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Roles and Responsibilities of Speech- Language Pathologists With Respect to Reading and Writing in Children and Adolescents

Ad Hoc Committee on Reading and Written Language Disorders

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About This Document

This technical report was drafted by an ad hoc committee formed by the American Speech-Language-Hearing Association (ASHA). Members of the Ad Hoc Committee on Reading and Written Language Disorders were Nickola Wolf Nelson (chair), Hugh Catts, Barbara J. Ehren, Froma P. Roth, Cheryl M. Scott, and Maureen Staskowski. Vice Presidents for Professional Practices in Speech-Language Pathology Nancy Creaghead (1997–1999) and Alex Johnson (2000–2002) provided guidance and support. Roseanne P. Clausen provided ex officio assistance from the National Office; Diane Paul-Brown and Susan Karr served as consultants to the committee.

Technical Report

Background

The position statement was motivated by the need for (a) speech-language pathologists (SLPs) with the knowledge and skills to provide assessment and intervention for children whose persistent language difficulties frequently involve problems with learning to read and write; (b) understanding and advocacy for the direct role SLPs should play in providing literacy instruction; (c) collaborative partnerships between SLPs and teachers to foster literacy acquisition for general education students at risk for or experiencing reading and writing disorders; and (d) responses to practical questions from ASHA members about roles and responsibilities.

The position statement acknowledges the background and training that prepare SLPs to support the development of (a) spoken language as a foundation for learning to read and write; (b) sound- and word-level awareness for grasping the alphabetic principle; (c) comprehension and formulation skills for using higher-order semantic and syntactic forms; and (d) knowledge of literate discourse structures for comprehending and producing coherent spoken and written texts. This statement is consistent with the ASHA Scope of Practice in Speech-Language Pathology,¹ which includes language and communication disorders in spoken, written, graphic, and manual modalities (American Speech-Language-Hearing Association, 1996) and with the ASHA Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist (American Speech-Language-Hearing Association, 1999).

The position statement reflects an extensive body of research that confirms the importance of adequate awareness of the sound structure of words, verbal memory and retrieval, and general language knowledge in learning to read (e.g., Blachman, 1997; Catts & Kamhi, 1999). It is designed to narrow the gap between research and practice, building on research supported by the National Institute of Child Health and Human Development (Lyon, 1995, 1999; Lyon, Alexander, & Yaffe, 1997; Lyon & Moats, 1997) and a report of the National Research Council (Snow, Burns, & Griffin, 1998). It addresses the National Education Goals (U.S. Department of Education, America Reads Challenge, 1997), which emphasize that all children in the United States will start school ready to learn, and that every adult

¹ The scope of practice for SLPs includes literacy assessment and intervention for adults (who have developmental or acquired communication disorders), as well as for children and adolescents, but that work is beyond the scope of this set of papers.

American will be literate. It also responds to concerns raised by publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983) and the subsequent national standards movement (Kendall & Marzano, 1997). Finally, it is consistent with requirements of the Individuals with Disabilities Education Act of 1997 (Public Law 105-17) that special education and related services should be linked to progress within the general education curriculum.

The position statement and accompanying guidelines also respond to requests from ASHA members to clarify the roles that SLPs should play in addressing reading and writing. They are designed to support the notion that professionals can collaborate with school administrators, teachers, other professionals, and parents to develop programs for promoting emergent literacy and literacy skills among general education students as well as those with identified spoken language and literacy problems.² They are intended to assist ASHA members in advocating for quality services, developing programs, and fostering collaborative relationships in the area of literacy instruction. The technical report acknowledges that changes in speech-language pathology practice patterns (e.g., caseload priorities and size, service delivery models) and academic program content may be necessary to achieve literacy goals. It also acknowledges the essential collaborative nature of these roles and responsibilities.

The technical report summarizes the literature that establishes the scientific base for the position statement and provides the background for the guidelines. For comprehensive literature reviews, the reader is referred to several recently published sources (Blachman, 1997; Catts & Kamhi, 1999; Simmons & Kameenui, 1998; Snow et al., 1998; Speece, Roth, Cooper, & De La Paz, 1999; van Kleeck, 1994). The technical report also outlines the professional knowledge base that prepares SLPs to make unique contributions to collaborative teams of educators and other specialists concerned with the mutual goal of helping all individuals become competent literate language users.

