

Language, Students with Learning Disabilities, and Students with Attention Deficit Hyperactivity Disorder

Students with learning disabilities comprise a large, if somewhat poorly defined, segment of the population of children with special needs. This chapter describes both the specific language characteristics of children with learning disabilities and the effects of these language difficulties on their academic and social performance. In addition, the language and communication difficulties of students with attention deficit hyperactivity disorder are reviewed. Although these are considered separate disorders, both children with learning disabilities and those with attention deficit disorders often have language difficulties that impact their school success. Some suggestions are provided for teaching children with language-learning disabilities.

Learning Outcomes

After reading this chapter, you should be able to:

1. Explain the difficulties in defining learning disabilities and attention deficit hyperactivity disorder.
2. Identify the major language difficulties experienced by many students with learning disabilities and those with attention deficit hyperactivity disorder and the impact of language difficulties on learning.
3. Identify appropriate instructional approaches for students with language-learning disabilities.

Keisha W.: A Case Study

Keisha W. is an 8-year-old African American student in a regular second-grade class. Her teacher is concerned about her lack of progress in reading and her poor socialization. The teacher also reports that Keisha is pleasant and cooperative but is very shy and reluctant to participate in groups. Keisha is reading at an early first-grade level, and her reading is slow and hesitant. Her first-grade teacher noticed similar problems with reading and socialization but hoped that the child would outgrow these problems.

Mrs. W. has struggled to provide for Keisha and her two brothers since her husband left her 3 years ago.

Mrs. W. has held a succession of low-paying jobs and has been unemployed several times. The family lives in public housing in a high-crime neighborhood. Mrs. W. has reported that Keisha's early development was normal, although she remembers that Keisha had frequent colds and earaches and was always a quiet child.

Keisha was observed in the classroom during a group reading lesson and during group work on a writing assignment that followed the reading lesson. When called on to read, she read very quietly. She hesitated frequently and misread a number of words. She needed a great deal of

(continued)

Keisha W.: A Case Study Continued

assistance to complete a paragraph. However, when asked a question about the passage, she responded correctly. During the group activity, Keisha kept to herself; she joined in only when prompted to do so by her teacher.

Keisha was tested for possible classification for special educational services. Her Wechsler Intelligence Scale for Children—Fourth Edition (WISC-IV) scores in the major cognitive areas clustered within the average range. Within the verbal area, her results varied from the 6- to the 9-year levels. The Test of Language Development-3 (Primary) was administered and yielded a spoken language quotient (SLQ) of 84. This score placed Keisha in the below-average range. Her test profile indicated that her lowest scores were in word articulation and word discrimination—elements of phonology. Keisha scored highest in grammatical understanding and picture vocabulary.

What are we to make of a case like Keisha's? Here is a child who seems to be bright and does not have a behavior problem, yet she is struggling to succeed in school. What

is wrong? It is because of cases like Keisha's that the term *learning disability* was developed. Keisha must have a disability that diminishes her ability to learn, some would argue. As a result, she is not achieving to her potential. Yet, calling her "learning disabled" certainly does not solve Keisha's problems. We want to know more about her. What exactly is wrong? What can be done?

In this report, there are several hints that Keisha has some sort of language-based learning disability. For example, her difficulty reading words, her reluctance to talk, and results from the language testing could indicate a language-based disability. Yet, Keisha talks normally and can communicate when she is encouraged to do so. Her language disorder, if indeed there is one, is really quite subtle. In order to better understand Keisha and other children like her, we will examine the term *learning disabilities* and the relationship between language disorders and learning disabilities.

Defining Learning Disabilities and Attention Deficit Hyperactivity Disorder

What is a learning disability? How do we know that such a thing even exists? In 1960, there were no classes for children labeled *learning disabled*. In the 2011–2012 school year, there were over 2.3 million children classified as learning disabled in the public schools of the United States (4.7% of the entire school population). Although this is a very large number of children, the percentage of the school population identified as learning disabled has actually decreased from a high of 6.1 percent in the 2000–2001 school year to 4.7 percent in the 2011–2012 school year (U.S. Department of Education, 2015). Cortiella and Horowitz (2014) identified several factors that may explain the decrease in identification of students with learning disabilities, including expansion of early childhood education, improvements in reading intervention, and efforts such as the use of the response to intervention (RTI) approach (see the RTI Action Network website) to identify children with learning difficulties at an early age and provide intervention in the general education classroom without formal identification (Cortiella & Horowitz, 2014).

Where did all of these children with learning difficulties come from? The answer to this question lies partly in the history of the term *learning disability* and partly in its definition. Dr. Samuel Kirk proposed the term in 1963 to describe "a group of children who have disorders in development of language, speech, reading, and associated skills needed for social interaction" (Kirk, 1963, p. 2). Kirk's proposal resonated with professionals who worked with children who had been identified by a variety of labels, including perceptually impaired, brain damaged, borderline mentally retarded, dyslexic, childhood aphasic, and so on. Now there was one label that could be used to identify children with significant learning difficulties.

Although the term *learning disabilities* helped consolidate the young field of special education and channel research funding into better understanding of significant learning difficulties, it also set off a search for the "cause" of learning disabilities—a search that continues to this day.

Early theories of learning disabilities focused on perceptual deficiencies, especially auditory and visual perception, as the probable cause. It was hypothesized that students with learning disabilities had particular difficulty integrating perception with motor functions (perceptual-motor functioning).

Assessment batteries and intervention materials were developed and disseminated. Although some children may have been helped, the perceptual-motor theory of learning disabilities ultimately faltered on evidence that, in most cases, perceptual and perceptual-motor intervention simply did not work (Kavale & Mattson, 1983). Still, vestiges of the perceptual theory of learning disabilities linger to this day.

In the 1980s and 1990s, the information-processing theory of learning disabilities was predominant. This theory grew out of what was being learned about processing information in the rapidly developing computer field. Applied to humans, information-processing theory provided sophisticated models of learning that showed how information might flow and be altered during the learning process. It also helped researchers describe how learning might break down and cause the sort of learning problems seen in children identified as learning disabled. Intervention methods such as learning strategies were developed to help children overcome their information-processing deficiencies. Information-processing theory presented a more sophisticated explanation of what might be causing the academic and social difficulties characteristic of individuals with learning disabilities, but it has proved hard to implement in practice. In addition, many children with learning disabilities exhibit no clear pattern of information-processing difficulties.

One of the difficulties in defining learning disabilities is that we appear to be searching for a single underlying cause for a group of disabilities that is unlikely to have a single cause. Partly as a response to this dilemma, the **response to intervention (RTI)** model emerged as an alternative way to identify children with learning disabilities. Rather than searching for internal learning difficulties, the focus of the RTI model is on examining the outcomes of instruction. Students who fail to keep pace with their peers receive supplementary instruction designed to help them improve their learning and catch up with their classmates. In the past decade, the RTI model has become widely used in the United States, although, as Fuchs and Deshler (2007) note, a number of issues remain to be addressed, including the application of the model to older students and to content area reading and writing. The RTI Action Network has developed a checklist for identifying students with suspected learning disabilities on their website (search for RTI Action Network and click on "Checklists").

Another approach to understanding individuals with learning disabilities is to identify subgroups within the general population. The International Dyslexia Association (2012) estimates that approximately 85 percent of children with learning disabilities have difficulties primarily in reading and language. Although debate among researchers continues, there is a growing consensus that reading disorders are caused by difficulties with language. If true, this theory can help practitioners identify and intervene with children at risk for learning difficulties. Although there may be different causes of the learning difficulties experienced by other children labeled as learning disabled, the subgroup approach helps narrow the search for causative factors. Of course, in a sense, looking for subgroups marks a return to the days before the use of a single label, but that might be a necessary step in order to better identify and teach children with learning disabilities.

Another group of children that is sometimes included in discussions of learning disabilities is students with attention deficit hyperactivity disorders. Attention deficit hyperactivity disorder (ADHD) has been defined as "a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development" (American Psychiatric Association, 2013). The symptoms of ADHD include inattention, hyperactivity, and impulsivity.

By definition, ADHD is not a type of learning disability. However, up to 45 percent of children with ADHD exhibit academic learning difficulties similar to those experienced by students with learning disabilities (Du Paul, Gormley, & Laracy, 2014).



Watch this video to learn more about ADHD. What are the types of ADHD discussed in this video?

