



**Disabilities and Reading:
Understanding the Effects of
Disabilities and Their Relationship to
Reading Instruction and Assessment**



Partnership for Accessible
Reading Assessment

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Martha L. Thurlow, Ross E. Moen, Kristin K. Liu, Sarah Scullin, Kristin E. Hausmann, and Vitaliy Shyyan

March 2009

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Thurlow, M. L., Moen, R. E., Liu, K. K., Scullin, S., Hausmann, K. E., & Shyyan, V. (2009). *Disabilities and reading: Understanding the effects of disabilities and their relationship to reading instruction and assessment*. Minneapolis, MN: University of Minnesota, Partnership for Accessible Reading Assessment.



Partnership for Accessible Reading Assessment

University of Minnesota
207 Pattee Hall
150 Pillsbury Dr. SE
Minneapolis, MN 55455

<http://www.readingassessment.info>
readingassess@umn.edu

This work is supported, in part, by the U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research—Grant No. H324F040002. Opinions expressed do not necessarily reflect those of the U.S. Department of Education or offices within it.



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Acknowledgment

This paper was developed by combining several separate reports, each of which involved a collaborative effort of numerous members of the Partnership for Accessible Reading Assessment (PARA) staff, as well as invaluable assistance and input from a number of other individuals representing various organizations that are members of the General Advisory Committee for the National Accessible Reading Assessment Projects. The PARA contributors are listed here alphabetically: Kristin Eisenbraun, Christopher Johnstone, Sheryl Lazarus, Kristi Liu, Danielle Matchett, Ross Moen, Mari Quenemoen, Rachel Quenemoen, Sarah Scullin, Vitaliy Shyyan, Sandra Thompson, and Martha Thurlow. The General Advisory Committee organizations and individuals assisting us included: Suzanne Fornaro, who is Past-President of Learning Disabilities Association; Stan Dublinske, who is Senior Advisor for Planning of the American Speech-Language-Hearing Association; Drew Albritten, who was Executive Director of the Council for Exceptional Children; Ross Mitchell, who was Research Scientist at Gallaudet University; and Jean Martin, who was President of the Association of State Consultants of Blind/Visually Impaired. Several other individuals provided detailed input, including suggestions for specific (and better) wording. These individuals included Silvia Diehl, Diane Paul, Rhea Paul, Cynthia Pearl, Patricia Prelock, Rose Sevcik, and Kathleen Whitmire.

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Introduction

Until relatively recently, many students with disabilities were excluded from assessment and accountability systems, often because these students were considered to be more difficult to instruct and assess. Excluding these students left them outside the very systems intended to identify problems and to point toward ways to improve education for these students. That is why many advocates for students with disabilities welcomed and continue to support provisions of the No Child Left Behind Act of 2001 (NCLB), which requires states to include all students in statewide assessment and accountability systems.

Inclusion of students with disabilities in assessment and accountability systems is beneficial for their educational process, but further steps need to be taken to ensure that tests measure students' performance adequately. When comparing the performance levels of students with disabilities with the performance levels of students without disabilities, researchers generally found that the performance levels of students with disabilities were lower than those of students without disabilities (Klein, Wiley, & Thurlow, 2006; Thurlow, Bremer, & Albus, 2008; VanGetson & Thurlow, 2007). When low performance levels are obtained on assessments that provide an accurate picture of students' knowledge and skills, such test results can indicate areas in which test takers need additional instructional effort to improve their learning. However, if features of an assessment prevent students with disabilities from accurately demonstrating their knowledge and skills, the test results have little utility in guiding instructional efforts. In this case, the assessment needs to be improved to portray students' knowledge and skills more accurately.

Education experts have attempted to design various assessment tools and practices that would remove inappropriate barriers to identifying what students with disabilities actually know and can do. Elliott, Thurlow, Ysseldyke, and Erickson (1997) discussed various accommodations that are used to overcome assessment barriers; since the time this publication was released, state policies have evolved significantly (Christensen, Lazarus, Crone, & Thurlow, 2008; Lazarus, Thurlow, Lail, & Christensen, in press). Thompson, Johnstone, and Thurlow (2002) and Thompson, Thurlow, and Malouf (2004) described ways in which principles of universal design of assessment (UDA) can be incorporated in the design of assessment to either remove assessment barriers without requiring accommodations or make testing accommodations easier to apply.

Many UDA principles and most accommodations research efforts have been designed to remove barriers in mathematics and other content areas without addressing the reading content area. Therefore, it is worthwhile to investigate accessibility principles specifically to make reading assessment accessible for students with disabilities. The Partnership for Accessible Reading Assessment (PARA) is part of a national effort to accomplish this—find ways to assess most appropriately the reading performance of students with disabilities.

Assessment experts and reading experts who have extensive knowledge in their own fields may know relatively little about students with disabilities. People who know a great deal about one disability may know relatively little about other disabilities or about how disabilities interact with reading or with large-scale statewide reading tests. Some understanding of the issues specific to various disabilities and how those issues affect reading and the assessment of reading is essential to efforts underway to develop accessible reading assessment.

This report is intended to provide enough common ground on the issues surrounding reading and students with various disabilities to facilitate discussion of accessible reading assessment. The information in this report was obtained through a broad review of literature and Web sites of national agencies and organizations, along with input and feedback from professionals in the disability areas. It is not intended to be a comprehensive research review of disabilities or reading-related issues, but nevertheless should prove useful for understanding the effects of disabilities and their relationship to reading.

Seven disabilities are discussed in the order of their prevalence. These are: specific learning disabilities, speech or language impairments, mental retardation, emotional/behavioral disabilities, autism, deaf or hard of hearing, and visual impairments. Although these disabilities do not comprise all of the possible disability categories or even the most common disabilities, they do represent those often considered most challenging for reading assessment. This report provides: (1) an overview of the characteristics of students with each disability, (2) a description of common approaches to reading instruction for students with each disability, and (3) assessment approaches and issues that surround the assessment of reading for students with each disability.

Characteristics of Students with Disabilities

This section highlights general characteristics of the seven disability categories described in this report (specific learning disabilities, speech or language impairments, mental retardation, emotional/behavioral disabilities, autism, deaf or hard of hearing, and visual impairments). Table 1 provides federal definitions used to identify students in each disability category.

Based on the Individuals with Disabilities Education Act (IDEA) Part B Child Count data (www.ideadata.org, 2008), 45.5% of students receive special education services for specific learning disabilities (see Figure 1). The next largest disability group is speech or language impairments totaling 18.9%, followed by mental retardation at 8.9%, and emotional disturbance at 7.7%. Students with autism make up 3.2% of students served in special education, and students with multiple disabilities make up 2.2% of these students. Smaller categories of students in special education include students with developmental delay at 1.3%, hearing impairments at 1.2%, and orthopedic impairments at 1.0%. Students with visual impairments and traumatic brain injury each make up 0.4% of students served by special education, while the remaining 9.2% of students have other health

