

THE PEARSON COMMUNICATION SCIENCES AND DISORDERS SERIES

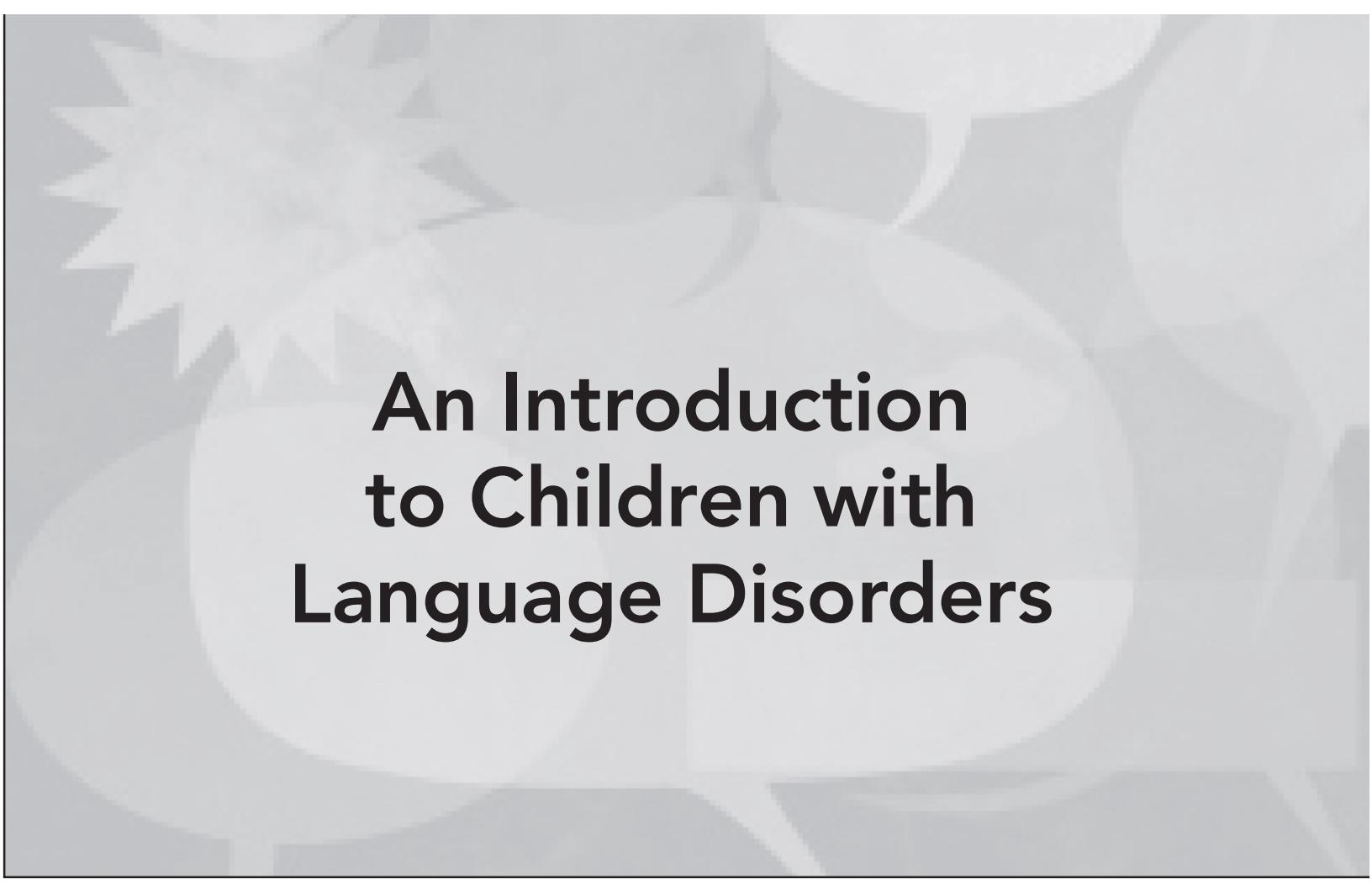
# AN INTRODUCTION TO CHILDREN WITH LANGUAGE DISORDERS

VICKI A. REED



Pearson

FIFTH EDITION



# **An Introduction to Children with Language Disorders**

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# An Introduction to Children with Language Disorders

Fifth Edition

Vicki A. Reed

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**Library of Congress Cataloging-in-Publication Data**

Names: Reed, Vicki, author.

Title: An introduction to children with language disorders / Vicki A. Reed,  
James Madison University.

Description: Fifth edition. | Boston : Pearson, [2017] | Includes  
bibliographical references and indexes.

Identifiers: LCCN 2017003341 | ISBN 9780133827095 | ISBN 0133827097

Subjects: LCSH: Language disorders in children.

Classification: LCC RJ496.L35 R44 2017 | DDC 618.92/855—dc23 LC record available at  
<https://lccn.loc.gov/2017003341>

10 9 8 7 6 5 4 3 2 1



Print Edition  
ISBN-10: 0-13-382709-7  
ISBN-13: 978-0-13-382709-5

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I have been blessed to have so many wonderful friends and mentors.  
This book is dedicated to you for letting me stand on your shoulders.

Thank you from the bottom of my heart.

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# Preface

## OVERVIEW OF THE BOOK

The focus of this book continues to be about children who do not acquire language normally. It is intended both for students who are learning about children's language disorders in order to help the children and for professionals wanting to update their knowledge in order to serve the children better. Language is the most powerful and important human ability. It affects educational achievement, relationships, and entire lives. Children with language disorders do not have easy access to this ability and are at a severe disadvantage. They struggle with learning and with human interactions; a language disorder alters a child's relationships with caregivers, undermines academic success, disturbs interpersonal relationships, limits vocational potential, and isolates the child from mainstream society.

This edition continues the organizational structure of the previous edition. There are three parts. The first provides an overview/review of normal language in two chapters—the bases of language and communication and normal language development in children and adolescents. Nine chapters that focus on the language difficulties of different populations comprise the second part of the book. Several of these chapters address language problems associated with children with intellectual disabilities, specific learning disabilities, autism spectrum disorder, auditory impairments, cultural and linguistic differences, and acquired language impairment, plus a chapter that looks at language issues associated with other special populations of children, such as gifted children and those with cleft palate. Two other chapters discuss the language of preschoolers with specific language impairment and adolescents with language impairment. These two chapters bookend the chapter on children with specific learning disabilities. The ordering of the three chapters is purposeful, attempting to convey the progression of specific language impairment in preschool children through the early school years and into and through adolescence. A main message is that the language impairment does not disappear and it is not "cured." Across the nine chapters in this section of the book, a number of the topics covered in the chapters are those often overlooked in other texts on language disorders in children. Each chapter includes considerations for intervention associated specifically with the population of children discussed in the chapter. The third part of the book consists of three chapters that focus on intervention for children with language disorders—a chapter on assessment, one on intervention, and a third, unique chapter on augmentative and alternative communication as an intervention approach with children with language difficulties.

## NEW TO THIS EDITION

Although the overall organization of the previous edition has been retained, this new edition contains considerable changes. An aim in revision was to include new content related to topics. Another aim was to reflect changes in the field of child language disorders. As a result, some topics have been expanded while others have been reduced. Some reordering of topics has also occurred to reflect current thinking and practices. Examples of "what's new" are the following:

- The authors for some of the contributed chapters have changed. This edition welcomes Geraldine P. Wallach, Marsha Longerbeam, Jeff Sigafoos, Stacey Pavelko, Sarah E. Hegyi, and Kate L. Anderson as either new sole authors or coauthors.
- Across chapters, new tables have been included and a number of tables and figures from the previous edition have been significantly revised where new data are available; other tables and figures from the previous edition have been omitted.
- New content reflecting current information is evident throughout the book.

- Although all chapters have been updated, three chapters have undergone major revisions and expansions—Chapter 4, “Language and Children with Learning Disabilities,” Chapter 6, “Language and Children with Intellectual Disabilities,” and, in particular, Chapter 7, “Language and Children with Autism Spectrum Disorder”—in order to reflect new diagnostic criteria.
- Where specific published language tests are referred to in several of the chapters, newer versions of the tests are cited when appropriate.
- Since the previous editions, increasing recognition of discourse issues beyond narratives has emerged in our thinking about children with language impairment. Therefore, discussions of expository discourse have been expanded and are more frequent in several chapters.

We hope readers will find that these and other new features offer current information and perspectives and reflect the shifts in thinking and knowledge over the last several years. Children with language disorders depend on professionals providing services based on current knowledge.

## ACKNOWLEDGMENTS AND THANK-YOUS

A book, whether a new or revised edition, involves the efforts of many people. I am deeply grateful to the authors who offered their expertise and knowledge in their contributed chapters. I am also very thankful for the hard work of many responsible, conscientious, and bright undergraduate and graduate students who assisted with the revisions. I anticipate that their exceptional personal commitment to the project foreshadows their success as professionals and their ability to help and advocate for children with language disorders. And, the reviewers—Amy Ann Cocanour, University of Nevada, Reno; Ruth Crutchfield, SLPD., CCC-SLP, University of Texas Pan American; Shana Goldwyn, Fitchburg State University; Johanna Price, Western Carolina University—offered suggestions and comments that helped improve this edition. Importantly, however, are the people in our personal lives. These individuals assist us to keep our balance, as well as our focus. They were truly significant factors in helping this edition see the light of day. We hope you know that you have our thanks, but more importantly, you have our hearts.

*Vicki A. Reed*

PART  
1

# Aspects of Normal Language and Communication

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# 1

# Language and Human Communication

## AN OVERVIEW

### LEARNING OBJECTIVES

After reading this chapter, you should be able to

- Explain what comprises communication
- Describe the components of language
- Describe comprehension and production and the relationship between these various communication modes
- Explain the various communication modes
- Explain the biological, cognitive, and social bases of human communication

When two people talk with each other, one person usually speaks while the other person listens. The speaker encodes thoughts into mental representations of words and sentences and changes these into a continuous stream of speech sounds or acoustic energy. The speech sounds travel through the air in the form of sound waves (acoustic energy) and reach the listener's ear. The listener then decodes the sound waves into a stream of speech sounds, the speech sounds into the intended string of words, and the string of words miraculously into what the speaker originally thought. A breakdown in any step along the way may result in miscommunication or even a failure to communicate. Importantly, both the speaker and the listener must share the same code or symbolic system of what sounds and words represent what thoughts. Put simply, they must share the same language.

This book is concerned with the symbolic process of communication called language and the ways in which children do or do not use it. Before we can examine children's language disorders, however, we, like the speaker and the listener, must share the same language. Therefore, the purpose of this chapter is to overview for the reader the foundations of human communication and other topics that provide a platform for discussing children's language disorders. We discuss the terms *communication*, *language*, *speech*, and *extralinguistic elements of communication*, and we look at the different components of language and the relationship between understanding and using language. We also consider different communication modes. Finally, we review some of the biological, cognitive, and social bases of human communication. The content of the chapter is built primarily on two pillars—information that

is now recognized as relatively “common” knowledge for respective topics and knowledge provided by foundation researchers in their areas. Inclusion of many of the citations in the chapter thus attempts to recognize their early, still relevant, and important contributions to the study of child language disorders.

## COMMUNICATION

Communication refers to the sending and receiving of messages, information, ideas, or feelings. It is a broad term that encompasses not only the physical production of speech and the symbolic nature of language but also any behavior or action that conveys a message. For example, a throat clear may convey a message that a person has a sore throat. A baby’s cry conveys needs or discomforts that require attention. In these instances, the spoken word is not essential.

Communication is not limited to humans. Other animals communicate. Unlike other animals, however, humans have the ability to communicate highly complex thoughts, feelings, and ideas through the use of language. Humans also have the capacity for speech. Extralinguistic behaviors, which are discussed below, additionally contribute to the communicative process.

### Language

Language is a code in which we make specific symbols stand for something else. Bloom (1988) defines language as “a code whereby ideas about the world are represented through a conventional system of arbitrary signals for communication” (p. 2). According to this definition, coded symbols refer to real things, concepts, or ideas, and the things that the symbols represent are the *referents*. In the English code, there is no reason why an animal with four legs that is noted for tail wagging and barking is labeled a *dog*. Such an animal could as easily be coded as a *sloot*—and perhaps it is, in a code system other than English. Although the symbols are arbitrary, the symbols and their appropriate referents must be mutually agreed on by members of a community using the code if the code is to be meaningful. In this sense, language is a *convention* (Bloom, 1988).

Language is also a system in which *rules* or regularities guide which coded symbols may be combined with other symbols and in what order and what symbols can be used in what situations. These rules or regularities are predictable and can be used to identify what are and are not acceptable uses of language. For example, in the English language, the word order in the sentence “The ball is not red” is acceptable and considered correct, whereas the word order in the sentence “The ball not is red” violates accepted rules even though the words in the two sentences are identical.

The number of rules that delimit a language is finite. Once these finite rules are learned, however, a person can generate an infinite variety of meaningful messages by combining and recombining the symbols according to the agreed-on rules. The system of rules that results in the ability to produce an infinite number of expressions gives language its creative feature. By applying systematic rules, a language user can generate expressions never used or heard before, and another user of the same language can understand those expressions by employing the same rules. Every day, humans create sentences never spoken or written before, and they hear or read sentences and paragraphs they have never before encountered.

Because a language consists of regularities or sets of rules, members of a language community (including children) must learn the rules and induce the regularities in order to use the language. Among the rules that must be learned are those that determine who can say what to whom when and how. Language is, therefore, a *learned* or acquired behavior.

The ability to learn language is considered an innate human ability. Most infants are born with the capacity to acquire language, but this does not mean that infants inevitably use language. Even with the capacity to acquire language, infants still need to *learn* the language or code of the linguistic community in which they are reared.

## Speech

Speech is the oral expression of language. It involves the sensorimotor processes by which language users reproduce the coded symbols that are stored in their central nervous systems so that others can hear the symbols. Consequently, speech production requires the neurological control of physical movements to create sound patterns. These sound patterns are produced as a result of respiration, phonation, resonance, and articulation. *Respiration* refers to the coordinated, rapid muscular activities of the chest (which controls the lung action). Respiration provides the air in which a speech sound wave travels. Without air, there would be no way of phonating. *Phonation* refers to the production of sound through vibration of the vocal cords (vocal folds) in the larynx. Once a sound has been created, it resonates in the vocal tract (pharynx, oral cavity, and nasal cavity). Finally, the *articulators* (including the tongue, jaw, lips, and palate) are used to modify the sound into a vowel or a consonant. A consonant is produced by constricting the airstream, whereas a vowel is produced without significant constriction of the airstream through the mouth. An important point is that language is the code, whereas speech is the sensorimotor production of that code.

## Extralinguistic Aspects of Communication

As we saw previously, communication can be any behavior or action that conveys a message. If a speaker said, “The baby’s sleeping,” in a quiet whisper accompanied by a frown and an upright open-hand gesture in front of the listener, the speaker’s original thought and, therefore, communicative intention may have been not to comment on the fact that the baby is asleep but to stop the listener from waking the baby by speaking loudly. A term often used to refer to behaviors such as loudness, frowning, or using gesture is *extralinguistic communication*. These may enhance or even change the linguistic code. Extralinguistic elements include paralinguistics, nonlinguistics (nonverbal communication), and metalinguistics.

**Paralinguistics.** Paralinguistics refers to the melodic components of speech that modify the meaning of the spoken message. Melodic components include stress, pitch, and intonation. *Stress* is the relative loudness with which certain syllables in words are produced. For example, in the word *blackbird*, if the first syllable is said more loudly than the second syllable, the meaning is a specific type of bird. If there is no difference in stress between the syllables, the meaning is any bird that is black. If we take the word *pervert*, it is difficult to know whether the written word refers to a *pervert* (noun) or the act *to pervert* (verb). In spoken English, stress can communicate meaning. Stress can also be used for contrastive emphasis within utterances. One speaker might say, “I like the *red* jacket,” whereas a second speaker might say, “I like the *blue* jacket.” In doing so, the second speaker contrasts the color *red* with the color *blue* through the use of stress.

Pitch and intonation can also modify the meaning of a spoken message. Ladefoged (2006) describes *pitch* as the “auditory property of a sound that enables a listener to place it on a scale going from low to high” (p. 295). *Intonation*, on the other hand, refers to the patterns of rises and falls in pitch within and across utterances. Pitch and intonation both enhance a spoken message. For example, pitch can convey personal characteristics of speakers, such as their gender, age (to some extent), and emotional state. Changes in pitch can also alter the meaning of a word, as is seen in tone languages such as Mandarin Chinese, Thai, and Vietnamese. Intonation can be used to convey syntactic information. For example, the sentence “He went skydiving” could be said as a statement of fact, with falling intonation at the end of the utterance, but the same sentence could be expressed as a question or surprise, with rising intonation at the end of the utterance. In both examples, the sequence of speech sounds remains the same, but a difference in meaning is signaled by the intonation pattern.

The combination of these melodic components of speech creates prosody. Because prosody is superimposed on the segments of an utterance (e.g., the speech sounds, words, or phrases), the melodic components are often referred to as *suprasegmental* devices. These act

above the level of a segment to enhance the overall meaning of an utterance to convey an emotion or an attitude. Without paralinguistics our speech would sound robotic or dull, that is, like computer speech.

**Nonlinguistics (Nonverbal Communication).** The nonlinguistic aspect of communication is sometimes referred to as nonverbal communication. *Proxemics*, one aspect of nonverbal communication, refers to the ways that use of space and physical distance between speakers communicate. Another way speakers communicate nonverbally is with body language, or *kinesics*. Kinesics refers to the way in which body movements are used for communication, such as with gestures to point to objects or head shakes to signal “no.”

In many respects, nonverbal communication can be considered a system itself. In his now classic, insightful, and sometimes humorous book on nonverbal communication, Hall (1990) described ways in which unspoken communication is so very important and can vary by cultures. To emphasize the importance of nonverbal communication in human interaction, he entitled his book *The Silent Language*. Consciously or unconsciously, we engage in nonverbal communication, sometimes to emphasize concurrent oral messages, sometimes to contradict simultaneous oral messages, and sometimes to substitute for oral messages. For example, the utterance “That chocolate caramel fudge looks nice” could mean that the speaker thinks chocolate caramel fudge is appealing. But when spoken by a customer in a candy store, accompanied by pointing and leaning toward a piece of chocolate caramel fudge displayed in the store window, it could mean that the customer would like to purchase some fudge. Our understanding and use of nonverbal cues can largely determine the quality and effectiveness of our interpersonal relationships. In fact, some suggest that nonverbal communication carries more than half of the social meaning in interpersonal communication situations. When we are in a foreign country and unable to communicate through the use of speech and language, we often resort to using nonlinguistic cues to communicate and hope that those cues are appropriate symbols for that country. It is important to know that nonlinguistic behaviors, like specific words, are not always universal in what they communicate and that cultures differ in uses of and meanings associated with specific elements of nonverbal communication. A nod of the head in the United States or Australia indicates agreement (“yes”), while the same gesture in Bengal indicates “no” (Axtell, 1991).

Because inaccurate or ineffective interpretation and use of nonverbal communication can lead to problems in establishing and maintaining social relationships with others, an awareness of nonverbal communication, the nonlinguistic elements that make up particular nonverbal systems, and the ways in which these influence relationships are important. Some children who struggle with language experience deficits in the ability to understand and express nonverbal cues correctly. Such difficulties can result in the development of poor self-images and self-concepts, potentially leading to even more impaired interpersonal relationships.