<https://www.youtube.com/watch?v=0Wz7LdLFJVM>

Existing definitions have done little to resolve the dilemma of learning disabilities. The definitions tend to be broad and offer little help to practitioners seeking to identify children in need of intensive remediation. For example, the federal definition of learning disabilities, incorporated in the Individuals with Disabilities Education Act (IDEA, 2004), states:

The term “specific learning disability” means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. Such disorders include such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

The definition was designed to be broad and inclusive, although its last section was meant to exclude other causes of learning problems from the category of learning disabilities. However, the definition has been difficult to apply in practice. Until recently, IDEA required local education agencies (school districts) to use discrepancy between achievement (usually defined as standardized test scores) and potential (IQ) to identify students with learning disabilities. The 2004 amendments to IDEA make the use of discrepancy optional and call for a process that determines if a child responds to “scientific, research-based intervention” (the RTI approach mentioned earlier in this chapter).



In this video by the National Center on Learning Disabilities, they call learning disabilities an “umbrella term.” What does this mean for understanding the concept of learning disabilities?

https://www.youtube.com/watch?v=yG_xSBsFMPQ

The federal definition of learning disabilities identifies disorders of language (spoken or written) as the defining feature of the disorder. The definition recognizes that most children labeled as learning disabled have difficulty understanding and using language. However, IDEA also includes the disability category of “speech or language impairment,” which is defined as “a communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment, that adversely affects a child’s educational performance.” As you might imagine, there can be a lot of confusion about the terms *learning disability* and *speech or language impairment*. After all, according to the definitions, many children with “learning disabilities” have a disorder of language. But many children with “speech or language impairment” have difficulties with educational performance. To make matters worse, many speech-language specialists use an entirely different term (*specific language impairment [SLI]*) to describe children who have “a language deficit, but without accompanying factors such as hearing loss, low intelligence scores, or neurological damage” (Kaderavek, 2014). Researchers have found that up to 50 percent of children with reading disorders (the most common type of learning disability) may also meet the criteria for SLI and that a similar percentage of children with SLI could be considered reading disabled (McArthur, Hogben, Edwards, Heath, & Mengler, 2000). See Table 7.1 for a summary of definitions of learning disabilities.

Although there is a lot of overlap between learning disabilities and specific language impairments, there may be differences as well. Children with specific speech and language impairments are typically identified prior to entering formal schooling. Their

Table 7.1**Definitions of Learning Disabilities and Related Disorders**

Category Label	Definition	Characteristics
Learning Disabled	Disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written.	Difficulties in thinking, listening, speaking, reading, spelling, or math.
Speech or Language Impairment	A communication disorder—such as stuttering, impaired articulation, a language impairment, or a voice impairment—that adversely affects a child's educational performance.	Speech and/or language difficulties, usually apparent early in development, that impact learning.
Specific Language Impairment	A language deficit, but without accompanying factors such as hearing loss, low intelligence scores, or neurological damage.	Significant language difficulties, usually first identified at an early age.

Sources: Based on IDEA (2004); Kaderavek (2014).

language delays and differences are so significant that they have caught the attention of their parents, preschool teachers, or family physicians. Their language disabilities are usually more significant and affect several areas of language (Bishop & Snowling, 2004). On the other hand, children with learning disabilities are not usually identified until they enter school. Their difficulties first show up in school-related tasks. Their language difficulties may be more subtle and less pervasive than those encountered by children with specific language impairments.

Most of the research on the relationship between language and learning disabilities has been conducted with students whose primary learning difficulty is in reading and writing. The *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-V) definition of learning disabilities (specific learning disorder) includes subcategories for impairments in reading, writing, and mathematics. Within the reading subcategory, children can be diagnosed with difficulties in word reading accuracy, reading rate or fluency, or reading comprehension. Reading disabilities have been estimated to occur in approximately 10 to 15 percent of the school-age population (Shaywitz et al., 1992). Over the years, a number of different theories about the causes of specific reading disabilities have been proposed (see Vellutino, Fletcher, Snowling, & Scanlon, 2004, for a review). Today, however, there is a broad consensus among researchers that specific reading disabilities are caused by language difficulties (Catts, Fey, Zhang, & Tomblin, 1999; Scarborough, 2005).

Whatever we call them—learning disabled, reading disordered, dyslexic, specific language impaired—it is clear that there are a number of children who, despite normal intelligence, fail to learn adequately in typical classrooms. Although this is clearly a heterogeneous population, many, if not most, children with learning disabilities have language difficulties. That does not mean that children with learning disabilities do not have other contributing learning difficulties such as attention deficits, memory difficulties, or organizational problems. But many of these learning problems may, in fact, be mediated by underlying language difficulties.

**Check Your Understanding 7.1**

Click here to gauge your understanding of the concepts in this section.

Language, Learning Disabilities, and Attention Deficit Hyperactivity Disorder

Historically, many different causes for learning disabilities have been proposed. Possible causal factors have included brain injury, perceptual disorders, and differences in neurological processing (Lerner & Johns, 2015). For most children with learning disabilities, however, there is no readily identifiable cause for their learning difficulties. But contemporary views of the causes of learning disabilities focus primarily on language difficulties.

The evidence for the relationship between learning disabilities and language comes from a variety of sources. First, children with language difficulties have been found to be at high risk for reading difficulties (Bishop & Adams, 1990; Catts, 1993; Snowling, Bishop, & Stothard, 2000). For example, in a study of approximately 200 kindergarten children with language impairments, researchers found that by fourth grade more than 50 percent of the children performed significantly below average on a test of reading comprehension—a rate more than five times greater than children with typical language development (Catts, Fey, Tomblin, & Zhang, 2002). In addition, the severity of the language impairment was found to be related to the reading deficit.

The second type of evidence for a relationship between language and learning disabilities comes from studies that have reported the existence of specific language deficiencies in children with learning disabilities. Most of these studies have been conducted with children whose primary learning difficulty was in reading. These studies have identified a variety of language-learning deficits related to poor reading performance (Vellutino, Fletcher, Snowling, & Scanlon, 2004). Although phonological processing difficulties have most often been found to be related to reading difficulties, researchers have more recently focused on children whose primary reading difficulties are in reading comprehension rather than in word attack. Children with reading comprehension difficulties have been found to have difficulty in many areas of language, including vocabulary knowledge and syntactic skills, but not phonological awareness (Nation, Cocksey, Taylor, & Bishop, 2010).

Although there is overwhelming evidence that reading disabilities are related to language disabilities, there continues to be debate about which aspects of language are most important. There is a growing consensus among researchers that there appear to be two types of reading disabilities. One type (often called “dyslexia”) is caused primarily by deficits in phonological processing. The second type is caused by difficulties in various aspects of language (Catts, Adlof, Hogan, & Weismer, 2005). Moreover, Catts and others (e.g., Snowling & Hayiou-Thomas, 2006) have claimed that children with phonological disorders are more likely to have problems with word attack, whereas children with more general language difficulties have problems primarily in comprehension (Catts, Adlof, & Weismer, 2006). Let’s examine in more detail the evidence for language-learning disabilities in students with reading and learning disabilities.

Phonology

Deficits in phonological awareness—especially phonemic awareness—have been found to be highly related to reading failure. Phonological awareness is an ability that develops over time in typically developing children. By 5 years of age, most children can divide words into syllables, but they are just beginning to be able to divide words into sound units (phonemes). There is a great deal of evidence that children’s sensitivity to the sounds of their language and their ability to manipulate those sounds is related to the acquisition of reading skills (Bradley & Bryant, 1983; Wagner & Torgesen, 1987). In fact, phonological awareness and memory have been found to be highly predictive of reading success by both the National Early Literacy Panel (2008) and by the National Reading Panel (2000). As noted in Chapter 6, good readers tend to have good phonological skills, whereas poor readers lag behind in the development of phonological awareness.



Watch this video of a therapist working with a young child on learning to associate sounds with letters. How does the therapist help the child make the association between letters and sounds?

Deficiencies in a number of phonological skills have been identified in children with reading disabilities, including difficulty dividing syllables into phonemes (Fox & Routh, 1980), identification of sounds, phoneme segmentation and detecting rhyme (Blachman, 2000; Bradley & Bryant, 1983; Brady, Shankweiler, & Mann, 1983; Snowling, 2000; Torgesen, Wagner, & Rashotte, 1994; Tunmer, 1989; Vellutino, Scanlon, & Spearing, 1995). Early difficulties with phonological processing have been found to be related to later reading and writing problems, especially when they co-occur with other language difficulties (Lewis, Freebairn, & Taylor, 2000).

In their review of the research, Vellutino and colleagues (2004) concluded that “there is now strong and highly convergent evidence in support of weak phonological coding as an underlying cause of the [specific reading disability] disorder” (p. 12). With so many studies reaching a similar conclusion, there can be little doubt that phonological awareness plays a very important role in reading disorders.

