas: reading, mathematics, and written expression. Some children have problems in only one select academic area, while others may experience difficulties in all three.

## **Reading Deficits**

Reading provides a fundamental way for individuals to exchange information. It is also a means by which much of the information presented in school is learned. As a result, reading is the academic area most often associated with academic failure. Reading is a complex process that requires numerous skills for its mastery. Consequently, identifying the skills that lead to success in reading is extremely important.

Reading difficulties are observed among students with learning disabilities more than any other problem area of academic performance. It is the most prevalent type of academic difficulty for students with learning disabilities. It is estimated that as many as 90% of students with learning disabilities have reading difficulties, and even the low estimates are approximately 60% (Bender, 2001).

Most authorities believe that this problem is related to deficient language skills, especially phonological awareness—the ability to understand that speech flow can be broken into smaller sound units such as words, syllables, and phonemes.

According to Hallahan and Kauffman (2003), it is easy to see why problems with phonology would be at the heart of many reading difficulties. A person who has problems breaking words into their component sounds will have trouble learning to read. And there is suggestive evidence that readers of English are more susceptible than readers of some other languages to problems with phonological awareness. Some have speculated that this is why reading disabilities are more prevalent in English-speaking countries than in some other countries (p. 162).

Becoming a skilled reader is so important in our culture that an unskilled reader is at a great disadvantage in school and in the workplace. The following problems may prevent a child with learning disabilities from learning to read (Kirk, Gallagher, & Anastaiow, 2003, p. 224).

- Faulty auditory perception without hearing impairment
- Slow auditory or visual processing
- Inability to distinguish or separate the sounds of spoken words
- Lack of knowledge of the purpose of reading
- Failure to attend to critical aspects of the word, sentence, or paragraph
- Failure to understand that letters represent units of speech

Recent research has begun to reveal a great deal about the fundamental nature of children's reading disabilities and the type of instruction most likely to remediate reading problems (Jenkins & O'Connor, 2001). In summarizing the research, Torgeson and Wagner (1998) state that (1) the most severe reading problems of children with learning disabilities lie at the word, rather than the text, level of processing (i.e., inability to accurately and fluently decode single words), and (2) the most common cognitive limitation of these children involves a dysfunction in the awareness of the phonological structure of words in oral language (p. 226).

Clearly, problems with the reading process are very prevalent among students identified as having learning disabilities. However, the specific problems that they have in reading vary as much as the many components of the reading process (Hardman et al., 2005). These difficulties include, but are not limited to oral reading, reading comprehension, word recognition skills, and reading habits.

## Oral Reading Difficulties

Many students with learning disabilities have difficulties with reading fluency (Mercer, Campbell, Miller, Mercer, & Lane, 2000). Reading fluency, most frequently defined as the rate of accurate reading (correct words per minute), is more than a status symbol for children; it is an important indicator of reading ability (Hunt & Marshall, 2005). Students with fluency problems may read aloud in a word-by-word manner without appropriate inflection or rhythm, unable to relate the patterns of spoken language to the printed word. Students with weakness in this area often dread being asked to read in class (Friend, 2005).

According to Salvia and Ysseldyke (1998), common oral reading problems include the following:

- **Omissions.** The student skips individual words or groups of words.
- **Insertion.** The student inserts one or more words into the sentence being orally read.
- **Substitution.** The student replaces one or more words in the passage by one or more meaningful words.
- **Gross mispronunciation of a word.** The student's pronunciation of a word bears little resemblance to the proper pronunciation.
- **Hesitation.** The student hesitates for two or more seconds before pronouncing a word.
- **Inversion.** The student changes the order of words appearing in a sentence.
- **Disregard of punctuation.** The student fails to observe punctuation; for example, may not pause for a comma, stop for a period, or indicate a vocal inflection, a question mark, or an exclamation point.

**Analyzing Oral Reading Miscues.** An oral reading error is often referred to as a miscue. A miscue is the difference between what a reader states is on a page and what is actually on the page. According to Vacca, Vacca, and Grove (1986), differences between what the reader says and what is printed on the page are not the result of random errors. Instead, these differences are caused by the thought and language of the reader, who is attempting to construct what the author is saying. Analysis of miscues can be of two types. With quantitative miscues analysis, the number of reading errors made by the student is counted. With qualitative miscues analysis, the focus is on the quality of the error rather than the number of different mistakes. This type of analysis is not based on the problems related to word identification, but rather on the differences between the miscues and the words on the pages. Consequently, in qualitative miscue analysis some miscues are more significant than others (Vacca et al., 1986).

According to John (1985), a miscue is significant if it affects meaning. Miscues are generally significant when the following statements apply:

- The meaning of the sentence or passages is significantly changed or altered, and the student does not correct the miscue.
- A nonword is used in place of the word in the passage.
- Only a partial word is substituted for the word or phrase in the passage.
- A word is pronounced for the student.

Miscues are generally *not* significant in the following cases.

- The meaning of the sentence or passage undergoes no change or only minimal change.
- Miscues are self-corrected by the student.
- They are acceptable in the student's dialect.
- They are later read correctly in the same passage.

Through miscue analysis, teachers can determine the extent to which the reader uses and coordinates graphic, sound, syntactic, and semantic information from the text. According to Goodman and Burke (1972), to analyze miscues you should ask at least four crucial questions:

- **Does the miscue change meaning?** If it does not, then it is semantically acceptable within the context of the sentence or passage.
- **Does the miscue sound like language?** If it does, then it is grammatically acceptable within the context. Miscues are grammatically acceptable if they sound like language and serve as the same parts of speech as the text words.
- **Do the miscue and the text word look and sound alike?** Substitution and mispronunciation miscues should be analyzed to determine how similar they are in approximating the graphic and pronunciation features of the text words.
- **Was an attempt made to self-correct the miscue?** Self-corrections are revealing because they demonstrate that the reader is attending to meaning and is aware that the initial miscuing did not make sense.

Oral reading problems often cause tremendous embarrassment for children. Children with oral reading problems may read in a strained voice with poor phrasing, ignore punctuation, and grope for words like a much younger child would do when reading. Pollaway, Patton, and Serna (2001) confirm that a student's self-image and feelings of confidence are greatly affected by unhappy

reading experiences. Deficits in reading skills can also lead to acting-out behavior and poor motivation.

## Reading Comprehension Deficits

Students with learning disabilities often have difficulties with reading comprehension (Gersten, Williams, Fuchs, & Baker, 1998). These children often lack the skills required for understanding text and have poor word-analysis skills (Hunt & Marshall, 2005). Reading comprehension refers to a student's ability to understand what he or she is reading. Some students with reading comprehension difficulties are able to read a passage so fluently that you might assume they were highly proficient readers. However, when they are asked questions about what they have read, they have little or no understanding of the words. Students with this problem sometimes are referred to as word callers (Friend, 2005).

It is always necessary to assess not only decoding but also the ability to understand what is being decoded. According to Salvia and Ysseldyke (1998), there are six different types of reading comprehension skills:

**Literal comprehension.** The student reads the paragraph or story and is then asked questions based on it.

**Inferential comprehension.** The student reads a paragraph or story and must interpret what has been read.

**Listening comprehension.** The student is read a paragraph or story by the examiner and is then asked questions about what the examiner has read.

**Critical comprehension.** The student reads a paragraph or story and then analyzes, evaluates, or makes judgments about what he or she has read.