The Nature of Literacy

Defining Literacy

Literacy, as defined in the National Literacy Act of 1991 (Public Law 102-73), for speakers of English is “an individual's ability to read, write, and speak in English and compute and solve problems at levels of proficiency necessary to function on the job and in society, to achieve one's goals, and to develop one's knowledge and potential.” Without reference to English, the same definition applies equally to speakers of other languages.

This broad definition is consistent with school curricula and national and state standards. Significantly, it is inclusive of listening and speaking, as well as reading and writing. Although the present document focuses on reading and writing, a

² In these documents, the terms problems, difficulties, and impairments are used interchangeably to describe concerns about spoken or written language development; where applicable, literature reviews maintain terminology of the original.

complete understanding of literacy requires an appreciation of literate uses of spoken as well as written language³ and the relationship between them. Literate language uses, both spoken and written, are often more formal and more decontextualized, in that more of the meaning is in the words than in the nonverbal context (e.g., Cazden, 1988; Cummins, 1984; Wells, 1986). In addition, literate language emphasizes different types of sentence- and text-level complexity (Halliday, 1987; Scott, 1994).

Defining Reading

Reading can be defined as the processes by which one constructs meaning from printed symbols. Although a number of interrelated perceptual, linguistic, and cognitive processes are involved, reading can be divided into two general components—decoding and comprehension. Gough and his colleagues termed this a “simple view” of reading (Gough & Tunmer, 1986; Hoover & Gough, 1990). Decoding refers to word recognition processes that transform print to words. It includes both direct routes (visual, orthographic) and indirect ones (sound-symbol correspondence). Comprehension refers to processes by which language is understood and interpreted. It involves construction of meaning at the word, sentence, and discourse levels. The simple model of reading emphasizes the equal importance of decoding comprehension. Decoding in the absence of comprehension is not reading. Likewise, attempted comprehension without adequate decoding is not reading. The simple view has been appealing to practitioners and researchers alike (Kamhi, 1999).

The simple view of reading clearly illustrates that reading is dependent, for the hearing population, on spoken language. Reading takes advantage of the linguistic knowledge and processes that have evolved primarily for speaking and listening (Catts & Kamhi, 1999). In recognizing written words, the reader uses the rich lexical knowledge that has been developed through spoken language. This is particularly true in the early stages of reading acquisition, when the words children read are ones they already know and use in their spoken language. Decoding processes allow readers to access the meaning of these words based on familiar sound patterns (Lieberman, 1982; Lieberman & Shankweiler, 1985).

Reading comprehension also shows considerable overlap with spoken-language comprehension in that readers and listeners use similar linguistic knowledge and higher order processes. Proponents of the simple view of reading claim that once words have been recognized, reading and listening are much the same (Gough & Tunmer, 1986). Other researchers emphasize that printed language is not just speech written down, but differs in manner of complexity, style, and level of decontextualization; therefore, written language cannot be processed in exactly the same manner as spoken language (e.g., Cazden, 1988; Halliday, 1987; Perfetti, 1985). It involves higher level thinking processes (Perfetti, 1986).

Reading and listening also differ in their contexts of use. For example, speaking and listening typically involve social interaction with participants who share time and space, each having some control over the content of what is said. Reading, on the other hand, is usually an individual activity, in which authors and readers are remote in time and space. In particular, written-language communication lacks the

³ The term written language refers to reading and writing and related processes.

immediate social context and negotiation of content found in spoken-language interactions. As a result, some of the higher order comprehension processes employed in reading differ from those involved in spoken-language comprehension (e.g., Catts & Kamhi, 1999; Gough & Juel, 1991; Just & Carpenter, 1987; Wallach & Butler, 1994).

Defining Writing

Written-language production can be described from two perspectives—**process** and **product**. Both are important when considering the developmental needs of students.