Morphology

There is increasing evidence that morphological skills also play an important role in the development of literacy skills and in explaining literacy disorders. Research has found that morphological knowledge is related to vocabulary development, word reading, spelling, and reading comprehension (Apel, Wilson-Fowler, Brimo, & Perrin, 2012; Nagy, Carlisle, & Goodwin, 2013; Tong, Deacon, Kirby, Cain, & Parrila, 2011). Morphological awareness is important because it helps children analyze and understand complex words. Poor morphological skills can contribute to learning disorders in reading. For example, Casalis, Cole, and Sopo (2004) studied morphological awareness in French children with reading disorders (dyslexia). They found that morphological awareness (as well as phonological awareness) was poorer for the children with reading disorders than for their peers without reading disorders. Siegel (2008) compared the morphological awareness skills of sixth graders with reading disorders (dyslexia) to a group of English language learners and children with English as their first language. She assessed each group on a variety of reading tasks that included both morphological and phonological skills. Although there was little difference between the English language learners and native English speakers, the children with reading disorders did much more poorly on the tasks that measured morphological awareness.

Syntax

Research on the syntactic skills of children with learning disabilities has been clouded by some of the issues in definition we discussed earlier in this chapter. In other words, the answer to whether children with reading and learning disabilities have deficits in syntax depends on how one identifies learning disabilities. That may explain why some researchers have reported that children with learning disabilities have deficiencies in syntactic skills, whereas others have not found such problems. For example, a number of studies that used standardized tests of language skills have found that children with learning disabilities, especially those with reading disorders, have poor syntactic skills when compared to their peers of the same age without reading disorders (e.g., Bishop & Snowling, 2004; Catts et al., 1999; Mokhtari & Thompson, 2006; Nation, Clarke, Marshall, & Durand, 2004). Students with learning disabilities have been reported to have difficulty understanding syntactic structures such as complex sentences (e.g., those that contain relative clauses and use the passive voice) (Vogel, 1974) and to use shorter and less complex

sentences (Simms & Crump, 1983). Other studies have not found significant problems with syntax in children with reading and learning disabilities (Roth & Spekman, 1989; Shankweiler et al., 1995).

Why the differences in findings? Again, part of the answer lies in how one defines learning disabilities. Are we talking about students with reading disorders, language difficulties, math deficiencies, or all of the above? It would not be surprising to find different results depending on the nature of the learning problems of the children studied. In an attempt to get a more definitive picture of the syntactic skills of students with learning disabilities, Scott and Windsor (2000) carefully chose 20 children with language-learning disabilities. Each student had expressive language difficulties (measured by the Test of Language Development) and a specific reading impairment. These children were matched by the researchers with children of the same chronological age and to younger, typically developing children with a similar language age as the children with language-learning disabilities. All of the children watched videotapes and then were asked either to tell or to write a story about what they had seen. The researchers evaluated the children's responses on four major criteria: productivity, lexical diversity (vocabulary), grammatical complexity, and grammatical error. The results showed that children with learning disabilities produced shorter and less complex utterances than the group of the same chronological age but were similar to the younger children matched for language age. Similar results were found for grammatical complexity and for errors, although the group with language disabilities made more errors than either of the other groups. There were no differences found on lexical diversity (vocabulary), except in writing. The students with learning disabilities used less diverse vocabulary. The researchers concluded that children with the type of syntactic difficulties found in this study would have a very difficult time functioning in a regular education classroom. Their speaking and writing would be shorter, less grammatically complex, and filled with errors.

Although there has been conflicting evidence about the syntactic functioning of students with learning disabilities, there is sufficient evidence to suggest that syntax is an area of concern. The sort of problems experienced by children with learning disabilities may not always be obvious in spoken language, but these problems become more identifiable in reading and in written output.

Semantics

The acquisition and application of semantic knowledge are significant problems for many students with learning disabilities. In particular, research has discovered two main problem areas: **word finding** and the use of figurative language. Many studies have found that the expressive vocabulary skills of children with learning disabilities lag behind those of other children (e.g., Rudel, Denckla, & Broman, 1981). Children with a variety of learning disabilities, including reading disorders, take longer to retrieve words from memory than typically developing children (Bishop & Snowling, 2004; Catts et al., 1999). Some researchers believe that this word-finding problem is characteristic of children with reading disorders (Wolf, Bowers, & Biddle, 2000). In addition to their word-finding problems, students with learning disabilities have been reported to have difficulty with word meanings. Children with reading comprehension deficits have been found to have overall deficiencies in vocabulary (Catts et al., 2006).

Studies of children with learning disabilities have also reported specific problems with **figurative** (or nonliteral) **language**, such as understanding and using metaphors (Nippold & Fey, 1983), similes (Seidenberg & Bernstein, 1986), and idioms (Qualls, Lantza, Pietrzykb, Blood, & Hammera, 2004). Problems understanding and using nonliteral language may reflect the rigidity with which many students with learning disabilities seem to approach language. That is, it seems as though they become attached to the most concrete meaning of words, even when this clearly makes no sense in the context. Nonliteral language is often an important part of the curriculum; metaphors and similes are important language devices that are used in many stories. Students are asked to use such devices in their own writing (and are graded accordingly).

Pragmatics

Although most of the research on language and learning disabilities has focused on reading disorders, there are other ways that language may affect learning. For example, many children with learning disabilities experience significant difficulty with aspects of social skill development (Bryan, Burstein, & Ergul, 2004). Children with language-learning disabilities have been found to participate in fewer peer interactions and are less preferred communication partners (Weiner & Schneider, 2002). As a result, they often are less accepted by their peers and have difficulty establishing friendships. Since much of social interaction is language based, there is likely a relationship between social skills and the use of language for communication (pragmatics). Research has consistently found the area of pragmatics to be a major problem for children with learning disabilities (Boucher, 1986; Lapadat, 1991; Troia, 2011). Not only do these students have difficulties with language, but they often lack the ability (or the knowledge) to analyze social situations, to plan their responses, and to evaluate the consequences of their actions (Bryan, 1991; Vaughn, 1991).



In this video, two boys are having a conversation. What does the video suggest as ways to improve social communication?

<https://www.youtube.com/watch?v=3RjRZ9jMfs0>

In addition to the research with children classified as learning disabled, a number of studies have found that children with specific language impairments are at risk for social difficulties (Brinton & Fujiki, 1993). Children with specific language impairments have been found to have difficulty with social tasks, such as cooperative learning (Brinton, Fujiki, & Higbee, 1998), and to experience social rejection (Paul, Looney, & Dahm, 1991). More recently, Hart, Fujiki, Brinton, and Hart (2004) found that social behavior problems were linked to the severity of language problems. Specifically, children with more severe language disorders were less prosocial (sympathetic, comforting, sharing) than their peers without language disorders. Although children with specific language impairments often have more significant language difficulties than children identified as language-learning disabled, there is considerable overlap between the two groups, adding further evidence that language difficulties may be a factor in the often reported social problems of children with learning disabilities.

Children with learning disabilities frequently have significant difficulties with pragmatics, especially with conversational skills. They have difficulty clearly expressing themselves to others, they frequently fail to adjust their language to the needs and/or level of their listener, and they are not sure what to do when they do not understand something being said to them. These difficulties have consequences for classroom interaction, social relationships, and the ability to understand and use written language.

Metalinguistic Skills

Metalinguistic skill refers to “the ability to reflect consciously on the nature and properties of language” (van Kleeck, 1994, p. 53). When children play word games, use rhyme, or recognize nongrammatical sentences, they are using metalinguistic skills. As van Kleeck points out, metalinguistic skills are not essential for the development of spoken language. We don’t ask young children to tell us what parts of speech they just used (at least not before they enter school). However, many researchers believe that metalinguistic skills are essential for learning how to read and write.

We have already discussed one type of metalinguistic skill—phonological awareness. As children progress from the initial stages of reading to become more proficient readers, other types of metalinguistic skills become important. For example, children develop an

awareness of the grammatical rules that underlie language and the pragmatic rules that govern conversation.

Children with learning disabilities have frequently been found to have difficulty developing metalinguistic skills, especially phonological awareness. But researchers have also found that children with learning disabilities have difficulty recognizing grammatical and morphological errors and making the appropriate corrections (Kamhi & Koenig, 1985). In a study of predictors of reading difficulty, Menyuk and colleagues (1991) found that measures of metalinguistic abilities (including word retrieval, phonological, and semantic) were the best predictors of later reading problems, but that different metalinguistic skills predicted the performance of different children. Tong and colleagues (2011) examined both the morphological and syntactic awareness skills of fourth-grade children with good reading comprehension skills compared to those with poor comprehension. They found that the students with poor comprehension had weaknesses in both morphological and syntactic awareness.