**Affective comprehension.** The student reads a paragraph or story, and the examiner evaluates his or her emotional responses to the text.

**Lexical comprehension.** The student reads a paragraph or story, and the examiner assesses his or her knowledge of vocabulary words.

Here are some common reading comprehension problems of children with LD:

- Difficulties recalling basic facts (unable to answer specific questions about a passage, such as What was the dog's name in the story?)
- Difficulties recalling sequence (unable to tell the sequence of the story that was read)
- Difficulties recalling the main theme (unable to recall the main topic of the story)

When evaluating a child for reading comprehension, it is important to ask the following questions:

- Does the student guess at answers to the questions presented?
- Does the student show unwillingness to read or make attempts at reading?
- Does the student skip unknown words?

- Does the student disregard punctuation?
- Does the student exhibit inattention to the story line?
- Does the student drop the tone of his or her voice at the end of sentences?
- Does the student display problems with sounding out word parts and blends?
- Does the student exhibit a negative attitude toward reading?
- Does the student express difficulty attacking unknown words?

## Problems with Word Recognition

Students with learning disabilities often have difficulties with word recognition, which relates to the student's ability with respect to sight vocabulary. According to Salvia and Ysseldyke (1998):

*A student learns the correct pronunciation of letters and words through a variety of experiences. The more exposure a student has to specific words and the more familiar those words become, the more readily he or she recognizes those words and is able to pronounce them correctly. (p. 464)*

In order to identify written words, we use a number of different skills. Here are some of the most important word analysis skills:

- The ability to associate sounds with the various letters and letter combinations used to write them (phonic analysis)
- Immediately recognizing and remembering words (sight-word reading)
- Using the surrounding text to help figure out a specific word (using context)

The skills listed above rely heavily on perception, selective attention, memory, and metacognitive skills. Thus, word recognition depends almost entirely on the cognitive skills that are most problematic for individuals with disabilities (Hunt & Marshall, 2005).

According to Gargiulo (2004), here are common word recognition errors:

- **Omissions.** Omitting a word (Tom saw [a] cat.)
- **Insertions.** Inserting words (The dog ran [fast] after the cat.)
- **Substitutions.** Reversing letters in a word (no for on, was for saw)
- **Mispronunciations.** (Mister for miser)
- **Transpositions.** Reading words in the wrong order (She away ran instead of she ran away.)
- **Unknown words.** Hesitating for 5 seconds at words they cannot pronounce
- **Slow choppy reading.** Not recognizing words quickly enough (20 to 30 words per minute)

## Poor Reading Habits

Children with reading difficulties often have poor reading habits. As a teacher, it is critical that you be aware of these actions when watching your students read on a daily basis. Gargiulo (2004) lists some behaviors that are exhibited by children with poor reading habits.

- **Tension movements.** Frowning, fidgeting, using a high-pitched tone of voice
- **Insecurity.** Refusing to read, crying, attempting to distract the teacher

- **Loses place.** Losing place frequently
- **Lateral head movements.** Jerking head
- **Holds material close.** Deviating extremely from 15 to 18 inches

## Dyslexia

Dyslexia is one of several distinct learning disabilities. It is a specific language-based disorder characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing abilities. The difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment. Dyslexia is manifested by variable difficulty with different forms of language, often including, in addition to problems reading, a conspicuous problem with acquiring proficiency in writing and spelling.

Simply stated, dyslexia is a type of reading disorder in which the student fails to recognize and comprehend written words. Dyslexia is a severe impairment in the ability to read, despite normal intelligence, normal opportunities to read, and an adequate home environment. Although the precise organic cause of dyslexia is unknown, it is generally thought that this problem results from difficulties with phonological awareness—a lack of understanding of the rules that govern the correspondence between specific sounds and certain letters that make up words (Lyon & Moats, 1997; cited in Gargiulo, 2004, p. 216). In other words, letter-sound recognition is impaired.

Various types of reading disorders have been recently cited by the American Academy of Special Education Professionals' Educator's Diagnostic Manual of Disabilities and Disorders (2007). Listed below are the reading disorders most frequently seen in children with dyslexia:

- **Direct Dyslexia.** Direct dyslexia refers to the ability of the individual to read words aloud correctly, yet not comprehend what he or she has just read.
- **Dyseidesia Dyslexia.** Such an affected individuals will have poor sight-word vocabularies and will rely on using time consuming word attack skills (a phonetic approach) to decode many words. As a result, students with this condition will read laboriously. Decoding becomes inaccurate for many phonetically irregular words, log for laugh. Characteristic spelling errors include phonetic equivalents for irregular words, such as rede for ready.
- **Dyseidetic Dyslexia.** Children with the dyseidetic type of dyslexia are able to sound out individual letters phonetically but have trouble identifying patterns of letters in groups. Their spelling tends to be phonetic even when incorrect (laf for laugh). Children in this group have deficits in vision and memory of letters and word shapes, making it difficult for them to develop a sight vocabulary. However, they have the ability to acquire adequate phonetic skills.
- **Dyslexia with Dysgraphia (Deep Dyslexia).** With this condition, a person has a problem in writing letters and words, grasping word-meanings, integrating the sounds of letters, and in pronouncing unfamiliar and, sometimes, even familiar words. People in this category face the biggest challenge and need our closest attention for educational and career planning.
- **Dyslexia without Dysgraphia (Pure Dyslexia).** This disorder occurs when a person has problems reading but not writing. Some students with pure dyslexia have trouble doing written arithmetic because they have to read the text and the numbers, but may not have

any problem doing spoken arithmetic. Dyslexia without dysgraphia may never be identified, because, to confuse matters, a person may have nearly normal oral language and his or her writing and oral spelling may be virtually unimpaired.

- **Dysnemkinesia Dyslexia.** Dysnemkinesia involves minimal dysfunction of the area of the motor cortex involved in letter formation. Individuals with this disorder can be characteristically distinguished by their frequent letter reversals, such as d for b, as in doy for boy.
- **Dysnomia.** A type of dyslexia specifically associated with difficulties in naming and naming speed.
- **Dysphonetic Dyslexia.** Dysphonic readers have difficulty relating letters to sounds, so their spelling is totally chaotic. They are able to recognize words they have memorized but cannot sound out new ones to figure out what they are. They may be able to read near the appropriate grade level but are poor spellers. Dysphonetic dyslexia is viewed as a disability in associating symbols with sounds. The misspellings typical of this disorder are phonetically inaccurate. The misreadings are substitutions based on small clues, and are also semantic.
- **Literal Dyslexia (Letter Blindness).** With this condition, a person has difficulty identifying letters, matching upper case letters with lowercase, naming letters, or matching sounds with the corresponding letters. Here, a person may read individual letters of the word but not the word itself, or read a word, but not understand the meaning of the word. Some people with literal dyslexia may read words partially. For example, a person may read the word lice as ice, or like. The person may realize that these words are incorrect, but cannot read the words correctly. Some people with literal dyslexia do better by moving their finger along the outline of a word, or by tracing the letters in the air.
- **Mixed Reading Disability Dyslexia (Alexic Reading Disability).** Children with mixed reading disabilities have both the dyseidetic and dysphonic types of reading disorder. This subtype combines the deficit of the first two groups. This person may have disability in both sight vocabulary and phonetic skills. People with this form of dyslexia are usually unable to read or spell.
- **Neglect Dyslexia.** This condition occurs when a person neglects the left or the right side of words, a problem particularly highlighted in reading long words. For example, if asked to read strowt, he or she may read it as owt. Given a word such as alphabetically, persons with this particular form of dyslexia will miss some of the first few letters. For example, they may read it simply as betically. There may be a problem with compound words. For example, a compound word such as cowboy may be read partially, as cow or boy.
- **Phonological Dyslexia.** This disorder occurs when an individual has difficulty in converting letters to their sounds. They can read words that are already familiar to them, but have trouble reading unfamiliar or novel words. They also have difficulty in reading a nonword such as tord. They may misread this nonword as a real word that looks similar. They sometime also misread actual words as other ones that look similar. The word shut may pose this particular problem, much to a listener's dismay.
- **Primary Dyslexia.** This is a dysfunction of, rather than damage to, the left side of the brain (cerebral cortex) and does not change with maturity. Individuals with this type are rarely able to read above a fourth-grade level and may struggle with reading, spelling, and writing as adults. Primary dyslexia is hereditary and is found more often in boys than in girls
- **Semantic Dyslexia.** This occurs when a person distorts the meaning of a word or incorrectly reads a word because of the confusion in the meaning of the given word. People with semantic dyslexia may say an antonym, a synonym, or a subordinate of a word instead of the word proper. For example, they may misread dog as cat or fox. They