Writing processes include the cognitive-linguistic and motor acts that are involved when generating written texts. They include planning (prewriting), organizing, drafting, reflecting, revising, and editing (Hayes & Flower, 1987), as well as forming letters and sequences of letters into words. When engaged in the process of writing, mature authors view the overall written task, such as producing a report, writing a story, or writing a letter to the editor, as a problem to be solved, with the overall purpose of communicating ideas in the most effective manner (Emig, 1977; Nystrand, 1982). As in spoken communication, writers produce texts for such purposes as informing, entertaining, or triggering some other response in their communication partners; writers, however, lack the immediate feedback and joint construction of meaning that occur in participatory spoken-language interactions. Rather, the relatively solitary processes of writing often must be accomplished with an imaginary audience in mind. The processes of writing also are recursive rather than linear, in that mature writers, in particular, plan and revise in cycles throughout the text-generation process (Hayes, 1996; Hayes & Flower, 1987). In these ways, writers benefit from the increased time to reflect, rework, and polish a piece of discourse in contrast to the immediate demands of online spoken communication.

Written products are the result of the writing processes. A piece of writing (a product) can be examined at several levels. Products may be described at the word level (e.g., word choice, spelling), sentence level (e.g., grammar, complexity, style), and text level (e.g., discourse structure, cohesive devices, coherence). They also may be described relative to writing conventions (e.g., capitalization, punctuation, and paragraphing), and relative to communication functions (e.g., to entertain or inform) and effectiveness (e.g., evidence that the author has appropriately judged and met audience information needs).

Written products vary widely in terms of length and complexity, from single-word labels and lists to multi-volume literary works. Functional written language is produced with less attention to style than formal literate texts. Adult **functional** writing includes such daily tasks as writing checks, making lists, or filling out applications. Modern lists of functional written language include email messages. Although email communication shares many features with informal spoken-language interaction, anyone who has had communication breakdowns over the Internet has experienced how the lack of paralinguistic information and an immediate partner can lead to pragmatic difficulties. Production of written language is considered truly **literate** when an author produces texts of some length that others read for information or pleasure. For school children, writing may vary

Development of Reading and Writing

along the functional-literate continuum when teachers, for example, require written responses to questions on tests and worksheets compared with giving assignments to write stories, poems, or individualized reports.

Planning, generating, and revising are largely private mental acts, making it difficult to construct precise models of what authors do when they write. Researchers studying the process of writing have often asked authors to think aloud while writing (Emig, 1971; Hayes & Flower, 1980, 1987). Observation of young authors at work using think-aloud or other protocols can yield insights about (a) planning and organizing strategies, (b) the ability to remain focused for an extended period and to reflect on written work, and (c) decisions to revise or edit based on rereadings or social interactions with peers regarding preliminary drafts (Graham & Harris, 1999; Harris & Graham, 1996b). In addition, written products can yield information about children's linguistic concepts and abilities at the word level (including graphophonemic and morphemic components), sentence level (e.g., notions about grammar as revealed in punctuation), and text level (e.g., notions about how discourse is organized and structured according to genre and purpose) (Scott, 1999).

Reading

The preparation for reading begins long before children enter school (Snow et al., 1998). Children who live in literate cultures typically experience abundant print activities and print materials in the home and other settings (Catts & Kamhi, 1999; Heath, 1982; McGee & Richgels, 1990; Ninio, 1983; van Kleeck, 1990; van Kleeck, Alexander, Vigil, & Templeton, 1996). Literacy is fostered as children gradually become aware of the uses of print in their environment and opportunities to use print. Children learn concepts about print, such as how a book is held, where to begin, that the words tell the story, and that print is read from left to right, as well as other mechanics of the writing system (Stuart, 1995). They begin to recognize print in their environment. They learn what constitutes a story (Sulzby, 1985a), and they develop phonological awareness and alphabetic knowledge—skills that are critical aspects of learning to read (e.g., Brady, 1997; Liberman, Shankweiler, Fischer, & Carter, 1974; Swank & Larrivee, 1998). In these many ways, interactions surrounding print lay the foundation for written-language development.

