

# School-Age Language Development: Application of the Five Domains of Language across Four Modalities

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## OBJECTIVES

- Differentiate language into four modalities of speaking, listening, reading, and writing
- Understand the shared and unique skills associated within and across each modality of language
- Describe language skills, by domain, associated with reading and writing in school-age children
- To apply the knowledge gained about the five domains of language to expectations of children during the school-age years (5 to 21 years old)

## INTRODUCTION

Language in the school-age years is complex for two reasons. First, language abilities across all five domains (phonology, morphology, syntax, semantics, and pragmatics) continue to develop through the high school years. For example, although all speech sounds are achieved by 8 years old, children need to use phonological abilities to learn to read and spell. Likewise, although children have all sentence types by the time they are 8, how they comprehend and produce sentences for academic purposes continues to grow. Second, academic demands require language skills across four modalities—listening, speaking, reading, and writing—with

an emphasis on the explicit teaching and development of the latter two skills. It is important to consider the relationships between spoken (listening, speaking) and written (reading, writing) forms of language during the school-age years. The purpose of this chapter is to extend foundational knowledge in language development and contextualize it for older children.

To understand how language is applied into and through the school-age years, one must consider the context of language use. From birth to 5 years of age language development is contextualized to the home, parents, primary care providers, daycare centers, and preschools. This means that when children communicate with parents, primary care providers, and preschool

teachers, their communication is generally supported by the context of the home or classroom. Children are likely talking about things in their environment, not abstract ideas, as they do during the school-age years. During the school-age years, language is contextualized to school and the academic demands of formal education, but at the same time language becomes decontextualized from the immediate task at hand. For example, children are asked to read about unusual animals that they themselves have never had experience with or learn about a country located on the other side of the globe. Educational demands play a critical role in how language is used by children between 5 and 21 years old. For example, there are vocabulary words specific to academics that may never be used at home such as *hypotenuse*, *square root*, and *phylum*.

Language is at the center of the education system, and beyond the age of 5 years old, all children are enrolled in compulsory education. Language is used by teachers to provide instruction and directions for academic content but also to regulate classroom behavior and schedules. Language is used by school-age children to negotiate their way around the classroom, the school building, the sports field, and the playground. Children use their language abilities to ask questions and make comments to teachers and peers, to create and develop social interactions, and to understand and produce written language in the classroom. Language is at times the topic of instruction, specifically during English language arts courses, and during other times it is the tool used by educators to provide instruction in math, science, or social studies. Metalinguistic skill refers to the ability to think about and analyze language in a purposeful manner. Metalinguistic ability plays an important role in language development and use of language during the school-age years. For example, when a child constructs a sentence, she must think about who will read that sentence and how it will be understood. Children with certain kinds of language impairments (e.g., autism) have difficulty developing metalinguistic skills.

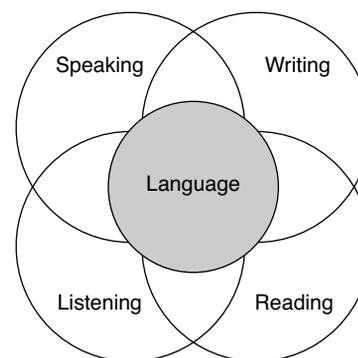
The 2014–2015 school year will mark the full implementation of the Common Core State Standards for schools (Common Core State Standards Initiative, 2012) in 45 of 50 states nationwide. These curricular standards, available at [www.corestandards.org](http://www.corestandards.org), indicate the core skills all students nationwide need to achieve across academic areas from kindergarten through twelfth grade. Academic areas include language arts, math, and science. The Common Core standards target not only reading and writing abilities across academic areas but also speaking and listening abilities. This new emphasis of

all four modalities being implemented as part of all curriculum content, including science and social studies, means that children in school will be required to speak and write about topics in these content areas utilizing spoken and written language for learning purposes.

## LANGUAGE IN FOUR MODALITIES

In the school-age child, language extends across four modalities: listening, speaking, reading, and writing. Research shows these four modalities are all considered language because of shared processing and production areas of the brain; however, each modality also has unique skills associated with it (Berninger & Abbott, 2010). That is, each modality has common language skills and unique language skills associated with it. The commonality between the four modalities is language, and simply stated, language is processed in the brain; what differs is the modality in which this occurs. To be specific, expressive modalities are *speaking* and *writing* and receptive modalities are *listening* and *reading*. Yet oral modalities are *speaking* and *listening*, whereas written modalities are *reading* and *writing*. **Figure 12-1** provides a visual depiction of common and unique skills across the four modalities of language.

The four modalities of language share neural processing areas (i.e., in the brain). These processing resources of the brain are common to or shared by all four modalities of language. However, the manner in which language is comprehended or expressed embodies unique components, as well. For example, one can comprehend language through both auditory and visual input. During a conversation we primarily listen to language; however, we also comprehend visual cues associated with body language processed through the eye. Another manner of visual input for language is reading, where language



**FIGURE 12-1** Visual depiction of language as having shared and unique skills represented across four modalities.

is in written form and is understood by decoding print and using reading comprehension skills to gain meaning. Said differently, reading is the comprehension of linguistic information through written form, and this input is considered visual. When expressing language orally, we primarily use our mouths to speak the ideas, thoughts, feelings, and so on, inside our minds. Similarly, we can formulate ideas in written (print) forms that are expressed through the hand onto paper (for the traditionalists out there) or through hand onto computer (for everyone else!).