**Metalinguistics.** The third extralinguistic element of communication is metalinguistics. The prefix *meta-* as it is used in *metalinguistics* means something like “beyond” or “higher” or “transcending,” not unlike how it is used in the word *metaphysics*. As such, *metalinguistics* refers to the ability to use language to communicate or talk about and to analyze language. It involves thinking about language, seeing it as an entity separate from its function as a way of communicating, and using language to judge the correctness of language and to correct it; it is an awareness of the components of language, and it is seeing language as a tool and controlling how we use language. For example, identifying and generating rhyming words involves metalinguistic ability.

Frequently, monitoring whether our messages are understood and consciously deciding how to clarify them involve metalinguistic skills. If we return to our example of the customer requesting a piece of chocolate caramel fudge using the utterance “That chocolate caramel fudge looks nice,” the response of the sales assistant would provide the customer with information about the success of his or her utterance. If the sales assistant nods agreeably but fails to begin to pick up the piece of fudge, then the customer would recognize a need to rephrase

the request, perhaps in a way that makes it an explicit request. Alternatively, the sales assistant might say, “Pardon, what did you say?” from which the customer would become aware of a need to correct or clarify the utterance in order to be understood.

### A Bit More about the Relationships among Speech, Language, and Communication

Communication involves the sending and receiving of messages. Although it can be as simple as a sneeze, it can also be a complex symbolic code expressed through the action of respiration, phonation, resonation, and articulation accompanied by paralinguistic and nonlinguistic cues. Figure 1.1 shows how the various terms we have discussed (speech, language, paralinguistics, nonlinguistics, metalinguistics, and communication) relate to one another. Sometimes, we may communicate just using nonlinguistic behaviors, such as raising our eyebrows or frowning. We may also communicate using language without speech, as is the case with writing.

It is also important that we differentiate further between the two key terms *speech* and *language*. As our definitions so far have indicated, language and speech are closely related but are not the same. The two sentences “The dog is black and white,” and “Is the dog black and white?” consist of the same sounds. However, the order of the sounds and therefore the order of the words in the two sentences are different, as is the resultant meaning of the two sentences. As another example, to produce the sentences “I want it to fit,” and “I want it to sit,” a child must only alter speech movements slightly to produce the difference between “f” and “s.” Yet the meaning of the two sentences is quite different based on the one speech sound variation.

It is possible for a child’s code system (language) to be intact but for the same child to have difficulty with the articulation of speech sounds. For example, a child who has an interdental lisp and says “th” for “s” might say the words *thing* and *sing* the same way, but from the context we can tell that the child knows the words mean different things:

I can “thing” Old McDonald has a Farm.

I don’t like that thing.

It is also possible for a child’s speech production to be intact but for the child’s language system to be deficient. As examples, a child who says, “I want it no to go,” “The geese are flying,” or “I don’t

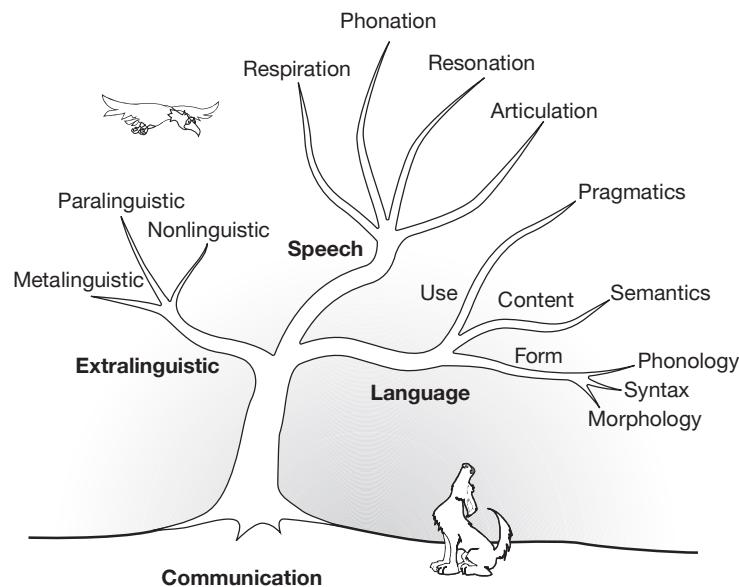


FIGURE 1.1 | Components of Communication

want for you to sick," with well-pronounced sounds in a highly fluent manner, is demonstrating problems with language, not speech.

## COMPONENTS OF LANGUAGE

Spoken languages are made up of components. Some authors call these *elements*, some call them *parameters*, and others call them *aspects*. Whatever they are labeled, the intent is to break language into parts in order to discuss and describe it. Often, we consider there to be five basic components of language: (1) phonology, (2) semantics, (3) syntax, (4) morphology, and (5) pragmatics. Each is part of a system and is therefore governed by regularities and sets of rules that all speakers of a specific language must learn if they are to communicate effectively. Although we can discuss each of these components separately, they are all inter-related in language functioning, as we will see in later chapters.

### Phonology

When we utter a word such as *fish*, we produce a string of speech sounds that represent the word *fish*, beginning by lightly biting the bottom lip with the top front teeth, then producing the vowel sound, then using the tongue to produce the sound "sh." If people who understand English were to hear the production of this string of speech sounds, they would know that the word was *fish*. A listener who understands and speaks a language other than English would not know what was being said. This idea of using a specific set of speech sounds in a particular sequence within a language to communicate meaning is the essence of phonology. *Phonology* is, therefore, language based and relates to the phoneme patterns that are governed by the rules of a specific language which lead to meaning within the language. To appreciate this definition, we need to examine the concept of speech sounds, or *phonemes*, more closely.

Phonemes are sounds that distinguish one meaningful word from another. When we look at a string of speech sounds in words, we see that by changing just one speech sound within a word, we can differentiate one word from another. For example, in the word pair *cat/rat*, sound differences occur in the initial positions of the words. The sounds that create these meaning differences (in this case, "c" and "r") are phonemes. By replacing the "c" in "cat" with other sounds to create *rat*, *mat*, *hat*, *fat*, *pat*, *that*, we discover that "r," "m," "h," "f," "p," "th" are also phonemes of English because they result in words with different meanings. Phonemes can be classified as either vowels (*mat*, *met*) or consonants (*hat*, *pat*).

One problem that becomes painfully clear as we watch children attempting to learn to read is the lack of consistency between the way an English sound is said and the way it is written. For example, the letter "c" is pronounced as a "k" sound in *cat* and as an "s" sound in *center*, and the long vowel "a" is spelled *ay* in *bay*, *a* in *fade*, and *ea* in *break*. Trying to use usual alphabetic symbols to write English as it is said is very difficult. This is where the International Phonetic Alphabet (IPA) comes to the rescue. It is a system that has a correspondence between a written symbol and a sound. That is, a spoken sound is represented by one consistent printed symbol. Many of the symbols of the IPA are shown in Table 1.1. As can be seen, the symbol /s/ represents the "s" sound in *sun* and *cement*; the symbol /dʒ/ represents the "j" sound in *jump*, *badge*, and *fudge*; and the symbol /θ/ represents the "th" sound in *thumb* and *tooth*. In this text, symbols that occur between / / indicate that they are IPA symbols and designate the relevant pronunciation as shown in Table 1.1. In using the IPA, a word in the language is transcribed on paper to match the way a speaker produces it. The exact number of phonemes in American English is difficult to determine because there are acceptable variations within the language. Some of these variations result from dialectal differences. Most estimates of the number of phonemes suggest that there are 40 to 46.

Each language has a limited set of phonemes that makes up the sound system; each language also has its own set of phonotactic rules or rules governing which phonemes can be combined with other phonemes and in what order. In English, *ksont* is not a word and never could be, even though all the individual sounds that make up the word are acceptable

**TABLE 1.1 |** The International Phonetic Alphabet

Consonants				Vowels and Diphthongs			
Voiceless		Voiced					
Symbols	Key Words	Symbols	Key Words	Symbols	Key Words	Symbols	Key Words
p	pig	b	big	i	feet	u	food
t	to	d	do	ɪ	hit	ʊ	foot
k	coat, key	g	goat	e	cake	o	toll
f	fine	v	vine	ɛ	head	ɔ	fog
θ	thumb	ð	the	æ	pack	a	father
s	cider, sun	z	zipper	ʌ	dug	ɒ*	law
ʃ	she	ʒ	vision, azure	ə	sofa	aɪ	time
tʃ	chair	dʒ	gem, huge	ɜ	fur	aʊ	house
h	hello	m	me	ə̄	mother	ɔɪ	toil
w	when	n	new	ɜ̄*	bird	ju	fuse
		ŋ	ring	ā*	mad		
		l	letter				
		r	run				
		w	we				
		j	yes				

\*These vowels occur in some eastern and/or southern American speech patterns.

English phonemes. On the other hand, *skont*, which is also not an English word, potentially could be a word in the language because the sequence of phonemes is possible. We see the application of English phonotactic rules in Lewis Carroll’s opening passage to his literary classic “Jabberwocky”: “Twas brillig, and the slithy toves did gyre and gimble in the wabe: All mimsy were the borogoves, and the mome raths outgrabe.” English speakers are able to read the passage aloud and sound like they are producing acceptable English because the non-sense words abide by the phonotactic rules. If Lewis Carroll’s opening passage began with something like “Ksee ngot, and the lsiyth ptosv did yger and rgilbe in the wabeh,” we would struggle to pronounce many of the words because they fail to conform to the phonotactic rules of English. Children learning the phonological system of their language must learn to use not only the acceptable set of phonemes but also the phonotactic rules for combining these phonemes sequentially into words.

## Semantics

Semantics deals with the referents for words and the meanings of utterances. At a basic level, semantics involves the vocabulary of a language, or the lexicon. Sequences of phonemes combine to form words. The words are then used to represent items, attributes, concepts, or experiences. As we know, many words can have multiple meanings depending on the situations in which they are used. *Peel* can refer to the rind of a piece of fruit or the act of stripping or tearing off. In identifying the meanings of words, we typically think of the dictionary meanings. These dictionary meanings are the *referential meanings* or denotative meanings of words. However, words may have *connotative* or *emotionally associated meanings*. These meanings can, in fact, be so strong as to actually produce physical responses to the word. To many, the word *snake* can create chills even though the denotative meaning of the word refers to one of several kinds of limbless reptiles.

A word and its referents can trigger associations with another word and its referents. In some instances, the associated words belong to the same category as the original word. For example, the word *cow* may trigger one to think of *pig*, *horse*, and *sheep*. In other instances, the associated word or words may be the category for the original word—*animal* or *farm animal*.

Words can be categorized and recategorized through the process of abstraction. In the process of categorizing words, we identify or abstract the similarities among the referents for the words and use the similar characteristics to form another category that is also labeled. In

his classic explanation of the hierarchical organization of meaning and word relationships, Hayakawa (1964) used the example of Bessie the cow to demonstrate the categorization and abstraction of referents. One of the lowest levels of categorization of Bessie is that of “cow,” some of the abstracted characteristics of which include animal, four legs, tail, milk giver, and *moo*. This category of abstracted qualities ignores the individual differences among all the other cows that make up the group and focuses only on the similar characteristics. The similar characteristics or attributes form the category “cow.” However, cows have characteristics similar to chickens, pigs, and horses. Those abstracted similar characteristics can be categorized and labeled as “livestock.” The term *livestock* becomes a superordinate category for cows, chickens, and pigs. In turn, livestock is similar to all other salable farm items, and based on these attributes, a new category of “assets” is abstracted. “Livestock” is now subordinate to the superordinate category of assets. The abstracted similar attributes of all possible assets allow the formation of a new category—“wealth.” Each time a new category was created, we increased our level of abstraction, and with each level of abstraction, we moved farther and farther away from the concrete, or that which can be perceived by the senses. “Wealth” is an abstract concept. Its attributes cannot be perceived by the senses; therefore, its referents are said to be relatively abstract.

The use of superordinate and subordinate categories in the lexicon helps to bring order to our experiences. By categorizing and labeling our experiences, it is not necessary for us to treat each experience as a totally new one. Because we have finite memories, this skill is efficient and allows us to store cognitively more information than if it were not used. Children learning the semantic system of their language must acquire a categorization system somewhat consistent with that of others in the language community. Much of the educational system does, in fact, center on teaching children the categorization of attributes and how to move from superordinate categories to subordinate categories and vice versa—for example, units of instruction on colors, animals, and transportation.

Not only does the semantic component of language deal with the lexicon, but it also involves the meanings conveyed by the relations among words. This aspect of semantics is termed *relational meaning*. In fact, some words, such as *an* or *if*, really take on meaning only as they are used with other words. Furthermore, when the individual meanings of words interrelate in a multiword statement, the statement takes on a meaning that goes beyond the separate words. This meaning is the statement’s *propositional meaning* and is partly derived from the logical relationships inherent in the sequence of words. In the sentences “The boy climbs the tree,” and “The tree climbs the boy,” the words are identical. The first sentence is plausible, while the second is not, even though the individual words within the sentences retain their usual referents. The order in which the words are arranged imposes certain restrictions on the logical relationships among the words, and these restrictions are violated in the second sentence.

Earlier, in discussing semantics, reference was made to the multiple meanings of individual words. In situations where a word may have several different referents, we typically determine its meaning from the contexts in which it is used and its relationship to other words uttered. We can use the word *table* to illustrate the derivation of meaning by employing cues regarding the word’s logical relationship to other words in a sentence. Although *table* has several meanings, we can surmise from the sentence “The table was too small to use six chairs” that the referent for the word is a piece of furniture; from the sentence “As the rains continued, the table continued to rise” that the referent is probably a water level rather than a floating part of a dining set, although this could be plausible; and from the sentence “The table contained numbers she had never seen before” that the referent for the word is an organized grouping of numerals such as those of a statistician. However, using the word in some sentences may not aid in deriving the word’s meaning. For example, the sentence “Read about the table” gives us no clue as to the meaning of *table*. This is referred to as an *ambiguous statement*, and in these instances we must depend on previous utterances or the situation in which the sentence is expressed to determine the referent of *table*. Verbal humor is frequently based on multiple meanings of words.

Two other aspects of semantics involve figurative meaning and inferential meaning. *Figurative meaning* goes beyond meaning that can be derived from literal interpretations of

phrases. For example, “It’s raining cats and dogs” is implausible if interpreted at its literal level. Metaphors, similes, proverbs, and idioms all involve figurative meanings. Inferential meaning refers to meaning that is derived not from what is stated explicitly but from the logical relationships of statements. As an example, consider the following sequential statements:

Sally went to the restaurant and ordered from the standard menu. She loved her wantons and fried rice.

The kind of restaurant is not stated explicitly. Yet we are able to derive sufficient information through inferential meanings to increase the odds of making a correct, educated guess of a Chinese restaurant. Learning in school requires students to make an enormous amount of inferences to succeed, and increasing skill in inferring meaning is required with advancing grades.

### Syntax

All languages have systems of syntax, or sets of rules that govern how words are to be sequenced in utterances and how the words in an utterance are related. Phonemes combine to form words, and words combine to form phrases, clauses, and sentences. In the same way that phonological rules govern what phonemes can be combined in what order, syntactic rules determine what words can be combined in what order to convey meaning.

A basic English syntactic rule is the subject + verb + object sequence, which places the actor first followed by the receiver of the action. Although the words in the sentences “The boy hits the girl” and “The girl hits the boy” are identical, reversal of the word order signals a different meaning. Word combinations typically convey more specific information than any of the individual words alone do. For example, a child who utters the word *milk* may be indicating that the item is present, may simply be labeling it, may wish to have more of the item, or may not want it at all. If the child uses the utterance “more milk,” additional specificity is obtained, although the child may be indicating that a larger quantity is present or that an increase in the amount is requested. But when the child says, “I want more milk,” the child’s meaning is specific. If the child says, “More milk I want,” the listener may be able to understand the child’s wish, but the utterance violates the syntactic rules for the intended meaning. In most instances, however, precise sequencing of words using correct syntactic rules is essential if the exact intended meaning of an utterance is to be conveyed. The words in the sentences “When she was 10 years old, she reported that a dog had bitten her” and “She reported that a dog had bitten her when she was 10 years old” are identical, but the meanings of the two sentences are different, depending on the location of the clause “when she was 10 years old.”

The explanation for how children are able to learn what seem to be implicit syntactic rules is a continuing matter of considerable debate. We will not wade into the debate here. What most agree about, however, is that there is a generative element, so that once syntactic rules are learned, numerous sentences or phrases can be generated, and thus numerous ideas can be expressed. Table 1.2 shows a number of the multiple phrases and ideas that are possible with knowledge of a single syntactic rule—article + attributive + noun sequence.

**TABLE 1.2 | Use of a Syntactic Rule to Generate Multiple Phrases**

Article	+	Attributive	+	Noun
The		Pretty		Dress
A		Big		Doll
An		Old		Apple
The		Tremendous		Crowd
An		Exhaustive		Experience

**TABLE 1.3 |** Various Transformations and Examples

Transformation Types		
Negation	Question	Negation & Question
The ball is not red.	Is the ball red?	Isn't the ball red?
The girl does not run.	Does the girl run?	Doesn't the girl run?
The flower is not blooming.	Is the flower blooming? What color is the ball? When is the girl running? Why is the flower blooming? What is this?	Isn't the flower blooming? When isn't the girl running? Why isn't the flower blooming?

Another aspect of syntax is that a *transformational element* is involved. That is, with a set of operational rules, sentences can be changed by adding, deleting, and/or rearranging the words to derive sentences of various types. To illustrate, the sentence “The girl is riding a horse” can, by rearranging the words, be transformed into the question “Is the girl riding a horse?” or, by adding the word *not* in the correct place, transformed into the negative, “The girl is not riding a horse.” In both transformations, the meaning conveyed by the first sentence is altered. However, both transformed sentences are based on the structure of the original sentence, “The girl is riding a horse.”

Chomsky’s (1965, 1981) concepts of syntax and language learning have had a major influence on our thinking about how children acquire language and the syntactic components of the language in particular (e.g., generative transformational grammar). A discussion of his theories and others that have evolved from the theories is not appropriate for this text. However, we can see in Table 1.3 further examples of how we can transform sentences and creatively alter meaning once we know “the rules.”

## Morphology

Morphology deals with the rules for deriving various word forms and the rules for using grammatical markers or inflections. These derived word forms include plurals, verb tenses, adverbs, superlatives, and many words associated with school curricula, for example, *photosynthesis*, *polynomial*, *pseudonym*. Table 1.4 shows how we can use morphology to change meaning.

**TABLE 1.4 |** Examples of Morphological Derivations of Words

Root Word: <i>drive</i>		Root Word: <i>gentle</i>	
<b><i>drives</i></b>	Third-person singular, present tense or plural noun for motor paths	<b><i>gently</i></b>	Adverb
<b><i>drove</i></b>	Irregular past tense	<b><i>gentleness</i></b>	Noun
<b><i>driven</i></b>	Past participle, functioning as part of a verb form or as an adjective	<b><i>gentleman</i></b>	Noun
<b><i>driving</i></b>	Present participle, functioning as part of a verb form or as an adjective, as in <i>driving rain</i>	<b><i>gentlemanly</i></b>	Adverb
		<b><i>ungentlemanly</i></b>	Adverb

Because morphology is concerned with sequences of phonemes, it is sometimes discussed as part of the phonological system. Sometimes it is considered part of the semantic system because of the meaning derived from the phoneme sequences, and sometimes it is classified as part of the syntactic system because of the interrelationships among varying word forms, their functions within sentences, and word order. Furthermore, morphology is sometimes considered a separate component of language because of the unique rules affecting differing word forms.