As children begin to learn to decode words, they go through a number of stages (Catts & Kamhi, 1999; Ehri, 1991). They first associate spoken words with features of print in context, such as the logos of brand names, referred to as the **logographic stage**. As children enter school and formal reading instruction, they begin to use sound-letter correspondences to recognize words. When children successfully use some of the letter-sound cues in words, they have attained the **transition stage**. For example, a child who recognizes the first letter of a word and guesses a word having the same initial sound has begun to apply the alphabetic principle (that letters represent sounds in the English language). During this transition stage, some children also begin to develop an early sight-word vocabulary for high-frequency words they recognize as a whole, although they are not yet proficient at decoding unfamiliar words. When children learn to use letter-sound relationships to decode entire new words, the **alphabetic stage** has been reached. Of course, this alone does not help children achieve fluent reading. Children must develop a large repertoire of sight words that can be recognized without decoding each letter,

including a variety of irregularly spelled words. Gradually, children learn to use spelling patterns to recognize familiar chunks in a word. This stage, known as the **orthographic stage**, is crucial to achieve **automatic word recognition**, which is the final stage in the development of word recognition.

Although these word-recognition stages describe general developmental trends, some believe they oversimplify, at best, and may even obscure the developmental process of reading. For example, at a given point for a given child, the mechanism of word recognition for various words will be at different stages. Words that the child encounters frequently will be processed orthographically; less common words still require sound-by-sound decoding. According to the “self-teaching hypothesis” suggested by Share and Stanovich (1995), these lower frequency words then join the ranks of the automatically recognized words when phonological awareness and application of the alphabetic principle help the child move them to the automatic level. Such self-teaching accounts help to explain how most children come to read many more words than they are directly taught and how fluency is attained seemingly overnight for some children.

For most children, achieving this level of automaticity in word recognition occurs after explicit instruction in learning to read, as well as considerable practice. Beginning readers start decoding words by attacking individual letters, but more advanced readers pronounce groups of letters without sounding out each letter (Ehri, 1997). Children acquire this skill as they gain experience in reading different words that share common letter patterns (Treiman, Goswami, & Bruck, 1990). Most children become facile decoders in the early grades; however, some children need continued, systematic, and explicit instruction over a longer period of time to achieve automaticity in word recognition. In fact, difficulty in acquiring accurate and fluent word-identification abilities is the core deficit in a specific reading disability, sometimes referred to as **dyslexia** (Stanovich, 1988; Torgesen, Wagner, & Rashotte, 1997). By third grade, children are expected to demonstrate automaticity in recognizing words so that they can devote their attention and energy to developing and fine-tuning their comprehension skills. This also is the time at which many children are identified as needing special education services for literacy problems. Signs that children are at risk for difficulty can be detected much earlier, however, by considering their phonological and other spoken-language abilities (Catts, Fey, Zhang, & Tomblin, 1999).

Comprehension of spoken language lays the foundation for reading comprehension (Sulzby, 1985b). In the preschool years and early grades, children expand their use and comprehension of language to understand the world and their experiences. They are exposed to narrative and expository texts and learn to monitor what makes sense and what does not. They learn to question and to respond to texts that are read to them during many important literacy experiences at home and at school. In their early elementary years, they learn to develop and test hypotheses about what will happen next as they gain skill for comprehending more elaborate narrative structures (Ruddell & Ruddell, 1994; Westby, 1999).

By the end of third grade students are gaining flexibility and self-monitoring skills (Snow et al., 1998). As students move into upper elementary and secondary schools, they gradually expand their knowledge of narrative and expository text structures, enhancing comprehension. They acquire important skills for

comprehending higher level texts, including how to use schema knowledge and metacognitive processing abilities (Westby, 1999). Such skills enable them to read texts with different styles and genres that are less familiar in construction and linguistically more complex. Secondary students learn to adjust their reading depending on the varied demands of texts and reading purposes. Maturing readers recognize when they are having difficulty understanding and they know how to implement such metacognitive strategies as re-reading or asking a question to facilitate comprehension (Brown, 1980; Bruce, 1980; Flavell, 1979; Paris, Wasik, & Turner, 1991).

Students from upper elementary grades through college are expected to read textbooks, reports, and other lengthy texts to learn a large part of their curriculum. The ability to read informational text containing many unfamiliar words and limited context is often assumed. Abstract, ambiguous, technical, and figurative material in texts also must be understood and applied. To meet these challenges, good readers self-monitor their comprehension and use repair strategies to help themselves understand difficult text. They also formulate questions regarding the text, taking the learning process beyond the text into their own lives and applying the knowledge learned (Brown, 1980). Adolescents also are expected to demonstrate knowledge gained through reading in written form (Scott, 1994). Students at the secondary level must demonstrate mastery of skills across disciplines, much of which relies on intact spoken- and written-language skills (Ehren, 1994).