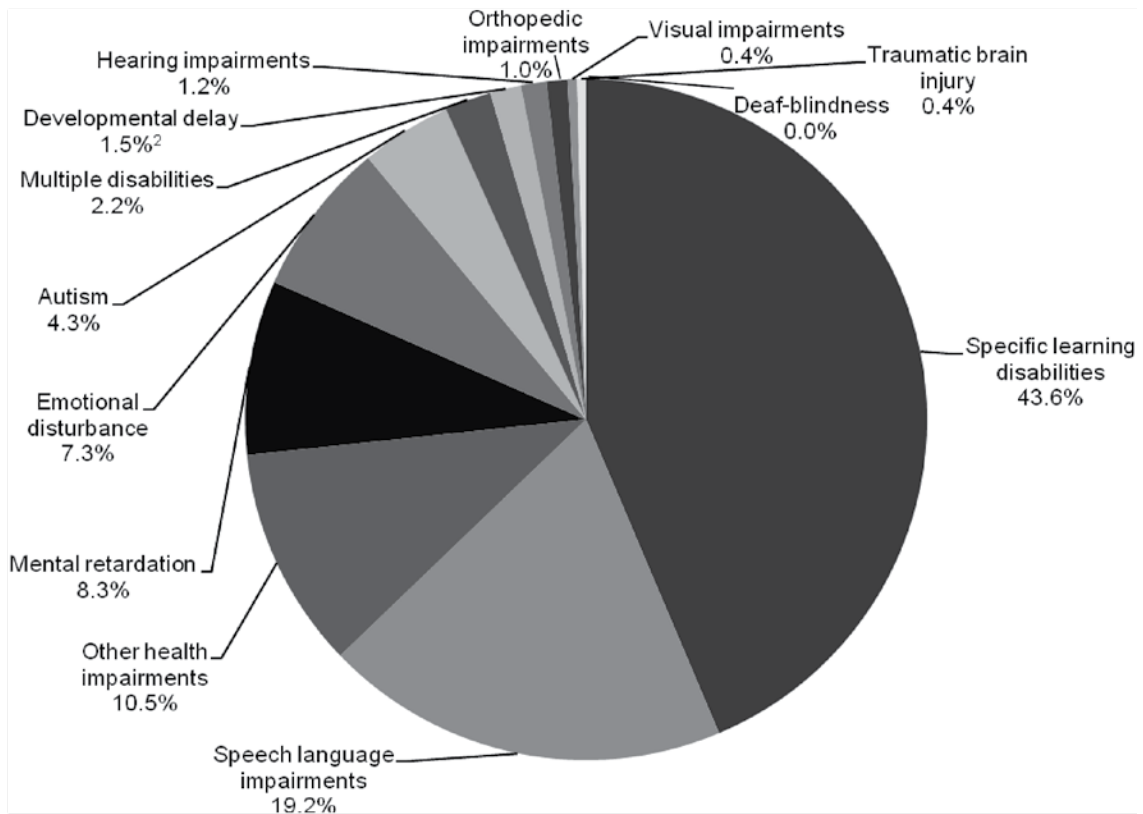
impairments, a category that often includes students with attention deficit hyperactivity disorder (ADHD).

Table 1. Characteristics of Students in Seven Disability Categories

Disability Category	Federal Definitions^a
Specific learning disabilities	The term means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.
Speech or language impairments	A communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment, that adversely affects a child's educational performance.
Mental retardation	Significantly subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child's educational performance.
Emotional or behavioral disabilities [Federal term: Emotional disturbance]	(i) The term means a condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child's educational performance: (A) An inability to learn that cannot be explained by intellectual, sensory, or health factors. (B) An inability to build or maintain satisfactory interpersonal relationships with peers and teachers. (C) Inappropriate types of behavior or feelings under normal circumstances. (D) A general pervasive mood of unhappiness or depression. (E) A tendency to develop physical symptoms or fears associated with personal or school problems. (ii) The term includes schizophrenia. The term does not apply to children who are socially maladjusted, unless it is determined that they have an emotional disturbance.
Autism	A developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3, that adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. The term does not apply if a child's educational performance is adversely affected primarily because the child has an emotional disturbance, as defined in paragraph (b)(4) of this section.
Deaf or hard of hearing	A hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, that adversely affects a child's educational performance.
Visual impairments or blindness	An impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness.

^aSource: IDEA §300.7 (Authority: 20 U.S.C. 1401(3)(A) and (B); 1401(26))

Figure 1. Distribution of Disability Categories



¹Percentages in this figure are based on a total number of 6,007,832 students receiving special education services (www.ideadata.org, 2007).

²Developmental delay is applicable only to children ages 3 through 9.

These data reflect significant increases in some disability categories during the past decade or more. For example, the incidence of specific learning disabilities increased by more than 300% over 30 years (President's Commission on Excellence in Special Education, 2002). Other findings indicate, for example, that in addition to the number of deaf or hard of hearing students receiving special education services with their primary disability identified as deafness or hearing impairments, there are additionally estimated 500,000 students with hearing loss or deafness who receive special education services under a different primary disability category, most frequently learning disability, speech or language impairment, and mental retardation (R. Mitchell, personal communication, January 10, 2007). Other data indicate that only about 10% of school-age children with visual impairments are blind and depend exclusively on tactile or auditory methods such as braille or audio text to read (Erin, 2003).

The challenge of learning English and having a disability adds another level of complexity to learning to read and demonstrating reading achievement (Muller & Markowitz, 2004; Spear-Swerling, 2006). Table 2 shows the number and percentage of English language learners (ELLs) with disabilities for the 2001-2002 academic year, which are the most recent nationally representative data available (Zehler, Fleischman, Hopstock, Pendzick, & Stephenson, 2003). According to Table 2, it has been estimated that about 199,599 ELLs received special education services for specific learning disabilities, totaling in approximately 55.9% of school-age ELLs with disabilities. About 83,982 ELLs received special education services for speech or language impairments, comprising approximately 23.5% of ELLs with disabilities. Typically, to qualify for these services, ELLs must demonstrate difficulties with communication that are not related to the second language acquisition process, and demonstrate that those difficulties are present in both the first and second language). About 8,723 ELLs received special education services for emotional or behavioral disabilities, approximately 2.4% of school-age ELLs with disabilities. The distribution of ELLs with disabilities in other disability categories in 2001-2002 did not appear to be different from the distribution of categories for students with disabilities overall.

Table 2. Estimates of ELLs with Disabilities

Disability Category	Number of ELLs with Disabilities^a	Percent of ELLs with Disabilities^a
Specific learning disabilities	199,599	55.9%
Speech or language impairments	83,982	23.5%
Mental retardation	28,056	7.9%
Emotional or behavioral disabilities	8,723	2.4%
Autism	4,561	1.3%
Deaf or hard of hearing	6,028	1.7%
Visual impairments or blindness	2,000	0.5%

^aData for ELLs with disabilities are from Zehler, Fleischman, Hopstock, Pendzick, and Stephenson, 2003.

Students with Specific Learning Disabilities

Learning disability is an umbrella term that refers to various groups of disabilities marked by significant difficulties in the acquisition or use of listening, speaking, reading, writing, reasoning, or mathematical skills (National Joint Committee on Learning Disabilities, 1998). Specific learning disabilities (SLDs) are “chronic conditions of presumed neurological origin which selectively interfere with the development, integration, and/or demonstration of verbal and/or nonverbal abilities. [It exists] as a distinct handicapping condition and varies in its manifestations and in degree of severity” (Learning Disabilities Association of America).

Learning disabilities historically were manifested by a discrepancy between achievement and intelligence. Often deficits occurred in particular academic areas and could not be explained by other factors (Mellard, Deshler, & Barth, 2004). Traditionally, a requirement in the diagnosis of learning disabilities was the use of the IQ-discrepancy formula. This discrepancy was measured by the difference in intelligence, or a child's potential ability to perform, and the child's actual performance. A student's achievement had to be significantly lower than intellectual ability to be eligible for special education services for a learning disability. This approach has created significant controversy about over-identified or misidentified students with learning disabilities. Specifically, over-identification of students from minority groups (such as African Americans or Hispanic Americans) has emerged as a concern (Coffey & Obringer, 2000), although U.S. Department of Education (2002) data indicate that when compared with average percentages, the percentages of Hispanic students receiving services for learning disabilities are slightly higher and the percentages of African-American (non-Hispanic) students receiving services for learning disabilities are slightly lower. Recent federal policies permit approaches to the identification of students with learning disabilities that emphasize failure of students to respond to interventions rather than the discrepancy approach (IDEA, 2004; Vaughn & Fuchs, 2003). Subsequently, discussion has emerged about the validity of this approach for ELLs (Barrera, 2006; Klingner, Sorrells, & Barrera, 2007) and for comprehensive assessment of learning disabilities (Kavale, Holdnack, Mostert, & Schmied, 2003; Mastropieri, 2003).