Morphology is concerned with meaning, and the smallest meaning units of a language are called *morphemes*. In some instances, the smallest unit or form that conveys meaning is a word, such as *drive* (Table 1.4). Even though the word is composed of phonemes, none of them is meaningful by itself. Therefore, *drive* cannot be broken into smaller units and retain its meaning. *Drive* is a morpheme. In other instances, however, the smallest unit that conveys meaning is not a word. For example, *ing*, when added to a verb, denotes the progressive tense and its associated meaning. Therefore, when *ing* is added to the verb, it signals a meaning that is somewhat different from the meaning *drive* alone. While *ing* is not a word, it is still a morpheme.

There are basically two classes of morphemes: roots and affixes. *Roots* are words that cannot be divided into any smaller units, while *affixes* are morphemes that are attached to roots in order to alter meaning. In the word *driving*, the root is *drive*, and the affix, in this case a suffix, is *ing*. In the word *redo*, the root is *do*, and the affix, in this case a prefix, is *re*. Sometimes the affix involves deriving a grammatical form and conveying grammatical information, such as *ing* on *drive*. Other terms used for such affixes are inflections, inflectional morphemes, grammatical markers, and grammatical inflections. In other instances, the affix involves deriving an altered word meaning that conveys semantic information, such as the *re* on *do*. A term used for these affixes is *derivational morphemes*.

Another classification of morphemes uses the terms *free morphemes* and *bound morphemes* to identify the two different kinds. A free morpheme is able to occur alone in the language. In the previous example, *drive* is a free morpheme because it can occur meaningfully by itself. However, *ing* is a bound morpheme because it cannot occur by itself and be meaningful; it derives its meaning only when attached to another morpheme. Therefore, its function is bound to that of another morpheme. There is obviously a parallel between free morphemes and roots and bound morphemes and affixes. Words must be viewed in terms of the smallest units of meaning they possess to determine the number and types of morphemes they contain. The word *ungentlemanly* in Table 1.4 contains two free morphemes (*gentle* and *man*) and two bound morphemes (*un* and *ly*).

Examples of common rules for attaching bound morphemes to free morphemes include the formation of plural nouns by adding “s” (pronounced as the /s/ sound) to the root noun (*cat* to *cats*), past-tense verbs by adding “ed” (pronounced as a syllable *uhd*) to the root verb (*bait* to *baited*), superlative adjectives by adding “est” to the root adjective (*short* to *shortest*), and reflexive pronouns by adding “self” to the objective pronoun (*him* to *himself*). However, such rules do not explain the formation of plural nouns for which the “z” sound is used (*home* to *homes*), for which a syllable with “z” (pronounced as *uhz*) is used (*house* to *houses*), or for which the entire word changes (*man* to *men*). The examples do not explain past-tense verbs pronounced with a “t” or “d” at the end (*kick* to *kicked* or *comb* to *combed*), superlative adjectives that use a different word (*good* to *best*), or reflexive pronouns that use “selves” (*them* to *themselves*). The concept of allomorphs is needed to explain such variations. An *allomorph* is a variation of a morpheme that does not alter the meaning of the original morpheme. Table 1.5 lists several examples of allomorphs that are used to indicate noun plurals, verb tenses, and verb person and number.

In some cases, the use of allomorphs is determined by specific rules; for example, to form a noun plural when the root ends with a voiceless consonant, such as “p,” add “s” to the root, except when the voiceless consonant is a fricative or an affricative, such as “sh” or “ch,” in which case *uhz* is added to the root. However, in English many of the allomorphs to be used are irregular. That is, there are no specific rules governing their application. Why do we pluralize *child* by using *children*, and why do we use *was* as a past tense of *be*? Because no rules can be used for the irregularities, they must simply be memorized. Children, in the

**TABLE 1.5 | Examples of Allomorphs for Noun Plurals, Verb Tenses, and Verb Person and Number**

<b>Noun Plurals</b>				
book			books	/s/
robe			robes	/z/
twitch			twitches	/əz/
leaf			leaves	
<b>Verb Tenses</b>				
kick	kicked	/t/	kicked	/t/
comb	combed	/d/	combed	/d/
eat	ate		eaten	
ring	rang		rung	
do	did		done	
bait	baited	/əd/	baited	/əd/
tear	tore		torn	
<b>Verb Person/Number</b>				
kick			kicks	/s/
comb			combs	/z/
eat			eats	/s/
ring			rings	/z/
do			does	
have			has	

process of learning the morphology of their language, often overgeneralize the morphological rules and use the rules in place of the irregular allomorphs (*comed* instead of *came*, *deers* instead of *deer*, and *gooder* instead of *better*). Even adults may have difficulty with some of the irregular allomorphs. Context and/or syntax are often the only ways to determine the meaning of some irregular allomorphs or to know whether an allomorph has been used correctly. For example, *deer* does not change its form from singular to plural. If *deer* is the subject of a sentence, a verb may indicate whether the noun is singular or plural (“The deer is jumping” or “The deer jumping”).

### Pragmatics

Language is used for specific reasons, and without these there would be no purpose for language. Language helps us achieve communicative or social functions. This aspect of language is referred to as pragmatics. Because the area of pragmatics is concerned with the whys, and therefore, the hows of language use, some prefer to see pragmatics not as a component of language that is equal in status to the other components, such as syntax or semantics, but rather as the “super” component that drives, organizes, and encompasses the other components. This perspective is often referred to as a functionalist model of language.

When we think of people talking with each other, we can visualize each taking turns during which they produce sequences of connected speech; these people are engaging in discourse. Some confusion exists in the literature about two terms often used in discussion

of pragmatics—discourse and narrative. For our purposes, *discourse* will be used to refer to the connected flow of language. This frequently relates to conversations and communicative interactions between people, but different kinds of discourse may also occur in, for example, speeches, soliloquies, reports, or explanations of procedures or theories. *Narrative* is one form of discourse, that of telling a story. A narrative is a frequently used logical description of a sequence of events. We employ narratives in discourse when describing a movie we have seen or giving an account of what happened when we went shopping. Stories, as in children's fairy tales or in novels, are another type of narrative. *Expository discourse* is another category of discourse. It is generally a more formal form of discourse and is used to inform. Ukrainetz (2006, p. 250) explains that there "are many expository genres and many different ways of dividing up the expository pie." We see expository discourse in reports, procedures, explanations, analyses, and persuasion, for example. It is a primary form of discourse in school as students advance in grades.

The process of reading is largely a language-based function. This means that when individuals read paragraphs or pages of text, they are engaging in interpretation of print discourse. Consequently, discourse is both a spoken and print form of language use. The same varieties of spoken discourse are seen in print discourse.

Effective language use requires that sequential utterances be related to each other. This aspect of pragmatics, termed *cohesion*, refers to the organization and order of utterances in a whole message so that the individual ideas of each utterance build logically on the previous ones. It is related to discourse. As with the other components of language, the different genres of discourse follow different rules for how they are organized, the order of utterances for logical formulation of a message, and methods of gluing these utterances and the organization together for good cohesion. The following is part of a classic example, provided by Wiig and Semel (1984), in which cohesion problems are illustrated in the sequential utterances of a boy engaging in narrative discourse, in this case a narrative retell as he attempts to relate the plot of a television show:

So he was scared to tell John-boy that he stoled his poem, but he didn't really. He just got an idea from John-boy's poem. And then John-boy was trying to figure out what who shot this man he knows. And then the man stole the chickens and then that night he bring 'em back. (p. 288)

The adequate inclusion of temporal words and grammatical inflections indicating time references to help listeners orient themselves to the interrelationships of ideas and events and the use of appropriate referent identification for pronouns are parts of delivering coherent messages. Another important aspect of delivering coherent messages involves using not only coordinating conjunctions (e.g., *and*, *so*) but also subordinating conjunctions (e.g., *because*, *if*, *when*) to produce complex sentences that contain more than one proposition and convey relations among the propositions. Adverbial conjuncts (e.g., *nevertheless*, *however*) are other devices that contribute to cohesion.

Being able to provide coherent messages also depends, in part, on determining what listeners already know about the topics under discussion. Shared knowledge between listener and speaker is not given emphasis or, in some cases, even reported. However, knowledge that only the speaker has must be stated in order for a listener to comprehend a message. This aspect of pragmatics is termed *presupposition* and refers to the provision of sufficient but not too much information for adequate listener comprehension. Appropriate use of presuppositions requires that a speaker gauge listeners' needs for specificity and frames of reference. We have all experienced irritation with speakers who waste valued communication time reporting what is obviously known without proceeding to the key parts of a message. In contrast, we have attempted to engage in conversations in which we were unable to follow the speaker's sequence of ideas because adequate background information was not supplied.

The concept of presupposition is related to theory of mind (TOM). TOM refers to an individual's ability to understand and interpret another person's knowledge and beliefs, particularly when they are different from one's own perspectives (Baron-Cohen, 1989, 2000). It is important to understand what another person might believe or know in order to formulate our messages in a way that meets the needs of our listeners. Ability with TOM is a skill that children learn as they mature and an ability that has been found to be problematic for

many children with language disorders. We will, therefore, see TOM discussed again later in this text.

When individuals fail to make appropriate presuppositions and then cast their messages inappropriately, a communication breakdown is likely to occur. When this happens in written language, the writer often does not have an opportunity to repair the breakdown. However, when the communication breakdown occurs in spoken language, the opportunity to repair may be possible and we are generally required to attempt to repair it. In conversation, the process of repair is twofold. First, speakers are obligated to identify when listeners have not understood their messages and supply additional information or modifications of the ways in which previously given information was delivered. Second, listeners must signal their lack of understanding. These signals may be verbal, such as the statements "I don't understand," "What did you say?" or "Would you repeat that please?" Or listeners may use nonverbal cues, such as puzzled facial expressions, to indicate that they have not understood.

During a conversation, both the speaker and the listener take turns responding to each other's utterances. One part of this rule-governed behavior is that one does not interrupt or talk over the other. However, turn taking also involves acknowledging the previous utterances but without repeating unnecessary content and expanding the content of the conversation with appropriate additional information. Such behavior facilitates topic maintenance. Topic maintenance requires that a person about to speak abide by the constraints of the topic created by a previous speaker and reply with responses appropriate to the topic. For example, an appropriate response and one that would continue the topic to the statement "I bought a new car" would be "What kind is it?" In contrast, the response "It's cold outside" would be startling and disconcerting to the previous speaker and would probably discontinue the first topic, if not the interaction. However, there are times when we wish to change a topic that has already been introduced. These are referred to as *topic shifts*. Topic shifting is acceptable if it is not done so frequently that our conversational partners begin to think we are uninterested in them and if it is done smoothly rather than abruptly.

One reason written communication is often thought of as being a more advanced and complex form of language use than spoken language is that the writer does not have the advantage of "real time" communication repair. The reader is not there when the writer writes. Consequently, the writer has a greater load, for example, to presuppose what the reader will know at the time of reading, to organize ideas in cohesive ways that build the writer's propositions in ways that conform to the reader's likely knowledge level, to select the appropriate language structures (syntax, morphology) and words for both the reader's needs and the meaning of the message, and to choose the appropriate genre for the propositions to be put forth in the written message. Managing the load requires a high level of language competency in the spoken form to transfer to the written form and knowledge of the rules of written discourse. This in part explains why students who struggle with their spoken language generally struggle to achieve competency in reading and writing.

In certain situations with certain people, specific rules dictate the way we are supposed to communicate. For example, it would be very inappropriate during an interdisciplinary educational staffing on a child to relate the results of testing as "Sally sure did ace the hearing test but bombed the IQ test." In contrast, it might be acceptable to say to a friend and colleague that "Tom aced the continuing ed. course he took." Several researchers have described different styles or registers of communication, some of which are intimate, casual, consultative, formal, and frozen (Joos, 1976). Effective use of language involves determining in communicative situations which styles are appropriate and wording messages accordingly.

Language also functions as a means of engaging in human relationships. Adolescents, for example, are known for their use of language as a way of establishing and maintaining peer friendships (Thurlow, 2005). Language is also an avenue for initiating relationships. As an example, if we wish to meet a person sitting next to us in an audience, we might ask what time the performance is expected to start even though we already know. The function of the utterance in this instance is not to acquire information but rather to make contact. The same query, of course, could be made for the purpose of receiving information, and another important function of language is to acquire information. For most adults, messages often serve more than one function at the same time, and adults usually vary their messages

appropriately between direct and indirect speech acts. That is, they use alternative forms of language to accomplish similar purposes, depending on the context and the person to whom they are addressing the messages. While an imperative (a direct speech act, such as “Close the door”) might be acceptable in some instances, a question (an indirect speech act, such as “Can you close the door?”) is more appropriate in others. As we can see, the form (syntax, phonology, semantics, and morphology) of a message does not always correspond to the intents or functions of the message. And certain ways of using language vary from context to context. What is socially and culturally acceptable in one situation violates the appropriate rules in another. Competency with pragmatics might well be considered social competency (Prutting, 1982).

Another aspect of communication that contributes to the tapestry of skills that make up communicative competency that deserves additional attention is fluency. *Fluency* in the delivery of messages refers to the number of false starts, hesitations, fillers, and revisions that take place as speakers say their utterances. These fluency interrupters are often referred to as speech disruptions or mazes and should not be confused with stuttering, which is a speech disorder. While mazes or speech disruptions occur in most people’s speech, they interfere with communication if they are too frequent or long. They can sometimes indicate language impairment when they represent difficulties in formulating syntactic or morphologic structures or rapid retrieval of words from our mental lexicons. However, we sometimes use particular fluency disruptors deliberately to help convey part of our message. For example, if we wish to appear thoughtful about what we are saying, we might introduce more hesitations and false starts into our utterances than if we said the same thing with total assurance. As discussed previously in the chapter, extralinguistic aspects of communication such as paralinguistic and nonlinguistic devices can also be used to enhance or even change the linguistic meaning of an utterance. The ability to use such devices falls within the pragmatic component of language.

Children, in the process of learning the form and content of language, must also learn how to handle the many aspects of pragmatics to communicate effectively in a variety of situations. As we have seen, among the many aspects are the following:

1. The various functions and acts that utterances serve and the shift among different discourse genres for different functions
2. The coherence of sequential statements
3. The fluency with which messages are delivered
4. The ability to take turns during dialogues and at the same time maintain topics of conversation
5. The provision of adequate information for listeners to comprehend spoken and written messages without supplying redundant information
6. The responsibility to repair communication breakdowns and request additional information when messages are not understood
7. The appropriate use of nonverbal communicative cues
8. The codes or styles of communicative behavior employed in different situations, that is, our ability to code switch

Skill in employing these elements, combined with the ability to use the phonological, semantic, syntactic, and morphological systems accurately, embodies what we refer to as *communicative competency* or *proficiency*.

## COMPREHENSION AND PRODUCTION

In our discussion on the pragmatic aspects of language, we saw that language use often involves at least two people interacting in a communicative situation—the sender of a message (speaker or writer) and the receiver of a message (listener or reader). In spoken language interactions, the people typically take turns in the roles of sender and receiver. This communicative process is referred to as *dyadic communication*. However, the notion of turn taking

breaks down when we consider printed language; although the sender writes, the message to the receiver is delayed so turn taking is limited. Mobile communication alternatives are modifying the sender-receiver relationships in terms of turn taking. Although the speed of message sending and receiving is less in mobile than in usual print modes, it does not equate to turn taking speed or the quantity of communicative cues available in real-time dyadic communication.

Regardless of communication mode, a basic assumption is that for the communicative act to be complete, both the sender and the receiver must use the same code and know the same rules of the language. The sender takes an idea and applies the appropriate language rules to put the idea into code. In spoken language, the sender then transmits the code through speech production. Also in spoken language, the listener hears the sound transmission, applies the same language rules to match the code with the one already neurologically stored, and then, one hopes, comprehends the message. In other words, the sender *encodes* the message, and the receiver *decodes* the message. Terms often used interchangeably with *encoding* are *expression* and *production*, while *reception*, *understanding*, *interpretation*, and *comprehension* are terms often considered synonymous with *decoding*.

It is generally agreed that for adults in most situations, comprehension skills are greater than production abilities. For example, for most of us, our understanding vocabularies are superior to our expressive vocabularies (the words we use to convey our thoughts to others). There has also been a general belief that this superiority of comprehension over production applies to children in their acquisition of language. This belief appears reasonable when one considers the superiority of receptive to expressive skills in adults and when one observes that very young children often appear to understand much more language than they produce.

The research on the acquisition of comprehension and production skills in children has, however, yielded some conflicting results. It appears that in some situations children's comprehension of language does precede their production. This certainly is true in the early stages of language learning. However, in other situations, production abilities appear superior. Factors such as the definition of comprehension being used, the degree of comprehension being measured (e.g., depth and/or breath of comprehension of the word *snake*), and the amount of contextual support attached to the comprehension tasks likely affect how we interpret the relationship between production and comprehension. It may be that the relationship between comprehension and production changes with age. It may also be that comprehension and production are related but distinct skills. As Miller and Paul (1995) write, "One thing we have learned is that language comprehension and production, while following predictable patterns of acquisition in most children, do not always correspond perfectly to each other, even in an individual child" (p. 1).

## COMMUNICATION MODES

In our discussion of comprehension and production, the primary focus was placed on hearing as the input modality for comprehension, and speaking as the output modality for production. These are the input-output modalities that make up the auditory-oral system for language. The auditory-oral system is the most common way of using language and the one that most children acquire first. However, other combinations of input-output modalities that people may use include the visual-graphic (reading and writing) and the visual-gestural systems, as shown in Figure 1.2.

### Auditory-Oral System: Hearing and Speech

The functional components of the auditory-oral system are hearing and speaking. Phylogenetically, humans heard and comprehended before they read, and they spoke before they acquired the ability to write. In the history of the human species, we have been hearing and talking for a very long time, and our bodies have had lots of time to evolve to

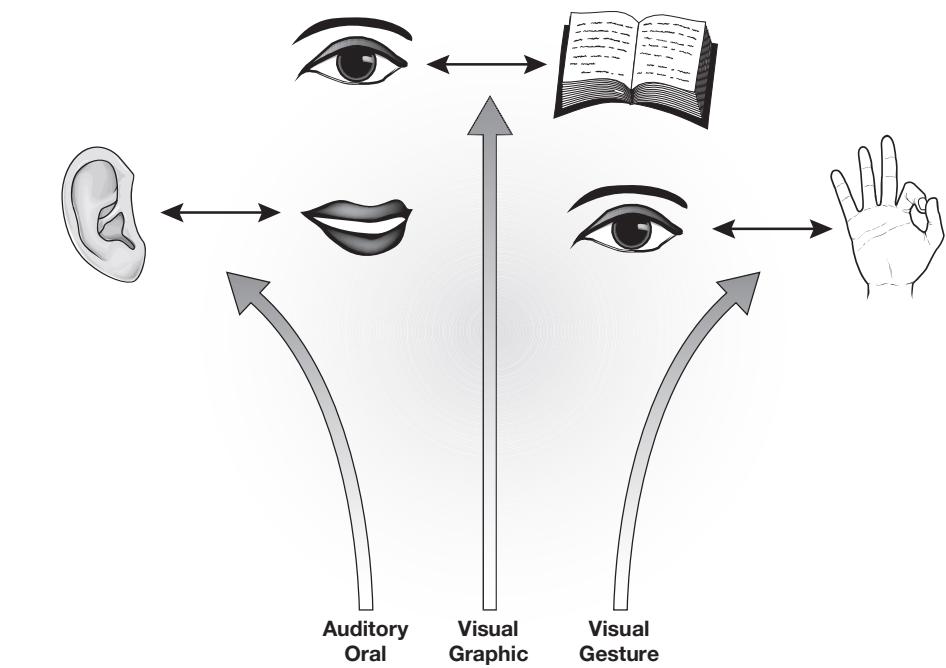


FIGURE 1.2 | Modes of Communication

support these functions well. By comparison, we have been reading and writing for only a short time, and our bodies have not had quite the same amount of time to evolve to support these functions as well. In many ways, the auditory–oral mode for language is also more flexible than the visual–graphic mode. Vision is a unidirectional sense, whereas hearing is multidirectional. We can see in only one direction at a time, but we can hear sounds originating from many directions despite the positions of our heads. Furthermore, we can talk when our hands are busy, but we cannot write. Speaking needs no special instruments, whereas writing requires the use of a pencil, pen, or a keyboard.