may misread twist as twisted, or buy as bought. Some have trouble reading function words such as of, an, not, and and.

- **Spelling Dyslexia.** This occurs when a person has problems reading all types of words and sometimes has trouble identifying individual letters. Their reading is extremely slow and hesitant, particularly on long words. While a normal reader takes about 30 milliseconds for reading each additional letter, a spelling dyslexic may take about a second to do the same. Some dyslexics tend to read words one letter at a time, even if the words are short and familiar.
- **Surface Dyslexia.** This condition occurs when a person can read words phonetically but has problems with whole word recognition (i.e., yacht = yachet).
- **Trauma Dyslexia.** This condition usually occurs after brain trauma or injury to the area of the brain that controls reading and writing. This type of dyslexia is rarely diagnosed in today's school-age population because they will often receive a classification in special education of Traumatic Brain Injury (TBI) rather than LD.
- **Visual Dyslexia.** People with this condition usually cannot learn words as a whole component. There are problems with visual discrimination, memory synthesis, and sequencing of words. Reversal of words or letters when reading, writing, and spelling is common.

It is important to identify students with dyslexia or other severe reading disabilities early, before they fall far behind their peers in word-recognition skills. Students who appear to be learning letter-names, sounds, and sight words at a significantly slower rate than their classmates are at a risk for developing later reading problems. And yet, despite the enormous problems children with dyslexia face, the general consensus among researchers is that they can improve. When the diagnosis of dyslexia is made in the first two grades, more than 80% of the children are brought up to grade level. However, if the diagnosis is not made until the fifth grade, only 10 to 15% are helped (Kirk et al., 2003).

Finally, it is critical to remember that not all children with learning disabilities suffer from dyslexia. The term dyslexia is overused in the popular press, which often gives an inaccurate impression that everyone with a reading or literacy problem suffers from dyslexia.

## Math Deficits

Although disorders of reading have traditionally received more emphasis than problems with mathematics, the latter are gaining a great deal of attention (Hunt & Marshall, 2005). Authorities now recognize that math difficulties are second only to reading disabilities as an academic problem area for students with LD (Hallahan & Kauffman, 2003). Researchers estimate that about one out of every four pupils with LD receives assistance because of difficulties with mathematics (Rivera, 1997). According to Lerner (2003), each student with mathematical difficulties is unique; not all children exhibit the same deficiency or impairment.

Students with learning disabilities may have problems in both math calculations and math reasoning (USOE, 1977). These students often have a number of problems in mathematical thinking (Hunt & Marshall, 2005). Mathematical thinking is a process that begins early in most children. Even before formal education begins, children are exposed to various situations that involve the application of mathematical concepts. As they enter formal schooling, they take the knowledge of what they had previously learned and begin to apply it in a more formal manner.

It is necessary to understand that mathematics and arithmetic are actually two different terms. Although most people use them interchangeably, they each have distinct meanings. According to Merriam-Webster (m-w.com), **arithmetic is:**

*a branch of mathematics that deals usually with the nonnegative real numbers including sometimes the transfinite cardinals and with the application of the operations of addition, subtraction, multiplication, and division to them*

**while mathematics is:**

*the science of numbers and their operations, interrelations, combinations, generalizations, and abstractions and of space, configurations and their structure, measurement, transformations, and generalizations.*

Mathematics involves many different abilities, as suggested by the list below:

- Estimating
- Doing computational skills
- Solving problems
- Understanding measurement
- Using mathematics for prediction
- Creating and reading graphs and charts

Schools begin the process of learning math skills in kindergarten and proceed throughout the child's formal education. Even at the college level, mathematics is often a core requirement in many liberal arts schools. In general, next to reading, mathematics is probably the area most frequently assessed in school systems.

## **Analysis and Interpretation of Math Skills**

According to McLoughlin and Lewis (1990), mathematics is one of the school subjects best suited for error analysis because students respond in writing on most tasks, thereby producing a permanent record of their work. Also, there is usually only one correct answer to mathematics questions and problems, making scoring unambiguous.

Today, the most common use of error analysis in mathematics is assessment of computation skills. Cox (1975) differentiates between systematic computation errors and errors that are random or careless mistakes. With systematic errors, students are consistent in their use of an incorrect number fact, operation, or algorithm (p. 354). McLoughlin and Lewis (1990) identified four error types in computational analysis:

- **Incorrect operation.** The student selects the incorrect operation. For example, the problem requires subtraction, and the student adds.
- **Incorrect number fact.** The number fact recalled by the student is inaccurate. For example, the student recalls the product of 9 &#728; 6 as 52.
- **Incorrect algorithm.** The procedures used by the student to solve the problem are inappropriate. The student may skip a step, apply the correct steps in the wrong sequence, or use an inaccurate method.

- **Random error.** The student's response is incorrect and apparently random. For example, the student writes 100 as the answer to  $42 \div 6$ ; 6. (p. 354)

Different types of errors can occur in the mathematics process other than these four mentioned. For example, a student may make a mistake or error in applying the appropriate arithmetical operations. Such an example would be  $50 - 12 = 62$ . Here, the student used the operation of addition rather than subtraction. The student may understand how to do both operations, but consistently gets these types of questions wrong on tests due to the improper use of the sign involved.

Another problem the student may encounter is a slip. When a slip occurs, it is more likely due to a simple mistake rather than a pattern of problems. For example, if a child correctly subtracts  $20 - 5$  in eight problems but for some reason not in the ninth problem, his or her error is probably due to a simple slip rather than a serious operational or processing problem. One error on one problem is not an error pattern. Error patterns can be assessed by analyzing all correct and incorrect answers. When designing a program plan for a particular child in mathematics, it is critical to establish not only the nature of the problems but also the patterns of problems that occur in the child's responses.

Also, handwriting can play an important role in mathematics. Scoring a math test often involves reading numbers written down on an answer sheet by the student. If a student's handwriting is difficult to interpret or impossible to read, this can create serious problems for the evaluator with respect to obtaining valid scores. When a student's handwriting is not clear on a math test, it is important that the evaluator ask the student for help in reading the answers. By doing so, the evaluator is analyzing the math skills that need to be assessed rather than spending time trying to decode the student's responses.