The research evidence suggests that children with learning disabilities, especially those with reading disorders, have a variety of language-learning deficits. Difficulty with phonological processing is the most often reported language difficulty, but a variety of other language problems are associated with reading and learning disabilities. The strongest source of evidence for a relationship between language and learning disabilities comes from intervention studies. Although children with language disorders may be more likely to have reading difficulties, and students with reading disorders may have language difficulties, neither of these findings is conclusive evidence that language and reading are causally related. In order to show cause, we need to see evidence that enhancing language skills improves reading outcomes. Fortunately, a number of studies have found just such a result. For example, Bradley and Bryant (1983) looked at the effects of sound-categorization training on the reading development of beginning readers. Children who were poor at sound categorization were taught to recognize and group words by their sounds. Children who were taught this skill did better on reading and spelling tests than other children who were taught to group by word meaning or who received no training. In a review of the research on the effects of phonemic awareness intervention, Ehri and colleagues (2001) found that phonemic awareness intervention was generally very effective. One of their analyses was on effect sizes on phonemic awareness training. Effect sizes measure the strength of an intervention. An effect size of 0.20 is considered weak, 0.5 is considered moderate, and anything above 0.8 is considered strong. Ehri and colleagues (2001) found the overall effect size for phonemic awareness interventions to be 0.86 for improving phonemic awareness itself. They also found that phonemic awareness training had a moderately positive effect on both reading (0.53) and spelling (0.59). The researchers found these effects to be true for typically developing children and for those who were identified as at risk for reading difficulties. The effects were less robust for children identified as having reading disorders.

Results such as these support the conclusion that phonological awareness difficulties are a cause of reading disabilities. The National Reading Panel (2000) concluded that "phonological awareness training improves reading performance in preschoolers and elementary students, and in normally progressing students, as well as in older disabled readers and younger children at risk for reading difficulties" (pp. 2–19).

Similarly, there is increasing evidence that instruction in morphological skills, including activities that focus on morphological word parts and patterns, can improve literacy outcomes for students with literacy difficulties (Goodwin & Ahn, 2010).

Although there is a lot of evidence that language skills are related to reading and that training in language can enhance reading, children with language-based reading disorders are often not identified as candidates for language intervention. Typically, their language-learning difficulties are more subtle than those of most children who are identified at an early age for speech and language intervention. It is interesting to note, however, that several researchers have found that the most effective interventions for reading difficulties combine instruction in phonological awareness with intensive language instruction (Hook, Macaruso, & Jones, 2001).

Language and Attention Deficit Hyperactivity Disorder

ADHD is one of the most common neurobehavioral disorders of childhood. The U.S. Centers for Disease Control and Prevention (2011) estimates that approximately 11 percent of children age 4 to 17 years (6.4 million) have been diagnosed with ADHD as of 2011. Although ADHD is not recognized as a category of disability under the Individuals with Disabilities Education Act, many children with ADHD receive special education and related services under the “Otherwise Health Impaired” category or other categories.

Although speech and language disorders are not a core characteristic of children with ADHD, research has found that a significant percentage of children with ADHD have speech and/or language difficulties. A review of studies that have examined the co-occurrence of ADHD and language impairments by Mueller and Tomblin (2012) found percentages of language impairments ranging from a low of 45 percent to a high of 90 percent. Despite the evidence that language disorders are frequently associated with ADHD, language is not usually part of the treatment plan for students with ADHD. Why is this so? Mueller and Tomblin (2012) have suggested a number of factors to explain the lack of focus on language issues, including an exclusive focus on social and behavioral issues, failure to assess language skills, and belief that literacy difficulties are the result of lack of motivation rather than language difficulties.



In this video, a girl with ADHD and a language disorder describes the impact of the language disorder on her life. What were some of the ways that her language difficulties affected her?

<https://www.youtube.com/watch?v=RIRpgWI2bWs>

A number of specific language disorders have been identified in the ADHD population. For example, Gremillion and Martel (2012) compared the semantic language skills of a large sample of children with ADHD ($n = 266$) between 6 and 12 years of age to those of a similar sample of children without ADHD. The children were tested on their word knowledge, working memory, and reading and mathematics achievement. The researchers found that the children with ADHD performed significantly lower than their peers on all of the measures. They concluded that semantic language difficulties combined with memory deficiencies could account for much of the reading and mathematics underachievement of the children with ADHD. Martinussen and Mackenzie (2015) reached a similar conclusion in their examination of the differences between children with ADHD with good reading comprehension as compared to those with poor comprehension. They found that the poor comprehenders in their sample of 45 adolescents with ADHD had significantly lower scores on a measure of expressive vocabulary than did their peers with good reading comprehension. Both of these studies suggest that semantic language difficulties, particularly vocabulary deficiencies, may be related to the academic underachievement that is characteristic of some children with ADHD.

Students with ADHD often have significant problems with social interaction and in developing peer relationships. A variety of factors may contribute to these difficulties, but problems with social communication (i.e., pragmatic language) have been found to be an important factor in social development deficiencies (Redmond, 2004). Children with ADHD have been reported to have significant difficulties in the domain of pragmatic language, especially in social communication (Bishop & Baird, 2001). Specifically, they have been found to have poor conversational initiation skills (Bishop & Baird, 2001), have difficulty in the role as speaker (Mikami, Huang-Pollock, Pfiffner, McBurnett, & Hangai, 2007) as well as listener (Nilsen, Mangal, & Macdonald, 2013), and have difficulty with discourse management and narrative discourse (Staikova, Gomes, Tartter, McCabe, & Halperin, 2013). For example, when Purvis and Tannock (1997) asked boys with ADHD age 7 to 11 years to retell a story, they found that, compared to non-ADHD peers, they made more errors in sequencing the story elements and made ambiguous references (using pronouns where the individual being referred to was

Teacher Perspective: Students with Reading Disabilities

In the resource room class that I taught in this year, many of the students were way below grade level in reading. They did not like to read during regular class time because they struggled. They would not raise their hand to answer any questions for fear they would answer wrong and get laughed at. I encouraged them to participate and helped them when I could. One young man never liked to do his bookmark after he read his book. He was always behind

everyone else. He was also absent quite often. When I asked him to answer a question, he shut right down. Then he would make noises so he would get into trouble and be asked to leave the room. It took me a while to figure out what was happening. Once I figured out what was going on, I pulled him back to the table and worked with him one on one. He just struggled at reading. With a little more help, the behavior issues began to stop.

not clear), making it difficult for the listener to follow their retelling of the story. In the study by Staikova and colleagues (2013), the researchers concluded that the pragmatic deficits of children with ADHD appear to be highly related to their social skills difficulties.

The research on the language abilities of children with ADHD indicates that these children tend to have more language difficulties than might be expected. Their difficulties are primarily in the use of language for engaging in successful social communication. In addition, recent research suggests that language and cognitive difficulties may contribute to significant problems with written expression (Re, Pedron, & Cornoldi, 2007).

Impact of Language Impairments

Research has found that children with language disabilities are clearly at risk for academic failure, especially in reading. In fact, the incidence of reading disabilities in children with early language difficulties has been estimated to be between 4 and 75 percent (Bashir & Scavuzzo, 1992). There is some evidence that children with language-learning disabilities are also at risk for emotional problems (Baker & Cantwell, 1982). Therefore, it is essential that teachers and other professionals intervene as soon as possible to help these students.

For those who think that if we just wait long enough, children with language disabilities will get better, the news is not good. Although some studies have found that children with early language problems improve over time, most researchers have concluded that these children continue to be significantly impaired in their learning when compared to that of their peers (Rissman, Curtiss, & Tallal, 1990). In one study (Aram, Ekelman, & Nation, 1984), a group of children with early identified language disorders was examined 10 years later. Most adolescents (70%) continued to have difficulties with academic tasks and social acceptance. Although some children with early language problems do, indeed, grow out of them (30% of the children in the study just cited), it appears that most continue to experience significant problems. Therefore, it is important for teachers to recognize language disorders and use effective intervention approaches.



Check Your Understanding 7.2

Click here to gauge your understanding of the concepts in this section.