Unique skills associated with speaking would be the articulation of sounds, words, and sentences for the purposes of communication. Unique skills associated with listening are the processing of acoustic signals by the ear and associated centers of the brain, until the signal is transferred to language centers of the brain. Just as prosodic cues of pitch, tone, and loudness are necessary for conveying information effectively, so too are visual cues like gesture and facial expressions. Unique skills associated with reading include the decoding of words on paper in order to understand the written message. These messages can vary in length, purpose, and academic level, and require unique skills associated with visual and cognitive areas of the brain. However, once the message is processed, it must be comprehended, and this happens the same way heard language is comprehended. Unique skills associated with writing include the use of the hand for expression along with spelling abilities and the myriad of other skills associated with writing. Irrespective of the mechanical and cognitive demands of writing, language is at the root of the messages we express at the word, sentence, and text levels (Abbott, Berninger, & Fayol, 2010; Berninger, 2000; Berninger & Abbot, 2010).

## **FIVE DOMAINS ACROSS FOUR MODALITIES**

Recall the five domains of language: phonology, morphology, syntax, semantics, and discourse (pragmatics). Children in the school-age years can be observed to use all five domains of language across four modalities of language. Here, I will expand on the development of the skills required for speaking and listening by focusing on reading and writing using the model depicted in Figure 12-1. At times it is obvious how each domain of language is utilized across each modality; in other cases it is not. In some examples, development is confined to one quadrant or one half of the language modality model, whereas in other examples it is clear how the five domains of language occur within and across quadrants of the model.

## **Phonology**

Phonemes are the smallest units of language and account for an integral part of school-age language understanding and production. Likewise, the student must listen to speech from teachers and peers during school, which requires phonological processing. The challenge for students in school becomes how phonology relates to reading and writing. Research shows that children with histories of phonological and/or speech sound disorders have more difficulties with acquiring written language skills than non-affected peers (Catts, 1993; Catts, Fey, Tomblin, & Zhang, 2002). In fact, phonology plays an important role in learning to read and write. To be able to read, the child needs phonological and phonemic awareness skills in order to decode print. The reader is reminded that a translation between phonemes and orthographic symbols is involved in reading and writing. To be able to write, specifically to spell, the child relies on his phonology or understanding of sound to spell words.

### ***Phonological and Phonemic Awareness***

Phonemic awareness, the ability to manipulate sounds without print, is a skill that falls under the umbrella term of *phonological awareness* (Cunningham, 2005). By the time children enter school, phonological awareness is assumed, meaning children are expected to be able to hear the differences in syllables, words, and sounds. Strong phonological awareness means that children understand that there is a difference between a sound, a letter, and a word. Without this ability, learning to read is compromised. Think about this: a child tries to read the word *dog* for the first time under the guidance of the teacher. The teacher says, “Sound it out” or perhaps “What’s the first sound in the word?” If the child cannot follow that directive without print, how is he supposed to be able to respond accurately with the added stress of print and a teacher standing over his shoulder? Moreover, without intact phonology, the child would not be able to achieve the task of decoding and would require support of the teacher and speech-language pathologist to improve this aspect of language for reading.

### ***Spelling***

Phonological ability plays a significant role in the development of spelling. Research shows that when children spell words, they are using phonological, orthographic, and morphological knowledge (Bahr, Silliman, Berninger, &

Dow, in press; Berninger, Abbott, Nagy, & Carlisle, 2006; Silliman, Bahr, & Peters, 2006). Phonological knowledge is the most basic linguistic resource that children use to spell and is defined as “the spelling of a word using the grapheme (letter) that represents the sound.” Children learn the letters of the alphabet and gain the knowledge that each letter has a sound. Using their phonological knowledge to spell, they write the letter that best represents the sound they perceive in the word. For example, a child may spell the word *cat* as “kat” where they use a letter that best represents the /k/ sound to spell a word. Similarly, a child may spell the word *lamb* as “lam” where the last sound in the word is /m/, and therefore it would not make sense to include the letter *b* in that word. Phonology will only get you so far in spelling words in the English language, because of the many odd spelling rules and variations of these rules.

The word *orthography* is Greek for “correct writing” and refers to the written system of a language. Orthographic knowledge, therefore, is the understanding of the written system’s rules and variations of rules for spelling purposes. For example, the word *late* has three sounds and could phonologically be spelled as “lat”; however, the silent *-e* at the end of the word is an orthographic spelling pattern that is seen repeatedly in the English language. A child with an intact phonological system would never be able to correctly spell the word *late* without the orthographic knowledge that silent *-e* is required. Another example would be the word *light*, which has three sounds. A child with good phonological abilities might spell the word as “lit” or “lite,” both of which are legal spellings in English; neither of which, however, represent the target word. Even with intact phonological abilities, a child would not be able to spell English words without gaining orthographic knowledge of spelling patterns.

## Morphology

There are two types of bound morphemes, both of which are relevant to school-age populations: grammatical and derivational. The developmental milestones of the 14 grammatical morphemes identified by Brown (1973) are expected to be well developed before the child enters school at 5 or 6 years of age. Children with language difficulties may not comprehend or produce these morphemes consistently well into the school-age years (Windsor, Scott, & Street, 2000). Because of this, grammatical morpheme comprehension and

production needs to be considered in the elementary school years. If you have ever had the pleasure of listening to a child with a language impairment who has difficulties with morphology read out loud to you, you might recall that the child elided the grammatical morphemes *-ed*, *-ing* and *-s* on more than one occasion, despite the visual representation of these morphemes in written text. Windsor et al. (2000) observed this in their sample of fourth and fifth grade students with language-learning difficulties. Specifically, children who produce these grammatical morphemes in spoken narrative and expository samples often omit them when they write. These data suggest that grammatical morphology continues to be an area of growth and potential concern for school-age children with language impairments.