Children typically learn to use the auditory–oral system before they learn to use the visual–graphic system. That is, they can listen and speak before they know how to read and write. Developmentally, maturation of the physiological bases for audition and speech occurs before those used for reading and writing. Yet developmental maturation is not the only reason for children’s earlier proficiencies with the auditory–oral system. For most Western languages, writing evolved as a system of visual symbols used to represent auditory symbols. The auditory–oral system is generally the basis of the visual–graphic system.

### Visual–Graphic System: Reading and Writing

In the visual–graphic system, reading is employed as the input mode, and writing is used as the output mode. As indicated above, reading and writing are relatively newly acquired human skills, so the neurophysiological bases of these functions have not had as much time to establish themselves in humans as the neurophysiological bases of listening and speaking. Nevertheless, the functions of reading and writing are closely related to the auditory–oral system. In many respects, the visual–graphic system is a code for another code—the auditory–oral system. As a code, language symbolizes experiences and thoughts. This code can then be represented by a system of sounds combined to form words and sentences. However, these sounds (which are themselves a code) can be recoded and rerepresented as visual rather than auditory symbols. That is, reading and writing are codes for hearing and speaking, which themselves are codes for the actual experiences or ideas. In the process of learning the visual–graphic language system, children learn a new coding system based on a previously learned code system.

Given the complex reciprocal relationships between the auditory–oral and visual–graphic systems, it is no surprise that children who have problems with the auditory–oral system often have difficulties learning to read and write. Most professionals emphasize both the importance of an adequate auditory–oral system in learning to read and the relationship between oral language skills and reading achievement. In a bottom up theory of reading, the auditory–oral system is viewed as the underpinning of learning to read such that a child learning to read learns to segment printed words, decode letters in them, match them to some stored auditory model (phonetic and phonemic segmentation), and then retrieve a corresponding word (lexical retrieval). However, reading also involves using already known semantic–syntactic information, world knowledge, and information about discourse structure to predict and organize what is being seen on the printed page. This is consistent with the *top-down theory* of reading, in which higher-order linguistic and cognitive skills play an important role in reading. Skills associated with both the bottom-up and top-down theories (phonological and syllabic segmentation, rapid lexical retrieval, semantic–syntactic abilities, narrative skills, general knowledge level) have been found to be factors in learning to read. It may be, however, that these different skills play more prominent roles in the process at different stages in learning to read and in different children at different times. This perspective is consistent with the *parallel, or interactive, theory* of learning to read.

There are several analogies between the visual–graphic and auditory–oral systems. The auditory and visual modalities are the receptive aspects of the two systems, whereas the oral and graphic modalities are the expressive aspects. The auditory component is based on a set of sounds that combine to form spoken words; the visual component is based on a set of letters that combine to form written words. Just as oral production for speech is a sensorimotor process, the same is true for graphic production for writing. Reception for the auditory–oral system involves transduction (conversion of waves into neural impulses) and auditory perception and processing of sound waves. Similarly, reception for the visual–graphic system involves transduction and visual perception and processing of light waves. Rules govern the use of both systems.

Although there are several analogies between the auditory–oral and visual–graphic systems, there are also differences. One difference is the sequence in which the two systems are usually acquired. Furthermore, although rules govern both systems and although some rules are similar, there are also different rules. One obvious difference deals with punctuation. Another relates to spelling. These are not factors in the auditory–oral system. Another difference deals with the level of grammatical complexity. The semantic–syntactic level used in the auditory–oral system is generally less complex than that found in the visual–graphic system once one progresses beyond the early learning stages. Still another difference relates to the amount of context that is available to aid understanding, a factor that we encountered previously in this chapter. Reading and writing are more decontextualized modes of communication than listening and speaking. That is, fewer cues to decipher and impart meaning are available in reading and writing compared to listening and speaking. We cannot point or use facial expressions to communicate in reading and writing, although graphs, illustrations, and pictures are attempts to supplement written material. Another difference is that speech consists of sounds that occur over time, and these are generally temporary and fleeting. Writing consists of marks in space that are relatively permanent and can be referred to repeatedly. However, it is faster to speak than to write, and most children acquire the auditory–oral system without formalized instruction, whereas carefully planned instructional processes are typically offered in schools in order to teach children to read and write. Finally, while use of the auditory–oral system can develop independently of the visual–graphic system, proficiency with the visual–graphic system is exceedingly difficult to achieve without first acquiring some proficiency with the auditory–oral system. This point will be reiterated in later parts of this text.

### Visual–Gestural Systems

Consistent with our earlier discussions, the visual modality combined with gestures, body postures and movements, and/or facial grimaces can be used as communication modes. A form of a visual–gestural communication system, nonverbal communication with its non-linguistic elements, was discussed previously, and that discussion will not be repeated here.

Here we introduce readers to two other forms of visual-gestural communication systems: manual communication and other forms of augmentative/alternative communication. We include brief discussions of these two systems because they are used with some children who have language and/or speech disorders.

**Manual Communication.** Manual communication, or sign language, is sometimes used by people who are deaf or severely hearing impaired. Children with other speech and/or language problems also sometimes use manual communication. There are many forms of manual communication. Some use manual signs that correspond closely to or match exactly the sequence of morphemes in English syntax. Other forms are actually languages different from English. One is American Sign Language (ASL), which, as the name implies, is a language communicated through the visual-gestural modalities used in the United States. However, other English-speaking countries, for example, England and Australia, have different signed languages, such as Auslan in Australia. Just as speakers of one language, such as Greek, will not understand speakers of another language, such as Cantonese Chinese, users of ASL cannot be expected to understand users of Auslan and vice versa.

Understanding that ASL is a language and not English expressed through gestures raises several questions about the education of children who are hearing impaired. For example, are we, in teaching reading and writing to children who already know ASL, attempting to teach them to use a visual-graphic system of a language (English) for which they have little background? Is this a second-language visual-graphic system for them? For those children who acquire some oral communicative skills, are these oral skills based on a different language than the one they may already know (ASL)?

**Augmentative/Alternative Communication.** In addition to manual communication, a number of augmentative/alternative communication (AAC) systems rely primarily on visual-gestural modes for communication. With professionals' increased understanding of and emphasis on communication, greater use of AAC for individuals with speech and/or language problems has evolved. Advances in technology in general have also facilitated the development of a wide variety of more sophisticated, efficient, and flexible AAC systems. Later in this text, we will discuss AAC in more depth as an intervention for some children with language disorders.

## BIOLOGICAL, COGNITIVE, AND SOCIAL BASES OF HUMAN COMMUNICATION

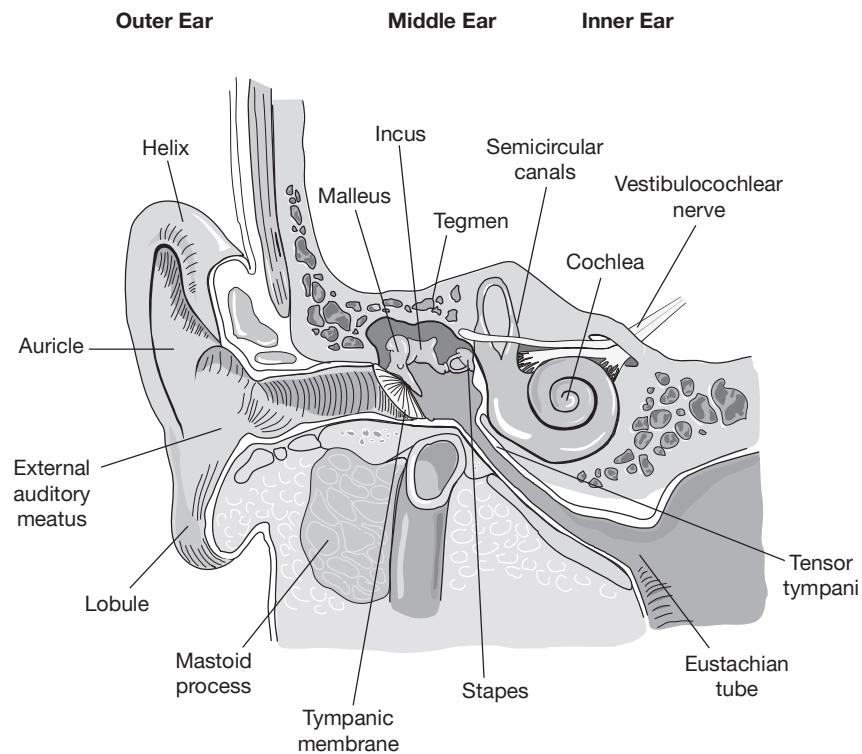
Communication is a complex linguistic, biological, cognitive, and social phenomenon. All these factors are involved in language functioning, but the ways in which they interact are not fully understood. Earlier in this chapter, we discussed some of the linguistic and social bases of language. Here, we introduce some of the biological and cognitive bases of language and include some additional discussion of social bases of language. Volumes have been written on each of these topics. We cannot hope to cover them in depth in one chapter. Rather, this chapter provides an overview or, for some readers, a refresher.

### Biological Bases of Communication

In the previous section on communication modes, we read that hearing and speaking were identified as the primary modalities used in spoken languages. Although other modalities, such as vision and gesture, may contribute to the total communicative process, our discussion here provides an overview of the major physical bases of auditory-oral language: the ear, the speech mechanism, and the nervous system.

#### Hearing and Listening

**Basic Anatomy and Physiology of the Ear.** The ear is the sensory mechanism that receives sound waves and converts them into mechanical, hydraulic, and finally electrical/electrochemical energy (neural impulses). If the ear is not adequately sensitive to a variety of sound



**FIGURE 1.3 |** The Ear

frequencies (the psychological parallel is pitch) and intensities (the psychological parallel is loudness), auditory information needed to receive and understand the spoken code of others is prevented from being converted to neural impulses and reaching the brain.

The ear consists of three main parts: the outer ear, the middle ear, and the inner ear. Together these are the peripheral hearing mechanism (Figure 1.3). In the *outer ear*, the auricle and ear canal (external auditory meatus) collect sound waves and funnel them toward the middle ear, where the waves hit the eardrum (tympanic membrane) and make it vibrate. The movement of the eardrum, now mechanical energy, is transferred to three small bones of the *middle ear*—the malleus, incus, and stapes—which pass the movement to the inner ear. The major structure for hearing in the *inner ear* is the cochlea. The *cochlea* contains a membranous structure suspended in fluid. As the mechanical energy in the middle ear reaches the inner ear, the fluid is set in motion. Mechanical energy now becomes hydraulic energy. As the fluid moves, it impinges on the membranous structure in the cochlea that also contains fluid and the end organ of hearing, the *organ of Corti*. Rows of cells that contain protruding hairs (*inner hair cells*, *outer hair cells*) extend from the organ of Corti to the membrane so that as the fluid moves, it causes the membrane to move, and the result is a rubbing or shearing action on these parts of the organ of Corti. This rubbing converts the hydraulic energy to neural energy, which travels to the brain via cranial nerve VIII (the vestibulocochlear, or auditory, nerve). The brain interprets the neural energy it receives.

*Biological Basis for Listening to Speech.* The middle and inner ears reach their adult size at 20 weeks' gestation. The auditory nerve is developed by the 24th week of gestation. Newborn infants thus enter the world having listened to their internal environment (e.g., mother's blood flow and heartbeat) and external environment (e.g., mother's speech, music, and environmental noises) for some months. They enter the world with some idea of what it sounds like. Infants can in fact discriminate between a variety of speech sounds and linguistic boundaries within weeks and months following their birth. Infants as young as 4 weeks old have also been found to attend longer to facial (lip) movements that match the vowels being heard than those that do not match the vowels being heard (Kuhl, 1990; Kuhl & Meltzoff, 1988).

Apparently, infants' attending skills are intermodal in that they associate lip movements with the appropriate speech sounds. How infants and toddlers actually learn to process incoming auditory stimuli, however, and understand the speech they listen to is a more complex phenomenon.

### **Speech and Talking**

*Basic Anatomy and Physiology of the Speech Mechanism.* The anatomical structures used to produce speech are actually parts of the respiratory and digestive systems (Figure 1.4). The exhaled air from the lungs provides the basic source of energy for speech. It is this air that is modified by the vocal folds in the larynx (“voice box”) and/or the vocal tract—pharyngeal (throat), oral (mouth), and nasal (nose) cavities above the vocal folds—that results in speech. The physical production of speech requires the processes of respiration, phonation, resonation, and articulation.

The *larynx*, located in the front of the neck, houses the *vocal folds*. The function of the larynx is not solely or primarily the production of sound. Rather, the larynx and vocal folds serve to stop foreign objects (such as food) from entering the airway and as such keep us alive. If we want the larynx to produce voice, then respiration and phonation are needed in addition to the functioning of the larynx. *Respiration* involves the inhalation and exhalation of air from the lungs. *Phonation* involves the use of the exhaled air from the lungs in conjunction with changes in subglottic air pressure to create vibrations of the vocal folds.

During the production of approximately one-half of the English consonants, the vocal folds do not move to phonate, or produce voice. Hence, these sounds are termed *voiceless consonants*. The production of voiceless consonants merely requires the air from the lungs to pass unobstructed through the vocal folds into the vocal tract. If a hand is placed lightly against the front of the neck (where the larynx is located) and the consonant /s/ is produced with no accompanying vowel, no vibration is felt. However, during production of all vowels and the remaining consonants, the vocal folds vibrate to create a voiced sound. Thus, phonemes that require vocal-fold vibration are termed *voiced sounds*. Vocal-fold vibration, or phonation, can be felt when a hand is held lightly on the front of the neck as a sound, such as /z/, is produced. The size of the vocal folds and the rate at which they vibrate are primary factors in determining the pitch of a person’s voice. Generally, the faster something vibrates, the higher is the pitch.

After the exhaled air passes through the larynx, it travels through the vocal tract (including the pharyngeal, oral, and or nasal cavities), as shown in Figure 1.4. When the vocal folds have vibrated and therefore vibrated the air, a sound wave is produced, and the vocal tract acts like a resonator, much like the main body of a cello. *Resonation* involves modifying the

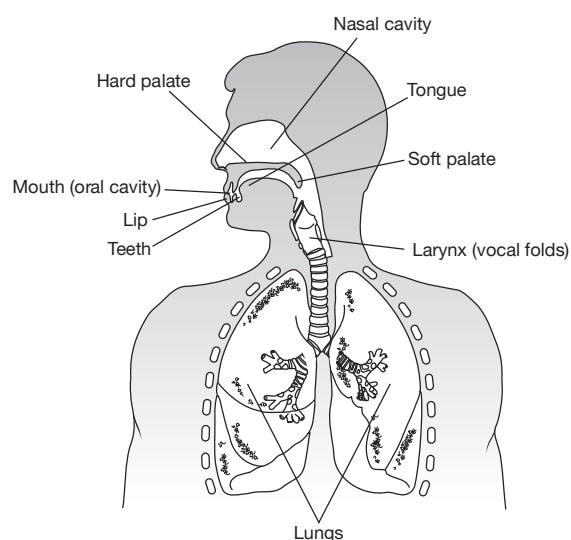


FIGURE 1.4 | The Speech Mechanism

sound generated by the vocal folds by changing the shape and size of the spaces in the vocal tract, which results in some parts of sound waves being emphasized and others being damped. The outgoing air (whether or not the vocal folds are vibrating) also hits barriers in the form of the palate (the roof of the mouth), the tongue, lips, and teeth. These barriers, some of which are movable, such as the tongue, are the articulators, and the different positions they take give the outgoing air (vibrating or not) different characteristics, that is, *articulation*.

The *impedance* (obstruction, barrier) of the air is greater for consonants than vowels. Some obstructions for consonants are complete and are then released (e.g., /p/, /t/, /k/), while other obstructions allow for an obstructed but continuous flow of air (e.g., /s/, "sh"). The type of obstruction is called the *manner of formation*. The place in the mouth where obstruction occurs for consonants (e.g., lips-teeth for /f/ or back of the tongue for /k/) is termed the *place of articulation*. The different positions of the articulators cause sound energy to be concentrated in different frequencies. For example, /s/ and /z/ have sound energy concentrated in higher frequencies, whereas /f/ and /v/ have sound energy concentrated in lower frequencies. If a consonant is voiced, such as /z/, the mouth noises created by the articulators are superimposed on the vibrating air created by the vibrating vocal folds. Therefore, voiced sounds have a fundamental frequency from the vocal-fold vibrations, which is comparatively low, and concentrations of sound energy in certain other higher frequencies (mouth noises) because of the obstructions of the articulators. For most English vowels and consonants, the exhaled air is directed into the oral cavity, or mouth. However, production of three English phonemes ("m," "n," and "ng") requires that the air be directed into the nasal cavity to create a nasal resonance (*nasalization*). The effect of the air in the nasal cavity can be felt if an index finger is placed lightly along the boney side of the nose while saying a prolonged /n/. As all three nasal sounds are voiced, the nasal resonance is superimposed on vocal-fold vibration.

For vowels, all of which are voiced, as we have noted, the articulators place few obstructions in the way of the exhaled air. Instead, movement of the articulators changes the internal shape of the mouth cavity in order to give each vowel its unique sound. These changes concentrate sound energy in different frequencies. For each vowel, energy concentration occurs in identifiable bands at different frequencies, including the low-frequency one associated with the vocal-fold vibrations. The frequency location of the higher-frequency bands of energy gives each vowel its unique acoustic features. The bands of energy are called *formants*, which are particularly important for receiving and perceiving speech and play important roles in what children with hearing impairments might be able to detect and perceive.