Writing

A child's early experiences with print serve writing as well as reading (van Kleeck, 1995, 1998). In print interactions, the fundamental discovery that a child must make is that writing is a second-order symbol system for "drawing" speech (Ferreiro, 1984), compared with speech itself, which is a first-order symbol system for representing objects and events. Early writing is almost always tied to pictures, in the form of labels for objects, and later, through multi-word descriptions of objects and events. These labels and short sentences become more "readable" as spelling progresses (Chapman, 1994). Even as emergent writers, many children are forming accurate ideas about why people write (e.g., to write notes, tell stories, do homework).

Some children enter kindergarten capable of writing a few words. A child should be a conventional writer by the end of the first grade. Conventional writing in this context is defined as the ability to produce connected discourse (at least a few sentences in length) that can be read by someone else without too much difficulty (Sulzby, 1992, 1996). From that point on, however, the developmental course of writing is a long one.

In early elementary grades, children write sentences that are shorter than those they say, and their writing is likely to contain grammatical errors that are not characteristic of speaking (Scott, 1999). Eventually, as spelling becomes more automatic, children's written sentences are equivalent in length to those they speak. By late elementary grades, the length of children's written sentences exceeds their spoken utterances, as writing takes on an increasingly literate lexicon and grammar (Kroll, 1981).

Students find planning and revising very difficult until well into the secondary school years (Bereiter & Scardamalia, 1987). In the later school years, writing competence is difficult to separate from academic instruction and experience. Although most high school seniors are capable of writing well-formed narrative and informational texts, persuasive writing remains difficult (Applebee, Langer, Mullis, Latham, & Gentile, 1994).

Spelling

To be a fluent writer, one must be a fluent speller. Like reading, the roots of spelling begin several years before formal spelling instruction. Read (1971, 1986) was among the first to capture the systematic and even creative attempts of emergent writers—a type of writing he called “invented spelling.” Progressing from scribbles and letter-like forms, preschool children discover that writing “draws” speech, and as a result, begin to use some letters that are accurate (or close) representations of the phonetic properties of speech. Highly salient consonants in initial position of words are best represented in invented spelling, whereas harder-to-hear sounds, such as nasals and vowels, are frequently omitted. That the phonetic properties of sounds are appreciated by young children is evident in the nature of their misspellings (e.g., a common misspelling of the *tr* in *tree* is *ch*, a reflection of the affricate properties of the *tr* blend). Emergent writers also code an appreciation of the phonological properties of sound in early spelling, as shown by Treiman, Cassar, and Zukowski (1994). Phonological awareness has been shown to be closely related to spelling, particularly in the early stages (Ellis, 1997). In fact, invented spelling is frequently cited as one of several ways of measuring phonological awareness.

From kindergarten to the early elementary grades, children more consistently demonstrate their knowledge of the alphabetic principle as they associate graphemes with phonemes across a wider variety of words. To attain relative fluency as a speller, children must learn the patterns that characterize English orthography (e.g., that the sound /i/ is represented by several possible sequences of two letters). Children in the mid-to-late elementary years should spell with enough fluency that composing (writing at the text level) is not negatively affected. Eventually, children realize that morphological meaning is encoded in the spelling system (e.g., *ed* signals that something happened in the past, regardless of how the end of the word sounds). These changes have been captured in five developmental stages (Henderson, 1990; cited by Masterson & Crede, 1999) as (a) preliterate stage; (b) letter-name (alphabetic) stage; (c) within-word patterns stage; (d) syllable juncture stage (e.g., doubling consonants at end of syllables with short vowels before adding suffix); and (e) derivational constancy stage.

Relationships Between Reading and Writing

Reading and writing are highly interrelated as processes and in contexts where they occur. It is difficult to isolate any aspect of reading development that does not have a writing counterpart. For example, children read syntactic patterns common in informational texts, and the same patterns emerge in their writing. Children become fluent orthographic readers at about the same time that their spelling reflects similar orthographic sophistication (e.g., the *ough* in *though* is correctly spelled). Because spelling requires matching every target letter of the word (i.e., full knowledge), it is thought to be more difficult than reading (Berninger, 1999). Nevertheless, many studies have demonstrated high correlations between reading

Language Base of Reading and Writing Problems

and spelling performance for both typical readers and readers with disabilities (Ehri, 1997). Reading and writing also are difficult to separate in the school context. Kindergarten children are asked by teachers to “read” what they “write.” Secondary students “read to find out what to write and write to demonstrate that they understand what they read” (Scott, 1999, p. 224).