Additionally, derivational morphemes play a critical role in the continued development of language, specifically morphological spelling and vocabulary growth. Derivational morphemes are prefixes and suffixes that change the meaning of words and oftentimes their syntactical function as well. We can explore this by looking at the word *happy*. This word by itself is an adjective used to modify a noun and indicate a communally understood level of joy. If one adds the simple prefix *un-* to the word, the meaning is now completely opposite (*unhappy*). Likewise, if one adds the suffix *-ness* to the word (*happiness*), the syntactical category changes from adjective to noun, affecting its place and purpose in a sentence. Now let us examine the same issue with a more challenging word for a school-age child: *finite*. By definition, this adjective means having bounds or limits. If we add the prefix *in-* to *finite* then the meaning changes to an opposite—limitless or without boundaries (*infinite*). Now if we take the word *infinite* and add the suffix *-y* we have the noun *infinity*. This is a common term used in math and sciences, meaning a limitless numerical value.

Clearly a strong morphological knowledge is helpful for the school-age child to make meaning of new words with changes in derivational morphemes. There are well over 500,000 words in the English language and hundreds of derivational affixes that can be added to the beginnings or ends of words resulting in an infinite number of possibilities. Therefore in the school-age years, knowing the meaning of the word *happy* or *finite* is just as important as knowing the meaning of the derivational morphemes, *un-*, *in-*, *-ness*, and *-y*. Having an understanding of the meanings of derivational morphemes is important for both comprehending and producing academic language

and should be considered across all four modalities of language.

### Spelling

Returning to spelling, morphological abilities play a critical role in the spelling of words by school-age children. Recall that spelling is dependent upon phonological, orthographic, and morphological knowledge (Bahr et al., in press; Berninger et al., 2006; Silliman et al., 2006). Morphological spelling is the application of the information presented in the previous section to the spelling of words. For example, a child may have heard the word *unhappy* and knows how to spell *happy* and has seen and used the prefix *un-* in other situations. If the child wants to spell this word for the first time, his knowledge of derivational morphemes would allow for the successful spelling of the word.

Apel and Lawrence (2011) compared children with histories of speech sound disorders to their typical peers on measures of morphological awareness in relation to spelling. Not only did children with typical development score higher on morphological awareness tasks but these tasks accounted for much of their success in spelling. Bahr et al. (in press) studied the spelling errors of typically developing children from first through ninth grades and found that beyond fifth grade, children continue to make spelling errors that are orthographic and morphological in nature. This suggests that morphological knowledge continues to be an important area of instruction and development for school-age children up to, and likely beyond, ninth grade.

Earlier, I provided an example of an orthographic spelling error using the word *light*. That same example also demonstrates a morphological spelling error. If a child were to spell the word as “lit” or “lite,” both of which are legal spellings in English, it would be considered an orthographic spelling error because the phonological information is present. However, the intended target word, and thus intended meaning, is not. Because the misspelled words are both legal spellings in English and represent other words with similar phonological information, they can also be considered morphological spelling errors. This is because the misspelled word represents a different meaning. Another example of this would be the commonly confused *there*, *their*, and *they’re*, which all contain the same phonological information with differing orthographic spellings and different meanings. If a child were to replace one with the other, meaning is compromised, but orthography

and phonology are intact. Thus the child has made a morphological spelling error.

### Syntax

Syntax is the architecture of words, phrases, and clauses toward the production of the unit known as the sentence (Shapiro, 1997). It is this structure that helps define the relationships between words. During the school-age years, children use syntax across all four modalities of language. For listening, children must understand and derive meaning from sentences heard; in contrast, for speaking they must produce meaningful sentences for a multitude of reasons. In school, children spend most of their day listening (or so we hope), most often to discourse or connected speech; however, in the context of the classroom, children are often following directions and responding to questions. In this sense children are processing complex syntax. For example, during a social studies lesson, a teacher likely begins by instructing students to open a particular book to a specific page, or to pair up with a classmate to engage in a particular task. These directives are generally complex sentences students must respond to. Likewise, during that same social studies lesson, the teacher will ask *wh-* and *yes/no* questions, which the student must process in order to provide an appropriate response. For speaking purposes, children generally respond to questions and ask their own questions throughout the day, another task for which developed and complex syntactic abilities are necessary.

With regard to the reading and writing modalities, children are processing syntax while reading and are producing sentences when writing. To the former, studies of understanding written sentences suggest that sentence-level processing contributes considerably to reading comprehension (e.g., Abbott et al., 2010; Adams, Clarke, & Haynes, 2009; Berninger et al., 2010; Scott, 2009). To the latter, research in the development of writing suggests that children in the primary grades (first to third) are producing written text at the word and sentence level (Berninger, Whitaker, Feng, Swanson, & Abbott, 1996). During the intermediate years (fourth to sixth) and through junior high and high school, children continue to produce text at the sentence level and moreover connect these sentences to produce meaningful text (Berninger et al., 1996; Whitaker, Berninger, Johnston, & Swanson, 1994). As children write, they must use the knowledge they have of syntax in the oral modalities and apply that to the written modalities, with the additional unique

skills associated with writing (e.g., handwriting, spelling, mechanics) superimposed.

The challenge for all children as they proceed through the school years is that syntax has to grow in both length and complexity to meet the academic demands of school. This is most often observed in spoken and written modalities. To quantify syntactic complexity, researchers have used a variety of different measures to capture the architecture and relationships between words, clauses, and phrases to form sentences. Interestingly, in spoken language one cannot use the term *sentence* because by definition a sentence is marked with an initial capital letter and final punctuation. Thus the term *utterance* is used to describe the syntactical unit of spoken language output.