Instruction for Language-Learning Disabilities

What are some effective instructional approaches for enhancing the language skills of students with learning disabilities? This section will focus on instruction in two specific areas known to be problematic for students with learning disabilities: phonological processing

and cognitive strategies. The methods discussed in this chapter were designed primarily to address the needs of students with learning disabilities, but they can be applied to other children experiencing similar problems. An overview of instructional approaches and methods for children with language and communication disorders is presented in Chapter 14 of this text, but specific methods developed primarily for specific populations of students with disabilities are presented within the chapter that addresses that disability.

Enhancing Phonological Awareness

Earlier in this chapter, we discussed the large research base that has implicated phonological awareness as a cause of the reading difficulties faced by most students with learning disabilities. As we noted, research studies have found that it is possible to teach phonological skills and have a positive effect on reading. Due to the strong and consistent findings linking phonological awareness to reading, a large number of phonological training programs have been developed during the past two decades (see Table 7.2 for examples). As a result, teachers and other educators are finding it increasingly difficult to decide which program to use. In their review of phonological training programs, Torgesen and Mathes (2000) suggested that any program should follow these principles:

1. *Instruction in phonological awareness should begin with easier tasks and move toward more difficult tasks.*

Example: Instruction should begin with segmenting words, then sounds within words, then beginning and ending sounds.

2. *Instruction in phonological awareness should be a regular part of the curriculum.*

Example: The authors suggest that phonological awareness activities should take place for 15 to 20 minutes a day in regular kindergarten classrooms.

Table 7.2

Phonemic Awareness Instructional Programs

Program	Developer/Date	Brief Description
Programs for Regular Classroom Instruction		
Ladders to Literacy: Preschool Kindergarten	Notari-Syverson, O'Connor, & Vadsey (2005) O'Connor, Notari-Syverson, & Vadsey (2005)	Activity books for phonological awareness and oral language skills for preschool and kindergarten ages.
Phonemic Awareness in Young Children	Adams, Foorman, Lundberg, & Beeler (1998)	Developmental sequence of activities in phonological awareness. Activities range from simple listening games to more advanced exercises in rhyming, alliteration, and segmentation.
Programs for Small Group or Individualized Training		
Launch into Reading Success: Book 2	Bennett & Ottley (2011)	In-depth, systematic phonological awareness training for young children.
Phonological Awareness Training for Reading (second edition)	Torgesen & Bryant (2013)	Small group activities for children with weaknesses in phonological awareness. Highly scripted lessons and activities.
Road to the Code	Blachman, Ball, Black, & Tangel (2000)	Small group instruction for children in kindergarten and first grade having difficulty learning to read.

3. *Teachers should expect that children will respond at widely varying rates to instruction in phonological awareness.*

Example: Some may progress quickly while others will require more intensive and extensive instruction to acquire phonological awareness skills.

4. *Instruction in phonological awareness should involve both analytic and synthetic activities.*

Example: Analytic activities require children to identify individual sounds within whole words (e.g., "What is the first sound in the word *dog*?). Synthetic activities involve blending together individual phonemes (e.g., "What word do these sounds make: /b/-/a/-/t/?").

5. *Because the first goal of instruction in phonological awareness is to help children notice the individual sounds in words, teachers should speak slowly and carefully, and should pronounce individual sounds correctly.*

Example: Many teachers confuse the letter name with the sound made by the letter (e.g., the letter *p* makes the sound *puh*, not *pee*). Also, words with blends can be confusing (e.g., *church* has six letters but just three sounds (/ch/-/ur/-/ch/)).

6. *It is not easy to pronounce individual phonemes correctly without some careful practice.*

Example: Teachers need to be aware of issues such as regional and local accents and the distortion that takes place when sounds are used in context (e.g., /b/ sounds different in *beet* and *bought*).

7. *Methods to stimulate phonological awareness in students are limited only by the creativity of teachers.*

Example: Good teachers embed phonological activities within many types of activities such as spelling and writing.

8. *Instruction in phonological awareness should be fun for teachers and students.*

Example: Imagine the delight that a child in a kindergarten class for children with special needs experiences when he recognizes the letter *b* and identifies the sound it makes while participating in a story-reading activity.

Box 7.1 provides an example of a phonological training program first developed and tested by Blachman (1991) and now available for use in the classroom as "Road to the Code" (Blachman et al., 2000). This program uses a variety of classroom-based instructional activities that are both fun and effective. When Blachman taught teachers to use these techniques, their kindergarten students outperformed others on several measures of phonological awareness and letter names.

Now that it is well established that phonological training can improve the phonological processing and reading of some children with disabilities, the question becomes which instructional methods are most effective. Although research has not yet found a definitive answer to this question (and may never do so, given the heterogeneous nature of learning disabilities), the results do provide research evidence that will enable teachers and other professionals to select instructional methods for students with phonological-processing problems. These methods have been shown to be effective and to meet the mandate of legislation, such as the No Child Left Behind Act, that requires the use of evidence-based practices.

For example, Torgesen and colleagues (2001) assigned 60 students with reading disorders, ages 8 to 10 years old, to two groups. Each group received one-on-one instruction for two 50-minute sessions each day for 8 to 9 weeks for a total of 67.5 hours of instruction. This was followed by generalization training, during which the teacher supported the children in their regular classrooms. One group was taught with the Auditory Discrimination in Depth (ADD) program (now known as the Lindamood Phoneme Sequencing program [LiPS]) (Lindamood & Lindamood, 2011). This program provides intensive instruction in phonological and reading skills using a multisensory approach in which students learn to use sensory information from the ear, eye, and mouth to identify, label, and classify sounds. Children are taught to identify and label the place and manner of articulation of

Box 7.1 Example of a Phonological Training Program

1. *Say-It-and-Move-It Activity.* This is a phonological segmentation task in which children are taught to represent sounds by using manipulatives (such as disks, tiles, or buttons). The children are taught to represent, with a disk, each sound they hear. Each child is given a card that is divided in half. The top half is a disk storage area. On the bottom half of the card, there is an arrow pointing from left to right. If the teacher says, "Show me the *a*," the children are to move a disk from the top half of the card to the left-hand end of the arrow and say the sound. After demonstrating mastery of this skill, the teacher progresses to two-phoneme words (*up, it, am*) and three-phoneme words (*sun, fat, zip*).
2. *Segmentation-Related Activity.* One of several segmentation activities is used in the second step of this lesson. For example, children might learn to group words based on rhyme, or they are taught to segment words using *Elkonin* cards. In this activity, the children are taught to identify the number of sounds in
- words using picture cards developed by the Russian psychologist Daniel Elkonin. The cards have a picture of a common word at the top (e.g., *sun*) and a series of boxes below the picture that represent the number of phonemes (not letters) in the word. Children are taught to move a disk along the boxes that correspond to each sound as they say the word.
3. *Letter Names/Letter Sounds.* Children are taught to use keywords and phrases to help them remember the sounds made by each letter. For example, they might see a card for the letter *t* that showed two teenagers talking on a telephone. Another activity described by Blachman is a post office game in which children select a picture that illustrates a word with a target letter (e.g., *pot* for *p*) and place it in the correct letter pouch. Later, as children learn the letter-sound relationships, letters are placed on the manipulatives used in the Say-It-and Move-It activity.

Source: Adapted from Blachman (1991).

phonemes using a special "language" (e.g., "lip popper" for the unvoiced, plosive sound /p/). The other group was taught using a program called Embedded Phonics, which was designed by Torgesen and colleagues (2001). Children in this program received intensive practice in word reading that was immediately applied to connected text. Instructional sessions included introduction of new words, spelling practice, word games, oral reading, and writing. The primary difference between the two approaches was in the amount of time spent on phonemic activities and on using phonemic skills in reading and writing. The ADD (LiPS) program emphasized learning phonemes out of context, whereas children in the Embedded Phonics program learned about sounds in the context of reading and writing activities.

The researchers found that children in both programs made substantial progress in both phonological processing and in reading. In fact, approximately half of the children in each group were reading at an average reading level 1 year after the intervention. Considering the severity of the reading deficiencies of the children in this study, this is an excellent result. Of course, that means that the other children were still behind their peers, even though their rate of reading progress did improve significantly. Surprisingly, there was no significant difference between the two approaches. The authors concluded that intensive remediation programs in phonological skills that are based on sound instructional practices, as were both of the programs in this study, can be effective for many children with significant reading difficulties.

The Institute for Education Sciences, a U.S. Department of Education program that reviews educational programs, reported that Ladders to Literacy was found to have potentially positive effects on alphabets and fluency and mixed effects on comprehension (Institute for Education Sciences, 2010).