Given the reciprocal relationships between spoken and written language, it is not surprising that literacy problems have their foundations in spoken-language difficulties. Young children with specific language impairments have difficulty on tasks measuring rhyme, letter names, and concepts related to print, as well as on some measures of narrative structure and recall (Boudreau & Hedberg, 1999; van Kleeck, 1995, 1998). Evidence of an association between language impairment and reading disability has also come from longitudinal studies (Bishop & Adams, 1990; Catts, 1993; Scarborough & Dobrich, 1990; Silva, McGree, & Williams, 1983; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998; Tallal, Curtiss, & Kaplan, 1989). In these studies, children displaying significant impairments in language (generally in semantic-syntactic-phonological aspects) have been identified in preschool or kindergarten and tested for reading and other academic achievement in later grades. Their collective results have shown that children with language impairments are four to five times more likely than normally developing children to have reading difficulties during the school years.

Studies also have been designed to examine directly the language abilities of children with reading disabilities. One approach has been to identify school-age poor readers and then study their performance on traditional measures of language development. In at least some studies, data on language development have been obtained before children became poor readers (e.g., Catts, Fey, et al., 1999; Fletcher, Shaywitz, Shankweiler, Katz, Liberman, Stuebing, Francis, Fowler, & Shaywitz, 1994). This work has shown that poor readers often have problems with receptive and/or expressive vocabulary (Wiig & Semel, 1975), semantic relations (Nation & Snowling, 1998), or in the comprehension and/or use of morphology and syntax (Fletcher, 1985; Morice & Slaghuis, 1985; Scarborough, 1991; Stanovich & Siegel, 1994; Wiig & Semel, 1975). Deficits, although sometimes relatively subtle, also have been reported in the comprehension and/or production of text-level language (Donahue, 1984; Feagans & Short, 1984; McConaughy, 1985; Roth & Spekman, 1986; Smiley, Oakley, Worthen, Campione, & Brown, 1977; Stothard & Hulme, 1992; Yuill & Oakhill, 1991).

Other researchers have examined poor readers' phonological processing abilities, using tasks that require awareness, memory, and manipulation of phonemes (e.g., word retrieval, rapid naming). This work has shown poor readers to have deficits in phonological awareness (Bradley & Bryant, 1983, 1985; Catts, Fey, et al., 1999; Fletcher, et al., 1994; Lombardino, Riccio, Hynd, & Pinheiro, 1997; Stothard & Hulme, 1995), phonological retrieval (Bowers & Wolf, 1993; Wolf, 1984, 1991), phonological memory (Torgesen, 1985; Vellutino & Scanlon, 1982), and phonological production (Catts, 1991; Rapala & Brady, 1990). Research also supports the conclusion that a reciprocal relationship exists between phonological awareness and reading. That is, some studies show that phonological awareness precedes and influences reading acquisition; others show that reading acquisition influences the development of phonological awareness (Ehri, 1987; Swank & Larrivee, 1998; Torgesen, Wagner, & Rashotte, 1994).

**Relevant Knowledge
and Skills of Speech-
Language
Pathologists**

Language problems appear to play a causal role in reading disabilities and also may be a consequence of them (Snow et al., 1998). The ability to understand and remember the meanings of new words depends on the level of a child's oral vocabulary (Robbins & Ehri, 1994). Poor readers, however, do not read as much as good readers and have less opportunity to acquire linguistic knowledge from reading (Guthrie, Wigfield, Metsala, & Cox, 1999). Stanovich (1986) dubbed this "rich get richer" principle as the "Matthew effect." Over time, reduced exposure to literate language can lead poor readers to experience other language problems. For example, poor readers may fall behind their peers in knowledge and use of higher level vocabulary, advanced grammar, and text-level structures. These and other aspects of language are dependent on rich literacy experiences that poor readers seldom encounter during the school years.