There are two primary ways to segment spoken utterances into *syntactic units*: communication units (c-units; Loban, 1976) and minimal terminable units (t-units; Hunt, 1970). According to Loban (1976), a c-unit consists of an independent clause with its modifiers and is generally reserved for spoken language analysis. According to Hunt (1970), a t-unit consists of an independent or main clause and all dependent or subordinate clauses and can be used for both spoken and written language. An independent clause can stand on its own, whereas a dependent clause cannot stand on its own. An independent clause generally has both a subject and a verb and there are no subordinating conjunctions within the clause. Dependent clauses generally have verbs but are dependent in two ways. First, the subject of the dependent clause is elided (hidden), but fret not, you can likely find it in the independent clause. Second, the dependent clause has both a subject and verb, but there is a subordinating conjunction within the clause, for example, the word *because* or *when*. The sentence “Because he was hungry” cannot be considered independent. The word *because* requires that two clauses be embedded within the sentence or t-unit. Now that we are clear on the difference between c-units, t-units, and clause types, let’s return to the topic at hand: complex syntax.

According to Hunt (1970), to measure syntax one must be able to quantify both length and complexity. To quantify length, one can count the number of sentences or utterances; however, this often becomes task dependent. Therefore, syntactic length is better measured by calculating the average words per syntactic unit. Likewise, clause length can be measured by counting the number of words per clause. Combined, both measures provide an index for syntactic length. To quantify complexity, one can count the number of clauses per syntactic unit, referred to as the subordinate clause index. Also, one can calculate the average t-units per sentence in writing,

which provides an index of main clause coordination. Syntactic complexity can also be assessed by examining the number of phrases and phrase types within syntactic units (Eisenberg, Ukrainetz, Hsu, Kaderavek, Justice, & Gillam, 2008; Scott & Stokes, 1995).

Research shows that syntactic abilities at the clause and phrase levels are necessary for children to produce and comprehend language across the four modalities (Hunt, 1970; Scott & Stokes, 1995). In a seminal paper, Hunt (1970) reported that syntax continues to develop and shows differences in both length and complexity through the high school years. Specifically, Hunt observed that students classified as low-, middle-, and high-performing pupils showed differences in syntactic length and complexity within and across grades in the expected directions. Specifically, the lower performing students produced shorter and less complex sentences, while the high performing students produced longer and more complex sentences. This has been observed to be a function of both development and genre. For example, narratives tend to be associated with less complex syntax, whereas expository genres demonstrate more complex syntax (Koutsoftas & Gray, in press; Scott & Windsor, 2000). Beers and Nagy (2011) examined the relationships between measures of syntactic complexity and writing genre (narrative, descriptive, compare/contrast, persuasive) in children grades three to seven. Findings from this study suggested that children wrote more complex sentences (i.e., more clauses per t-unit) for persuasive essays and more dense syntax (i.e., words per clause) for descriptive essays. In a different study, Beers and Nagy (2009) examined syntactic complexity and writing quality across two genres (narrative and expository) in the writing samples of adolescents. Findings from this study showed that the words per clause was positively related to quality of expository samples, whereas the clauses per t-unit was positively related to quality for narrative samples. Combined, these findings suggest that syntactic complexity varies greatly due to genre, age, and manner in which writing samples were collected—all of which should be considered when assessing and treating syntactic deficits in the spoken and written language of school-age children. For example, when assessing a school-age child’s writing, a written language sample can be analyzed for the various syntactic measures described above and compared to developmental normative data.

## Semantics

Semantic knowledge grows exponentially throughout the school years. Children are constantly bombarded with

new vocabulary and must learn not only the meanings of these words but how they are related to other words in their vocabulary. Think about the first time you heard the word *photosynthesis*. You were likely in a science class, perhaps biology, and the sound of the word alone was intimidating. Upon the first encounter with this word, an individual is going to make an initial link between the phonetic (word form) and semantic (meaning) information. The process of linking a word to its referent is referred to as fast mapping. Children must hear words multiple times to remember the word well enough to say it. Following initial encounters with the word, slow mapping occurs where the meaning of the word is enriched over time. During your science class, your teacher likely presented the word and explained that it is the procedure whereby plants take sunlight and turn it into food. (Please excuse the over-simplified definition; I am a speech pathologist, not a biologist.) Following the initial definition, you likely spent multiple classes enriching your knowledge of this complex process and thus enriching your knowledge of the word. For example, you may first read about it, then hear the teacher talk about it, and then do an experiment to illustrate the process. The initial encounter with the word was an opportunity to fast map the phonological information and the follow-up lessons were opportunities for enriching the meaning of this word.

After learning a word, a child must learn how the word is associated with other words in the lexicon. For example, *photosynthesis* is categorized with science words, specifically ones about plants. The word may also be related to other words with similar phonetic patterns such as *photo* or *synthesis*. Students with rich vocabulary may even be able attempt to understand the meaning of the word by using the knowledge they have about the two root words, *photo* and *synthesis*. Of course this would be impossible without understanding that the word is in the category of plants and sciences.

Semantic development during the school-age years is critical for academic success. In fact, the average high school graduate will have learned approximately 40,000 different words during the school-age years, which is an average of 5 to 8 new words per day (Nagy & Scott, 2000; Nippold, 2007; White, Power, & White, 1989). Further, vocabulary is a critical factor in reading comprehension and written expression. As mentioned earlier, The National Reading Panel identified vocabulary instruction as one of the top five critical components of reading instruction (National Institute of Child Health and Human Development, 2000). Research has demonstrated that semantic knowledge contributes greatly to

reading comprehension (Abbott et al., 2010; Berninger et al., 2010; Wise, Sevcik, Morris, Lovett, & Wolf, 2007). Likewise studies have demonstrated that semantic ability and vocabulary contribute uniquely to the writing process (Abbott et al., 2010; Berninger et al., 2010; Olinghouse & Leaird, 2009).