Difficulties with basic print reading and reading comprehension are the most common problems associated with learning disabilities (Gersten, Fuchs, Williams, & Baker, 2001). Because of the strong connection between spoken and written language, reading problems often can be traced to early delays in receptive and expressive language development (Catts, Fey, Zhang, & Tomblin, 1999; Catts & Kamhi, 2005; Scarborough, 2001). Among students who are diagnosed with learning disabilities, 80% are diagnosed because their reading skills lag behind; 90% of students with learning disabilities identify reading as their primary difficulty (President's Commission on Excellence in Special Education, 2002). Still, many children who receive special education services are able to close the achievement gap and read print on the same level as their peers. With the use of specialized techniques, these students can learn to generalize specific skills and strategies to a variety of reading situations.

Students with Speech or Language Impairments

This category encompasses a number of receptive and expressive impairments, including but not limited to, inability to understand or use language, stuttering, impaired articulation, or voice impairments. Hearing loss, neurological disorders, brain injury, mental retardation, drug abuse, physical impairments such as cleft lip or palate, and vocal abuse or misuse are all factors that can contribute to the severity of the impairment (National Dissemination Center for Children with Disabilities, 2008). There is evidence of a relationship between language impairments and reading disabilities, showing that a majority of native English speaking students who do not develop proficient reading skills in English had an early history of spoken-language deficits (Catts, Fey, Tomblin, & Zhang,

2002). Although the connection between language impairments and reading difficulties is not causal or inevitable, students with a history of language impairments are at risk for failure in reading achievement more than students without language impairments.

Recent reviews of literature indicated that approximately 50% to 60% of children with speech or language impairments outgrew the problem (Law, Boyle, Harris, Harkness, & Nye, 2000), while the remaining 40% to 50% had persistent speech or language impairments. Prathanee, Thinkhamrop, and Dechongkit (2007) examined factors associated with speech and language impairments, including biological factors (family history, prenatal care, gender, etc.) and environmental factors (number of siblings, maternal-paternal education, bilingual home, socioeconomic status, etc.). Studies invite further research to determine the strength of association and effect of these factors on student achievement.

Students with Mental Retardation

The mental retardation disability is “characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills” (American Association on Mental Retardation, 2002). The causes of mental retardation in children vary widely, including fetal alcohol syndrome, genetic disorders like Down syndrome and fragile X syndrome, environmental factors like lead poisoning, or diseases such as meningitis. For many years, students with mental retardation were identified solely using intelligence testing. IQ levels among students labeled as having mental retardation can vary from 20-25 (profound mental retardation) to 50-75 (mild mental retardation); according to DSM-IV-TR (American Psychiatric Association, 2000), 85% of individuals with mental retardation have *mild mental retardation*.

The term *mental retardation* is widely used and coded into federal law, but the term remains the subject of controversy. Some advocacy groups and professional associations argue that the negative stigma of the term mental retardation could be avoided by using other language. The ARC of the United States, one of the country’s largest advocacy organizations for people with mental retardation, eschews the term *mental retardation* in its mission statement (The ARC, 2004) in favor of *cognitive, intellectual, and developmental disabilities*. In 2004, Special Olympics updated its terminology from *mental retardation* to *intellectual disabilities* (see the Language Guide under “About Us,” then “Information about Intellectual Disabilities” at www.specialolympics.org). In this paper, we use the term *mental retardation* as a legal term defined by IDEA, while cognizant of this significant shift in terminology.

Characteristics of students with mental retardation vary widely. Students with mental retardation may have difficulty with expressive language, poor short-term memory, low level meta-cognition skills, and poor use of logic and organization. Some students who are labeled as having mental retardation also have motor difficulties that can affect their handwriting or their ability to hold reading material steadily (Rizopoulos & Wolpert,

2004). Students with mental retardation, similar to all students, demonstrate wide variation in strengths, weaknesses, interests, and motivation, all of which should be reflected in each student's Individualized Education Program (IEP).

Since school systems have begun to include students with moderate to severe mental retardation in assessments (IDEA, 1997, 2004) and accountability (NCLB, 2001), and thus also have included them in more academic instruction, these students have been achieving at much higher and more complex levels than was expected by researchers, practitioners, and advocates expected (see Moore-Lamminen & Olsen, 2005). This powerful evidence of achievement has forced educational professionals to revisit long-held assumptions about the benefits of academic instruction for all children, and is generating provocative reading research on new, rigorous approaches to reading and mathematics instruction for students with mental retardation (e.g., Browder, Ahlgrim-Dezell, Courtade, Gibbs, & Flowers, 2008; Browder, Spooner, Ahlgrim-Dezell, Harris, & Wakeman, 2008).

Students with Emotional or Behavioral Disabilities

This category covers a range of conditions, including affective disorders, anxiety disorders, schizophrenia, and conduct, attention, or adjustment disturbances. It does not include youngsters who are considered to be exhibiting social maladjustments, unless they also have emotional disturbance (National Association of School Psychologists, 2002). The official label for this group of students was formerly *serious emotional disturbance*; it was changed to *emotional disturbance* in the 2004 reauthorization of the IDEA. We use the terminology commonly used in schools—emotional or behavioral disabilities—to refer to these students in this report. Students in this category are predominantly male, disproportionately African American, and may take medication such as stimulants, antidepressants, and anti-anxiety drugs (Bradley, Henderson, & Monfore, 2004).

Students with emotional or behavioral disabilities display both learning problems and behavioral deficits (Kauffman, 2005) that affect their academic progress. Nelson, Benner, Lane, and Smith (2004) reported that 83% of the sample of students with emotional or behavioral disabilities involved in their study scored below reading standards. Compared to general education students or students with learning disabilities, students with emotional or behavioral disabilities demonstrate much lower academic achievement (Anderson, Kutash, & Duchnowski, 2001). The number of students representing this disability category has increased. Greenbaum et al. (1996) observed that the percentage of children with emotional or behavioral disabilities increased by 31% (from 54% to 85%) over the seven-year span of their study.

Students with Autism Spectrum Disorders

Autism is a neurological disorder that affects a child's ability to communicate, understand language, play, and relate to others (National Dissemination Center for Children with Disabilities). Children with autism demonstrate communication deficits that may

involve a complete absence of spoken language, along with an atypical focus or intensity of interests and repetitive patterns of behavior. Deficits in the development of certain language skills may occur, particularly in the area of comprehension of higher-level more complex discourse, which in turn, can affect reading comprehension ability (Wing, 1991). Although early reports suggested that close to half of children with autism never developed spoken language, current estimates, which reflect earlier diagnosis and intervention, suggest that 60-80% of children with autism do learn some spoken language (Rogers, 2006). Approximately 20% are considered “high functioning,” with IQ scores within the normal range and fluent spoken language (Tager-Flusberg, Paul, & Lord, 2005). This group includes children with Asperger syndrome (Klin, Volkmar, & Sparrow, 2000).

While *autism* is the most familiar label for these children, the condition actually comprises a spectrum of disability. Children are given the label of autism when they demonstrate all three of the diagnostic criteria for autism: severe deficits in social interaction, deficits in communication, and the presence of stereotypical and repetitive patterns of movements, activities, and interests. The term *autism spectrum disorders*, however, refers to the complex group of related disorders that have similar autism-like characteristics: (1) *Pervasive Developmental Disorder-Not Otherwise Specified* (PDD-NOS) refers to a collection of features that look like autism but may not be as severe or extensive; (2) *Rett syndrome*, which primarily affects girls, is a genetic disorder characterized by speech and motor skills that regress with age, along with other neurological disorders; (3) *Asperger syndrome* refers to the existence of autistic characteristics but relatively intact language abilities; and (4) *Childhood Disintegrative Disorder* refers to a condition in which development appears normal for the first few years of life, but then regresses with the loss of speech and other skills until the characteristics of autism are evident. In addition to this range of syndromes on the autism spectrum, children with autism spectrum disorder can show a wide range of levels of cognitive function, from superior levels of intellectual ability, to abilities in the range exhibited by children with mental retardation.

Some children with autism demonstrate *hyperlexia*, a precocious ability to decode words with relatively little ability to comprehend the meaning of what is read. The presence of hyperlexia can complicate the assessment of reading ability in these students because their strong word reading skills can mask deficits in the ability to understand what they read.