*Biological Basis for Speech Production.* Infants' vocal tracts become adultlike over the first 3 years of their life. Unlike the ear, which is born ready to listen to speech, the infant vocal tract differs from the adult and so is not in such a ready state for producing speech. Hillis and Bahr (2001) note the following differences between the newborn's vocal tract and that of the adult:

1. The oral space of the newborn is small.
2. The lower jaw of the newborn is small and somewhat retracted.
3. Sucking pads are present in infants but not in adults.
4. The tongue takes up more relative space in the newborn, because of the diminished size of the lower jaw and the presence of sucking pads in the cheeks.
5. The tongue shows restrictions in movement, partially because of the restricted intraoral cavity in which it resides.
6. Newborns are obligated mouth-breathers. They do not breathe through their noses.
7. The epiglottis and soft palate are in approximation in the newborn as a protective mechanism.
8. Newborns can breathe and swallow at the same time.
9. The larynx is higher in the neck of the newborn than in the older infant or adult. This eliminates the need for sophisticated laryngeal closure to protect the airway during swallowing.
10. The Eustachian tube in the infant lies in a horizontal position. It assumes a more vertical angle in the adult. (pp. 17-18)

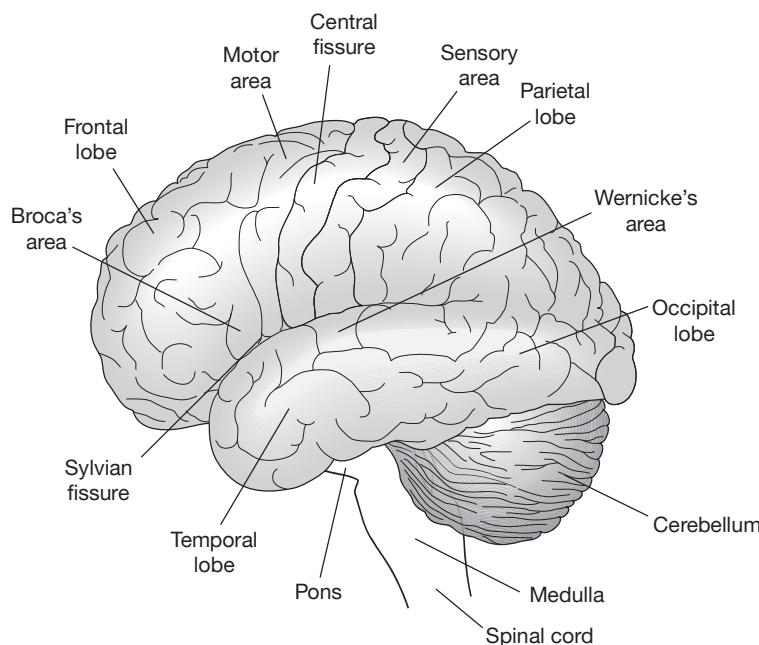
Over the first 3 years of life, the vocal tract anatomy and function of a child change. For instance, tongue muscle tone increases, tongue movements become dissociated from jaw movements, lip closure improves, the larynx moves farther down the vocal tract, and more sophisticated movements (including elevation) of the larynx occur during swallowing (Hillis & Bahr, 2001). Together, these changes coincide with an improvement in the child's ability to articulate. Thus, although the speech production mechanism is devoted primarily to breathing and swallowing, it develops into a marvelous platform for speech production.

### **The Controller and Interpreter: The Nervous System**

*Basic Anatomy and Physiology of the Nervous System.* Two major divisions of the nervous system are integrally involved in communication: the central nervous system (CNS) (brain and spinal cord) and the peripheral nervous system (PNS) (cranial and spinal nerves). A third division, the autonomic nervous system, regulates the presumably involuntary bodily functions, such as stomach and bowel contractions and heartbeat. Since this last system affects speech and language only indirectly, it will not be discussed here.

**The Central Nervous System.** At its superior end, the spinal cord forms a structure known as the *brain stem* (Figure 1.5). The cerebrum (often referred to as the *brain*) sits on top of the brain stem and surrounds it, much as a mushroom top surrounds the upper stem of the mushroom. The wrinkled outer surface of the cerebrum is the *cortex*. The cerebellum is located below the cerebrum and behind the brain stem. Like the cerebrum, the cerebellum also has a wrinkled outer surface called a cortex. The wrinkles of both structures are the result of folds in the surfaces. Each ridge created by these folds is known as a *gyrus*, or *convolution*, and each indentation caused by the folds is called a *sulcus*, or *fissure*. These convolutions and fissures provide us with landmarks in order to describe the brain. These also result in greater brain surface area than would a smooth surface.

Both the cerebellum and the cerebrum are divided into left and right hemispheres. Each cerebral hemisphere is further divided into four lobes. The most anterior lobe is known as the *frontal lobe*. The *parietal lobe* lies behind the frontal lobe and is separated from it by the *central fissure*. Behind the parietal lobe is the *occipital lobe*. The *temporal lobe* is on the side and separated



Lateral View

FIGURE 1.5 | The Brain

from the frontal lobe by the *Sylvian fissure*. The area around the Sylvian fissure is known as the *perisylvian area*, which contains the *planum temporale* in the upper portion of the temporal lobe in the perisylvian area. The planum temporale is well implicated in language function.

The cells that make up the nervous system are referred to as *neurons*. Most neurons contain a nucleus (contained within a cell body), an array of dendrites extending from one side of the nucleus—which conduct impulses toward the nucleus—and an axon extending from the other side of the nucleus—which conducts impulses away from the nucleus. When a neural impulse is generated by the nucleus of a neuron, the impulse travels along the axon until it reaches another cell. The point at which one neuron meets another is referred to as a *synapse*. The neural impulse then crosses the synapse and continues its journey onto adjacent cells via chemicals known as neurotransmitters. Curiously, the power and complexity of the human brain are due not to the number of neurons but rather to the rich array of interconnections (particularly dendritic connections) between neurons.

As the result of studies investigating the effects of damage to parts of the brain on neurological functions and, more recently, studies using newer neuroimaging techniques, we know that certain functions in adults are generally related to different parts of the cerebral cortex. The *motor area* is located in the frontal lobe in front of the central fissure. Neural impulses are sent from the motor area to various muscles of the body, including those involved in speech production, in order to produce movement. For most adults, regardless of which hand is dominant, the left cerebral hemisphere is the primary controller of speech and language. For the majority of the population, the left frontal lobe in front of the motor area and above the Sylvian fissure is a region known as *Broca's area*. This area programs speech production. It coordinates neural signals that then travel to the motor area (also located in the frontal lobe but in front of the central fissure) and subsequently to the articulators. Congruent with the left hemisphere's dominance for speech and language, Broca's area in the left frontal lobe is typically described as more convoluted than the corresponding area in the right hemisphere. Furthermore, for adults, damage to Broca's area in the left hemisphere impairs speech production, whereas damage to the same area in the opposite hemisphere typically results in no discernible disturbance of speech production. The sensory area of the cerebrum is located in the parietal lobe just behind the central fissure. This area receives neural impulses from various parts of the body and uses this information to help control functions in those parts of the body.

Many of the functions of the temporal lobe are involved in receiving and processing auditory stimuli. For example, the auditory (vestibulocochlear) nerve, which transmits neural impulses from the ear to the brain, courses toward the temporal lobe. An area in an adult's left hemisphere especially important for the comprehension of oral language—Wernicke's area—is located partially in the temporal and partially in the parietal lobe. The left Wernicke's area is dominant for understanding spoken words. In contrast, processing of other types of sounds, including music, generally takes place largely in the right hemisphere. However, there is some evidence that in adults, both the right and the left temporal-parietal areas are active when they listen to speech.

Although certain functions can be attributed to specific parts of the cerebral cortex, there are tremendous interactions among areas of the brain, interactions requisite for normal functioning, including language learning and function. One way in which the structure of the cerebrum provides for functional interrelationships among cortical areas is via its association fibers. These fibers, located in the interior of the cerebrum, interconnect various cortical areas, including lobes and hemispheres. The largest and most important interhemisphere fiber is the *corpus callosum*. Another particularly important association fiber connects Wernicke's area with Broca's area.

The cerebellum is the last structure of the CNS to be discussed. This structure is integrally involved in analysis and coordination of motor activity, although it does not initiate any of the activity. Its analytic and coordinating functions result in the ability to produce well-timed, smooth movements.

**The Peripheral Nervous System.** The PNS is made up of 12 pairs of cranial nerves and 31 pairs of spinal nerves. The cranial nerves extend from the brain stem primarily to the neck and head areas, and the spinal nerves extend from the spinal cord to the remaining lower parts

**TABLE 1.6 |** Seven Cranial Nerves Involved in Language and Speech

Number of the Nerve	Name	Functions
V	Trigeminal	<i>Sensory</i> —face; jaw; mouth <i>Motor</i> —jaw; soft palate
VII	Facial	<i>Sensory</i> —taste; mucous membrane of soft palate and pharynx <i>Motor</i> —face; lips
VIII	Vestibulocochlear (auditory)	<i>Sensory</i> —hearing; balance
IX	Glossopharyngeal	<i>Sensory</i> —taste; mucous membrane of pharynx, middle ear, and mouth <i>Motor</i> —pharynx
X	Vagus	<i>Sensory</i> —mucous membrane of pharynx, larynx, soft palate, tongue, and lungs <i>Motor</i> —larynx; pharynx
XI	Accessory	<i>Motor</i> —soft palate; larynx; pharynx; neck
XII	Hypoglossal	<i>Sensory</i> —tongue <i>Motor</i> —tongue

of the body. Many of the nerves contain both sensory fibers (which travel to the CNS and provide it with information) and motor fibers (which transmit commands from the CNS to various parts of the body). Cranial nerves are identified by both roman numerals and names. Seven of these 12 pairs of cranial nerves are especially important for speech and language functions (*see* Table 1.6). These nerves carry the command signals originating in the CNS to the specific muscles of speech production that they innervate. Their sensory fibers then feed back to the CNS information about the performances of muscles. This allows the CNS to monitor the activities and send corrective signals if necessary. Furthermore, information about the acoustic characteristics of a speech signal, sent to the CNS via the auditory nerve, augments other sensory data about an organism's speech and language performance.

*Neurological Basis for Human Communication.* Much of our discussion thus far has centered on the adult nervous system. Care must be taken when attempting to draw parallels between adult and child neurological functioning. The nervous systems of children are immature. Like the speech production mechanism, the newborn's nervous system, particularly the CNS, has further anatomical and physiological advances to come. This can be seen by the sheer difference in weight of the human brain. At birth, the infant's brain weighs only 25 percent of the adult brain weight. However, 5-month-old fetuses may have complete sets of neurons. Rather than more neurons, an increase in the interconnections between the neurons results in the increasing brain weight in a child's postnatal brain development. If we focus on the areas of the brain involved primarily in communication development, according to Hillis and Bahr (2001), by about 3 months of age dendritic branching becomes "more advanced in the oral area of the cortical motor strip than in Broca's area and in the right hemisphere than in the left hemisphere" (p. 3). By around 2 years of age, dendritic branching is thought to become more complex in Broca's area and throughout the rest of the left hemisphere, and by 6 years of age, dendritic branching in Broca's area is more advanced than the oral region of the motor cortex (Hillis & Bahr, 2001). Thus, children are born with the neurological *potential* for speech and language acquisition. With exposure and experience, children's brains change and learn to understand and produce speech and language.

Having noted that certain parts of the adult brain are dedicated to linguistic functions and that children's brains gradually develop the rich array of interconnections seen in the adult brain, children's brains differ from those of adults in one particularly important aspect. Children's brains are described as having more *plasticity* and less cerebral *localization* and specialization than those of adults. Consequently, the effects on language seen from focal CNS damage in adults may not be seen in children. Damage limited to left-hemispheric areas in children appears not to account fully for the presence of developmental language disorders as opposed to language disorders seen in children who have acquired language problems as a result of childhood trauma or disease. Although we have come a long way in our knowledge, we do not currently have a thorough understanding of how the brain works, including its functioning with regard to learning language and speech initially and subsequently performing activities related to learned language and speech. This explains, in part, why we still do not have all the answers regarding language disorders in children.

### Cognitive Bases of Language

**What Is Cognition?** For months before birth, an infant was curled up in a protective and nurturing environment. The day of birth brings with it a new environment to get to know and understand if he or she is to survive. Thus, cognition is the process of getting to know the environment and to make sense of it, a process that starts at birth or earlier and continues throughout life as stimuli, events, and environment continuously change.

According to Piaget (1954), infants have psychological structures (schemas or schemata) that allow them to process and organize incoming stimuli. Over time, these schemas adapt or change in response to incoming stimuli. In Piaget's pursuit to understand the development of cognition, he proposed a series of stages through which children progress as they learn to "get to know" the world in which they live. Specifically, Piaget proposed four stages of cognitive development: (1) the sensorimotor stage from birth to about 2 years, (2) the pre-operational stage from about 2 to 7 years, (3) the concrete operations stage from about 7 to 11/12 years, and (4) the formal operations stage from about 11 years to 14/15 years. These are described in more detail in Table 1.7.

Within the first year of infancy, specifically during the sensorimotor stage of cognitive development, children develop a particularly important cognitive ability that enables them

**TABLE 1.7 |** Characteristics of Piaget's Stages of Cognitive Development

Sensorimotor (0–2 years)
<b>Substage 1: 0–2 months</b>
Reflexive sensorimotor behavior
Reflexive vocal/prelinguistic behavior
<b>Substage 2: 2–4 months</b>
Coordinated hand–mouth movements
Coordinated eye–hand and auditory orienting movements
Anticipatory gestures
<b>Substage 3: 4–8 months</b>
Begins to act motorically on objects
Searches for objects
Babbles and imitates sounds
<b>Substage 4: 8–12 months</b>
Begins to recognize own ability to cause objects to move
Early stages of walking
Searches for objects based on memory of last location
Uses first word

**TABLE 1.7 | Continued**

Sensorimotor (0–2 years)
<i>Substage 5: 12–18 months</i>
Experimentation with objects' functions and properties Imitates models' behaviors when models present Walks Evidence of object permanency
<i>Substage 6: 18–24 months</i>
Represents objects internally Problem solving with thought Acquires basic cause–effect relations Uses memory for deferred imitations Uses words when referents not present
Preoperational (2–7 years)
<i>Preconceptual: 2–4 years</i>
Experiences difficulty with sub- and supra classifications Uses transductive reasoning (inferences from one specific to another specific) Over- and underextends word meanings
<i>Intuitive: 4–7 years</i>
Thought guided by perceptions Deals with only one variable at a time Lacks conservation and reversibility Employs improved but still inadequate classification skills Egocentric Concreteness of thought
Concrete Operations (7–11/12 years)
Uses effective classification skills Acquires conservation and seriation skills Uses coordinated descriptions Employs logical causality Reasoning limited to concrete operations Less egocentric
Formal Operations (11/12–14/15 years)
Uses hypothetical and prepositional reasoning Demonstrates lack of egocentricity Employs adequate verbal reasoning and logical “if . . . then” statements Can deal with the abstract Uses deductive and inductive thought processes

to learn more about the world in which they live—they learn to create symbolic mental representations. That is, they learn to represent their environment in their brains, not just as it occurs in the here and now. This is important for language acquisition. Recall that earlier in this chapter we defined language as a code in which we make specific symbols stand for something else. Thus, it would seem that cognition and language are related. However, there is no universal agreement concerning the nature of the relationship. Does cognitive development for specific mental processes occur *before* the acquisition of language structures? Does language influence cognition? Are the developments of language and cognition separate entities that become entwined at some point? If so, when? Finally, how do language and cognition influence each other? We have no definitive answers to these questions yet, although a number of theoretical positions regarding the relationship of language and cognition have been advanced.

**The Relationship between Cognition and Language.** The relationship between cognition and language is not completely understood but many theories about this relationship have been proposed. The theories have been known to cause scholarly debates among their proponents, some more heated than others. An in-depth discussion of the theories is not appropriate for this text, so the following sections present a few of the more prominent perspectives of the earlier theorists whose work has provided foundations for our thinking about language and cognition today and whose work has, therefore, influenced many of the intervention approaches that are used with children with language disorders.

**Dependency of Language on Cognition.** According to one view of the relationship between language and cognition, language use is a function of cognition, and its acquisition is dependent on underlying cognitive processes. Proponents of this position strongly support the notion of cognitive precursors to language, that is, prerequisite cognitive abilities that children need to develop before learning various language skills. This viewpoint is sometimes referred to as the *strong cognition hypothesis*.

Piaget is one of the best-known advocates of this position. According to Piaget, children progress through each of the cognitive developmental stages he proposed (see Table 1.7) in order, without skipping any of them, and each stage of development is the foundation for each succeeding stage. As children progress through the stages, they acquire the necessary cognitive operations that lead to the development of successively higher levels of language. Piaget, therefore, believes that thought precedes language. Language use is a reflection of underlying cognitive skills.

A related view of language functioning as dependent on cognition is the *weak cognition hypothesis*. This position proposes that cognition accounts for many of a child's language abilities but not all of them. There remain some aspects of language that do not derive directly from cognition. Rice (1983) referred to this as a partial "mismatch" between language and cognition and presented, as examples of the mismatch, "language acquisition not rooted in parallel change in meanings, linguistic competence exceeding the supposed cognitive base, and language-specific difficulties with the expression of meanings" (p. 353).

**Language and Cognition as Separate (but Sometimes Related) Entities.** A differing point of view concerning language and cognition is that although language and cognition are related, cognitive activity without language and language without underlying cognitive bases are both possible. For example, a composer or a sculptor at work is not necessarily directed by language processes (Langacker, 1968). From this perspective, cognition without language is possible. In contrast, Vygotsky (1962) proposed that language without appropriate underlying cognitive bases also occurs. He cited examples in which children correctly use conjunctions, such as *because*, *but*, and *if*, before they understand the logical relationships expressed by the terms.

Vygotsky (1962) also suggested that the developments of language and thought stem from different roots. A child progresses independently through a "preintellectual language" period and a "prelinguistic thought" phase. Although these lines of development are separate for some time, the two developmental processes do eventually merge. The child's thought then becomes verbal and language rational. According to Vygotsky (1962), once the union of language and thought has occurred, language becomes the foundation of further cognitive development:

The . . . [language] structures mastered by the child become the basic structures of his thinking. . . . The child's intellectual growth is contingent on his mastering the social means of thought, that is, language. (p. 51)

The *local homology model* offers a different point of view (Bates, 1979; Bates, Benigni, Bretherton, Camaioni, & Volterra, 1977). Some have observed that certain cognitive and linguistic skills develop at the same time but not necessarily in a predetermined order. That is, a specific language ability sometimes emerges first, and in other instances a cognitive ability appears. This perspective suggests a correlative relationship between language and cognition for some skills at certain points in time, but the particular correlation between cognitive

and language skills may not be maintained over time. Both language and cognition are seen as distinct functions that derive from a common but separate source. This model has found considerable favor with a number of professionals and researchers in the child language area.

*Language Mediation of Cognition.* Although there may not be agreement on the exact nature of the early relationship between language and cognition, many suggest that, once acquired, language does mediate many of our cognitive processes. Although Piaget believed that in the earlier stages of a child's development thought precedes language use, he stressed the importance of language in the acquisition of conceptual thinking in the later stages of a child's development.

Both Vygotsky (1962) and Luria (1961) have proposed that language mediates cognitive activity. They used their concepts of *inner speech* and language as a *second signal system* to explain. Vygotsky (1962) and Luria (1961) viewed inner speech as thought processes that take place in the form of words. Once language and thought have merged (as previously discussed), thinking occurs in terms of language or word meanings.

Vygotsky's concepts of inner speech led him to disagree with Piaget on the role of children's *egocentric* speech. Piaget described the egocentric speech of young children as speech that occurs with no intent to communicate with others, whether or not others are present, or with no attempt to consider the informational needs of others in communication. It is speech emanating from children who see themselves as the centers of the universe, without communicative concern for others. According to Piaget, egocentric speech disappears as children develop, and socialized speech—speech aimed specifically at interpersonal communication—emerges. Vygotsky, however, proposed that the egocentric speech of children is a forerunner of inner speech. He viewed the function of egocentric speech as an overt act of thought, or putting thought into expressed words. According to Vygotsky, the acts of expressing cognitive processes in words are children's ways of guiding and regulating their actions and thoughts. He suggested that as children develop, they are able to turn the overt expressions of thought inward into language, which is used for the same purposes of regulating and guiding thoughts and actions but is not heard by others, that is, inner speech. In contrast to Piaget, Vygotsky described egocentric speech as evolving into inner speech rather than disappearing and being replaced by socialized speech.

The discussion of egocentric speech functioning to regulate and guide thought and action and then evolving into inner speech for the same guiding and regulating purposes leads us to Luria's view of language functioning as a second signal system. As children interact with the environment and the verbalizations of adults, complex connections between perceived phenomena and words are formed (Luria & Yudovich, 1971). Initially, adult verbalizations in the presence of stimuli serve to guide children's behaviors, either to focus the children's attention on specific, essential features of stimuli or to modify and direct their actions in certain directions. That is, in the early developmental stages, the regulation (or direction) of children's cognitive activities and behaviors is externally controlled by the verbalizations of adults that occur simultaneously with perceived phenomena. Because of the connections between these perceptions and others' verbalizations, children eventually begin to use the verbalizations internally to regulate their own behaviors. Through this process, children learn to use language to direct their own thoughts and actions. Language becomes a mediator of cognition and purposeful behavior. For Luria, language is the basis of the development of higher mental processes because of the second signal function it plays in mediating experiences.