Vocabulary has been measured in a variety of different ways from both spoken and written language samples. Similar to syntactic analyses of language, one must be concerned with both length and complexity when it comes to vocabulary and word usage. A child who speaks or writes considerably more than peers when given the same elicitation prompt is likely to have a greater vocabulary; however, the total number of words cannot be the only index used to quantify semantic knowledge. Other considerations include lexical variety, word length, and frequency of the word in the language (Olinghouse & Leaird, 2009). Lexical variety is a common measure used to assess vocabulary complexity and is generally done by measuring the number of different words within a set amount of words. For example, one would measure the number of different root words in the first 50 or 100 words of a language sample. This measure must always be truncated so that it is comparable between students and does not replicate the total number of words produced. Lexical diversity is often affected by genre (Koutsoftas & Gray, in press) and age (Olinghouse & Leaird, 2009). Longer words tend to represent more complex vocabulary, and so the number of syllables per word has also been used as an indicator of complex or more advanced vocabulary (Olinghouse & Leaird, 2009). The frequency of words used within samples or within a language are also strong indicators of the complexity of vocabulary. For example, in one series of studies, researchers listed all the words used in writing samples by all participants and then rank ordered these words, with the least frequently occurring words receiving higher scores (Berninger et al., 1996; Whitaker et al., 1994). Similarly, a word that is considered high frequency in the English language (e.g., *have*, *chair*, *under*) would receive lower scores than less commonly occurring words (e.g., *egress*, *colloquial*, *heretofore*) (Olinghouse & Leaird, 2009).

Nippold (2007) identified three primary methods that promote the learning of new words in school-age children: direct instruction, contextual abstraction, and morphological analysis. Direct instruction is simply when a teacher, parent, or peer provides the meaning of a new word for a student. This can be accomplished in many ways, two of which are discussed here. First, the student comes across a word he does not understand and seeks

out the definition by asking a teacher, parent, or peer, to which the reply is a definition of the word. Second, the student seeks the definition of a word from a dictionary, either paper form or online. The difficulty with the second option is that one word may have multiple definitions and the student must use the context of the word to select the best definition. A second method that promotes the learning of new words is contextual abstraction, which is the use of context to glean the meaning of a novel word. For example, in the previous sentence the word *glean* was used and may be novel to the reader of this book. However, using the information within the sentence that precedes and follows the word, along with information in nearby sentences, the reader is able to figure out the meaning from context. Incidentally, in this context, *glean* means “to learn, discover, or find out.” The third method that promotes the learning of new words is morphological analysis. This was previewed earlier in the section on morphology where I explained that knowing the meaning of affixes like *un-* and *-ness* would help students glean the meanings of the words *unlikely* or *likeliness*. In addition to knowing the meanings of affixes, students must also understand and identify root words within the morphologically bound words and realize that by adding an affix the part of speech changes, from noun to adjective, for example. Sometimes this is obvious or transparent as in the word *unlikely* or *likeliness*. Other times it is more difficult or opaque, especially when the addition of the affix changes the root word pronunciation or spelling. For example, the suffix *-ate* can be added to the root word *predict*, changing the word to *predicate*, where both the spelling and pronunciation of the root word changes form.

It is not likely that a teacher is going to directly present and teach five to eight new words per day across the school-age child’s academic career. Therefore, contextual abstraction and morphological analysis play larger roles in how the school-age child’s vocabulary grows and develops. To be specific, school-age children are learning most of these five to eight new words per day from reading complex texts across multiple genres and from listening to these words being spoken to them by teachers, parents, and peers.

A challenge for semantic instruction for school-age children is selecting the appropriate words to teach. Beck, McKeown, and Kucan (2002) suggest a three-tiered approach to categorizing words based on their utility. The first tier, tier 1 words, includes basic words that do not require much teaching because they are of high frequency or utility in language. Examples of tier 1 words

include *table, walk, picture, computer, sit*. Tier 1 words do not require direct instruction, and children will likely know the meanings of these words without context. The second tier, tier 2 words, are high frequency words that occur across multiple domains. These are words that are used commonly across all classrooms, subjects, and individuals. Examples of tier 2 words include *essential, conclude, predict, summary*. Tier 2 words may require direct instruction; however, the school-age child is more likely to gain understanding of these words through contextual abstraction and morphological analysis. The third tier, tier 3 words, includes words that are less frequent and more domain-specific. For the school-age child, tier 3 words are subject specific and represent complex or abstract concepts. Examples of tier 3 words include *photosynthesis, industrialization, and exponent*. Tier 3 words generally require direct instruction along with enrichment of the meaning of the word through a variety of teaching strategies in the classroom.

### Pragmatics: Discourse

Until now, I have discussed four of the domains of language discretely, separating them from context. Oftentimes, especially with clinical populations, discrete instruction in phonology, morphology, syntax, and semantics is warranted. For instance, students may require instruction for phonological and phonemic awareness, spelling, morphological inflections, syntactic structures, and vocabulary. In reality, language in schools is presented at the discourse level, meaning that language is processed and produced by the school-age child in connected forms that involve stringing sounds together to form words, words to form sentences, and sentences to form discourse.

Discourse is defined as groups of utterances or sustained exchanges combined in cohesive ways to convey meaning (Merritt & Culatta, 1998). Instructional discourse is the particular type of exchange used in schools between teachers and students for the purpose of enhancing knowledge, guiding comprehension, developing skills, and processing connected text (Merritt & Culatta, 1998). In schools, this is observed in a variety of forms. Teachers provide classroom instruction, directions, lectures, and lessons and use discourse levels of language to convey this information. Students must then comprehend this discourse while listening and attending to instruction. Children must learn that the pragmatics of speaking to a peer differ from the pragmatics of speaking to a teacher.