Robinson, Manchetti, and Torgeson propose that for some children, math difficulties may be due to either deficits in phonological processing of the features of spoken numbers or failure to grasp meaningful concepts. They note that 43% of the students with a math disability also have reading problems (2002; cited in Smith et al., 2004).

## Dyscalculia

Arithmetic involves recognizing numbers and symbols, memorizing facts, aligning numbers, and understanding abstract concepts such as place value and fractions. Any of these may be difficult for children with developmental arithmetic disorders, also called dyscalculia, which refers to selective impairment in mathematical thinking or in calculation skills (Fletcher & Forman, 1994). Problems with number or basic concepts are likely to show up early. Disabilities that appear in the later grades are more often tied to problems in reasoning.

Various types of mathematical disorders have been cited by the American Academy of Special Education Professionals' Educator's Diagnostic Manual of Disabilities and Disorders (2007). Below are mathematical disorders frequently seen in children with dyscalculia:

- **Basic Number Fact Disorder.** Individuals with a Basic Number Fact Disorder have problems memorizing and retaining basic arithmetic facts, such as the answers to  $8 - 2$ ,  $7 + 1$ , or  $12 \div 2$ . It is not that individuals with Basic Number Fact Disorder do not remember any arithmetic facts, but rather they have problems memorizing as many facts

as other children do. Furthermore, they appear to forget facts rather easily. These children may struggle for years, will count their fingers to add and subtract, and seem unable to develop efficient memory strategies on their own.

- **Calculation Disorder.** By definition, calculation is problem solving that involves numbers or quantities. The calculation of numbers often gives students with learning disabilities great difficulties. Inconsistent calculation can lead to numerous errors when doing math work. Students with calculation difficulties often perform the incorrect mathematical operations. For example, when calculating  $8 + 2$ , they may respond 6, because they subtracted rather than added the two numbers.
- **Mathematical Abstraction Limitation Disorder.** Individuals with this disorder do not possess the ability to function at a high level of mathematical abstraction and as a result can only function on a concrete level of understanding. Individuals with this disorder tend to reach a ceiling in their ability to comprehend abstract math concepts.
- **Mathematical Estimation Disorder.** Children with dyscalculia seem to have an impaired sense of number size. This may affect tasks involving estimating numbers in a collection and comparing numbers.
- **Mathematical Language Disorder.** According to Garnett (1998), some students with LD are particularly hampered by the language aspects of math, resulting in confusion about terminology, difficulty following verbal explanations, and weak verbal skills for monitoring the steps of complex calculations. Teachers can help by slowing the pace of their delivery, maintaining normal timing of phrases, and giving information in discrete segments. Such slowed-down chunking of verbal information is important when asking questions, giving directions, presenting concepts, and offering explanations.
- **Mathematical Measurement Disorder.** Individuals with this disorder may have difficulty with concepts involving measurements, such as speed (miles per hour), temperature (energy per unit of mass), averages, and proportional measures.
- **Mathematical Navigation Disorder.** Children with this disorder can usually learn the sequence of counting words, but may have difficulty navigating back and forth, especially in twos, threes, or more.
- **Mathematical Organization Disorder.** Individuals with this disorder may have an inability to organize objects in a logical way. They may be unable to comprehend or mentally picture mechanical processes. They may lack big picture/whole picture thinking. They may have a poor ability to visualize the location of the numbers on the face of a clock, the geographical locations of states, countries, oceans, streets, and so on.
- **Mathematical Sequencing Disorder.** People with this disorder have trouble with sequence, including left/right orientation. They will read numbers out of sequence and sometimes do operations backwards. They also become confused on the sequence of past or future events.
- **Symbolic Mathematical Operations Disorder.** Individuals with this disorder may find it especially difficult to translate between number words, where powers of ten are expressed by new names (ten, hundred, and thousand) and numerals (where powers of ten are expressed by the same numerals but in terms of place value).
- **Temporal/Monetary Math Disorder.** People with this disorder tend to have difficulties in topics relating to time, telling time, keeping track of time, estimating time, monetary concepts, and counting money. Older children may exhibit difficulties with money and credit and cannot do financial planning or budgeting (e.g., balancing a checkbook). Individuals may have fear of money and cash transactions and may be unable to mentally figure change due back, the amounts to pay for tips, taxes, and so forth.
- **Visual-Spatial Math Disorder.** Students with this disorder have disturbances in visual-spatial-motor organization, which may result in weak or missing understanding of

concepts, very poor number sense, specific difficulty with pictorial representations, poorly controlled handwriting, and confused arrangements of numerals and signs on the page. Students with this disorder might have spatial problems and difficulty aligning numbers into proper columns.

- **Written Symbol System Disorder.** According to Garnett (2000), many younger children who have difficulty with elementary math actually bring to school a strong foundation of informal math understanding. They encounter trouble in connecting this knowledge base to the more formal procedures, language, and symbolic notation system of school math (Allardice & Ginsburg, 1983). The collision of their informal skills with school math is like a tuneless, rhythmic child experiencing written music as something different from what she already can do. In fact, it is quite a complex feat to map the new world of written math symbols onto the known world of quantities, actions and, at the same time, to learn the peculiar language we use to talk about arithmetic.

Whether because of the reading requirement or the ability to understand the mathematical concepts captured in a problem, students with learning disabilities may be unable to sort critical extraneous information, to recognize the correct computational procedure, or to determine whether the answer they obtain is reasonable (Jordan & Hanich, 2003). Mathematical difficulties are often major obstacles in the academic paths of students with LD and frequently continue to cause problems throughout high school. Mastery of fundamental quantitative concepts is vital to learning more abstract and complex mathematics, a requirement for youth with learning disabilities who are seeking to complete high school and attend colleges or universities (Cirino, Morris, & Morris, 2002; cited in Hardman et al., 2005). Further research on difficulties with mathematics and on effective instruction for students encountering such problems grows more important as such young people seek to achieve more challenging educational goals (p. 178).

Given these difficulties, it is not surprising that 50% of students with learning disabilities have IEP goals in math. As with reading and writing, explicit, systematic instruction that provides guided meaningful practice with feedback usually improves the math performance of students with learning disabilities (Fuchs & Fuchs, 2001; cited in Heward, 2003).

## Written Expression Deficits

Many individuals with LD exhibit deficits in written language (Hallahan, Kauffman, & Lloyd, 1999). Learning disabilities in the area of written expression are beginning to receive more recognition as a serious problem (Smith et al., 2004). Writing is a highly complex method of expression involving the integration of eye–hand, linguistic, and conceptual abilities. As a result, it is usually the last skill children master. Whereas reading is usually considered the receptive form of a graphic symbol system, writing is considered the expressive form of that system. The primary concern in the assessment of composition skills is the content of the student’s writing, not its form.

The term written language refers to a variety of interrelated graphic skills.