We have seen here several different views on the relationship between language and cognition. What we generally agree on, however, is that there is a relationship and that the relationship is different at different stages of development.

**Information Processing.** Information processing refers to the ways in which we deal with incoming stimuli and what we do in our heads to figure them out. There is considerable discussion in the literature about the role of various aspects of information processing in children's language learning and language disorders (e.g., Coady & Evans, 2008; Graf Estes, Evans, & Else-Quest, 2007; Leonard et al., 2007; Montgomery, Evans, & Gillam, 2009; Windsor,

Milbrath, Carney, & Rakowski, 2001). Several information processing models have been proposed, and in comparing models it is not unusual to find that they include different component processes, label the processes differently, and use different definitions for what appear to be similar processes. Furthermore, no one information processing model has been universally adopted. Ellis Weismer and Evans (2002) suggest that information processing accounts related to children's language disorders fall mostly into two broad groups—those emphasizing generalized processing and those focusing more on specific aspects of processing. Among the specific processing accounts, two aspects of processing are frequently discussed—phonological processing, which deals with the processes involved in the ability to mentally manipulate phonological aspects of language such as word rhyming or breaking words into their components, and temporal auditory processing, which deals more specifically with the ability to perceive brief acoustic events that comprise speech sounds and track changes in these as they occur quickly in others' speech. Among the generalized processing accounts, speed of processing (e.g., Miller, Kail, Leonard, & Tomblin, 2001), attentional capacity (e.g., Finneran, Francis, & Leonard, 2009), and overall processing capacity (Ellis Weismer, Evans, & Hesketh, 1999; Montgomery, 2000) are among those prominent in discussions.

Processing linguistically based (verbal) information involves such functions as the following:

- Selecting the elements of a verbal message to attend to
- Temporarily storing the representations of those elements in memory
- Keeping those representations active in our short-term memory so that they do not fade, disappear, or decay before we are finished working with them
- Organizing our cognitive functions and directing them to undertake particular tasks with the representations, that is, our analysis of the representations
- Choosing where and how to store the analyses of the representations in longer-term memory for future use—or in some cases not sending the analyzed information to long-term memory store

It can also involve how and when we access the stored information at a later date, the form in which it is available to us, and the degree to which the original elements are or are not distorted as a result of all the processing. On a small scale, it is not unlike what we do when someone tells us a new telephone number and we need to walk into another part of the house to dial it. Most of us attend carefully to presentation of the number and then make a conscious (cognitive) effort to keep the number rumbling around in our heads so that we can actually "hear" the number silently in our heads as we move to the other room. We do not want any part of the auditory representation of the complete number to disappear on us. If the number is one we believe we need only once, many of us promptly let the auditory representation of the number in our heads decay after dialing it. That is, we forget the phonological representation, "phonological" because the numbers are words to us and the words are made up of phonemes. If we believe we will need the number again at a later time after we dial it, we undertake different processing strategies to move it into our long-term memory, or we record it somewhere else in a different form. If we do the latter, we need to be able to find it when we need it—another memory process. If we decide to store it in our heads, we still need to be able to find and retrieve it when we need it—a different processing and memory process. Some of the associated terms encountered in information processing literature are *verbal working memory*, *working memory*, *short-term memory*, *auditory short-term memory*, *auditory processing*, *phonological processing*, *phonological memory*, and so on. Different terms are obviously associated with different accounts of information processing.

If we have inefficient or slow processing, smaller temporary storage capacities or resource limitations, poor working memories, problems dealing with fleeting, transitory auditory stimuli, or poor executive override and control of our processing, the elements we need to retain for processing incoming stimuli will decay in our heads before we have a chance to go through all the other processes we need to do with them for them to make sense, be usable,

or learn from. Something we also need to keep in mind is that while we are trying to process one thing, other information is coming our way. “System overload” is possible if tasks to be processed are too hard or too fast for us and/or our systems are too fragile to deal with what might be quite easy tasks for another individual with a more robust system. These ideas find their way into concepts about children and their language impairments when we talk about trade-offs between different aspects of language performance, children’s repetition of non-sense words as a way of assessing their information processing of phonological aspects of language, rehearsal strategies, central auditory processing disorder, and many other topics related to children’s language learning or their problems with language. These are among the concepts associated with information processing ability that readers will encounter in different parts of this text. In fact, our upcoming discussion of metacognition is not devoid of notions related to information processing.

**Metacognition.** Earlier in this chapter, we introduced the concept of metalinguistics. Like metalinguistics, metacognition relates to the ability to stand back from what we know and the cognitive skills that we have and to consciously analyze, control, plan, and organize them. As adults, we can think about our thinking and can decide what learning and cognitive strategies we might want to use in specific situations. We can even monitor our performance and may decide to employ different learning or cognitive strategies. For example, if we need to memorize a list, we might choose to use any of several types of rehearsal strategies—saying the list over and over, writing the list over and over, or making up sayings (associations). If one strategy does not work, we may choose to abandon it for another or to use several strategies simultaneously. In other instances, we may ask ourselves, “What else do I know with which I can associate this new piece of information?” or “How can I organize this information so it makes sense?” These are all metacognitive activities.

In order to engage in metacognitive activities, we need to *decenter*, that is, be less egocentric. Like metalinguistics, true metacognition in children is a later-developing skill, with some suggesting a shift to metacognitive abilities occurring sometime in the early elementary grades. These grades tend to correspond to about the time children enter Piaget’s concrete operations stage (Table 1.7). Another shift to higher-level, more refined metacognitive skills is generally seen at about grade 6, or 11 to 12 years of age, about the time children enter Piaget’s formal operations stage.

Not surprisingly, metacognitive skills are important in school success. Expectations for how children are to solve problems and approach learning increase as children progress through school. By high school, students are expected to monitor and plan their own learning and to think and reason with adultlike abilities. We suspect some relationship between metacognitive and metalinguistic skills, but, as with the relationship between cognition and language generally, the exact nature of the relationship is not clear. We do know, however, that many children with language disorders evidence problems with metacognitive tasks as well as problems with metalinguistic tasks.

## Social Bases of Human Communication

At birth, babies seem to have an innate tendency to seek social interaction. For example, newborns are particularly attracted to faces despite never having seen one. They will maintain their gaze at the face of an adult who is holding them and even show evidence of imitating facial movements of the adult. We can see how such eye gaze and facial imitations could logically influence an infant’s communication development. In fact, as we will see later in this text, infant’s problems in engaging in early eye gaze and facial imitations may be early warning signs of the presence of possible autism spectrum disorders.

In this section we will see that the social influences in children’s language-learning environments play a major role in their acquisition of language and the rules that govern how the code is used in context. What follows is a short discussion of the social bases of communication. We look at infant–caregiver attachment and the nature of infant–caregiver interactions. We also look at two skills that are integral to social interaction and language learning: imitation and reinforcement.

**Infant–Caregiver Attachment.** During the first few months of an infant’s life, he or she does not appear to mind being held by strangers or being briefly separated from caregivers. However, as infants get older, they begin to show definite signs of attachment. They may cry or become distressed when separated from familiar caregivers. By the time infants learn to crawl, they may display attachment by following their parents and actively seeking to maintain contact with them.

There are several reasons infants become attached to their caregivers. Certainly, one reason for this behavior is that specific adults take care of the infant’s basic needs. However, there seems to be more to the behavior; healthy infant–caregiver attachment may be the result of parents and infants sharing a unique system of communication. Caregivers become familiar with the ways their infants communicate needs and wants. The relationship is reciprocal. Infants learn that their caregivers are the ones who “understand” them and meet needs. In other words, there appears to be an interactional, communicative component to the infant–caregiver attachment.

**Infant–Caregiver Interaction.** Both infants and caregivers have behaviors that are conducive to communication development. As we read previously, infants have a preference for looking at the human face. Caregivers reciprocate by spending time gazing at their infant’s face while producing a wide array of facial expressions that in turn sustain the infant’s interest. Such early interactions provide a social foundation for speech and language development.

**Infant Behaviors during Infant–Caregiver Interactions.** Certain infant behaviors appear to stimulate adults to respond in specific ways. One of the main behaviors or attributes of an infant that seems to motivate adults to attend to them and respond to their needs is their helplessness. As we have also seen, infants prefer looking at the face. This is assisted by the fact that an infant’s best visual acuity is around the distance from the adult face to the infant being cradled in an adult’s arms. Infants also show a preference for their mother’s voice. Other infant behaviors that seem to act as positive reinforcers of adults’ language stimulation include eye gaze, smiling, and reciprocal touch and vocalization. As children become capable of producing some speech, they provide verbal feedback to adults in terms of what has and has not been comprehended, and they signal understanding by increasing their attention to the adults. Thus, children actually regulate the type of input they receive from caregivers so that the input can match what language models the children need to learn from at different developmental levels.

**Caregiver Behaviors and Language during Infant–Caregiver Interactions.** When adults interact with infants, they typically demonstrate a communication style different from the way they communicate with peers. Some of these behaviors include the following:

- Vocalizing in response to an infant’s smile
- Moving in closer to the infant
- Engaging in eye gaze with the infant
- Holding and cuddling the infant in their arms
- Imitating the infant’s behavior
- Waiting for the infant to respond to the adult’s behavior, such as a smile or vocalization, and as such engaging the infant in turn taking
- Engaging in rituals and routines such as “peekaboo”

Caregivers have also been shown to tune in to and respond to the different types of cries produced by their infants (hunger, pain, and anger cry). The caregiver’s responses may, in fact, teach infants that a cry results in attention, and therefore, if they want attention, they initiate a cry.

In addition to the array of adult behaviors listed previously, the speech and language used by adults when conversing with infants and young children differs. Most investigations of adults’ communication with young children have focused on mothers. Consequently, results tend to focus on discussions of *motherese*, or *infant-directed speech*, terms used to describe the unique characteristics of caregiver language patterns to young children. Table 1.8 summarizes a number of the unique characteristics of these patterns.

**TABLE 1.8 |** Characteristics of *Motherese/Infant-Directed Speech*

Short utterances
Syntactically simple but grammatically well-formed utterances
More concrete nouns and verbs and fewer modifiers in utterances
Proper nouns replacing pronouns
Length and complexity varied as a function of children's ages and language skills
Higher pitched than speech addressed to adults
Rising intonation patterns rather than falling patterns at the ends of the utterances
Duration of spoken words longer
Overall rate of speech slowed
Obvious pauses occur between individual utterances in mothers' speech
More than one stressed word in utterances
Stressed words typically substantive words rather than function words

As infants become young children and begin to use speech and language, not only do adults appear to modify their verbal input, but they also appear to alter the ways they respond to children's utterances. For example, corrections of young children's inaccurate utterances tend to be corrections of content (semantics) rather than morphosyntactic or phonological corrections. As children get older, however, mothers begin to correct these latter aspects of their children's utterances. During parent-child communicative interactions, adults have been found to respond to what the children say by using expansions and recasts of the children's utterances, with semantically contingent responses that may be paraphrases of the children's comments. Furthermore, adult responses tend to consist of frequent repetitions of messages.

Thus, it would seem that infant-caregiver interactions lay the foundation for speech and language acquisition. Infants seem to be prewired for social interaction. They also engage in certain behaviors that elicit responses from the adults around them. They become attached to caregivers who understand and respond to the ways in which they communicate. Primitive as these early communicative attempts may be, they pave the way for more complex symbolic communication. Caregivers also seem to have an ability to respond to infants that not only meets their needs but also provides them with a sociolinguistically rich environment that fosters speech and language acquisition.

*Infant-Caregiver Interactions and Language Disorders: A Possible Link?* Infants' responses to adult inputs can motivate the adults to continue their language-facilitating behaviors, discontinue them, or modify the behaviors to some that are less beneficial for language learning. Parents of children with language disorders have sometimes been criticized for not providing adequate and appropriate language stimulation for their children. However, this may not be a totally fair judgment. For the most part, parents of children with language disorders have been found to provide language stimulation similar to the stimulation that parents of younger children with normal language acquisition provide. In other instances, parents of children with language disorders may engage in some types of child-adult interactions that are less conducive to children's language learning. We must be careful, however, not to overgeneralize. In light of our previous discussion, it may be that the children, because of their disorders, do not provide the reinforcement for the parents to engage in appropriate language stimulation activities. It appears that children with a disability may not respond to parents' attention in ways that positively reinforce the parents to provide appropriate language stimulation.

**Imitation and Reinforcement.** The roles of imitation and reinforcement in language acquisition have been debated. Much of this debate has probably resulted from differing definitions of the terms. Imitation, if viewed as children's exact reproductions of adults'

utterances, cannot account fully for the language-learning process. If that were the entire basis of language and speech acquisition, children would not produce novel utterances. On the other hand, if we view imitation in light of Bandura's (1971) concept of social, observational learning, in which adults provide numerous models from which children abstract the key elements to form rules for behavior, then imitation that encompasses the rules, not exact duplications of the models, may well be involved in language learning.

This discussion does not imply that imitation in the form of exact duplications has no role in language learning, although its role may change as a function of age and/or language skill. Young children approaching the end of the sensorimotor stage of cognitive development have been found to produce a high percentage of imitative utterances. However, as productive language skills develop, the number of imitative responses decreases as children begin to use a higher proportion of unique, spontaneously generated utterances.

The role of reinforcement in language acquisition is also unclear. Reinforcement, as it is used in conditioning or stimulus-response theories of learning (Skinner, 1957), is not totally sufficient for language learning. Not all of children's early utterances are reinforced, and those that are may not be reinforced in a manner conducive to learning to talk. Yet children do learn to talk. Humans are social beings. If infants find that their early vocalizations and if toddlers discover that their early words establish and maintain adults' interactions with them, then we may consider that reinforcement is operating. Furthermore, adults' expansions and paraphrases of children's utterances, in addition to providing language models, probably serve to reinforce verbal behavior because they also maintain the adults' interactions with the children and support language production.

## SUMMARY

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In this chapter we have seen that

- Communication refers to the sending and receiving of messages. It can be as simple as a sigh or as complex as a spoken word.
- Extralinguistic aspects of communication include paralinguistics, nonlinguistics, and metalinguistics.
- Language consists of a system of phonological, semantic, morphological, syntactic, and pragmatic rules that are used to put ideas and thoughts into a code in order to communicate them to others and to relate to others. Language is the code; speech is one of several sensorimotor processes that can be used to produce the code.
- Communication involves both comprehension and production, but the relationship between comprehension and production is not fully agreed on.
- Communication can be accomplished through several modes: auditory-oral (hearing and speech), visual-graphic (reading and writing), and visual-gestural modes.
- Communication has biological, social, and cognitive bases.
- Metacognition involves conscious analysis, control, planning, and organization of our thinking.
- Infants have a tendency to seek social interaction, such as a preference for looking at the face, and engage in certain behaviors that make them active partners in their own language learning.
- Caregivers engage in an array of behaviors that facilitate social interaction with infants.

Communication refers to the sending and receiving of messages. For humans, language is the major vehicle for communication. Language comes about as a result of complex interactions among cognitive, physiological, psychological, and sociological factors. Numerous approaches have been taken in attempting to explain these interactions. None alone is sufficient to describe how children learn language. Language is a complicated human behavior that has yet to be explained by any single theory or approach.

# 2

## Normal Language Development

### A REVIEW

#### LEARNING OBJECTIVES

After reading this chapter, you should be able to

- Describe characteristics of infant communication development in the prelinguistic period
- Describe characteristics of language skills of children in the first-word period and aged 1.0 to 2.0 years
- Describe characteristics of language development of children in the two-word period
- Describe major features and characteristics of the language development of preschool and school-aged children
- Describe features and characteristics of language development in adolescence
- Describe features of literacy development and expectations of school and relationships with language

For young children, learning language is a relatively orderly process, although not all children acquire all language abilities in precisely the same order and at identical speed. There is individual variation. Nevertheless, as a general pattern, newly acquired skills are used to modify and augment existing language abilities, and these new abilities are based on earlier learned skills. The process is one of refinement, expansion, and extension. Language learning is synergistic in nature. All components of language—syntax, morphology, semantics, phonology, and pragmatics—interact to evolve gradually into adultlike competence. Although there is variability in individual children's language acquisition, there is also a great deal of consistency. What may be the most amazing aspect of this process is that by about 7 to 8 years of age, most children have learned to use oral language to communicate in basically adultlike fashion. This does not mean, however, that language development stops at these ages. We need to be careful not to fall into the trap of thinking that only uninteresting and minor language development occurs beyond 8 years of age. Many important language skills, especially those essential for higher levels of literacy acquisition and academic success, are not fully acquired until the adolescent years and possibly beyond. For adolescents, however, their continuing language growth is less predictable across individuals than for younger children because what language is acquired varies considerably based on their

individual varying life experiences and academic learning. Nevertheless, 7- and 8-year-old children typically produce a wide variety of well-formed sentences containing large numbers of different words with only rare speech production errors. Moreover, they use these sentence types and words effectively and fluently for many different purposes. Language acquisition in adolescence takes advantage of school curriculum, cognitive growth into the formal operations stage, and prior language learning so that language abilities explode in the areas of metalinguistics skills, discourse genres, high-level abstract semantic skills, complex syntax containing multiply embedded relative and other subordinate clauses, and morphologically complex vocabulary.

In this chapter, we will take a quick trip through some of the language achievements of younger children. The discussion is by no means complete, and much more has been written about children's language acquisition. An extensive discussion is well beyond the scope of this book. What this chapter does provide is an overview of some of the major language milestones during early childhood. We will then turn our attention to language development in adolescence. We also take a brief look at language and emergent literacy, the educational sequence of the early grades in which children need to use their language skills to achieve, and reading expectations across primary and secondary grades.

## THE PRELINGUISTIC PERIOD: THE FIRST 12 MONTHS

From the moment of birth, newborns communicate. Sucking movements may indicate that a newborn is ready to feed, squinting may indicate digestive upset, and crying may indicate pain. This period during which an infant communicates but does not use language is known as the *prelinguistic period*. To the casual observer, the prelinguistic period may seem quite uneventful. To the trained observer, however, the prelinguistic period is a hive of developmental activity. An incredible amount of learning takes place prior to an infant's first birthday in order for the "first word" to be uttered. The term *infant* is used in this section, in keeping with the Latin form of the word *infans*, which means "one unable to speak."

### Prelinguistic Communication Development

To appreciate the communication development of the prelinguistic infant, an understanding of the basic "pragmatic" elements of a speech act is needed. These basic elements include (1) the speaker having an intention to communicate—known as *illocution*, (2) the speaker expressing intention—known as *locution*, and (3) the listener interpreting another's intended utterance—known as *perlocution* (Bates, 1976). During the first 8 months of an infant's life, the focus is on the perlocutionary element of the speech act, and this is therefore known as the perlocutionary period. During this period, caregivers have a vital role to play in facilitating learning because the infant's behaviors are not intentionally communicative but need to be interpreted as communicative. Some of the infant's behaviors that caregivers interpret as communicative include the following:

- Different cries that reflect hunger, pain, or anger
- Facial expressions, including displeasure, fear, sorrow, anger, joy, and disgust
- Eye-gaze patterns, including mutual gaze (prolonged eye contact), gaze coupling (infant and caregiver looking at each other, looking away, and looking back), and deictic gaze (infant looking at an object of interest)
- Moving limbs and making mouth movements, such as opening the mouth, pushing the tongue forward, and smiling, when in a settled state

By about 3 months of age, the infant and caregiver engage in protoconversations. These often consist of the caregiver initiating an interaction, followed by the infant and caregiver engaging in greeting behaviors (mutual smiles and eye gazes). Play dialogue follows the greeting. During play dialogue, the caregiver talks, then pauses to allow the infant time to vocalize during the pause. The dialogue continues until the infant or caregiver looks away.