Discourse can also be observed in written texts or books where information is strung together in a storybook or textbook, in social studies or science, for example. Students produce discourse when speaking to their teachers and classmates and in the written form when writing stories, essays, book reports, and term papers (i.e., expository discourse). Merritt and Culatta (1998) provide a framework for discourse instruction and suggest that organization, content, and genre be considered when understanding how instructional discourse works. These three traits are related and can be observed across all kinds of instructional discourse whether classroom instruction, group discussion, or when read from text.

*Organization* refers to the complexity of discourse in terms of text elements and topics (Merritt & Culatta, 1998). For example, simple discourse has less complex organization with few levels of subordination and likely follows a sequential order, whereas complex discourse has multiple levels of organization with a great deal of subordination. Considering the other domains of language, specifically syntax and semantics, one would observe less complex syntax and more transparent or tier 1 and tier 2 words in simply organized discourse. Conversely, complex discourse would contain complex and lengthy syntax with multiple subordinating and coordinating clauses and likely contain less frequently observed vocabulary consisting of tier 2 and tier 3 words.

*Content* refers to the familiarity of concepts and subject matter being taught (Merritt & Culatta, 1998). The content of instructional discourse can vary from concrete and familiar concepts to abstract and unfamiliar concepts. Content is affected by children's background knowledge and motivation. For example, the child who goes to school in a rural farm community brings with him or her different background knowledge than the child who goes to school in a major city. Even then, background knowledge is variable within the rural or city school community and each child has his own unique experience that informs his background knowledge and how he acquires content. A social studies unit on agriculture and how food is processed would be more concrete for the rural farm student and quite abstract for the city student. Likewise, a social studies unit on public transportation would be familiar to the child schooled in the city and unfamiliar to the child who grows up on a farm.

*Genre* refers to the type or purpose of text or discourse (Merritt & Culatta, 1998). Genre can range from informal and personal to formal and impersonal, and this goes across different genre types that include narrative, expository, and persuasive, to name a few. Less formal

genres likely contain content familiar to the student with more simply organized text; therefore the syntax and semantics would be transparent for the student. More formal genres contain unfamiliar or abstract content with more complex organization and thus opaque syntax and semantics. The formality of genre is not dependent upon the type of genre. For example, science and social studies textbooks, which would be considered expository text, can range in how formally the information is presented. Further, narrative texts found in the literature curriculum can range in familiarity from simple sequential stories with few characters to complexly organized epics with multiple generations of characters.

Research shows that both narrative and expository discourse have structures that children must learn (Merritt & Liles, 1987; Nippold, Mansfield, Billow & Tomblin, 2008; Scott & Windsor, 2000). Narrative retells or stories (whether spoken or written) will include story grammar elements such as initiating events (i.e., problem), attempts to solve the problem, and solutions. Other story grammar elements include settings, internal responses of characters (i.e., feelings), and story endings. Merritt and Liles (1987) found that children construct narratives that include initiating events, attempts, and consequences and that these narratives were judged to be complete. Because children begin telling narratives as early as 2 years old (McCabe & Rollins, 1994), by the time they get to formal schooling, they are quite good at producing oral narratives. A major challenge in school becomes how to produce these in written form. Expository discourse also has a formal structure; however, these structures vary depending upon the purpose of the discourse (Merritt & Culatta, 1998). Expository structures include topic and detail structures, cause/effect structures, and temporal structures, to name a few. For example, in a history class one might retell a series of events that would require a temporal structure. An elaboration on these events that provides specific details would be a topic and detail structure. Lastly, if the event caused a noteworthy historical event, then a cause/effect structure might be in order. What differs between narrative and expository discourse is that children are exposed to narrative genres much earlier than expository genres. It is likely that many children only listen to and are asked to produce expository discourse for the first time during the elementary school years. The challenge for all students then becomes learning the different expository structures and then how to comprehend and produce these across all four modalities of language.

As part of the instructional discourse of schools, one must consider the social or pragmatic nature of the classroom, too. For example, students are generally expected to raise their hands when they have a comment or question. Yet, we have all observed the student who calls out an answer or asks a question without the expected hand-raise. This student may not be aware of the social pragmatics of the classroom for a variety of reasons. In fact, I have been in elementary school classrooms where hand-raising was not required and the class ran as flawlessly as can be expected. Westby (1997) discusses this in terms of “learning to do school” and suggests that in addition to the academic curriculum of school, students must also learn the social curriculum within the classroom as well as with peers outside of the classroom.

Another important area to consider is nonliteral language. Nonliteral language includes idioms, metaphors, similes, humor, proverbs, and abstraction. Many of us have been exposed to these terms in a language arts classroom and remember simple rules such as “similes use the word *like* or *as* and metaphors do not”. What is important to note is that nonliteral language is used by teachers and students throughout the academic day from kindergarten through high school. It is only when we are exposed to the metalinguistic rules presented in a language arts class that we become aware of the structure of this nonliteral language. This is important because children with language impairments, including children with learning disabilities and mild to severe autism, will not comprehend this nonliteral language. So, for example, the kindergarten teacher who uses the idiom “It’s raining cats and dogs” may see one or two students walk over to the window to look for a new puppy or kitten.

Discourse levels of language in the school-age years are complex and involve many considerations from instructional discourse to social pragmatics. Not all of this is obvious or attainable for all students, especially those that struggle with language. By understanding the role discourse plays and that phonological, morphological, syntactic, and semantic abilities are subsumed within discourse and pragmatics, one can identify language deficits that contribute to academic difficulties and target them during intervention.