**Composition.** The ability to generate ideas and to express them in an acceptable grammar, while adhering to certain stylistic conventions

**Spelling.** The ability to use letters to construct words in accordance with accepted usage

**Handwriting.** The ability to execute physically the graphic marks necessary to produce legible compositions or messages (Hallahan et al., 1999)

The impact of written language problems increases with a student's age because so many school assignments require a written product. Students with written language problems often exhibit the following characteristics:

- Feel overwhelmed by the idea of getting started
- Struggle to organize and use the mechanics of writing
- Struggle to develop their fluency
- Have difficulties spelling and constructing written products in a legible fashion
- Submit written work that is too brief

Many students with difficulties with written language use a “retrieve-and-write” approach, in which they retrieve from immediate memory whatever seems appropriate and write it down. They seldom use the self-regulation and self-assessment strategies of competent writers: setting a goal or plan to guide their writing, organizing their ideas, drafting, self-assessing, and rewriting. As a result, they produce poorly organized compositions containing a few poorly developed ideas (Sexton, Harris, & Graham, 1998; cited in Heward, 2003).

## Handwriting Difficulties

Handwriting refers to the actual motor activity that is involved in writing. Most students are taught manuscript (printing) initially and then move to cursive writing (script) in later grades. Some educators advocate that only manuscript or only cursive should be taught. In truth, problems may appear among students using either system. Children's writing changes as they mature. The focus of a youngster's writing shifts from the process of writing (handwriting and spelling), to the written product (having written something), to communication with readers (getting across one's message) (Hallahan et al., 1999, p. 396).

Gargiulo (2004) notes that early on, pupils focus on becoming competent in mastering the mechanical aspects of composition—spelling and handwriting; in the later grades, they learn to organize and present their ideas in a lucid and logical fashion. Children with learning disabilities, however, lag behind their nondisabled peers. Investigators have observed that individuals with LD use less complex sentence structure, incorporate fewer ideas, produce poorly organized paragraphs, and write less complex stories (p. 219).

**Dysgraphia.** Dysgraphia, the learning disability associated with written expression, entails writing skills that fall substantially below those expected given the individual's age, IQ, and education, such that academic achievement or activities of daily living are significantly impaired. Dysgraphia is the inability to perform motor movement, in other words, extremely poor handwriting. It is associated with a neurological dysfunction. Agraphia is an acquired disorder in which the ability to write and make patterns is impaired (Birsch, 1999; cited in Kirk et al., 2003). Students' handwriting problems can rise from any of the following conditions:

- A lack of fine motor coordination
- Failure to attend to task
- Inability to perceive and/or remember visual images accurately
- Inadequate handwriting instruction in the classroom

In general, students with dysgraphia often learn less from an assignment because they must focus on the mechanics of writing instead of on the content of their assignment (Turnbull et al., 2004).

Three different types of writing disorders have been recently cited by the American Academy of Special Education Professionals' Educator's Diagnostic Manual of Disabilities and Disorders (2007). Below are the writing disorders most frequently seen in children with dysgraphia:

**Dyslexic Dysgraphia.** With this disorder, spontaneously written text is illegible, especially when the text is complex. Oral spelling is poor, but drawing and copying of written text are relatively normal. Finger-tapping speed (a measure of fine-motor speed) is normal.

**Motor Dysgraphia.** With this disorder, both spontaneously written and copied text may be illegible, oral spelling is normal, and drawing is usually problematic. Finger-tapping speed is abnormal.

**Spatial Dysgraphia.** Individuals with this disorder display illegible writing, whether spontaneously produced or copied. Oral spelling is normal. Finger-tapping speed is normal, but drawing is very problematic.

## Spelling Problems

Spelling is the ability to use letters to construct words in accordance with accepted usage. Spelling ability is viewed by some teachers and school administrators equally with other academic skills. Being a poor speller does not necessarily mean that a child has a learning disorder. However, when poor spelling occurs with poor reading and/or arithmetic, then there is reason for concern. It appears that many of the learning skills required for good spelling are the same ones that enable students to become good readers.

Learning to spell is a developmental process, and young children go through a number of stages as they begin to acquire written language skills. Writing begins in the preschool years as young children observe and begin to imitate the act of writing.

*Dysorthographia* is the learning disability associated with spelling. Individuals with this disorder have difficulties utilizing clues from several sources that aid in deciding on the correct spelling of a word. Marshall and Hunt (2005) note that many students with learning disabilities spell a word as if it were being approached for the first time, without reference to an image of the word held in memory. The difficulties students with LD have in learning and applying the rules of phonics, visualizing the word correctly, and evaluating spellings result in frequent misspellings, even as they become more adept at reading. It is not uncommon to find the same word spelled five or six different ways on the same paper, regardless of whether the student is in the fifth grade or college (e.g., ther, there, there, and they're for their).

**Analysis of Spelling Skills.** Several questions should be addressed before one begins to analyze a child's spelling abilities (Pierangelo & Giuliani, 2005).

**Does the child have sufficient mental ability to learn to spell?** This information can be obtained from the school psychologist if an intellectual evaluation was administered. However, if no such test was administered, you may be able to find the results of a group school abilities index, which may be present in the child's permanent folder.

**Are the child's hearing, speech, and vision adequate?** This information can be obtained through the permanent record folder, information in the nurse's office, or informal screening procedures.

**What is the child's general level of spelling ability according to teacher comments, past evaluations, or standardized tests?** Teacher comments and observations about the child's spelling history are very important to show patterns of disability. Also, look at standardized tests to see if patterns exist through the years on such tests.

It is also important to look at these attributes:

- The child's attitude toward spelling in the classroom
- The extent to which the child relies on a dictionary in the classroom
- The extent of spelling errors in classroom written work
- Any patterns of procrastination or avoidance of written work
- The student's study habits and methods of work in the classroom
- The history of scores on classroom spelling tests
- Any observable handwriting difficulties
- Any evidence of fatigue as a factor in the child's spelling performance

Spelling Errors Primarily Due to Auditory or Visual Channel Deficits. Certain spelling errors may be evident in students with auditory channel deficits (Pierangelo & Giuliani, 2005).

**Auditory discrimination problems.** The child substitutes t for d or sh for ch and/or confuses vowels; for example, spells bit as bet.

**Auditory acuity or discrimination problems.** The child does not hear subtle differences in, nor discriminate between, sounds and often leaves vowels out of two-syllable words.

**Auditory-visual association.** The child uses a synonym such as house for home in spelling.

**Auditory-visual associative memory.** The child takes wild guesses with little or no relationship between the letters or words used and the spelling words dictated, such as spelling dog for home or writing phe for home.

These spelling errors may be evident in students with certain visual channel deficits:

**Visual memory problems.** The child visualizes the beginning or the ending of words but omits the middle of the words; for example, spells hppy for happy.

**Visual memory sequence.** The child gives the correct letters but in the wrong sequence, for example, writes the word the as teh or hte.

**Visual discrimination problems.** The child inverts letters, writing u for n, m for w.

**Visual memory.** The child spells words phonetically that are nonphonetic in configuration, for example, tuff for tough.



In general, common spelling errors to look for in students with dysorthographia include the addition of unneeded letters, reversal of vowels, reversal of syllables, and the phonemic spelling of nonphonemic words. Fortunately, the writing and spelling skills of most students with LD can be improved through strategy instruction, frequent opportunities to practice writing, and systematic feedback (Heward, 2003).

## Language Deficits

Students with learning disabilities often have difficulties with the mechanical and social uses of language (Hallahan & Kauffman, 2003). Specific mechanical deficits difficulties are often present in the three different areas (Gargiulo, 2004).