Children with autism spectrum disorders generally have problems in three core areas, with varying degrees of intensity: socialization, communication, and restricted patterns of behaviors and interests (Ruble & Gallagher, 2004). This may lead to difficulty understanding social rules such as taking turns and sharing, problems with understanding and reading the emotions of others, difficulty taking the perspective of other people, and problems initiating and maintaining interactions and conversation with other people (Barnhill, 2004).

Students Who Are Deaf or Hard of Hearing

Students who are deaf or hard of hearing face unique challenges when reading, particularly those youngsters who have been deaf since birth. Yet with targeted interventions and accommodations in reading instruction and assessment, students who are deaf or hard of hearing can become proficient readers. Understanding the characteristics of students who are deaf or hard of hearing, as well as the communities in which they live, is an important step toward developing effective instruction and appropriate assessment for these students.

For the purpose of this paper, students who are deaf or hard of hearing will be treated as one group, except when specific research makes a clear distinction. The terms *deaf* and *hard of hearing* both denote hearing loss; the term *deaf* signifies a more severe degree of hearing loss. Although the word is used inconsistently, *deafness* usually denotes “the inability to hear and understand any speech” (Gallaudet Research Institute, 2007).

Students who are deaf or hard of hearing vary widely in terms of the cause and the degree of hearing loss, the age of onset of hearing loss, educational background, language and communication methods, and how individual members within the community feel about their hearing loss. Some deaf or hard of hearing students prefer to identify themselves as members of a linguistic and cultural minority group, while others may identify themselves as students with a disability. The ways in which students identify themselves reflect and shape their educational and communication experiences although for some, there are conflicts between the two. Across the United States, several languages and communication forms are used commonly by students who are deaf or hard of hearing, including American Sign Language (ASL), communication systems for visually encoding English such as Manually Coded English (MCE), Cued Speech, speech reading, total communication, and bilingual-bicultural approaches. In addition, some students use residual hearing and hearing devices, or may have surgically placed cochlear implants.

Cochlear implants receive signals from an external device which stimulates electrodes in the cochlea (Owens & Kessler, 1989). Geers (2002) concluded that the effectiveness of cochlear implants is related to the age of the individual at onset of deafness, the residual hearing before the implant, and a child’s learning environment. Children with cochlear implants who were born with severe to profound hearing loss are not as likely to achieve the kind of proficiency in spoken language as their hearing peers (Mayberry, 2000), but can focus on developing skills that enable them to take full advantage of the sound they are able to access (Power & Leigh, 2000).

Students with Visual Impairments or Blindness

Reading is most often thought to involve viewing print on a page or other medium, such as computer screens, and then decoding that print. Because visual disabilities interfere with an individual’s ability to see words on paper or other media, other modes of reading may need to be used. The degree of a student’s visual impairment, along with the impact

of potential additional disabilities, has varying implications for instruction, accommodations, and testing. Most students in this category have low vision, which includes tunnel vision and partial vision. Some students with visual impairments can read print efficiently without accommodations. Other students may use some tactile and auditory adaptations, but many can read print with magnification (Assistive Technology Strategies, Tools, Accommodations and Resources—AT STAR—Web site).

In recent decades, many educators in the United States have pushed for increased reliance on residual vision, and assistive technologies such as screen readers and magnifiers have become more widely available. These trends have led to a decline in the number of students learning to read proficient English braille (reflected in American Printing House for the Blind's annual distribution of federal quota, 2003). Considerable controversy has followed in the wake that has implications for reading. Some believe that proficiency in braille is essential for individuals with visual impairments or blindness to achieve satisfactory educational progress and argue that learning to read and write is necessary in order to become self-sufficient in adulthood (Johnson, 1996). On the other hand, other advocates suggest that braille may not always be appropriate for every student with a visual impairment, and that other avenues to accessing print are just as important as braille.

According to a study by Trent and Truan (1997), the age at the onset of blindness was the critical factor related to reading speed. Factors such as comprehension, degree of vision, methods of instruction, and attitudes toward reading or braille did not impact reading speed. The authors of the study also found that to increase braille reading speed, students should use braille daily and for a long period of time; early braille instruction was also an important contributor to speed. Rapid braille readers can decode as quickly as print readers (Erin, 2003). Still, on average, braille readers read at about half the speed of print readers, at about 150 words per minute (Pring, 1994).

Readers with visual impairments or blindness and readers without visual impairments show few differences in their linguistic and cognitive processes related to reading. Both types of readers use syntactic, semantic, and contextual clues to become proficient readers. Individuals who are blind or visually impaired simply face a barrier to accessing print (Koenig, 1992). Still, low vision or a diminished perceptual field has implications for developing reading fluency at both lower processing (efficient recognition of distinctive letter features, orthographic information, and sight word recognition) and higher processing levels (syntactic, semantic, and text discourse structure). Students with assistive visual technologies such as magnification and screen readers can often develop proficiency in processes like phonemic segmentation, blending, and decoding and gain enough automatic processing using these skills to develop proficiency in vocabulary and comprehension.

Instruction for Students with Disabilities

This section addresses the question of learning challenges encountered by students with each of the seven disabilities discussed in this report. It also identifies instructional approaches and techniques employed by educators to tackle these challenges. Table 3 summarizes some of the instructional approaches and techniques often used to deliver educational content to students in the disability categories. The approaches and techniques, however, are determined not by the category of disability, but rather by individual needs of students.

Table 3. Instructional Approaches and Techniques for Students with Disabilities

Disability Category	Featured Approaches and Techniques
Specific learning disabilities	Remediation Compensatory (assistive) technology Combined approaches
Speech or language impairments	Seating arrangements Monitoring sources of background noise Consistent class structure Maintaining the student's focus and attention Speech adjustments Using sequential words Using visuals
Mental retardation	Traditional (direct) instruction Holistic approach Assistive technology
Emotional or behavioral disabilities	Direct instruction Peer tutoring Setting adjustments
Autism	Motivation Specific interventions Assistive technology Visual organizers Direct instruction Read-aloud
Deaf or hard of hearing	American Sign Language Speech-based instruction Technology-based instruction
Visual impairments or blindness	Adaptations Accommodations (mobility training, instruction in brailing, etc.)

Research literature on instructional practices for ELLs with disabilities is scarce (Gersten, Baker, & Marks, 1999; Gersten, Baker, Shanahan, Linan-Thompson, Collins, & Scarcella, 2007), especially focused specifically on reading. One statewide study found that such reading strategies as fluency building, direct teaching of vocabulary through listening,

seeing, reading, and writing, and practicing paraphrasing and retelling were chosen as important by both educators and ELLs with disabilities (Shyyan, Thurlow, & Liu, 2008). In a recent nationwide study (Thurlow, Shyyan, Barrera, & Liu, 2008), educators recommended the following reading instructional strategies for ELLs with disabilities: relating reading to student experiences, using visuals, checking students' background knowledge, chunking and questioning aloud, and pre-reading survey of text.

Instruction for Students with Specific Learning Disabilities

Many students become fluent readers of print through systematic and explicit instruction. Yet, the question of *which* practices are best for students and have research-based evidence remains the subject of considerable controversy. The two approaches used most commonly for students with learning disabilities are remediation and compensatory (assistive) technology.

Remediation instruction is based on the process of diagnosing and solving specific reading problems or strengthening weak areas of reading. Remedial approaches are typically labor-intensive and involve direct instruction in the area of phonemic awareness, word recognition, and comprehension strategies. Gersten et al. (2001) reviewed research on reading comprehension for students with learning disabilities and found that direct instruction of comprehension strategies has been an effective approach in improving students' ability to decode and comprehend print. Barrera, Liu, Thurlow, and Chamberlain (2006) conducted a single case study investigating the effectiveness of the chunking and questioning aloud strategy for ELLs with learning disabilities. Study results indicated that this reading strategy improved reading achievement of ELLs with learning disabilities when used in an individualized setting.