## WRITTEN LANGUAGE

It is important to introduce the reader to a more in-depth look at the written modalities of language (reading and writing). While other sources provide an overview of literacy development, which includes a definition of literacy,

development of emergent literacy skills, definitions for what literacy is, and a review of relationships between spoken language deficits and later reading difficulties, this discussion extends that information to further explore the relationships between oral and written language in spoken and written forms and applications of these skills to children in schools.

Written language refers to print—both how we comprehend it (reading) and how we produce it (writing). If “language is a code whereby ideas about the world are expressed through a conventional system of arbitrary signals for communication” (Lahey, 1988, p.2), then the written code may have gone a step further by introducing quite arbitrary shapes to represent sounds (i.e., letters) that are strung together to shape words and sentences, which when combined carry simple to complex meanings. Yet, we are all able to figure out this code and are able to gain meaning from print. In some instances it just takes a lot more instruction on the code and a whole lot of instruction in comprehending. Let’s review current theories about how reading and writing work.

## READING

The *Simple View of Reading* (Hoover & Gough, 1990) is the most prominent theoretical model used to describe reading comprehension. The simple view of reading suggests that reading comprehension is the product of decoding and linguistic comprehension, depicted as follows:

$$\text{Reading Comprehension} = \text{Decoding} \times \text{Linguistic Comprehension}$$

Decoding is the process of translating orthographic symbols into phonemic symbols to decipher the meaning of printed words (Cunningham, 2005). Word attack skills are those a child uses to decode orthographic symbols, and they include decoding individual sounds (phonemes), chunks of words (morphemes), and words within sentences (semantics). For example, the young reader will need to sound out the three phonemes in the word *dog*. More sophisticated readers will use their morphological skills to decode the word *doggy* by delineating the word *dog* and the additional morpheme *-y* in chunks. These word attack skills vary by child and developmental ability.

Linguistic comprehension is what we understand as the comprehension of language at the phonological, morphological, syntactic, semantic, and discourse

(pragmatics) levels. In this way, the simple view of reading suggests that reading comprehension is based on the relationship of both decoding and linguistic comprehension. For example, if a child was to have age-appropriate linguistic comprehension and no decoding ability, there would be no reading comprehension. Likewise, if a child was able to decode print but had poor linguistic comprehension ability, there would be no reading comprehension. Further, if a child is able to decode print at levels at or above her own developmental level, her reading comprehension would still only be as good as what her linguistic comprehension allows.

The National Reading Panel identified five critical areas that should be targeted when providing instruction in reading (National Institute of Child Health and Human Development, 2000). These are phonemic awareness, phonics, fluency, vocabulary, and text comprehension. Relating these areas to the simple view of reading, the skills of phonemic awareness, phonics, and fluency are associated with the decoding portion of the model, while vocabulary and text comprehension are associated with the linguistic comprehension side of the model. Phonological and morphological abilities, as described in previous sections, are also necessary for improving skill in phonemic awareness and phonics, thus contributing to reading fluency. Semantic, syntactic, and pragmatic knowledge is associated with the linguistic comprehension side of the model. Specific skills associated with the five domains of language and reading comprehension are discussed in more detail in the section on the five domains of language.

## WRITING

When it comes to writing there are two prominent theoretical models used to explain writing, the writing process model (Hayes & Flower, 1980) and the simple view of writing (Berninger & Amtmann, 2003). Within the writing process model (Hayes and Flower, 1980) writing is the end product of planning, translating, and revising. *Planning* includes idea generation, goal setting, and organization. *Translating* includes two subcomponents: transcription and text generation (Berninger, 1999). Transcription includes the skills of handwriting and spelling whereas text generation includes the production of written language at the word, sentence, and text levels. *Revising* includes the ability to read and edit text that has been written. Research shows that children in the primary grades (first through third) attend to the translating process, but not until the end of the intermediate grades

(fourth through sixth) are children able to attend to the planning and revising components (Berninger, et al., 1996; Whitaker, et al., 1994).

The simple view of writing (Berninger & Amtmann, 2003) suggests that writing involves text generation, transcription, and executive functions. Specifically, *text generation* at the word, sentence, and discourse levels is the result of transcription and executive functions where *transcription* is still defined as handwriting and spelling abilities. Notably, executive functions related to writing are more clearly defined and highlighted in the simple view of writing. *Executive functions* related to writing include conscious attention, planning, reviewing, revising, and self-regulation.

## APPLICATION TO ADAM: A CASE STUDY OF SCHOOL-AGE LANGUAGE DEMANDS

This case study provides a common example of how breakdowns in any part of language can disrupt learning.

### Case History for Adam, a Student with a Language-Learning Disability

Adam is a fifth-grade student who is identified as having a language-based learning disability. His IQ is within normal limits with his nonverbal performance quotient slightly higher than his verbal performance quotient. According to standardized language testing his overall language ability falls about 1.5 standard deviations below the mean, with specific difficulties producing complex sentences and explaining the relationships between words that are similar. This testing further suggests that he is able to follow simple two-step directions; however, complex two-step directions that involve temporal or spatial concepts are challenging to him. Adam's language testing results are consistent with his classroom performance.

In the classroom Adam is always one or two steps behind his classmates when the teacher provides classroom instructions. He is able to spell words he knows with similar accuracy to his classroom peers. New words present two challenges for Adam. First, it takes him more time to learn to spell the word compared to his peers, and second, he is rarely able to recall the words to use in context or provide meanings for these words. Because of this, he rarely passes his weekly spelling and vocabulary tests. When it

comes to reading, Adam is able to read classroom material with similar accuracy to his peers; however, his reading fluency is somewhat slower than his classmates. Adam has difficulty understanding what he reads; this is demonstrated by not being able to retell narrative or expository text with similar accuracy to his classmates. Furthermore, he does poorly on multiple choice and short answer questions about text he reads. Adam enjoys listening to classroom read alouds by his teacher and is able to retell these stories with better accuracy than when he reads stories himself. Unfortunately, as the school year goes on, there is less opportunity for classroom read alouds, especially in the fifth-grade classroom. With regard to writing, Adam is able to produce short narrative stories and expository essays. Although he is able to generate good ideas for his writing, when translating these ideas to paper his difficulties with spelling, semantics, and syntax become obvious. He generally has difficulty spelling less frequent words and his writing demonstrates less variety in word choice with simple sentences.