These are sometimes also referred to as reciprocal interactions between adult and child. Protoconversations are an important experience for the infant, as they teach the infant the basic ingredients of a conversation, including initiating and taking turns. By 6 months of age, many infant–caregiver interactions become triadic because they begin to extend to an object or a toy of interest.

By about 8 months of age, the infant begins to show signs of communicative intent and thus enters the illocutionary period of communication development. This period typically spans the period 8 to 12 months of age. Gestures such as showing objects to adults, requesting items by pointing to them, and giving objects to adults are considered hallmarks of the illocutionary period. During this period, infants are able to follow the eye direction of an adult to locate an object at which the adult looks when the object is present in the infant's visual field. This ability to use joint attention or mutual gaze is important because it provides a basis for pairing words with objects. Another important communication milestone occurs around 8 to 9 months, specifically, the infants' comprehension of spoken words.

By 12 months of age, the infant enters the final stage for the development of the speech act, known as the locutionary period. Between 12 and 18 months of age, children gradually become able to use joint attention to locate objects outside their immediate visual field. Also at about the time of an infant's first birthday, he or she begins to use words to accompany or replace gestures. True language or symbolic representation of thought expressed in words has begun. A major milestone in language development has been achieved. The infant is no longer "unable to speak," has typically begun to walk, and is therefore considered a toddler.

### Prelinguistic Vocal Development

The sounds that infants make in the first year of life change from reflexive vocalizations to babbling to the emergence of the first word at approximately 12 months of age. This section reviews the vocal development of the infant over the first 12 months.

**Stage 1 (Birth to 2 Months): Reflexive Vocalizations.** From birth to approximately 2 months, the infant has a relatively small repertoire of reflexive vocalizations and vegetative sounds. The first reflexive vocalization is the birth cry, which is produced in response to the first breath. Subsequent cries signaling hunger, pain, and anger are considered a reaction to internal stimuli. Other types of reflexive vocalizations include coughing, grunting, and burping. Vegetative sounds include sighs, vowel-like sounds, and grunts associated with an activity, in addition to lip and tongue clicks and other noises associated with feeding.

**Stage 2 (2 to 4 Months): Cooing and Laughter.** From 2 to 4 months, the infant's range of vocalizations changes with the appearance of cooing, sounds associated with pleasure, and laughter. *Cooing* refers to vowel-like sounds (often "oo") preceded by velar consonant-like sounds such as "g" or "k." Infants are thought to coo when they are in a comfortable state. Infants have also been observed to produce pleasure-like sounds such as "mmmm" during this stage. Laughter emerges around 16 weeks. Crying and primitive vegetative sounds are thought to reduce from about 12 weeks on.

**Stage 3 (4 to 6 Months): Vocal Play.** From 4 to 6 months, the infant's repertoire of vocalizations expands to include a greater number of vowel-like and consonant-like sounds (including front plosives and nasals) to make way for marginal babbling. In marginal babbling, consonant and consonant-like sounds combine with vowels to create approximated syllables. Some of these productions contain sounds that are consistent with those in the infant's native language but others are not. Productions tend to favor those produced at the front so that we see the emergence of what are called the classic infant "raspberries" as well as lip smack. Intonation variations and other productions such as squeals and yells emerge.

**Stage 4 (6 Months and Older): Canonical Babbling.** The age 6 months is notable for the beginning of canonical babbling, which consists of reduplicated and nonreduplicated

**TABLE 2.1 |** Types of Canonical Babbling Seen in Infants from about Age 6 Months and Older

Type of Babbling	Description
Reduplicated	<ul style="list-style-type: none"> <li>■ Repetitive string of consonant–vowel productions</li> <li>■ Consonant sound remains constant</li> <li>■ May exhibit slight vowel changes</li> <li>■ Example: “mamamama”</li> <li>■ Tends to predominate in earlier babbling period (i.e., from about 6 months)</li> </ul>
Nonreduplicated or variegated	<ul style="list-style-type: none"> <li>■ Repetitive string of consonant–vowel productions</li> <li>■ Both consonant and vowel may change</li> <li>■ Example: “mababena”</li> <li>■ Tends to emerge somewhat later than reduplicated babbling</li> <li>■ Becomes frequent at about 12–13 months of age</li> </ul>

(or variegated) babbling. Babbling consists of well-formed syllables that contain at least one vowel-like sound and one consonant-like sound that are connected in quick succession. Descriptions of the two types of babbling observed during this stage are found in Table 2.1.

**Stage 5 (10 Months and Older): Jargon Stage.** The final stage of prelinguistic vocal development coincides with children’s production of first words. Jargon refers to series of mostly nonreduplicated (variegated) babbles overlaid with varieties of intonation and stress patterns. Other names for this type of jargon include conversational babble and modulated babble. During this stage, parents are often convinced that their infant is trying to say something, and strangers hearing it might do a double take, believing that the infant has talked to them. First words may in fact be produced among a string of jargon.

The types of consonants produced in jargon include stops, nasals, and glides, and these are also typical of children’s first words. Consonant types that do not appear in babbling include fricatives, affricates, and liquids. Predictably, these are not typical sounds of children’s first words. These observations provide support for the continuity hypothesis, which, according to Menn and Stoel-Gammon (2008), suggests that “children’s phonological patterns in early meaningful speech are linked directly to the patterns that they [children] use in babbling” (p. 72).

## THE FIRST-WORD PERIOD

### Phonology

Children typically produce their first word around their first birthday. To be considered a true word, it needs to be used consistently in a specific context, and it needs to have a recognizable phonetic form. That is, although the word may not match the adult pronunciation, it needs to closely resemble the adult target. During the beginning stages of phonological acquisition, children show individual variation. For example, although most children use plosive and nasal sounds, one child may favor labial sounds, such as /b/ and /m/, while another child may favor alveolar sounds, such as /d/ and /n/. It is possible that first words are entire phonological units rather than series of individual speech sounds. This would be consistent with an infant’s early jargon and babbling patterns. Once children have a single-word vocabulary of about 50 words, they adopt a new, more efficient strategy of treating each word as being made up of individual sounds, and as such they seem to enter a stage in which they pay attention to the phonological rules of the language they are learning.

## Semantics

Recall from Chapter 1 that children from birth to about 2 years of age are in Piaget's sensorimotor stage of cognitive development. One of the resulting cognitive achievements is the concept of object permanence, or object constancy, that is, that objects exist in the environment even though they may not be immediately visible. Object permanence is a basis for internal representations of the environment, mental images, or symbols of those objects and events that exist around the children. Many suggest that these internal representations are related to children's ability to use verbal symbols—words.

Lahey's (1988) classic work, still relevant today, identified three broad categories of the types of single words that children use to represent what they learn about the environment: *substantive*, *relational*, and *social*. Children use *substantive words* to name objects. Many of the words are used to refer to classes or categories of objects. As children learn more about the perceptual or behavioral consistency of objects, they learn that objects with similarly identified characteristics have the same names. Many of these early words are names for objects on which children can act and produce changes, such as *cookie*, *ball*, and *shoe*. Children at this stage use fewer attributives, such as words referring to color and size, than names for objects. Other types of substantive words refer to objects that children believe exist only as one of a kind. There is only one "Mommy," one favorite blanket, and, to the child, one bottle. In a child's mind, these are unique instances of objects that do not belong to a class of objects.

The second broad category of single-word utterances consists of relational words. *Relational words* describe the relationships or characteristics among objects, including movements of objects, or relationships of an object to itself, such as an object that has suddenly disappeared. Although most children use more substantive words than relational words, the reverse has been noted in some children. Types of relational words include existence, non-existence/disappearance, recurrence, rejection, denial, attribution, possession, action, and locative action (Lahey, 1988). Table 2.2 lists and explains the types of relational words that children use in the single-word stage. It is important to realize that the same word may actually be used to express several different relations. For example, *no* can be used to indicate

**TABLE 2.2 | Relations Expressed in Single-Word Utterances**

Relation	Explanation
Existence	An object is present in a child's immediate environment, and the child is attending to it. Examples: <i>this</i> , <i>that</i> , <i>ball</i> , <i>there</i>
Nonexistence/disappearance	An object is expected to be present but is not. An action is expected to occur but does not. An object has been present but disappears. Examples: <i>all gone</i> , <i>no</i> , <i>bye-bye</i>
Recurrence	An object reappears. Another object like the one the child is attending to is placed with the first one. An event happens again. Examples: <i>more</i> , <i>another</i>
Rejection	The child does not want an object or an event to occur. Example: <i>no</i>
Denial	The child rejects the truthfulness of a previous utterance. Example: <i>no</i>
Attribution	The child mentions a characteristic of an object or event, usually not shape or color in this stage. Examples: <i>big</i> , <i>little</i>
Possession	The child identifies ownership of an object. Examples: <i>mine</i> , <i>my</i>
Action	The child identifies or requests an action. Examples: <i>go</i> , <i>open</i>
Locative action	The child refers to a change in an object's location. Examples: <i>here</i> , <i>there</i> , <i>in</i> , <i>up</i>

Source: Lahey (1988).

rejection, denial, or nonexistence/disappearance. *No* is a very functional, versatile, and important word for children. A noun, such as *ball*, can be used to mean existence or recurrence (hence a relational word) or to label the object (hence a substantive word).

The last broad category of single-word utterances consists of *social words*, such as *hi* and *bye*. These are important words in a child's early repertoire, as they provide a foundation for establishing and maintaining human relationships according to the culture's social code. Although they are important, these words, unlike substantive and relational words, do not lead to later grammatical complexity.

During the single-word-utterance stage, there also seems to be a relationship between a child's phonological and semantic development. Children appear to learn more easily and quickly new words that begin with consonants they have used previously in other words than they do words that begin with consonants they have not yet used, and children exhibit greater phonetic accuracy in saying object words than action words. These observations suggest the notion of synergism among the various components of language in children's development.

### Pragmatics

One classification system of the various functions appearing in the communication of very young children that is still used today is that of Halliday (1975). He described seven purposes, or functions, of communicative attempts that occur between approximately 9 to 16 or 18 months of age. Table 2.3 lists and explains these seven functions. Because these functions emerge during part of a period in which children have few words, much of the communication may be accomplished in nonverbal ways. Halliday's (1975) view of communicative functions considered the listeners' responses. On the other hand, Dore (1975), who concentrated on the period during which children are using single words (approximately 12 to 18/24 months), focused on children's intention to use these single-word utterances, with less emphasis on the listeners'

**TABLE 2.3 |** Children's Functions and Intentions of Their Early Language

Halliday's Functions (9 to 16/18 months of age)		Dore's Intentions (approximately 12 to 18/24 months)	
Function	Description	Intention	Description
Instrumental	To receive material needs, desired objects, or assistance from others	Labeling	To name objects; no response expected
Regulatory	To control the behavior of others	Answering	To respond to adult's request
Interactional	To make interpersonal contact with others in their environment by initiating and/or sustaining contact with other people	Requesting action	To get adult to do something
Personal	To demonstrate awareness of self and express one's own feelings and individuality	Requesting an answer	To get adult to respond to request verbally
Heuristic	To attempt to have environments or events in the environments explained	Calling/addressing	To address adult; to get adult's attention
Imaginative	To pretend or playact	Greeting	To acknowledge adult's or object's presence
Informative	To communicate experiences or tell someone something	Protesting	To resist or deny adult's action
		Repeating/imitating	To model utterance after adult's; no response expected
		Practicing (language)	To rehearse language to self; no response expected

Sources: Dore (1975); Halliday (1975).

reactions to the intents. Dore's (1975) intentions are also shown in Table 2.3. As Prutting (1979) explains, Dore provides a way of identifying children's reasons (intentions) for communication, while Halliday furnishes a way of describing how well the reasons worked or functioned.

During the stage from about 16 or 18 months to 24 months, children use language for different functions. Earlier instrumental and regulatory functions combine with part of the interactional function to form a new function—the pragmatic function (Halliday, 1974). The *pragmatic function* is basically a controlling one that is used to satisfy desires and needs while interacting with people at the same time. Some response from the listener is expected. The newly acquired mathetic function is derived from the more basic personal and heuristic functions in combination, again, with part of the interactional function. The *mathetic function* focuses on language as a tool for learning more about the environment (e.g., asking the names of objects) and for commenting on the environment. In contrast to the pragmatic function, the mathetic function does not always require a response from the listener. Children use a third function during this period: the informative function. In employing the *informative function*, children actually convey information to the listeners. An important achievement occurs by the end of this stage: children learn that language can be multifunctional. That is, one utterance can serve more than one function at a time, a characteristic of most adult communications.

Two aspects of engaging in effective dialogues involve taking one's turn appropriately and helping to maintain the topic of conversation. Children even before the age of 9 months may engage in some rudimentary turn-taking skills in the form of reciprocal interactions. By the time children are 18 to 24 months old, they have learned to participate in dialogues and demonstrate ability in applying rules of turn taking in their dialogues.

## THE PERIOD OF TWO-WORD UTTERANCES

### Semantic–Syntactic Development

In the second year of life, children gradually expand their single-word vocabularies until they have learned to combine two words in one utterance. This first two-word utterance usually occurs around 18 to 26 months of age. A child's expressive vocabulary at 18 months is about 50 words. Between 18 and 24 months, children experience a lexical growth spurt, and at 24 months of age, they typically have a single-word lexicon of 120 to 300. A vocabulary of at least 50 words is generally considered the minimum prerequisite to beginning to combine two words into one utterance, but most 2-year-old children have expressive single-word vocabularies four to six times greater than 50 words at 2 years of age. Children need a variety of words in order to allow them eventually to use two-word combinations that, in turn, evolve into sentences.

The development that occurs from the single-word to the two-word stage is not haphazard. Children demonstrate an increase in the number of verbs, a reduction in other types of relational words, and an increase in the number of object-class words used in their language as they approach the two-word stage. Some have also suggested that children begin to produce chained single-word productions shortly before they use two-word combinations, although not all agree with this suggestion. *Chained single-word utterances* are two single words that children use in very close succession to each other but, based on stress and intonation patterns, use as individual words. These utterances appear to demonstrate that children are beginning to see more than one aspect of an event. That is, the children seem to identify and talk about relations within one event, such as *ball/roll* or *cookie/gone*. These successive single-word utterances may form a base for the two-word utterances about to occur, such as *ball roll*, *no cookie*, and *more juice*.

### Types of Two-Word Utterances

The two-word utterances that children typically begin to use about their second birthday are often described as reflections of *semantic relations* (Bloom, 1970; Brown, 1973). These two-word productions reflect meaning based on different relationships among the words in the

**TABLE 2.4 |** Common Semantic Relations

Relation	Example	Structure
Nomination	“That ball”	Demonstrative + N
Nonexistence	“No ball”	No (allgone) + N
Action–object	“Roll ball”	V + N
Agent–action	“Baby cry”	N + V
Recurrence	“More cookie”	More (another) + N
Action + locative	“Jump [on] chair” “Roll here”	V + N V + Loc.
Entity + locative	“Ball [in] chair” “Mommy here”	N + N N + Loc.
Possessor–possession	“Baby ball”	N + N
Agent–object	“Baby [roll] ball”	N + N
Entity–attributive	“Pretty ball” “Ball pretty”	Att. + N N + Att.
Notice	“Hi ball”	Hi + N
Instrumental	“Cut [with] knife”	V + N
Action–indirect object	“Give [to] doggie”	V + N
Conjunction	“Coat [and] hat”	N + N

Source: Brown (1973).

utterances. Children can use the utterance *baby ball* to signify possession (“baby’s ball”) or to signify the actor and the object of an action (“baby [rolls] ball”). An utterance can indicate two different meanings or two separate relations between the words. Table 2.4 lists a number of the more common semantic relations that Brown (1973) identified in children’s two-word productions. As we can see, different semantic relations can be expressed in the same grammatical form, such as noun + noun (N + N) to signify possession, agent–object, and entity–locative. Another significant characteristic of this stage of language use is the absence of morphological endings on the words used. Children do not use the possessive word endings even though their intent is to indicate possession, nor do they use any endings on verbs. Instead, only lexical, or root, forms of words are used.

Brown (1973) has termed this semantic relations period of language development Stage I. During this period, children use about an equal number of one- and two-word utterances. If we average the number of words in many of their utterances, we obtain a mean length of about 1.5. The average lengths of young children’s utterances are frequently used as measures of their language growth. Although we can average the number of words that children use in their responses, such an approach does not tell us whether the children are using more complex word endings, such as plural markers. A more common method of arriving at average length is to count the number of morphemes, both free and bound, that occur in the utterances. When children are in Stage I, this averaging procedure also results in a *mean length of utterance* (MLU) of about 1.5 because children are not yet using grammatical inflections, also referred to as grammatical morphemes. In the early periods of language learning, as MLU increases, the complexity of children’s utterances generally increases. However, when children begin using more complex sentence forms, this relationship between length and linguistic maturity does not remain as closely associated as in the earlier stages of language acquisition because there are ways other than length to increase syntactic complexity.

## THE PRESCHOOL AND EARLY SCHOOL YEARS

From the two-word utterance stage at about 2 years of age, children's language development grows in leaps and bounds. The ability to produce complete and complex sentences is acquired, speech becomes intelligible even to unfamiliar listeners, and vocabulary size explodes.

### Phonology

Children learn some sounds before others. This means that the words they say do not always match the adult pronunciation. For example, a child may say *moon* correctly at 2 years because the word contains early-developing sounds; however, words such as *spaghetti* and *spoon* may be pronounced as "detti" and "poon," respectively.

**Mastering Production of Speech Sounds.** At approximately 2 years of age, children use a repertoire of nine to 10 different consonants in the initial position of words. In the final position of words, these children use five to six different consonants. Between 24 and 39 months of age, children use an average of 2.2 consonant clusters (i.e., two or more consonants together acting like one, such as "sky") in the initial position and 1.7 clusters in the final position of words. With advancing age, children's phonological repertoires increase in terms of both the number of different sounds used and the word positions in which they are used. Most researchers agree that by age 7 or 8, children have fairly well mastered the English phonemes and are producing them correctly in their speech. However, some speech development may continue into fifth grade, or approximately age 10/11.

Several investigations have contributed significantly to our knowledge of when children learn to produce specific sounds (McLeod, van Doorn, & Reed, 2001a, 2001b; Poole, 1934; Smit, Hand, Freilinger, Bernthal, & Bird, 1990; Templin, 1957). Although differences in research designs and criterion levels prevent exact comparisons among results, several similar trends have emerged from the studies. Generally, children learn to master the production of nasal sounds, such as /m/, /n/, and /ŋ/<sup>1</sup>; stop consonants, such as /d/, /k/, /g/, /p/, and /b/; and glides, such as /w/, between 2 and 3 years of age. These phonemes are typically considered early-developing and relatively easy sounds. In contrast, fricative sounds, such as /s/, /z/, /ʃ/, and /ʒ/, and affricates, such as /tʃ/ and /dʒ/, are mastered later, often not until age 7 or 8. However, children do demonstrate variability in the ages at which they acquire individual phonemes (McLeod et al., 2001a, 2001b). There are also trends in terms of when children master the production of the various manners of articulation. For the most part, stop consonants and nasals are typically learned before fricatives and affricates. Furthermore, children often continue to have difficulties with /r/ and /l/ after they begin school.