Compensatory education programs recognize problem areas but focus on other skills and strategies so that students can learn other information. Compensatory approaches teach the student to cope with the area of reading affected by disability and compensate for deficits by using technology or other tools. Compensatory strategies are typically used for older children or for those whose print-reading disabilities are severe, but who have high levels of auditory comprehension. Examples of compensatory approaches include books on tape, having someone read a book aloud, or using assistive technology (AT) that can read books aloud and highlight words on the screen. The purpose of AT is to help students with learning disabilities meet challenging academic goals and to express the knowledge that they already have obtained.

Although remediation and compensatory approaches are often presented in isolation in educational literature, Thompson, Johnstone, Thurlow, and Clapper (2004) suggested that students with a variety of disabilities may benefit from a combination of approaches. Combining remediation and compensatory approaches appears to align with current legislation that requires grade-level achievement for all students, including students with learning disabilities. Combined approaches may aid in the overall development of students with learning disabilities by addressing decoding issues while at the same time

aiding students in meeting other grade-level reading expectations that do not require decoding (Thompson et al., 2004). The effectiveness of such approaches, however, is difficult to research scientifically, as holistic approaches have multiple dependent and independent variables.

Instruction for Students with Speech or Language Impairments

Children with speech or language impairments may experience a range of challenges in the school setting due to their disability. Examples of these challenges that have been identified by the American Speech-Language-Hearing Association (ASHA) include misunderstanding social cues, showing poor judgment, having difficulty understanding and expressing language, and having difficulty with tests. These challenges may be especially apparent in noisy, complex classroom environments (ASHA, 2005a, b). ASHA cited research indicating that children who are not fluent readers by the fourth grade are likely to struggle with reading into adulthood. Students who received intervention before age five had increased opportunity for overcoming speech or language impairments, with the potential to prevent academic issues later in life (ASHA, 2005).

Children with speech and language deficits can have reading problems that fall into two categories. First, they may have difficulty with decoding, or the ability to identify printed words through letter-sound correspondences. Research has shown that children with speech and language impairments tend to show poor phonological awareness and other higher level phonological skills (Gillon, 2000, 2002) and these skills are known to be related to the successful acquisition of literacy (Adams, 1997). For these difficulties, direct instruction and practice in phonological segmentation, sound counting, and letter-sound associations have been shown to improve decoding skills (e.g., Ball & Blachman, 1991; Snow, Burns, & Griffin, 1998). Second, children with speech and language impairments may have difficulty with reading comprehension because of their lack of facility with comprehending complex discourse (Bishop, 1997; Westby, 2005). In this sense, the comprehension difficulties are secondary to their weak grasp of higher level language in any modality, spoken or written. Intervention efforts to improve comprehension of spoken language would be expected to generalize to comprehension of written language as well (Westby, 2005).

Many techniques can facilitate reading success in the classroom for students with speech or language disabilities. These techniques are generally effective for all students. Teachers can improve the learning environment for children with speech or language impairments by manipulating their approaches in a variety of ways, including seating students away from auditory or visual distractions; monitoring sources of background noise (e.g. air vents, playgrounds, hallways, street traffic); establishing a consistent class time structure and routine; maintaining the student's focus and attention; ensuring that the child is paying attention before giving directions; speaking slowly and clearly; using sequential words such as "first," "next," and "finally"; and using visual cues and supports to aid comprehension. In addition, Ehren (2002) suggested that for students with speech or language impairments, the speech language pathologist might work with students on

vocabulary instruction to, in turn, facilitate reading comprehension; it has also been suggested that word learning strategies might be implemented to facilitate reading fluency and understanding of meaning in context (McGregor, 2005), or the scaffolding of language to support listening and expression in the context of literacy events.

Instruction for Students with Mental Retardation

The focus in education for students with mental retardation has shifted from an emphasis on providing *services* related to placement, such as disability specific classrooms or special schools, to providing individualized *supports* to help every student access the general curriculum in an inclusive classroom setting. The American Association on Mental Retardation (AAMR), a lead advocate of the “supports model,” emphasized in its 2002 definition of mental retardation that the effects of mental retardation can be ameliorated with personalized supports. This shift in thinking correlates with an increased emphasis on inclusionary and mainstream education for students with mental retardation, giving these students access to a challenging and interesting general curriculum and an integrated social environment. IDEA 1997 emphasized that students with disabilities must have access to the same challenging content taught to all students; this was reiterated and strengthened in IDEA 2004. Many special education researchers and advocates argue that holding students with disabilities, including mental retardation, to the same high expectations as all students will improve learning and educational outcomes for these students (McGrew & Evans, 2004).

Approaches to teaching reading to students with mental retardation fall broadly into two categories. One broad category is the traditional or direct instruction approach, which teaches reading as distinct subsets of skills such as phonics and sight word recognition (Rizopoulos & Wolpert, 2004). The traditional approach is based on a behaviorist model, emphasizing drill and practice of a linear set of literacy skills. The second approach is a progressive, holistic approach that teaches comprehension and critical thinking along with phonological awareness, decoding, vocabulary, and reading for enjoyment (Katims, 2000). Each of these approaches has had support with some students with mental retardation and for various purposes (Browder & Xin, 1998; Cunningham, 1999; Driscoll & Kemp, 1996; Hendricks, Katims, & Carr, 1999; Joseph & McCachran, 2003; Katims, 2000; Moni & Jobling, 2000).

Technology increasingly has become an important support for reading-related instruction and reading for students with mental retardation. For example, Erickson and Kopenhagen (1995) found that computer and light technology can give students with severe mental retardation the supports they need to build communication skills. Continued interest in the literacy outcomes of students with mental retardation and supporting research has blossomed in the past few years, and is most likely to be a productive area for the reading futures of students with mental retardation (Beukelman & Miranda, 2005; Erickson, Clendon, Abraham, Roy, & Van de Karr, 2005; Sturm, Erickson, & Yoder, 2003).

In their review of literacy approaches for adolescents with developmental delays, Rizopoulos and Wolpert (2004) suggested that both traditional and progressive approaches to literacy instruction can be appropriate for certain students. Recent research by Diane Browder looks closely at the assumption that students with the most severe mental retardation benefit only from functional approaches to literacy. Browder and her colleagues argue more research is needed to understand how students with severe mental retardation might benefit from explicit instruction in decoding and comprehension skills (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006).

Instruction for Students with Emotional or Behavioral Disabilities

Many students diagnosed with emotional or behavioral disabilities have a difficult time learning to read (Jorm, Share, Matthews, & MacLean, 1986; Kauffman, Cullinan, & Epstein, 1987; Maughan, Pickles, Hagell, Rutter, & Yule, 1996; Wehby, Falk, Barton-Arwood, Lane, & Cooley, 2003). Because of the wide range of characteristics of emotional or behavioral disabilities, no one learning strategy is effective for every student. For instance, a student who refuses to participate in a classroom reading exercise may lack the necessary skills due to missed classes or limited English proficiency, or may have encountered a difficult situation earlier in the day that interferes with classroom concentration. Alternatively, the student may simply refuse to participate out of disinterest in the exercise. It is often difficult for teachers to know whether to target instruction, behavior, or other factors.

Reading difficulties and behavior problems often are linked, but the causal or correlative nature of this relationship is unclear. Educators frequently have to intervene both academically and behaviorally to help students with emotional or behavioral disabilities learn to read. When considering the approach to take with a student, it is necessary to understand the student's past achievement and ability in reading classes, history of behavioral control, oppositional behavior, and emotional regulation. Rather than having specific processing deficits, these students usually must compensate for general lack of attention, high distractibility, or learning environments with too little task structure or direct instruction. It is also important for teachers to know the student's level of English proficiency if the student is an English language learner.

Few studies address reading interventions for students with emotional or behavioral disabilities (Coleman & Vaughn, 2000). In their review of the literature, Coleman and Vaughn found only eight studies that investigated interventions for elementary students with emotional or behavioral disabilities. Almost all of these used small samples of students and targeted only basic reading skills such as phonemic awareness and reading sight words. As an example, Wehby et al. (2003) had only eight subjects in their study of a comprehension intervention. No studies specifically address ELLs with emotional or behavioral disabilities. In focus groups, teachers of students with emotional or behavioral disabilities emphasized the importance of establishing trust to help these students overcome their fear of failure, and the need for instruction and interventions that meet a high level of interest for the students—games, magazines, or newspapers were better as

high interest reading materials than basic readers or other more traditional instructional materials (Coleman & Vaughn, 2000). The teachers also noted that students with emotional or behavioral disabilities were more likely to make leaps in progress rather than slow progress. Two approaches highlighted by teachers were direct instruction and peer tutoring.