**Syntax.** Rule systems that determine how words are organized into sentences

**Semantics.** Word meanings

**Phonology.** The study of how individual sounds make up words

Language deficits are found in the areas of oral expression and listening comprehension. These two areas control our ability to communicate with others, and therefore a deficit in either or both can have a major impact on the quality of life of a child with a learning disability, as well as his or her life in education (Smith et al., 2004). Studies have found that more than 60% of students with LD have some type of language disorder (Bryan, Bay, Lopez-Reyna, & Donahue, 1991).

## Oral Language Problems

Students with LD frequently experience difficulties with oral expression—a problem that can affect both academic and social interactions. Common problems associated with oral language include the following:

- Choosing the appropriate word. Children with LD will often use a less appropriate word because the right word will not come to them.
- Understanding complex sentence structures
- Responding to questions
- Difficulties in retrieving words. The response rate of children with learning disabilities may be slower than that of their nondisabled peers, and they may speak more slowly.

## Listening Comprehension Problems

Listening problems can also be misinterpreted. A child with a disability in listening demonstrates that disability in a negative way, for example, by failing to follow directions or by appearing oppositional or unmotivated. A teacher's careful observation and assessment of a student's language ability is important for ensuring the student's success (Smith et al., 2004).

## Problems with Pragmatics

One aspect of oral expression that is receiving increased attention is pragmatics, the functional use of language in social situations. Researchers note that children with learning disabilities sometimes experience communication problems in social settings (Bryan, 1998). Research in the field of children with language-learning disabilities has begun to focus more and more on the

area of pragmatics. Simply stated, pragmatics is the use of language in social situations. Children with learning disabilities often have problems with social conversations. These students may exhibit the following characteristics:

- Need extra time to process incoming information
- Not understand the meaning of the words or sequences
- Miss nonverbal language cues
- Not understand jokes
- Laugh inappropriately or at the wrong times
- Have difficulty doing group work
- Have difficulties giving or following directions
- Have conversations marked by long silences
- Not be skilled in responding to statements
- Not be skilled at responding to questions
- Have a tendency to answer their questions
- Make those with whom they talk feel uncomfortable (Hallahan & Kauffman, 2003)

Participating in conversations with friends can be especially troublesome for someone with a learning disability. The ebb and flow that is characteristic of conversations may elude them, and nonverbal language clues may also be overlooked. In short, many individuals with learning disabilities are not good conversationalists (Gargiulo, 2004). They have great difficulties trying to engage in the mutual give and take that conversation between two people requires.

## Disorders of Attention

- Attention is a critical skill in learning. Conte (1991) suggests that to be effective learners, children must be able to initiate attention, direct their attention appropriately, sustain their attention according to the task demands, and shift attention when appropriate. Deficits in these areas can have an impact on all areas of school. When children are not paying attention, they cannot respond appropriately to questions, follow directions, or take notes during a lecture. Social problems occur when the student interrupts others and does not listen to peers. Estimates of the number of students with LD that have attention problems range from 41% to 80% (Smith et al., 2004).

Attention problems for children with learning disabilities are often characterized as short attention span. A short attention span is defined as an inability to focus one's attention on a task for more than a few seconds or minutes. Parents and teachers note that many children with LD share the following characteristics.

- Cannot sustain attention for more than a short period of time
- Exhibit excessive daydreaming
- Are highly distractible

Individuals with learning disabilities often have attention problems (Kotkin, Forness, & Kavale, 2001). Their attention difficulties are often severe enough for them to be diagnosed as also having Attention-Deficit Hyperactivity Disorder (ADHD). ADHD is a diagnosis normally made by either a psychiatrist or psychologist, using the criteria as established by the American Psychiatric Association (1994). Although estimates vary, researchers have consistently found an overlap of 10 to 25% between ADHD and learning disabilities (Forness & Kavale, 2002).

Several characteristics of ADHD have long been recognized in many children with learning disabilities, and there is a significant level of comorbidity (a situation in which multiple conditions occur together) between the two conditions (some experts estimate as high as 25%).

## Overview of ADHD

Attention-Deficit Hyperactivity Disorder is a condition that can make it hard for a person to sit still, control behavior, and pay attention. These difficulties usually begin before the person is 7 years old. However, these behaviors may not be noticed until the child is older. Doctors do not know just what causes ADHD. However, researchers who study the brain are coming closer to understanding what may cause it. They believe that some people with ADHD do not have enough of certain chemicals (called neurotransmitters) in their brain. These chemicals help the brain control behavior. Parents and teachers do not cause ADHD. Still, there are many things that both parents and teachers can do to help a child with ADHD. As many as 5 out of every 100 children in school may have ADHD. Boys are three times more likely than girls to have ADHD. There are three main signs, or symptoms, of ADHD. These are (1) Problems with paying attention, (2) Being very active (called hyperactivity), and (3) Acting before thinking (called impulsivity).

More information about these symptoms is listed in the Diagnostic and Statistical Manual of Mental Disorders (4th ed. rev.) (DSM IV-TR), published by the American Psychiatric Association (2000). Based on these symptoms, three types of ADHD have been defined:

- **Inattentive ADHD.** The person can't seem to get focused or stay focused on a task or activity
- **Hyperactive-impulsive ADHD.** The person is very active and often acts without thinking
- **Combined ADHD.** The person is inattentive, impulsive, and too active
- **Inattentive ADHD.** Many children with ADHD have problems paying attention.

Children with the inattentive type of ADHD often exhibit the following characteristics:

- Do not pay close attention to details
- Can't stay focused on play or school work
- Don't follow through on instructions or finish school work or chores
- Can't seem to organize tasks and activities
- Get distracted easily
- Lose things such as toys, school work, and books (APA, 2000, pp. 85–86)

**Hyperactive-Impulsive ADHD.** Being too active is probably the most visible sign of ADHD. The hyperactive child is always on the go, although as he or she gets older, the level of activity may go down. These children also act before thinking. For example, they may run across the road without looking or climb to the top of very tall trees. They may be surprised to find themselves in a dangerous situation. They may have no idea of how to get out of the situation.

Hyperactivity and impulsivity tend to go together. Children with the hyperactive-impulsive type of ADHD often may:

- Fidget and squirm

- Get out of their chairs when they're not supposed to
- Run around or climb constantly
- Have trouble playing quietly
- Talk too much
- Blur out answers before questions have been completed
- Have trouble waiting their turn
- Interrupt others when they're talking
- Butt in on the games others are playing (APA, 2000, p. 86)

**Combined ADHD.** Children with the combined type of ADHD have symptoms of both of the types described above. They have problems with paying attention, with hyperactivity, and with controlling their impulses. Of course, from time to time, all children are inattentive, impulsive, and too active. With children who have ADHD, these behaviors are the rule, not the exception. Such behavior can cause a child to have real problems at home, at school, and with friends. As a result, many children with ADHD feel anxious, unsure of themselves, and depressed. These feelings are not symptoms of ADHD. They come from having problems again and again at home and in school. There is no quick treatment for ADHD. However, the symptoms of ADHD can be managed. It's important that the childfamily and teachers find out more about ADHD, learn how to help the child manage his or her behavior, create an educational program that fits the child's individual needs, and provide medication, if parents and the doctor feel this would help the child.

## Achievement Discrepancy

Although students who receive special education services under the learning disabilities category are an extremely heterogeneous group, it is important to remember that the fundamental defining characteristic of students with learning disabilities is specific and significant achievement deficits in the presence of adequate overall intelligence (Heward, 2003). Students with LD perform below expectations based on their measured potential, in addition to scoring below their peers in overall achievement. Attempts to quantify the discrepancy between academic achievement and academic potential for students with LD have appeared in the literature for some time, but the field still lacks a broadly accepted explanation of the phenomenon (Roderiques, 2002; cited in Hardman et al., 2005).