The fact that spoken-language problems are both a cause and a consequence of reading disabilities ensures that language problems will be a major component of almost all cases of reading disabilities (Catts & Kamhi, 1999). In some instances, the cause and consequence roles can be differentiated. In many cases, however, factors interact to such an extent that cause and consequence roles are obscured, especially in older poor readers (Apel & Swank, 1999). In any case, it is important to recognize that reading disabilities may take varied forms (Aaron, Joshi, & Williams, 1999). Even in cases in which spoken-language problems are not the immediate precursor of reading and writing difficulties, children with a history of reading problems may fail to develop higher level cognitive-linguistic skills (Cain & Oakhill, 1998; Stothard, Snowling, et al., 1998).

The reciprocal and multiple relationships between spoken and written language make it appropriate for SLPs to play an integral role in helping children become literate. SLPs understand individual differences in normal and disordered language development across the age span, as well as the role of sociocultural differences in language acquisition. This knowledge base, combined with skill in using diagnostic-prescriptive approaches for assessment and intervention, is particularly valuable in educational contexts. The knowledge and skills that SLPs already have regarding language in general, and additional knowledge and skills that they need to have for helping children acquire written language, are summarized here and outlined in greater detail in the accompanying knowledge and skills document.

Knowledge of language and its subsystems—phonology, morphology, syntax, semantics, and pragmatics—is highly relevant for prevention, identification, assessment, and intervention of literacy problems. SLPs possess such skills, as well as skill in diagnosing and treating children with phonological disorders. Their training in using the International Phonetic Alphabet (IPA) to transcribe the sounds of language, and their understanding of phonology and language processing, prepare them to design literacy programs to address difficulties involving phonological awareness, phonological memory, and phonological retrieval. This knowledge of phonemic structure enables SLPs to explain, for example, how a six-letter word (e.g., caught) can be composed of three phonemes (e.g., /kct/).

Knowledge of phonology also helps SLPs tailor lessons for success. They know how to reduce stimulus complexity in sound-segmentation activities, for example, by mixing continuant and stop sounds to maximize discriminability. They also understand how place and manner of articulation, coupled with voicing, affect

sound production and how sounds are affected by their position in words and surrounding phonetic contexts. SLPs can highlight these aspects for children having difficulty, teaching them to capitalize on tactile-kinesthetic and auditory cues in their word decoding and invented-spelling efforts. Such skills can be applied in individual treatment, during consultation with teachers to plan general education lessons on phonological principles, and in collaboration with others working with children both with and without literacy problems.

Beyond phonology, SLPs have knowledge of morphological, syntactic, semantic, and pragmatic systems, which also are crucial for reading comprehension and written expression. They understand the theories, principles, and developmental expectations for these systems through the school years. With their knowledge of spoken-language development, SLPs can then analyze how the advancing language demands of textbooks (Scott, 1994), academic talk (Sturm & Nelson, 1997), and curriculum may stress a student's capabilities. For example, a child who fails to comprehend or produce sentences with embedded relative clauses may be unable to comprehend questions at the end of a reading assignment that contain these structures. A child who lacks morphological awareness may have trouble learning to spell words that require this insight (e.g., *walked*, *humorous*). Children whose spoken stories are not at expected developmental levels will also find it difficult to write stories. Virtually any weakness in spoken language at any linguistic level will have an impact on reading and writing. SLPs are trained to do fine-grained analyses of children's strengths and weaknesses at word, sentence, and discourse levels. The results of such analyses can direct assessment of written language and lead to the generation of language-intervention protocols that match the needs of individual students (Westby & Clauser, 1999).

Academic programs in communication sciences and disorders historically have varied in their provision of information about reading, writing, spelling, and higher level language use. Currently, however, many educators and clinicians who are also SLPs are contributing textbooks, edited collections, journal articles, and in-service education programs about how to apply spoken-language expertise to problems of written language. This makes it possible for all SLPs to have access to the information. It is the contention of the accompanying position statement and guidelines on roles and responsibilities that (a) university programs and other agencies are responsible for providing pre-service and in-service learning opportunities; and (b) speech-language professionals working with children and adolescents are responsible for taking advantage of such opportunities. In addition, SLPs can seek assistance and information from other professionals. Because of the interdisciplinary nature of the work, numerous professionals are involved in helping children with reading and writing problems to become literate.