The Orton-Gillingham method is another intensive, individualized program for enhancing phonological processing. Based on the work of Samuel Orton in the early 20th century, the program uses a systematic, multisensory approach to teaching reading that emphasizes the development of phonological awareness, sound-symbol

relationships, and the basic elements of language (syntax, semantics, etc.). Multisensory instruction, incorporating visual, auditory, and kinesthetic/tactile learning pathways, is an essential component of the program. Although the Orton-Gillingham method has been in existence for more than 50 years, there is surprisingly little research on its effectiveness. A review of research by Ritchey and Goeke (2006) found that reading programs based on Orton-Gillingham principles were moderately effective, particularly for word attack and nonword reading measures.



Watch this video of an Orton-Gillingham reading lesson. What kinds of sensory inputs were used?

<https://www.youtube.com/watch?v=zZgS8lj1Ltg>

A number of reading programs have been derived from the Orton-Gillingham model, including the Slingerland Approach (Slingerland & Aho, 1994–1996), Project Read (Enfield & Greene, 1997), and the Wilson Reading System (Wilson, 1996). The latter program has become widely used in the last decade, especially since the development of Foundations[®], a program designed to be implemented in general education classes to prevent reading failure. There is limited research evidence to support the Wilson programs. An Institute for Education Sciences report (2007) found that the Wilson program had a “potentially positive” effect on learning alphabets but no evidence for effectiveness in improving reading fluency or comprehension.

Many phonological training programs were initially designed for use with individuals or small groups. But a number of programs have now been developed to use in regular education classes with the entire class (see Table 7.2 for some examples). There is now some research that shows that the use of such programs with kindergarten and first-grade classes can help children develop phonological skills (Hatcher, Hulme, & Snowling, 2004) and may be particularly beneficial for children at risk for reading disorders.

Several phonological training programs use some form of technology in the delivery of instruction. Two that have received some attention by researchers are the Fast ForWord program (Scientific Learning Corporation) and Earobics (Cognitive Concepts). Fast ForWord is the general name for a series of programs that feature computer-based activities designed to build language and reading skills in individuals with language-learning difficulties, including, but not limited to, individuals with learning disabilities. The original program was designed for children between kindergarten age and 12 years old who have a wide range of language-learning difficulties. The program now has five levels that cover the age range from preschool through high school. Scientific Learning Corporation (the program’s distributors) claims that students using the program “can achieve a one to two grade level reading gain in 8 to 12 weeks” (Scientific Learning Corporation, 2011).



Watch this demonstration of some of the elements of the Fast ForWord language program. What cognitive and language skills does the program claim to improve?

<https://www.youtube.com/watch?v=WuIFNyBnAAQ>

Most of the research on Fast ForWord has focused on the language program, since this was the first program developed and has been in use for the longest time. Fast ForWord Language (FFW-L) consists of seven computer games designed to teach specific language skills. Children play five computer games a day for a total of 100 minutes. The computer constantly monitors their success, adjusting the difficulty level upward or downward as necessary. Children progress through five levels on each of the seven games. One of the unique (and controversial) aspects of Fast ForWord is that at the first level of each game,

acoustic input is modified. That is, the sounds that the child hears are digitally manipulated to increase the duration and the intensity of the sound. It is hypothesized that children with language-learning difficulties cannot process incoming auditory input as quickly as other children. Therefore, slowing down this input should enhance their language-learning abilities. As the children progress through the levels, these sound enhancements are reduced until the child is hearing normal auditory input. Research on Fast ForWord has generally been mixed. Initial studies by Paula Tallal (the developer of the program) and her colleagues (1996) found that children with speech and language difficulties who played computer games that used modified auditory input outperformed similar children who played games without modifications. Later studies, however, generally failed to confirm the very dramatic results reported by the early studies. For example, in an intensive study of five children with significant language-learning difficulties, Friel-Patti, DesBarres, and Thibodeau (2001) reported significant gains in phonological processing for two of the participants but little improvement for the other three. In a study with a much larger number of children with language impairments, Cohen and colleagues (2005) compared the effectiveness of intervention using (1) Fast ForWord, (2) another series of computer-based language intervention activities, and (3) traditional speech and language therapy. Although children in all three groups benefited from instruction, those who received either of the computer-based intervention activities did no better than children who received traditional therapies. Similarly, Fey and colleagues (Fey, Finestack, Gajewski, Popescu, & Lewine, 2010) compared the effectiveness of the FFW-L program in combination with a more traditional narrative-based language intervention to determine if FFW-L could enhance the language training. In the narrative-based language intervention, children participated in several tasks designed to enhance grammar and storytelling skills. The authors found that children in the combined program (FFW-L + language intervention) did not outperform children who only received language intervention. Although research indicates that the FFW-L program can improve the phonological-processing ability of many (but not all) children with language-learning disabilities, it may be no more effective than other intensive language-intervention programs.

In addition to improvements in language skills, the developers of the Fast ForWord programs have claimed that children can improve their reading ability by participating in the program. Again, studies of these claims have yielded, at best, mixed results. For example, in a study comparing Fast ForWord with training based on the Orton-Gillingham program (a multisensory, structured language approach that emphasizes instruction in the alphabetic code), children with reading and language disorders made significant improvements in both language and reading with both approaches. Children trained using the Fast ForWord program did improve their reading skills, but not more than children using the other approach. Another study of children with learning disabilities found that Fast ForWord did not significantly improve either the language or the reading scores of most of the children. However, children with more severe learning problems did benefit from instruction using the program (Troia & Whitney, 2003). To test whether the acoustically modified speech used in FFW-L can improve reading, Loeb and colleagues (2009) compared the effects of FFW-L to those of a computer-based intervention for language that did not use acoustically modified speech and a traditional language intervention approach where a therapist worked with a child on a one-to-one basis on language tasks. The researchers found that all of the interventions improved blending skills, but none significantly improved reading. As is the case with language outcomes, there is little evidence FFW-L can improve reading skills as significantly as the program developers have claimed. However, new Fast ForWord products targeting reading have recently been developed that have not yet been tested in large-scale research studies.

Another computer-based program that has been used to teach language skills to children with language-learning disabilities is the Earobics Literacy Launch program (Cognitive Concepts). Earobics uses a series of computer-based activities to teach phonological awareness, auditory processing, and phonics skills. There are three versions of the program: one for children 4 to 7 years old, one for children ages 7 to 10, and a third

program for adolescents and adults. In each program, the participant moves through a series of levels while playing interactive games. The computer automatically adjusts the difficulty level in response to the participant's answers. The authors claim, "Elementary school students across the country are making dramatic, statistically significant gains in essential literacy skills." The company's website (search for Earobics) presents reports from several school districts that have successfully used the Earobics Literacy Launch program. The Institute for Education Sciences (2009) found that the use of Earobics had positive effects on alphabets and "potentially positive" effects on fluency.



Watch this demonstration of some of the activities in the Earobics program. What are the skills being taught in this demonstration?

<https://www.youtube.com/watch?v=pEB0yJIT-fs>

The effectiveness of Earobics Literacy Launch, Fast ForWord, and the LiPS programs was compared in a study of 60 children with reading and language deficits (Pokorni, Worthington, & Jamison, 2004). Children received 3 hours of instruction in one of the programs each day in a summer program. The authors found that the LiPS program was the most effective in improving phonological skills. The Earobics program was also effective, but the Fast ForWord program was not effective. None of the programs significantly improved reading skills.

In summary, there is now overwhelming evidence that phonological training programs can improve the phonological skills and perhaps the reading skills of many children with learning disabilities. There is, as yet, no clear evidence that technology-based programs such as Fast ForWord or Earobics Literacy Launch are superior to other programs. However, the research does suggest that intensive, long-lasting intervention can work. Phonological training has generally been used successfully with young children who are beginning readers to improve phonemic awareness and word identification skills. What about older children with language-learning problems? What can we do for them?

Mnemonic Strategies

One type of approach that has been frequently found to be useful in helping older students learn a variety of skills is mnemonic **strategy training**. With this approach, students are taught *how* to learn, not just *what* to learn. In other words, the children are taught a strategy to use as they are learning.

Many students with learning disabilities have difficulty learning new vocabulary words. Mastropieri (1988) described a strategy for vocabulary learning that she and her colleagues have applied successfully in a number of academic areas (Scruggs & Mastropieri, 1992). The keyword strategy includes the following steps:

1. *Recoding*. The new vocabulary word is recoded into a keyword that sounds similar to the target word, is familiar to the student, and can be easily pictured. For example, *forte* (meaning "loud") could be recoded as *fort*.
2. *Relating*. The student relates the keyword to the target word, using an illustration. A sentence that relates the word to the drawing is created. In our example, a picture of a fort during a battle might show guns firing. The sentence might read, *The guns at the fort are loud*.
3. *Retrieving*. The definition of the new vocabulary is recalled by thinking of the keyword, creating the drawing (either actual or imagined), thinking of the related sentence, and stating the definition—*forte* means "loud."