The setting in which students with emotional or behavioral disabilities receive instruction may also have an impact on their reading achievement. Bradley, Henderson, and Monfore (2004) found that students with emotional and behavior disorders in U.S. schools were more likely to be referred to more restrictive settings, and four times more likely than students in other disability groups to be educated in a separate public facility. While some students may benefit from the small class sizes and individualized instruction in these settings, the increased emphasis on behavioral control may sacrifice academic rigor. In a national survey, Gagnon and McLaughlin (2004) found that 25% of day treatment and residential schools serving students with emotional or behavioral disorders reported offering a school-developed program that was not aligned to state or local general education curriculum guidelines. Furthermore, about one-third of teachers reported that they used teacher-identified assessments as their primary accountability measure of student learning, leaving these schools with little or no link to district or state accountability systems (Gagnon & McLaughlin, 2004). Students served by these institutions may fall behind in the general curriculum, making it difficult for them to reintegrate into public schools.

Instruction for Students with Autism Spectrum Disorders

Some common approaches recommended for teaching reading to students with autism are ones that can benefit all students. For example, Kluth and Darmody-Latham (2003) suggested that teachers focus on students' interests in order to improve motivation. Providing reading material on children's special interests (many students with autism develop circumscribed interests in idiosyncratic topics such as trains or weather) can help motivate children, but attempts should be made, as well, to expand interests to include more age- and socially-appropriate material to provide students with more information that can support connections with peers and progress in the school curriculum.

Because the life experiences of children with autism may be limited, reading material relevant to a child's own experiences can promote comprehension (Broun, 2004). In addition, however, specific interventions aimed at fostering reading comprehension that are used with other children with reading difficulty, including creating anticipatory sets, using graphic organizers, and practicing summarization, can be helpful for these students. Teachers should frequently check for comprehension given that these students, especially those with Asperger syndrome or hyperlexia, may be proficient decoders but may not understand what they have read.

Educators in the United States have also used reading interventions specially designed for students with autism, albeit with varying success. Research has demonstrated that a

variety of approaches assist students with autism in communicating academic knowledge. Word processors, computers, and augmentative communication devices (such as touch screens or communication boards) are generally considered to be useful communication aids for some individuals with autism spectrum disorders. Likewise, visual organizers such as advance organizers, flow charts, concept maps, or Venn diagrams help concretize literary information for students (Hetzroni & Tannous, 2004). Direct teaching of figurative language or words with multiple meanings may also promote better comprehension of literary material. Finally, students who have difficulty reading print may benefit from teacher read-aloud activities (Kluth & Darmody-Latham, 2003). Little research has focused on approaches for ELLs with autism spectrum disorders.

Instruction for Students Who Are Deaf or Hard of Hearing

Students who are deaf or hard of hearing use many communication approaches, and these have implications for instruction, especially in public school or mainstream classes. Many deaf or hard of hearing students receive some instruction in classes where the teacher may not know sign language, and thus a sign language interpreter is brought into the class to provide sign language interpretation.

A student who is deaf and whose first language is ASL often learns to read by looking at English print while a teacher, parent, or other instructor interprets the story in ASL, helping the child to relate the written word to the signed meaning. Beginning readers who are deaf or hard of hearing, like most students, also use illustrations and pictures as an aid to construct meaning from text. Learning to read for these students entails moving from signed elaboration toward direct translation of English print to ASL (Schleper, 1996), followed by higher level comprehension, interpretive, and inference skills.

Research conducted by Goldin-Meadow and Mayberry (2001) suggested that individuals with good signing skills may be better readers than individuals with poor sign language skills. Some researchers (e.g., Hafer & Wilson, 1998) have even suggested that ASL can improve reading and communication skills for other groups of special needs students, such as those with learning disabilities, autism, or aphasia, when used as a supplementary way to communicate. This is in contrast to earlier researchers (e.g., Newport & Meier, 1985), who found that ASL did not ease the task of learning to read because of its lack of congruence with the linguistic structure and vocabulary of written English.

There is no consensus among researchers, educators, parents, or those who are deaf or hard of hearing about the best reading strategies for students who are deaf or hard of hearing. Some argue that ASL is the primary language of a vibrant deaf community in the United States, and that a deaf child is best prepared for a productive life when ASL is taught as the primary language of instruction. Others suggest that speech reading or manually coded English should play an important role in the educational program of a student who is deaf or hard of hearing. Still others argue that technology, such as cochlear implants, should be made routinely available to children who are deaf or hard of

hearing. The implications for both instruction and assessment of reading may be quite different depending on the perspective one takes on these issues.

Chamberlain (2002) argued that reading development is contingent on a fully developed primary language, and that incomplete or inconsistent signed or spoken language may affect the development of reading proficiency. In the United States, 90% of children who are deaf are born to hearing parents who should learn sign language as a second language to communicate with their child. As a result, preschool age deaf children often receive limited amounts of comprehensible input, leading to delays in language acquisition (Kuntze, 1998; Meier & Newport, 1990). Good language skills, on the other hand, are strong predictors of reading ability and proficiency for students who are deaf or hard of hearing.

Goldin-Meadow and Mayberry (2001) argued that the acquisition of good language skills alone is not enough, because individuals who are deaf or hard of hearing still need to know how to map between language and print. According to Schirmer, Bailey, and Lockman (2004) the best deaf readers use phonological structure in whole word recognition; however, phonological decoding for a student who is deaf or hard of hearing differs from “sounding out” words by a hearing student (Chamberlain & Mayberry, 2000). Ruiz (1995) states that students who are deaf or hard of hearing have developed a complex process to learn how to read, and therefore are able to acquire reading skills and proficiency at the same level as their hearing peers. Most likely, much more research is needed on reading development and instruction of children who are deaf (Schirmer & McGough, 2005).

Students who are deaf or hard of hearing benefit from having access to accommodations, both in instruction and assessment. For instance, eBooks can help these students access written language and literature. eBooks are electronic versions of books that can be viewed on a computer screen where English print and sign language are intertwined. The use of eBooks in instruction can help students who are deaf or hard of hearing to develop literacy skills and make the transition to physical books.

Instruction for Students with Visual Impairments or Blindness

Students with visual impairments or blindness often require adaptations or accommodations to access regular education classrooms and curricula. Examples include contrast and color highlighting, steady lighting, varied time requirements, optical devices, monoculars, hand-held magnifiers, or auditory materials. Students who are blind may use adaptations such as raised maps, real objects, or other tactile materials (Erin, 2003). Other accommodations for students with visual impairments or blindness may include specialized instruction that is not part of the general curriculum, such as mobility training or instruction in braille.

Students with low vision can often read standard print comfortably with decreased viewing distance or by using a hand magnifier or other optical devices. Large print material

increases the apparent size of the object through a lens system. However, using a hand magnifier can result in physical strain and blockage of lighting. Students who depend on large print books for most or all of their reading materials are often disadvantaged because of the limited availability of large print materials. Students with low vision can avoid the disadvantages of using only one strategy by acquiring a variety of efficient literacy tools that incorporate a range of technologies. Many people with visual impairments or blindness use assistive technology, which consists of computer programs that speak the text on the screen or magnify text in the word processor. Braille embossers can also turn text files into hard-copy braille, although the availability of this technology may vary by language.

Koenig and Holbrook (1995) developed a procedure called the Learning Media Assessment to determine the best media for a student to use for reading and other learning activities. The educational team or teacher can use the procedure to identify primary and secondary media to help a student learn to read and write most efficiently.