Early in the school years, youngsters with LD may find themselves two to four years behind their peers in level of academic achievement, and many fall even further behind as they continue in the educational system. This discouraging pattern often results in students dropping out of high school or graduating without proficiency in basic reading, writing, or math skills (U.S. Department of Education, 2002; cited in Hardman et al., 2005, p. 178).

The difficulties experienced by children with learning disabilities—especially for those who cannot read at grade level—are substantial and pervasive and usually last across the lifespan (Mercer, 1997). The tendency to think of learning disabilities as a mild disability erroneously supports “the notion that a learning disability is little more than a minor inconvenience rather than the serious, life-long condition it is [and] often detracts from the real needs of these students” (Hallahan, 1998, p. 4; cited in Heward, 2003).

## Memory Deficits

It is well documented that children and adolescents with LD have significant difficulties remembering academic information and nonacademic information, such as doctors' appointments, homework assignments, multiplication facts, directions, and telephone numbers. Teachers frequently comment that, with these students, it seems to be "in one ear and out the other," which can be highly aggravating for teachers as well as parents (Gargiulo, 2004). Teachers and parents also report that memory skills are inconsistent. For example, a student may know the multiplication facts on Thursday and then fail the test on Friday (Hardman et al., 2005).

Parents often state that they cannot understand how their children can be so intelligent and forget such simple things. Early research in learning disabilities has documented that students with LD have a real deficit in memory (Hallahan & Kauffman, 2003). Teachers have long complained that children with LD have poor memory.

Several studies have suggested that students with LD have more deficits in memory than students without LD except in the area of long-term memory (Swanson, 1994). Students with memory deficits have difficulty retaining learned information, repeating information read or heard, following multiple directions, and performing tasks in the right sequence (Smith et al., 2004).

The memory difficulties faced by students are normally either in short-term memory (STM) or working memory (WM). STM involves the ability to recall information after a short period of time. Short-term memory tasks involve the recall, in correct order, of either aurally or visually presented information (such as a list of digits, letters, or pictures) shortly after hearing or seeing the items several times (Hallahan, 1999). Working memory requires that the individual retain information while simultaneously engaging in another cognitive activity. According to Silver (2001), people with LD are more likely to have concerns with short-term rather than long-term memory. He explained that children and youth with these limitations need to concentrate on new information, and to repeat it continually, in order to keep it in short-term memory. If their attention is disrupted, the information may be lost (Bowe, 2005). Working memory is involved, for example, when we try to remember a person's address while also listening to directions on how to arrive there (Swanson, 1994). Deficits in memory, particularly working memory, often translate into difficulties in the classroom. Success with reading and math seems to depend more on working memory than short-term memory. Working memory also appears to be crucial for word recognition and reading comprehension (Ashbaker & Swanson, 1996).

Although there are various theories as to why students with learning disabilities have difficulties with memory tasks, it appears that they do not use "strategies for remembering" the way their nondisabled peers do. For example, when presented with a list of words to memorize, most children will rehearse the names to themselves. They will make use of categories by rehearsing the words and grouping them together. Students with learning disabilities are not likely to use these names spontaneously (Hallahan & Kauffman, 2003).

O'Shaughnessy and Swanson (1998) suggest that the problem is mainly with an inability to code new information for memory storage and a decreased motivation for difficult mental effort. On a positive note, when children with learning disabilities are taught a memory strategy, they perform memory tasks as well as non learning-disabled students (Smith et al., 2004).

## Cognition Deficits

Students with learning disabilities will often demonstrate problems in cognition. Cognition is a broad term covering many different aspects of thinking and problem solving. Students with learning disabilities often exhibit disorganized thinking that results in problems with planning and organizing their lives at home (Hallahan & Kauffman, 2003). Research suggests that children with LD have differing, rather than uniformly deficient, cognitive abilities (Henry, 2001). This finding has led to the development of specific, highly focused instruction for individuals with learning disabilities to replace generic curricula, reflecting the assumption that their cognitive skills are generally poor (Hardman et al., 2005).

According to Smith and colleagues (2004), students with problems in cognition may share the following characteristics:

- Make poor decisions
- Have trouble adjusting to change
- Make frequent errors
- Require concrete demonstrations
- Have delayed verbal responses
- Have difficulties understanding social expectations
- Require more supervision
- Have trouble getting started on a task
- Have trouble using previously learned information in a new situation

## Metacognition Deficits

Students with learning disabilities often have problems with metacognition. Metacognition is defined as one's understanding of the strategies available for learning a task and the regulatory mechanisms needed to complete the task.

Metacognition has at least three components:

**Recognize task requirements.** Students with LD frequently have problems judging how difficult tasks can be. For example, they may approach the reading of highly technical information with the same level of intensity as reading for pleasure.

**Select and implement appropriate strategies.** Students with LD often do not come up with strategies to help themselves in and outside of school. For example, if asked to name ways in which they can help themselves remember to bring their homework into school the next day, they may not have any ideas, whereas the nondisabled peers will suggest writing a note to themselves, putting the homework by the front door, and so on.

**Monitor and adjust performance.** Students with LD often have problems with comprehension monitoring. Comprehension monitoring is the ability to keep track of one's own comprehension of reading material and to make adjustments to comprehend better while reading. For example, a student with LD may not have a good sense he does not understand what he is reading. Good readers are often able to make the necessary adjustments, such as slowing down or rereading

difficult passages. Students with reading problems are also likely to have problems picking out the main ideas of paragraphs.

Hallahan and colleagues (1999) refer to metacognition as “thinking about thinking.” Students with problems in this area might have difficulty focusing on listening, purposefully remembering important information, connecting that information to prior knowledge, making sense out of the new information, and using what they know to solve a problem. They often lack strategies for planning and organizing, setting priorities, and predicting and solving problems. An important component of metacognition is the ability to evaluate one’s own behavior and behave differently when identifying inappropriate behavior or mistakes (Smith et al., 2004). Competency as a learner requires that students exhibit these metacognitive skills (Kluwe, 1987).

## Social–Emotional Problems

The literature suggests that to be socially accepted, students should be cooperative, share, offer pleasant greetings, have positive interactions with peers, ask for and give information, and make conversation (Gresham, 1982). Some children with LD have a real strength in the area of social skills. However, several characteristics of learning disabilities, such as those noted concerning language, can create difficulties in social and emotional life (Smith et al., 2004).

Although not all children with LD have social–emotional problems, they do run a greater risk than their nondisabled peers of having these types of problems. In the early years they are often rejected by their peers and have poor self-concepts (Sridhar & Vaughn, 2001). As adults, the scars from years of rejection can be painful and not easily forgotten (McGrady, Lerner, & Boscardin, 2001). A possible reason for these social–emotional problems is that students with LD often have deficits in social cognition. They may have the following characteristics:

- Misread social cues
- Misinterpret the feelings of others
- Not know when they are bothering others
- Be unaware of the effect of their behavior on someone else
- Be unable to take the perspective of others or put themselves in someone else’s shoes

Research has consistently found a higher-than-normal rate of behavioral problems in the classroom among students with learning disabilities (Cullinan, 2002). In a study of 790 students enrolled in K–12 LD programs in Indiana, the percentage of students with behavioral problems (19%) remained consistent across grade levels. However, it should be noted that the relationships between students’ behavioral problems and academic difficulties are not known. In other words, we do not know whether the academic deficits or the behavioral problems cause the other difficulty. Furthermore, many children with LD exhibit no behavioral problems at all (Heward, 2003). Research further suggests that social interaction problems for students with LD seem to be more evident in those who have problems in math, visual-spatial tasks, tactual tasks, self-regulation, and organization (Worling, Humphries, & Tannock, 1999).