Although this technique may seem slow and cumbersome, it works. It has been applied successfully in a number of studies to improve the vocabulary learning of students

with learning disabilities (e.g., Condos, Marshall, & Miller, 1986; Mastropieri, Scruggs, Levin, Gaffney, & McLoone, 1985). Use of the keyword mnemonic method does not have to be limited to students with disabilities. Uberti, Scruggs, and Mastropieri (2003) reported the results of a study in which the keyword approach was compared to more traditional vocabulary instruction—providing either a picture to illustrate a word or providing a definition only—in classrooms that included both disabled and typically developing 8- to 10-year-old students. The typically developing students learned approximately equally in all three conditions, but the students with learning disabilities did far better with the keyword approach—actually outperforming their peers.

The keyword method is just one example of a learning strategy that may be used to help older students with language-learning difficulties. The research on this and other instructional techniques suggests that it is possible to help these students overcome at least some of their learning difficulties.

Cognitive Learning Strategies

A number of studies have examined the use of cognitive learning strategies to enhance the language skills of students with learning disabilities, especially in the area of vocabulary learning. Cognitive strategy instruction provides students with a framework for understanding words and the relationships between words by helping students recognize the similarities and differences between words. For example, in a study by Bos, Anders, Filip, and Jaffe (1989), high school students with learning disabilities were taught to use a semantic feature strategy that used a relationship chart on which the most important ideas in a reading passage were listed across the top and related vocabulary terms were listed on the side. Students were guided to develop a definition of each word and then discuss how the word related to the ideas from the text. Students who used this method outperformed their peers who simply used a dictionary to look up definitions. After reviewing a number of studies that used some form of cognitive strategy instruction for word learning, Jitendra, Edwards, Sacks, and Jacobson (2004) concluded that this was a highly effective approach to teaching vocabulary to students with learning disabilities.

Another type of learning strategy is morphological analysis. This method involves teaching students to use word parts such as prefixes, suffixes, and root words to derive the meaning of a word. Harris, Schumaker, and Deshler (2011) compared a morphological analysis strategy to an alternative strategy approach for enhancing the vocabulary skills of high school students with learning disabilities. The researchers found that both students with disabilities and those without disabilities in both treatment groups made statistically significant gains in their ability to define the target vocabulary words. However, students in the morphological strategy group outperformed their peers who used the alternative vocabulary strategy as well as those in the control group on a test of morphological analysis skills.

Technological Applications

Emerging technologies show promise in helping children with learning disabilities overcome their learning difficulties. Two studies by Kennedy and his colleagues (Kennedy, Deshler, & Lloyd, 2015; Kennedy, Thomas, Meyer, Alves, & Lloyd, 2014) examined the use of podcasts to deliver vocabulary instruction in social studies content areas to high school students with disabilities. The content acquisition podcasts developed for these studies used a multimedia format based on universal design of learning principles. The podcasts present illustrations of the word to be learned with text and a voice-over that explains the word and its definition. The researchers found that when the students with disabilities were taught using the content acquisition podcasts, they had significantly higher scores on vocabulary probes and learned the words faster than when they were taught using the standard approach.

Speech recognition holds a lot of promise for students with reading and writing difficulties. Speech recognition programs translate the spoken word into text on the computer

screen. Early systems were expensive and difficult to use, but current programs, such as Dragon Naturally Speaking (Nuance Communications) and IBM's Via Voice are making speech recognition more practical and accessible than ever. Speech recognition software (along with voice output programs that translate words on the computer into speech) will make computers more functional for children with a wide range of learning disorders.

Since word recognition software is relatively new, research on its use in classroom situations with children with disabilities is limited. However, the research in existence points out both the potential benefits as well as the limitations of this emerging technology. Higgins and colleagues (Higgins & Raskind, 2000, 2004; Raskind & Higgins, 1999) have conducted the most extensive research on the use of speech recognition programs with students with learning disabilities. They have found that students who use this technology can improve their word recognition, spelling, reading comprehension, and phonological processing.

Despite the positive results reported in these studies, speech recognition technology is not without difficulties. Many of the students reported experiencing frustration with the time it took to "train" the program to recognize their voice and with the errors the software produced. Additionally, most speech recognition programs are not as accurate in recognizing children's voices, especially when the children have language and/or reading difficulties, as is the case with most students with learning disabilities.

Read the following case study about James, and then respond to questions about the case in your Pearson eText.

James: A Case Study

EDUCATIONAL HISTORY, CURRENT PLACEMENT, AND PROGRESS

James is a 9-year, 6-month-old student who has been classified as special education under the "Specific Learning Disability" classification. James received basic skills instruction in reading in first grade. Due to a concern by his parents and teachers concerning his gains in reading, he was referred to the district's child study team at the beginning of his second-grade year. He was classified that same school year and began receiving services in an inclusion classroom and a pullout resource classroom (for reading and writing only). Throughout third grade, James continued to receive instruction in both an inclusion general classroom and a pullout resource setting (for reading and writing).

James is currently a fourth-grade student in an inclusion classroom. James has participated in the general classroom setting within the inclusion classroom for science, social studies, math, spelling, and grammar for the entire school year. From September through December, he received instruction in reading and writing in a pullout resource room setting. At that point, his parents requested that he be placed back into the general classroom. They believed his progress was stagnating in the resource room and that he felt isolated from his peers, and they wanted him to have the opportunity to rise to the occasion. Beginning

in January, James began to receive all his academic instruction in the general classroom.

Academically, James has shown an aptitude for mathematics and has steadily earned grades of A and A—throughout the school year. James is also highly curious in science and social studies, and has earned high Bs and As in those subjects throughout the year. James has experienced ebbs and flows in rule-based subjects such as grammar and spelling. His performance generally falls within the high B to A range, with occasional dips in which he earns Cs. Reading is the area in which James has the most difficulty. He has deficits in expressive and receptive vocabulary, verbal memory, and attention in regard to reading. These deficits have made it difficult for James to comprehend reading materials and to demonstrate (in written and verbal means) his understanding. Despite his difficulties, James has worked extraordinarily hard since joining the general classroom environment and, through his efforts and the supports provided to him, has maintained a B average. In writing, James has difficulty structuring his work and completing his thoughts. This is largely due to his expressive vocabulary and verbal memory deficits (he can easily forget the direction of his writing as he writes). However, with the use of graphic organizers and teacher support, James is able to complete writing assignments at approximate grade level proficiency.

(continued)

James: A Case Study Continued

In addition to the instruction James receives in the inclusion classroom, he also sees a speech-language pathologist three times per week for a total of 1 hour each week. They have focused on strategies to help James expand his receptive vocabulary such as breaking words into prefixes, roots, and suffixes (morphology) and defining new words through context clues and using word keyword strategies. Their sessions have also focused on expanding James's expressive vocabulary through strategies such as having James view a picture and then create a word web to describe the whole picture or parts of the picture using as many words as he can that are applicable.

James also receives services from an occupational therapist. He does not have regular sessions with this professional; instead, she observes James once a month in the classroom setting and makes recommendations for accommodations that may aid in James's classroom development. The occupational therapist and the teacher also meet briefly once a week to discuss James's progress, and the therapist sees James outside of the classroom as needed.

PHYSICAL/HEALTH DEVELOPMENT

Before describing James's language development, it is important to detail his physical and health development. James's mother gave birth to him after a 39-week pregnancy (which is about typical). He was reported to hit all physical and cognitive milestones within the range of typically developing children. James is an outstanding athlete, particularly excelling in swimming. Although his gross motor skills are above average, observations of James, tests, and collaborative discussions with the occupational therapist reveal a weakness in terms of fine motor skills. He struggles with tasks such as finger-thumb succession. According to the occupational therapist, this is a developmental issue that is linked to his sensory processing of touch sensation. This is the reason he receives occupational therapy services.

Just before the age of 2, James had his first ear infection. These ear infections would prove to be chronic. James has had numerous ear infections throughout his life and six separate surgeries to insert tubes in his ears to reduce the instances of infection. Ear infections still continue currently, with his mother reporting winter to be the worst season for infections. In 2012, his hearing was assessed at the Children's Hospital of Philadelphia under normal circumstances (without an ear infection). James was found to have normal hearing acuity bilaterally; however, he was found to need a higher signal-to-noise ratio. This indicates that James has trouble distinguishing between the primary auditory input and background noise.