Assessment of Students with Disabilities

In this section, we explore issues associated with assessment of students in the seven disability categories addressed in this report. Accommodations are one of the principal components of assessment processes for students with disabilities. Table 4 summarizes some of the assessment accommodations highlighted in this section.

Accommodation policies for ELLs with disabilities have emerged relatively recently (Albus & Thurlow, 2007). They generally follow the accommodations allowed for students with disabilities, but may add linguistic-based supports such as glossaries and translations.

Assessment of Students with Specific Learning Disabilities

Reading is central to learning; children who do not learn to read print by the second grade are likely to struggle with learning throughout their lives (Stanovich, 1985). However, for students who have difficulty with reading, accommodations can be used during assessments. One of the most common—and controversial—assessment accommodations provided for students with learning disabilities is the read-aloud accommodation. This accommodation allows portions of tests to be read aloud to students by another person. Read-aloud accommodations are very common in mathematics and other subject area tests, but often are not allowed (or flagged as “non-standard”) for reading tests (Lazarus, Thurlow, Lail, Eisenbraun, & Kato, 2006; Thompson, Blount, & Thurlow, 2002). Students who read test booklets visually may be provided extended time or allowed to take their test in a quiet place. Extended time and alternative settings are less controversial accommodations because they are not perceived to interfere with the state-defined targeted proficiencies of a reading test, whereas a read-aloud accommodation more often is perceived to interfere with what the reading test is supposed to be measuring. Despite this perception, little research has been done on the constructs of reading that are actu-

Table 4. Assessment Accommodations for Students with Disabilities

Disability Category	Featured Assessment Accommodations
Specific learning disabilities	Read-aloud Extended time Alternative settings Use of technology
Speech or language impairments	Breaking down assessments into smaller parts Extended time Use of a textbook or dictionary Assistive augmentative communication devices
Mental retardation	Extended time Large print Read-aloud directions Alternative settings Visual cues Encouraging students to stay on task Noise buffers Adaptive furniture
Emotional or behavioral disabilities	Alternative settings Tests with fewer questions per page Taking breaks Extended time Reinforcements during testing Use of calming music Take-home tests
Autism	Alternative settings Extended time Computer test formats
Deaf or hard of hearing	Sign interpreted directions Visual cues Seat location Amplification
Visual impairments or blindness	Braille Large print Read-aloud

ally tested on large-scale assessments, and which constructs may or may not require print reading (see Johnstone, Thurlow, Thompson, & Clapper, 2008). Further research is needed to determine the extent to which read-aloud accommodations (or increasingly, use of technology to read print) affect the processes of reading in large-scale assessments.

Unique questions arise as researchers continue to understand better the cognitive aspects of learning disabilities. In reference to large-scale assessments, what types of accommodations should be allowed? Answers to accommodations questions relate specifically to the types of skills that are assessed in large-scale reading tests. Do these reflect the complexity of the reading process or are they focused on a few specific sub-skills of read-

ing? And what should these tests reflect? Each of these questions will need attention as researchers, policymakers, and practitioners continue to grapple with improving educational outcomes for students with learning disabilities.

Assessment of Students with Speech or Language Impairments

Students with speech or language impairments may struggle on tests because their language impairments hamper their ability to understand directions or the wording of specific test items, even when administrators read them aloud. They may also have increased test anxiety due to a history of struggling with academic tasks and the added pressure of high stakes assessments, whether the stakes are for the system or the student. Accommodations for students with speech or language impairments may include having material read aloud, having the assessment broken down into smaller parts, additional time, use of a text book or dictionary, an assistive augmentative communication device, or a variety of other accommodations. As noted for students with learning disabilities, few states allow the read-aloud accommodation without any restrictions (Lazarus et al., 2006). Many more states allowed directions to be repeated, re-read, or clarified although there were scoring consequences in some states when this was done. Testing environment accommodations, including noise buffers and amplification equipment, were considered by a majority of states to be non-controversial accommodations.

Measuring reading proficiency is not straightforward, even for typical students. Despite the work of several expert panels and national reading initiatives, there is still disagreement on what constitutes reading proficiency. For students with speech or language impairments—who may have difficulty with sound/symbol connection, auditory processes, and language comprehension—what reading proficiency means, how to help students achieve it, and how educators measure it are even less clear.

For instance, researchers are undecided about the extent to which reading fluency predicts overall reading ability for these students. Despite considerable evidence that rapid naming (Catts, 1993) and letter identification (Catts et al., 2002) in kindergarten are excellent predictors of reading achievement in first and second grade for students in general, we do not know whether this holds true when children have speech or language impairments. And does this matter when it comes to state and district assessments? Are there aspects of these assessments that create a need for fluency skills? Do certain characteristics of students with speech or language impairments create one set of issues, and other characteristics create another?

Assessment of Students with Mental Retardation

Most students with mental retardation participate in the same large-scale reading assessments as all students. Although not all students with mental retardation will require supports or accommodations on large-scale assessments, these students have access to the same accommodations that other students with disabilities receive. Whether a student will require extra time on tests, large print, read-aloud directions, alternative setting ac-

accommodations, or other supports to demonstrate maximum proficiency depends on the individual strengths and weaknesses of each student. The most common accommodations used for students with mental retardation include breaking tasks into smaller steps, providing read-aloud directions or questions, and visual cues (such as arrows, stickers, or stop signs, highlighting of key words or verbs, or supplementing text with pictures). Other accommodations range from encouraging students to stay on task and oral directions accompanied by written directions, to noise buffers and adaptive furniture (Lazarus et al., 2006).

Some students with the most significant cognitive disabilities who are unable to participate in large-scale assessments even with accommodations are eligible to take alternate assessments. All alternate assessments are aligned to grade-level academic content standards, but they can be based on grade level achievement standards, modified achievement standards, or alternate achievement standards. The students who may participate in alternate assessments based on grade level achievement standards may need accommodations not available on general assessments or need different formats or contexts to demonstrate grade-level proficiency (National Center on Educational Outcomes Web site, 2005). Students who participate in alternate assessments based modified achievement standards similarly may need extensive accommodations, depending on the nature of the assessment. Students with the most significant cognitive disabilities can demonstrate proficiency on an alternate achievement standard. Alternate assessments based on alternate achievement standards should promote access to the general curriculum and reflect professional judgment of the highest achievement standard possible for each individual student.

Assessment of Students with Emotional or Behavioral Disabilities

Students with emotional or behavioral disabilities generally take the same reading assessments as students in the general education classroom who do not have disabilities, but not necessarily in the same way. Accommodations for both classroom testing and state or district assessments are often used by students with emotional or behavioral disabilities. Common accommodations include taking the test in a quiet room without distractions, taking a test that has fewer questions per page, taking breaks as needed, and allowing more time to finish the test.

In 2005, 43 states allowed students to take breaks during testing (with one state allowing this accommodation with restriction); 41 states allowed extra time on tests with no restrictions, three states allowed it in certain circumstances, and one state allowed it in certain circumstances and with implications for scoring (Lazarus et al., 2006). Some of these states restricted the use of these accommodations to certain circumstances, or the use of the accommodations had scoring or aggregation implications. Many states also allowed setting accommodations that might help students with emotional or behavioral disabilities maintain their concentration on the assessment—46 states allowed students to be tested individually, and 40 states allowed students to take tests in a study carrel, without any restrictions or scoring implications.

Given the wide variety of instructional and behavioral needs of students with emotional or behavioral disabilities, there are many issues that remain to be addressed when it comes to assessment, especially those assessments that measure reading. If motivation is such an integral aspect of the students' disability, then why are there no accommodations available that address this? For example, the use of reinforcements during testing may make sense for these students, yet they are rarely addressed in states' accommodation policies. Other unique accommodations, such as the use of calming music, or the allowance for tests to be taken at home—while some may seem to stretch the bounds of what is appropriate for security reasons—may be most appropriate when considering students who have school phobias. Motivational issues for these students are rarely addressed in state accommodation policies or in the design of the assessments themselves.