Adam does well in mathematics. He is able to perform mathematical operations (addition, multiplication, subtraction, division) of multidigit whole numbers with decimals up to the hundredths place, which is consistent with the fifth-grade math curriculum. In fact, he is really good at this and enjoys math very much because of this. He is able to extend this knowledge to fractions as well and apply his strong math skills to measurement problems. Difficulties are observed when it comes to word problems. He is able to easily extract the numbers from a word problem; however, he often performs the incorrect mathematical operation. This is likely due to two factors: first, his difficulties understanding what he reads, and second, his difficulties with vocabulary.

Adam enjoys art, music, and gym classes tremendously and has quite a few friends in his class and schoolwide. He is what you would call a social butterfly and gets along well with peers and teachers. His parents are supportive and understand his difficulties with language, and they make ample time to help him with his homework. He receives speech-language therapy twice weekly in a group no larger than five. The school is considering adding a special education support in the form of a resource room to provide Adam additional supports when he struggles academically.

Adam's profile is similar to many of the cases clinicians will face in the school setting where strengths and weaknesses are apparent. Considering the five domains of language and how they are observed across four modalities provides an opportunity to understand the language demands of school for Adam. Adam is considered to have a language-learning disability because his deficits in language negatively impact his academic success and impede learning. As we have learned by now, learning in schools is highly dependent upon language, and breakdowns in language could result in academic failure.

### Adam's Language Demands across Five Domains of Language

Adam's case study provides an opportunity to explore deficits in language across five domains. Adam has general comprehension difficulties with obvious difficulties with semantics and syntax. Regarding phonology, Adam reads somewhat less fluently than peers, suggesting that deficits in language could be affecting his phonemic awareness and thus compromising his decoding. He has phonological deficits in spelling, where Adam has difficulty spelling new words. This however, could also be related to difficulties with orthographic and morphological knowledge. Morphological deficits could also contribute to Adam's vocabulary deficits. He does not understand many words and has a limited vocabulary. It is possible that his difficulties with language could affect morphological analysis of new words. Further, his difficulty with reading fluently and understanding complex syntax may impede his ability to contextually abstract the meanings of novel words. Although Adam is able to decode text with the same proficiency as peers, his comprehension of this text is an area of weakness. This is likely attributable to general deficits in language. Recall the simple view of reading where comprehension is the product of decoding and linguistic comprehension; given observed difficulties with both aspects of the model, reading comprehension for Adam is compromised.

Adam's syntactic and semantic difficulties likely contribute to his difficulties with writing as well as math. When it comes to writing, Adam has good ideas but has difficulty transforming these ideas to writing. Specifically, his writing lacks lexical variety and consists of simple sentences. These deficits were observed in his spoken language and consequently his writing demonstrates these same deficiencies. Because of

his limited vocabulary and poor syntax, his writing scores on standardized tests will likely suffer, despite his good ideas. When it comes to math, Adam is able to perform mathematical operations that are expected by fifth graders. Where he suffers is when it comes to word problems, which are prevalent in the fifth-grade math curriculum. For example, Adam can easily divide fractions; however, when the same information is presented in text, he cannot identify the type of mathematical operation he needs to perform. This is likely due to his difficulties with reading comprehension, which are rooted in his semantic and syntactic deficits.

Adam's strong social skills help support his success with discourse and pragmatic demands of the classroom. In these ways he is able to ask for clarification and negotiate social situations with peers and adults. Given the support Adam is receiving, including speech therapy, he will likely be able to overcome these academic difficulties and be successful in his current and future compulsory education.

## SUMMARY

In sum, the five domains of language are evident across all four modalities of language. Moreover, the critical

role language plays toward academic success has been unpacked for the early student in language development and disorders. This chapter has described the five modalities of language rather discretely from one another. It is important to understand that these skills are nested together and dependent upon one another. For example, children cannot spell if they cannot delineate sounds. Likewise, children cannot write a sentence if they cannot formulate one orally. Further, you cannot form a sentence without understanding where in discourse it is to appear and without the use of morphological markers to make meaning certain and precise. The point is that these five domains of language work in concert with the four modalities of language. Lastly, language is the primary tool for academic success and development of school-age children.

Application of this conceptualization of language in the school years provides an insight into the language deficits and how they affect academics in the case example of Adam. The early student in language development and disorders can apply knowledge of the five domains of language across four modalities to the case study of Adam. This allows a better understanding of the critical and important role that language plays during the school-age years and an understanding of the detriments of breakdowns in language function.

## KEY TERMS

Decoding  
Language modality  
Listening  
Metalinguistic skills  
Phonemic awareness  
Phonological awareness  
Reading

Simple view of reading  
Simple view of writing  
Speaking  
Text generation  
Transcription skills  
Writing  
Writing process (planning, translating, revising)

## STUDY QUESTIONS

- Describe and differentiate the four modalities of language and then describe how the five domains of language are observed across the four modalities.
- Explain the simple view of reading and then indicate which domains of language play a critical role in the process. Do the same for the simple view of writing.
- Identify and describe one unique skill associated with each of the four modalities of language.
- Using the case study of Adam, identify one or two more linguistic areas that you would want to further assess for treatment purposes.

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