Language Development

James's parents have self-reported to have interacted with James as much as his siblings and to have made literacy activities (such as reading to and with James) a key focus of his early childhood. Still, James's parents reported language deficits from an early age in terms of vocabulary and reading comprehension (both materials that James has read and stories that have been read/told to him). This may certainly, as has been suggested by professionals who have worked with and assessed James, be attributable (to at least some degree) to his history of chronic middle ear infections.

When James was first formally tested as a second-grade student, it was found that he had deficits in language in general. As a young student, James had struggles with elements of phonology, morphology, syntax, and semantics. Pragmatics was not an area of concern. He interacted properly with adults and peers. Throughout his school experience, James made significant gains in phonology and moderate gains in syntax. With the intensive strategies used by teachers and particularly the speech-language pathologist, James has made gains this school year in morphology through word attack strategies such as identifying prefixes, suffixes, and roots. Reading comprehension continues to be an area of weaknesses (and the target of many goals) as James continues to learn and implement semantic skills to improve expressive and receptive vocabulary strategies as well as strategies to improve verbal memory and aid James in organizing his thoughts.

EVALUATION OF LANGUAGE AND COMMUNICATION SKILLS

This section is broken up into two sections: informal and formal assessments. Although James has participated in comprehensive testing in speech, language, and communication skills in the past, the testing that is to be reported upon is limited in scope to skills related to expressive and receptive vocabulary. This decision was made based on the goals that have been prioritized for James by both the parents and the school for this school year. James's parents have made it clear to the school that it is their wish to have vocabulary acquisition skills and vocabulary usage strategies as the top priority in terms of the intervention services he receives in school as well as strategies that are expressly taught in the general classroom. School personnel (teacher, special education teacher, speech-language pathologist, and case manager) agree that, although there are other factors that contribute to James's school performance, expressive and receptive vocabulary skills are a significant deficit

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James: A Case Study Continued

for James and that interventions to aid James in these areas would be greatly beneficial. It is for these reasons that expressive and receptive vocabulary skills were the focus of testing for this report.

Informal Assessment

James has been the focus of consistent informal assessments of vocabulary skills throughout the school year. This is partially due to general classroom practices by his teachers this year (both the general and special education teacher), but also due in part to his parents' wishes related to vocabulary skills. Informal assessments based on observations have been focused on independent reading (fiction and nonfiction), class work, and tests.

James has been periodically assessed on independent reading tasks by both the teacher and the special education teacher in the classroom who have collaborated to share results and findings. Independent reading task assessments have occurred during James's reading of textbooks, news articles, novels, and short stories (both fictional and nonfictional). He has been found to be below his peers in terms of defining grade level words. He has also been found to have poor skills in terms of monitoring his own understanding of words, such as stopping himself when he comes across words he does not know or recognize. As a result, he rarely uses word vocabulary strategies to learn new words and aid in his comprehension of his reading task independently. When prompted to use such strategies (identifying prefixes, suffixes, and roots and using context clues to infer meaning and then checking against a glossary or dictionary), he has been able to attempt them with moderate success. When asked a question or to summarize what he has read, James often will hesitate and give an answer of "I know the answer, but I don't know how to say it" (or a similar answer). With assistance from a teacher or peer with whom James is able to talk out his answer or when James is given assistance finding the "right words," he is generally able to express his opinion, although overly simple words are often used.

When working on independent class work (questions from a textbook or a worksheet), James has been observed in terms of his strategies when he does not know a word in the question. James rarely seeks help when he does not understand a question. He will occasionally look at his neighbor's paper; at times, he copies his neighbor's answer, but more often, he looks at his neighbor's response to help him understand what is being asked. Most often, however, James will guess at the meaning of a question he does not understand and formulate his answer based on

his guess. When he asks for assistance or when a teacher approaches James about a question that is not fully understood based on the words used, James is typically able to understand the question through talking with a teacher or having the teacher explain or reword the question. When James understands the question, his responses are typically understandable, although the vocabulary used in answers is typically below grade level expectations.

James takes his grades very seriously, and when he is taking a test, he will ask for assistance with vocabulary that he does not know within a question. On vocabulary tests, he generally does well when he has had time to practice words ahead of time (typically above the class average). He does poorly, however, on vocabulary tests on words for which he has not had time to prepare. These words, for example, test to see if James has retained knowledge of the word from reading assignments, is able to properly use skills to determine word meaning based on word parts (prefix, suffix, roots), or is able to infer word meaning based on context clues. In responding to short response or essay questions on tests, he is typically able to respond appropriately, although his word choice is simpler than his peers and he is often unable to use specific words that would be expected on tests in areas such as science and social studies.

For informal assessments, the accommodations that are ensured by his individualized educational plan as well as those deemed appropriate by the teacher, special education teacher, speech-language pathologist, and his parents are in place. Accommodations pertinent to these assessments include rewording and rephrasing of questions and directions, preferential seating, tasks broken into manageable portions, checklists and graphic organizers, additional time on tests and quizzes, and testing in a small group setting.

Formal Testing

The results of three formal tests have been included in this report. The first test included, the Woodcock Johnson-IV (WJ-IV), was conducted by an independent learning consultant. This is a comprehensive language and literacy test; however, James's vocabulary scores will be used because they fall within the scope of the assignment. The second test was the Expressive One-Word Picture Vocabulary Test (EOWPVT-4) administered by James's teacher in conjunction with the speech-language pathologist. The third test, the Rapid Automatic Naming (RAN) subtest of the Clinical Evaluation of Language Fundamentals 4 (CELF-4), was administered by the teacher.

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James: A Case Study Continued

Although the WJ-IV was not administered by the teacher, it is included in this report to give a more complete picture of James and to help clarify the objectives and goals that have been implemented based on the testing. Furthermore, the results of the WJ-IV have been found to conflict with the results of subsequent tests. The discrepancies between the results of these tests are important in formu-

lating the objectives and goals, and possible factors that led to the differing results will be discussed in the analysis section of this report. Finally, the discrepancies underline the possible limitations of standardized testing and the importance of proper balancing between formal and informal assessments while developing goals and objectives.

FORMAL TESTING RESULTS

Woodcock Johnson-IV. This is a standardized test that is normalized to James's same-aged peers. James was 9 years, 5 months old when he was given this assessment.

Subtest	Standard Score	Percentile Rank	Description	Grade-Level Equivalent
Reading Vocabulary	74	4	Limited	1.4
Oral Expression	79	8	Limited	2.2
Picture Vocabulary	64	1	Limited	Not listed

Expressive One-Word Picture Vocabulary Test (EOWPVT-4). This is a standardized test that is normalized to James's same-aged peers. James was 9 years, 6 months at the time the assessment was given.

Raw Score	Standard Score	Percentile Rank
111	107	68

Rapid Automatic Naming (RAN) subtest of the Clinical Evaluation of Language Fundamentals 4 (CELF-4). This subtest of the CELF-4 is normalized to James's same-aged peers. James was 9 years, 6 months at the time the assessment was given.

Color-Shape Time	143 seconds
Color-Shape Time Criterion	Non-normal*

*Based on the performance of James's peers, the assessment considers 95 seconds or less to be "normal," 96 to 114 seconds to be "slower than normal," and 115 seconds or above to be "non-normal."

Color-Shape Errors	4
Color-Shape Errors Criterion	Normal*

*Based on the performance of James's peers, the assessment considers five or fewer errors to be "normal," six to seven errors to be "slower than normal," and eight or more errors to be "non-normal."

Neither accommodations nor modifications for James as he took part in these formal assessments were deemed necessary. Although he has proper classroom accommodations and modifications, he was able to participate in these assessments fully.

Apply Your Knowledge 7.1: Case Study: James



Click here to assess your understanding of James's case.



Check Your Understanding 7.3

Click here to gauge your understanding of the concepts in this section.

Summary

In this chapter, we have examined the language difficulties of children with learning disabilities and children with attention deficit hyperactivity disorders. Problems with defining *learning disabilities* present one of the biggest challenges to identifying students with learning needs. Despite the uncertainty created by problems with definition, overwhelming research shows that language difficulties are an important cause of learning disabilities and that they do not usually get better on their own. In addition, research on students with ADHD has found increasing evidence of language difficulties in this population. Instructional approaches, including phonological training methods to enhance word identification ability, mnemonic strategies, cognitive learning strategies, and technological applications, were presented. After reading this chapter, you should be better able to identify language disorders in the classroom, understand some of the consequences of language disabilities, and be better prepared to teach children with learning disabilities and those with ADHD.