Most of the questions that have been raised about the assessments for students with emotional and behavioral disabilities address accommodation issues. Many of these have not been considered at all by states and districts, although some have—for example, in 2005, 18 states allowed the test to be taken in the home; six additional states allowed this accommodation under certain circumstances and one state allowed it under certain circumstances and with implications for scoring (Lazarus et al., 2006). Yet it will be important also to consider whether there is anything about reading tests themselves that makes them a challenge for students with emotional or behavioral disabilities. Can the design of the assessments themselves address the needs of these students, without changing the standards of proficiency?

Assessment of Students with Autism Spectrum Disorders

Students with autism may struggle on tests for a variety of reasons. Lord and McGee (2001), in discussing the participation of students with autism in screening assessments, noted a variety of provisions that need to be made. Among these was the need to attend to the student's functional adjustment to the testing situation. The Committee on Educational Interventions for Children with Autism (Lord & McGee, 2001) indicated that the "results of specific assessments obtained in more highly structured situations must be viewed in the broader context of a child's daily and more typical levels of functioning and response to real-life demands. The child's adaptive behavior (i.e., capacities to translate skills into real world settings) is particularly important" (p. 27). They also indicated that the "behavior of a child will vary depending on such aspects of the setting as novelty, degree of structure provided, and complexity of the environment..." (p. 27). In essence, these and the other recommendations indicate that assessments should consider the social and communicative difficulties that a student with autism may exhibit.

Without research to guide state or district achievement testing of reading, there are several considerations for students with autism to participate in assessments in their most advantageous environment, with each student's social and communication challenges in mind. According to large-scale test accommodation literature, accommodations such as alternative settings, extended time, and computer formats (Thompson, Blount, & Thurlow, 2002) are among those that may be appropriate for students with autism.

Unique questions arise for some students in this population. For example, can students be given long breaks, even across multiple days, to accommodate their difficulty focusing on the test itself? Is there anything about the test design itself that can be adjusted—without changing the proficiency standards—to assess these students better in reading?

Assessment of Students Who Are Deaf or Hard of Hearing

Individuals who are deaf or hard of hearing depend on multiple learning modalities that have implications for the development and implementation of assessments. According to the Gallaudet Research Institute (1996), students who are deaf should be provided with accommodations in statewide testing situations, and the accommodations should be aligned with those that they have used for instruction. Accommodations used most often by students who are deaf or hard of hearing during testing include sign interpreted directions or sign interpreted questions, visual cues, seat location, and amplification.

States' policies on these kinds of assessment accommodations vary widely. For example, in 2005, sign language interpreted directions—defined as directions that are presented to the student in signed language, cued speech, or signed English—were allowed on statewide tests (in 45 states) with few restrictions. Signed interpretation of questions is allowed in 39 states, though it is often considered to be a nonstandard accommodation with scoring implications. Visual cues (arrows, stickers, stop signs, highlighting, key words, or supplemental text with pictures) are allowed in 28 states, amplification in 48 states, and changes in seat location in 34 states (Lazarus et al., 2006).

Students who are deaf or hard of hearing may encounter test items that they cannot answer because of the nature of their disability. For example, an item on a reading test that asks students to identify “sound alike” words is not accessible to a student who has a significant hearing impairment. Many people might agree that these students should not be assessed on skills that require access to sound, but this leads to questions about whether the entire test should be changed because items might be inappropriate for a small group of students. Alternative options, such as creating special replacement items for these students, likely would raise other issues surrounding validity and scoring. Nevertheless, consideration of challenges such as items that ask about sound or entire sets of questions that are based on poetry and rhyming suggest that universally designed assessments, those that have optimal standard assessment conditions for today's diverse population of students, are important for students who are deaf or hard of hearing.

Assessment of Students with Visual Impairments or Blindness

The relatively low performance of some students with visual impairments or blindness on academic tests may be due to lagging reading skills (Corley & Pring, 1993). Yet some children with low vision read as well or better than their peers without visual impairments or blindness (van Bon, Adriaansen, Gompel, & Kouwenberg, 2000). Despite some explanations that suggest specific eye anomalies are more detrimental to reading performance than others (von Bon et al., 2000), it is unclear which factors contribute to

the variability in reading achievement of children with low vision. In fact, the finding that some children with low vision read very well suggests that factors other than visual impairment affect student performance.

Students with visual impairments or blindness rely on a host of supports and accommodations to read in the classroom, yet the same supports and accommodations may not be available for state assessments. Although nearly every state offered English braille as a test accommodation in 2003, the use of braille in four states was restricted or had implications for scoring and aggregation (Lazarus et al., 2006). In other words, some students in those states had the option to take tests in braille, but those students might automatically receive a non-proficient score or their scores might not count. Large print was allowed by nearly all states as an accommodation without restrictions.

Read-aloud accommodations, which are often used by students with visual impairments or blindness who are not using braille or print enlarging technology, were more controversial in states' accommodation policies (Lazarus et al., 2006). Although nearly all states allowed tests to be read aloud, only two permitted read-aloud accommodations with no restrictions; in six states, this accommodation was non-standard but there were no implications for scoring or aggregation, 26 states permitted questions to be read aloud only under certain circumstances, and 11 states allowed this accommodation under certain circumstances and with implications for scoring.

State policies on accommodations for students with visual impairments or blindness mirror common assumptions about reading. Most people agree that large print and English braille should be considered standard valid accommodations on reading tests for students with visual impairments or blindness, presumably because these accommodations still entail a decoding process similar to reading print. Because read-aloud accommodations, such as human or screen readers, bypass the decoding process, many people consider them to be invalid measures of reading. Still, research is scarce on how these accommodations affect the reading process for students with visual impairments or blindness.

One could question whether this is an accurate representation of how accommodations affect the reading process for students with visual impairments or blindness. Decoding an English braille version of a passage of text is not directly comparable to decoding the same text in standard English print, but how this non-comparability plays into the assessment equation is unclear. The fact that English braille uses contractions and other "shortcuts" might suggest that students have a short-cut version of text that would be easier to read. On the other hand, the complex use of the same cell to mean different things depending on the position within a word or sentence might suggest that students have a more complex decoding task than decoders of standard print. Other research has indicated that braille reading demands a greater level of phonological awareness and memory than print reading.

To date, given the relatively small numbers of students who use braille versions of state tests and the expenses associated with creating those versions, states are not offering braille tests in other languages. This appears to be true even if the standard English print version of the text is translated into a standard print version in another language. Also, the availability of “contracted” versus standard braille versions of the assessment may be an issue for some students who are accustomed to using one form over the other.

Issues also surround the use of reading accommodations for students with low vision or blindness. Oral presentations require the development of attention and memory skills beyond those used in traditional decoding. The default enlarged print size in a test booklet may or may not be the optimal size for a student’s level of visual impairment. Extended time is almost always a needed accommodation because of the format differences. As with all students, accommodations for students with low vision or blindness must be familiar and used prior to the testing situation.

Conclusion

This introduction to some of the characteristics of students who have one or more of seven highlighted disabilities (specific learning disabilities, speech or language impairments, mental retardation, emotional/behavioral disabilities, autism, deaf or hard of hearing, visual impairments) indicated some of the most commonly noted issues and approaches in instructing and assessing these students in reading. The goal was to serve as an introduction to the needs and issues of students with various disabilities to provide some common ground for individuals who come from varied backgrounds, and have important contributions to make to identifying ways to increase the accessibility of reading assessments for students with disabilities.

In general, instructional approaches and techniques employed to deliver reading content for students in the seven disability categories were found to be determined not by the disability category, but by the students’ individual needs. Similarly, many assessment approaches and accommodations are selected by educators based on students’ unique needs, although some accommodations are disability-bound, for example, use of braille for the visual impairments or blindness category. Little research is available on reading instruction and assessment for ELLs with disabilities, and the field would benefit from further studies that investigate effective disability- and language-specific instructional and assessment approaches and strategies for this student population.

Although our summary provides important information on reading instruction and assessment for students with disabilities, there is a need for research to identify ways in which assessments can be made to be more accessible to students with disabilities, while at the same time preserving what the assessments are intended to measure. This is the intent of the three projects that are part of the National Accessible Reading Assessment Projects (NARAP—see www.narap.info).

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