After reviewing 152 different studies, Kavale and Forness (1996) concluded that 75% of students with LD exhibit deficits in social skills. Studies of teacher ratings also suggested that students with learning disabilities have lower social status than other students. Social skills deficits include the following:

- Acceptance by peers
- Difficulty making friends
- Being seen by peers as overly dependent
- Being less likely to become leaders
- Resolving conflict
- Managing frustrations
- Initiating or joining a conversation or play activities
- Listening
- Demonstrating empathy
- Maintaining a friendship
- Working in groups

Some students with LD, however, experience no problems getting along with peers and teachers. For example, Sabornie and Kauffman (1986) reported no significant difference in sociometric standing of 46 high school students with LD and 46 peers without disabilities. Moreover, they discovered that some of the students with LD enjoyed socially rewarding experiences in inclusive classrooms. One interpretation of these contradictory findings is that social competence and peer acceptance are not characteristics of LD but are outcomes of the different social climates created by teachers, peers, parents, and others with whom students with LD interact (Vaughn, McIntosh, Schumm, Haager, & Callwood, 1993; cited in Heward, 2003).

In some cases, the social dimensions of life pose greater problems for students with LD than their specific academic deficits, and yet this dimension is essentially ignored in the definitions and labels that relate to learning disabilities. Many professionals would not support broadening the definition of learning disabilities to incorporate social and emotional dimensions, although it is clear that these are substantial (Hutchinson, Freeman, & Bell, 2002; cited in Hardman et al., 2005).

Years of failure can create other concerns. Wright-Strawderman and Watson (1992) found that 36% of a sample of students with learning disabilities indicated depression. Other researchers have reported psychological problems including feelings of inadequacy, anxiety, frustration, and anger (Bender, 2002).

Many students with LD are inept at understanding and interpreting social cues and social situations, which can easily lead to strained interpersonal relationships. Bryan (1977) suggests that the social-emotional difficulties of persons with learning disabilities may be the result of social imperceptiveness—a lack of skill in detecting subtle affective cues.

## Nonverbal Learning Disorders (NLD)

Nonverbal learning disorders (NLD) is a neurological syndrome consisting of specific assets and deficits. The assets include early speech and vocabulary development, remarkable rote memory skills, attention to detail, early reading skills development, and excellent spelling skills. In addition, these individuals have the verbal ability to express themselves eloquently. Moreover, persons with NLD have strong auditory retention. Four major categories of deficits and dysfunction also present themselves.

- **Motoric dysfunction.** Lack of coordination, severe balance problems, and difficulties with graphomotor skills



- **Visual–spatial–organizational dysfunction.** Lack of image, poor visual recall, faulty spatial perceptions, difficulties with executive functioning (the brain’s ability to absorb information, interpret this information, and make decisions based on this information), and problems with spatial relations
- **Social dysfunction.** Lack of ability to comprehend nonverbal communication, difficulties adjusting to transitions and novel situations, and deficits in social judgment and social interaction
- **Sensory dysfunction.** Sensitivity in any of the sensory modes: visual, auditory, tactile, taste, or olfactory

Foss (2004) reports that statements like the following are often true of individuals with a nonverbal learning disability:

- They talk a lot but really say very little.
- They see the trees, not the forest.
- They focus on details, but do not apprehend the main idea.
- They do not see the whole picture.
- They do not read facial expressions, gestures, nor other nonverbal aspects of communication; they miss the subtleties, nuances.
- They may be inappropriate in their social interactions.
- They have few friends; friendships tend to be with older or younger persons rather than peers.
- They tend to process information in a linear, sequential fashion, not seeing multiple dimensions.
- In spite of relative strength in sequencing or recalling sequences, they may confuse abstract temporal concepts; they have significant difficulty recognizing cause–effect relationships. (NLD Online, 2004)

## Motivational and Attribution Problems

Students with LD will often lose the motivation to succeed in school. As failure starts to become more prominent, they begin to take on an external locus of control. External locus of control is a motivational term whereby an individual believes that he no longer has control over his fate in life. People with external locus of control believe that they will have a good day or a bad day depending on how outside influences affect them. They feel powerless and no longer believe that they control their own destiny. This differs from people with an internal locus of control, who believe that they are “the captain of their ship,” that they control their successes and failures. Students with LD and external locus of control believe that their lives are dictated by luck or fate, rather than by their own internal factors such as determination, hard work, or ability.

Chronic difficulties with academic assignments often lead children with learning disabilities to anticipate failure; success is seen as an unattainable goal no matter how hard they try. Seligman (1992) identifies this outlook as learned helplessness. Youngsters who maintain this attitude frequently give up and will not even attempt to complete the task. As a result, even when success is possible, the individual no longer tries because she has the mindset that failure is inevitable anyway. What individuals believe about the source of their own success or failure on a task is known as attribution. Many students with LD attribute success not to their own efforts but to situations or events beyond their control.

Because of their propensity for academic failure, individuals with learning disabilities tend to become passive or inactive learners. They are not actively involved or engaged in their own learning (Torgeson, 1977) and often fail to demonstrate initiative in the learning process. Swanson (1998) calls these pupils “actively inefficient learners.” Motivation is the desire to engage in an activity. Many special education and general education teachers, especially those in middle and high schools, comment that students with learning disabilities are not motivated to learn, and research suggests that this is a common characteristic (Fulk, Brigham, & Lohman, 1998).

## **Perceptual Deficits**

Many students with LD exhibit perceptual problems (Lerner, 2003). Perception does not pertain to whether a student sees or hears but rather to how that student’s brain interprets what is seen or heard. Perceptual disorders affect the ability to recognize stimuli received through sight, hearing, and touch, and to discriminate between and interpret the sensations appropriately. A child with a learning disability might not have any problems in these areas, or he might have deficits in any or all of them (Smith et al., 2004). For example, a student with a visual perception problem may see perfectly well the letters b-a-t written on the page. What the brain interprets them to be is t-a-b. Problems in auditory perception often include difficulties with perceiving sounds that are not attributable to a hearing loss (Kruger, Kruger, Hugo, & Campbell, 2001). For example, some students may have trouble understanding whether the word spoken was king or kin, hot or hut, fire or file. The result can be misunderstood directions, poor communication, and awkwardness in social situations (Friend, 2005).

## **Conclusion**

In conclusion, it should be evident that children with LD are truly a heterogeneous group. The characteristics exhibited by one child with a learning disability may be quite different than another one with a learning disability. As a future educator, it is essential that you understand all of the possible characteristics that may be seen in these children. By knowing what to look for and being able to identify the common characteristics, you may be able to help in the identification, diagnosis, and assessment of a child with a suspected learning disability. Ultimately, depending on where a student’s problems lie, understanding these characteristics or learning styles can lead to significant improvement in the academic performance, social awareness, and overall self-esteem of a child with a learning disability in your classroom.