So far, we have discussed only consonant sound development. Children generally learn to produce the vowels correctly before they acquire the consonant sounds. In fact, vowel production may be mastered by the time a child is 3 years old. It is unusual to see school-aged children making more than occasional errors in their vowel productions.

**Producing Words without All the Speech Sounds.** Children's simplified pronunciation of words follows patterns known as *phonological processes*. For example, if a child regularly substitutes consonants produced in the front of the mouth (e.g., /t/, /d/) for those that are supposed to be produced in the back of the mouth (e.g., /k/, /g/) and so says *tea* for *key*, the child might be said to be using a fronting process. Or, if a child regularly omits one or more consonants when they occur together as clusters and so says "poon" for *spoon*, the child might be described as using a cluster reduction process.

Several of these processes fall under the three broad classifications of syllable structure, assimilation, and substitution processes. In *syllable structure* processes, young children tend to omit consonants in the final position of words or syllables ("bi" for *bite*), delete unstressed syllables in polysyllabic words ("jama" for *pajamas*), and reduce the number of sounds produced in consonant clusters, such as /bl/ ("bu" for *blue*). *Assimilation* processes are those in

1. See Table 1.1 for the International Phonetic Alphabet.

**TABLE 2.5 | Expressive Vocabulary Growth from the First Year to First Grade**

Approximate Age	Approximate Number of Words in Expressive Vocabulary
15 months	10
18 months	50
20 months	150
2 years	120–300
3 years	1,000
4 years	1,600
5 years	2,100–2,200
6 years	2,600–7,000

which one sound in a word affects the production of another sound so that its production is modified. Examples of assimilative processes are “gog” for *dog* or “mam” for *lamb*. When children use both a syllable duplication and an assimilative process simultaneously, an utterance such as “gaga” for *doggie* may be produced. Finally, *substitution* processes are employed when children use one group of sounds, such as stops, in place of another group, such as fricatives. It is not uncommon to hear children say “toap” for *soap*.

As children get older, they discontinue using early phonological processes so that their productions of words approximate those used by adults. Because this learning process takes time, however, any one word may go through several stages in pronunciation. Consequently, just because a child is capable of saying a sound correctly in one word does not mean that the sound will be said correctly in all words that contain it if different phonological processes are operating in the production of the other words.

### Semantics

Table 2.5 illustrates what happens to expressive vocabulary size from the first word at about 12 months of age to first grade. In terms of receptive vocabulary, children comprehend their first words at about 8/9 months of age; at about 13 months of age, children comprehend about 50 words. By 6 years of age, their comprehension vocabulary is between 20,000 and 24,000 words, and by 12 years of age, it is about 50,000 words. The size of a child’s vocabulary depends, in part, on the experiences and words to which the child is exposed, which means that lexical growth in the early years has rather systematic patterns because infants’ and toddlers’ early life experiences have largely similar patterns (e.g., bottles, sleep, diapers, caregivers). In contrast, lexical acquisition in later primary and, particularly, in secondary school can take on individualist growth patterns because life experiences for the children and adolescents are more varied and their abilities to take advantage of the semantic richness of school is more varied. With regard to the early years, Rescorla, Alley, and Christine (2001) write that “young children are highly consistent in the words they acquire in their early lexicons” (p. 605). Patterns to what words children acquire and the sequence in which they add words to their lexicons include (Pan & Uccelli, 2008):

- Overextension and underextension of the meanings of words (e.g., overextension such as all four-legged animals being *dogs*; underextension such as *bottle* applying only to the baby’s bottle)
- Acquiring words that occur more frequently in their environments
- A general tendency to label first objects and actions, then words that attach attributes to objects or events (*big*), and, finally, words that express temporal, spatial, conditional, and causal relationships

- A shift from classifying words on the basis of perceptual or functional characteristics (concrete classifications) to classifying words according to abstract properties such as temporal-spatial features or animate-inanimate characteristics

There are several ways in which young children are believed to be so good at learning words. One way is with a process known as *fast mapping*. Dollaghan (1987) describes fast mapping as a lexical acquisition strategy in

which a listener rapidly constructs a representation for an unfamiliar word on the basis of a single exposure to it. This initial representation might contain information on the semantic, phonological, or syntactic characteristics of the new lexical item, as well as nonlinguistic information related to the situation in which it was encountered. (p. 218).

This first meaning may or may not be complete and/or accurate. It does, however, create a basis for further refinement as additional experiences with the word in context occur. Children seem to be able to fast map meaning by having only “incidental” exposures to new words. That is, new words occur in context in a child’s ambient environment, and the child is able to discern what the new word means. This is referred to as *quick incidental learning* (QUIL). However, the quick, partial learning of the meaning of new words only starts what is the longer-term, slow mapping process of vocabulary learning. Any new word and its partial meanings need to be remembered, and over time as new contexts are encountered in which a child is exposed to the word, refinements in the meaning need to be made. This longer term refinement of word meaning is sometimes referred to as *slow mapping*, with even more time needed for further refinement and extension of a word’s meaning, a process commonly referred to as *extended mapping*.

In addition to fast mapping and QUIL, a number of propositions have been advanced about how children figure out labels for and meanings of words. Some of these are the whole object-versus-object components proposition, the mutual exclusivity proposition, and the novel name-nameless category proposition. The *whole object-versus-object components* proposition (Golinkoff, Mervis, & Hirsh-Pasek, 1994) suggests that children will focus on an entire object as the most likely referent for a new word before thinking about one of the parts of the object or an attribute of the object as the possible referent. According to the *mutual exclusivity* proposition (Markman, 1989; Markman & Wachtel, 1988), a child will assume that a new word applies to an object that does not yet have a name (from the child’s perspective) and will not be inclined to give an already-named object a second label, that is, one item, one name, or mutually exclusive labels. Therefore, in a context where a new word occurs and the names for all things are known except one, the new word will be assumed to apply to the unnamed item and will not be another word for one of the other items. The third, the *novel name-nameless category* proposition (Golinkoff et al., 1994; Mervis & Bertrand, 1994), is similar to the mutual exclusivity proposition but adds that children will consider other possibilities, including another name for an object whose label is already known.

The strength of these three propositions as well as others in explaining how children go about figuring out what new names go with what referents is still a matter for discussion. What is certain, however, is that the context in which children encounter words and their referents is central to their word learning. What is also necessary for full knowledge of a word and its referents is multiple exposures to the word in multiple contexts.

**Spatial and Temporal Terms.** Children’s comprehension of spatial (location in space) and temporal (location in time) words develops gradually from about 2 years for *in* as a preposition to about 11 years for terms such as *before* and *after*, with children’s understanding of selected spatial and temporal relationships developing throughout Piaget’s concrete operational period (about grades 1 to 5 and approximately 7 to 11 years old). In grade 1, children’s ability to interpret temporal terms has been found to be greater than their comprehension of spatial relationships. However, after grade 1 children may be able to understand the spatial terms better than the temporal ones, a trend in favor of spatial relationships that continues throughout the primary grades.

Many conjunctions involve temporal concepts (e.g., “She will leave *when* it is convenient” and “We ate breakfast *before* we went to school”), as does the “wh-” question word *when*. And a number of these same terms also occur as prepositions (e.g., “We ate breakfast *before* school). Children generally use these temporal terms as prepositions before using them as conjunctions. Additionally, terms expressing order of events (e.g., *before* and *after*) appear to be learned prior to terms expressing simultaneity (e.g., *while* and *at the same time*).

Spatial relationships are also often expressed by *prepositions*. *In* and *on* are among the first of these word types to be acquired. Some words that function as prepositions also occur as part of a *verb particle*, that is, a multiword construction that functions as a verb, as in “She *put up* a good argument.” Like prepositions, these words as verb particles emerge early in children’s language and by about 4 to 5 years of age are used with reasonable accuracy. However, Wegner and Rice (1988) suggest that certain words seem to be used more as prepositions (*in*, *on*, and *over*) and others (*up*, *down*, and *off*) more as verb particles.

Other spatial prepositions (e.g., *in front of* and *next to*) are more difficult for children. The referents for these prepositions vary, depending on the children’s relationships to objects and the characteristics of the objects. When an object has a front, such as a person, *in front of* relates to the object’s front. For an object without a front, such as a ball, *in front of* derives its meaning from the relative positions of the speaker and the object—positions that can vary. Furthermore, *next to* can mean *beside*, *in back of*, or *in front of*, all of which can be very confusing for a child. As might be expected, these types of spatial prepositions develop later.

**Deictic Words.** Deictic words are terms that have changing referents, depending on who in a communicative dyad is speaking, on the respective locations of objects and people, and on the temporal relationships relative to the speaker and listener (Pan & Uccelli, 2008). The spatial prepositions discussed in the preceding section are deictic in nature. As another example, the referents for *I* and *you* shift as the speaker–listener relationship changes. The terms *here* and *there* and *this* and *that* vary depending on the location of the speaker, listener, and/or objects. Among the deictic verbs are *come*, *go*, *bring*, and *take*. Such words must be confusing for young children, although the literature suggests that children demonstrate some use of deictic shifts for first- and second-person pronouns (*I*, *you*, *me*) sometime between approximately 1 and 2 years of age. Third-person pronouns appear later in children’s language, between approximately 2 and 3 years of age, and their development may even continue to 5 years of age and possibly beyond. When children’s MLUs approach 4.0, they evidence deictic shifts for the terms *here*, *there*, *this*, and *that*. Other deictic words, such as *come*, *go*, *bring*, and *take*, tend to be learned later, and complete acquisition may extend into children’s school years.

## Morphology

One way in which young children increase their utterance length is to begin to use grammatical morphemes in their utterances. Recall that in the early two-word combination stage (Brown’s Stage I), a child’s MLU is 1.5, but no grammatical morphemes are attached to words. When children begin to use grammatical morphemes, their MLUs reach about 2.0. At this point, children progress into Brown’s Stage II, acquiring the present progressive *-ing* ending for verbs (“ball rolling”) and the prepositions *in* and *on* (“kitty in chair” and “cup on table”). It is important to note, however, that acquisition of a grammatical morpheme, as used in relation to Brown’s stages, means that a child uses it correctly in at least 90 percent of the situations in which it is required by adult standards, that is, in 90 percent of the obligatory contexts. Children may use morphemes such as *in* and *on* before this stage but not at the criterion level set by Brown. Table 2.6 summarizes Brown’s (1973) findings about the sequence in which children acquire 14 selected grammatical morphemes and indicates the corresponding stages determined by MLU at which the morphemes are acquired. The process of learning these morphemes occurs over several years, and children are developing other language skills during that time. For example, by the time children are 3 years old, they typically demonstrate the use of negative and interrogative sentences as well as basic declarative sentences.

Of the verb forms Brown (1973) investigated, irregular past-tense words such as *ran* and *saw* appear in children’s language before regular past-tense verb markers. In learning

**TABLE 2.6 | Sequence of Acquisition for Fourteen Grammatical Morphemes**

Morpheme	MLU	Maximum Length in Morphemes	Stage
<b>1.</b> Present progressive ending (-ing)			
<b>2. 3.</b> <i>In</i> and <i>on</i>	2.25	7	II
<b>4.</b> Noun plurals			
<b>5.</b> Past-tense irregular verbs			
<b>6.</b> Possessive nouns	2.75	9	III
<b>7.</b> Uncontractible copula (“Here I <u>am</u> ”)			
<b>8.</b> Articles			
<b>9.</b> Past-tense regular verbs	3.50	11	IV
<b>10.</b> Regular third-person singular present-tense verbs			
<b>11.</b> Irregular third-person singular present-tense verbs			
<b>12.</b> Uncontractible auxiliary (“He <u>was</u> running”)	4.00	13	V
<b>13.</b> Contractible copula (“She’s big”)			
<b>14.</b> Contractible auxiliary (“The boy’s eating”)			

Source: Brown (1973).

morphological rules, children typically acquire a more general rule first and then gradually modify and refine the rule to account for the more specific applications and exceptions, so this initially appears a bit strange. It may be that children simply acquire these irregular verb forms as vocabulary words instead of word form variations derived from lexical verbs. Support for such an interpretation comes from the observation that after children begin to use regular past-tense verb forms correctly, they often incorrectly apply the rules to irregular verbs previously used accurately—so that utterances such as “He runned” and “I seed a dog” are not uncommon (Tager-Flusberg & Zukowski, 2008). This is not inconsistent with research that suggests even some regular past-tense verb endings are first used with specific verb words, that is, as vocabulary items (Pine, 1999).

When regular past-tense forms (“She jumped”) appear, not all variations of regular past-tense verbs are acquired at the same time. Learning to use the variety of verb forms that occur in English is especially problematic for many children with language disorders. For this reason, we will take a somewhat closer look at normal verb morphological acquisition. Verbs to which the past-tense allomorph /d/ is added (*climbed*) appear to develop slightly before those to which the allomorph /t/ is attached (*jumped*). Phonological composition influences which allomorphic form is used. In the examples above, the voiceless stop /t/ is used following the final voiceless phoneme in the root, whereas the voiced stop /d/ is used following the final voiced phoneme in the root word. Acquisition of the /əd/ allomorph (*painted*) occurs somewhat later. Use of this allomorpheme is also influenced by the final phoneme in the root. Because it is not possible to produce two stop phonemes sequentially (e.g., /td/) without inserting a vowel, the syllable form of the allomorph /əd/ is used when the root ends in a stop.

There are also different ways in which irregular past-tense verbs are formed. Some use an internal vowel change (*swim* → *swam*), whereas others use both a vowel and a final consonant change (*catch* → *caught*). The former types seem to emerge somewhat earlier for children. In one classic study, 7- and 8-year-old children gave fewer than 75 percent correct responses for irregular verbs with internal vowel changes, and only about 40 percent gave correct responses for irregular verbs formed by changing both a vowel and a final consonant (Moran, 1975). Such data indicate that children are continuing to refine some of their morphology in the early school years.

According to Brown (1973), the regular forms of third-person singular present-tense verbs (“She jumps” and “He swims”) emerge after past-tense regular forms (see Table 2.6). Shortly thereafter, children begin to use irregular forms of third-person singular present-tense verbs (*do* to *does* and *have* to *has*). Of the 14 grammatical morphemes in Brown’s investigation, the verb forms involving the contractible copula and auxiliary (“We’re big” and “She’s running”) and the uncontractible auxiliary (“He was running”) were the last ones the children acquired.

Table 2.6 indicates that children begin to use regular noun plurals after present progressive verb endings and before irregular past-tense forms (Brown, 1973). Again, there are various forms of regular noun plurals, and there appears to be a developmental sequence for acquisition of these variations. Children’s utterances with the plural allomorph /z/ (*pigs*) tend to be more accurate before their utterances containing plural nouns with the /s/ allomorph (*boats*), whereas accurate use of the /əz/ plural allomorph (*houses*) is achieved after the /s/ and /z/ plural forms. The phonological influences on the allomorphemes are the same as those for past tense, as we saw above. Although children begin to use some noun plurals early in their language-learning process, the complete acquisition of plural forms takes several years, with children in the early primary grades potentially still demonstrating problems with plural nouns that require use of the /əz/ ending. The learning of irregular noun plurals (*child* to *children*) seems to lag considerably behind the acquisition of regular forms.

Brown (1973) indicates that children begin to use possessive forms of nouns shortly after the appearances of noun plurals and irregular past-tense verbs (see Table 2.6). Possessive forms of nouns are derived in basically the same ways as noun plurals, and their sequence of acquisition appears to be essentially similar. Correct use of the /z/ allomorph (*bug’s*) tends to be achieved somewhat before that of the /s/ allomorph (*duck’s*), which, in turn, tends to be acquired before the /əz/ ending (*horse’s*). We notice that regular forms of noun plurals, possessives, and third-person singular present-tense verbs all use the same word endings, /z/, /s/, /əz/. Therefore, it is not surprising that Brown (1973) found that once the children in his study correctly added the endings to form any one of the three word types (plurals, possessives, or third-person verbs), they used the other two types within 1 year.

Other morphological forms involve derivational morphemes. Unlike grammatical morphemes, derivational morphemes change the part of speech of a word, for example, an action (verb), *to farm*, to a person (noun) who performs the action, *farmer*, or the meaning of a word, for example, *mount* to *dismount*. Among the derivational morphemes are comparatives (*bigger*) and superlatives (*biggest*), noun and adverb derivations (*painter*, *fireman*, *violinist*, *gently*, *quickly*), and prefixes (*preheat*, *undone*, *misce*). The results of Berko’s (1958) classic study indicated that, even by age 7, children had not yet fully acquired the rules for forming comparative and superlative adjectives and for deriving nouns and adverbs. Prefixing also is a difficult skill to acquire because it requires knowledge of the meanings for both the prefix form and the root word. Refinement of morphological rules continues well into the school years, and in the adolescent is a major mechanism by which students advance their vocabulary by acquiring what are known as *morphologically complex words*, that is, words with multiple bound morphemes, e.g., *triangularity*.

### Syntax

Syntactic complexity increases both in terms of length and in terms of the types of syntactic structures children learn. Consequently, children extend their previous two-word utterances into multiword utterances and into different sentence forms.

**Expanding Two-Word Utterances.** Children learn to expand their utterances by combining previously separate semantic relations, such as “baby ball” (possessive) and “ball roll” (agent-action) to form “baby ball roll” (Brown, 1973; Lahey, 1988). Children do not, however, use any new relations in forming these longer utterances. Only previously expressed two-word semantic relations are combined and expanded. The production of the first true sentences is also derived from this combining process. Agent-action (“baby roll”) and action-object (“roll ball”) combine to form agent-action-object (“baby roll ball”), the subject + verb + object basic English syntactic rule discussed in Chapter 1. With gradually increasing skill in producing the basic sentence form, the child is acquiring the foundation abilities to begin to manipulate that syntactic form to make other types of sentences. As McLean and Snyder-McLean (1999) summarize,

Between 3 and 4 years of age, typically developing children are able to produce well formed, declarative sentences with generally appropriate grammar. . . . They can ask simple questions using *wh*- words. . . . Future learning will allow children to alter . . . declarative structures to produce interrogative forms. (pp. 170–171)

**Acquisition of Negatives.** In our discussion of the types of single words that children use, we saw that negative words occur very early in the developmental process. When children begin to combine words, negative utterances are produced by placing the negative marker *no* in front of an element that occurs in the predicate of a sentence, such as a verb or direct object. Utterances like “no milk” and “no go” are typical. Even though children at this stage may produce affirmative sentences with a subject and predicate (“boy roll ball”), the subject is deleted when a negative marker is added. It appears that the use of negation increases the length and complexity of an utterance, which, as a result, can exceed children’s linguistic capacities at the time. Perhaps to accommodate these limited capacities, the overall length and complexity of an utterance are reduced to a manageable unit by omitting the subject when a negative is added (“no roll ball”). Furthermore, the subject of a sentence is usually the information shared most between speaker and listener, so its omission tends not to affect communication. Meaning can still be conveyed despite the omission.

Children gradually learn to re-add the subjects to produce negative sentences such as “boy no roll ball.” However, before children’s negative sentences can evolve into more complex forms, the children need to learn that in English *no* is the negative word used with nouns and that *not* is the negative for verbs. The occurrence of later negative sentences also depends on the use of a copula or auxiliary verb (“The ball is not big” and “The boy is not running”). For sentences in which an auxiliary verb does not occur (“The boy eats”), an auxiliary in the form of *do* must be added (“The boy does not eat” or “The boy doesn’t eat”). Although the use of *do* plus a negative is generally considered to be a reasonably complex language skill, the negative words *don’t* and *can’t* do appear in children’s early language productions. These early occurrences of *can’t* and *don’t*, however, are typically viewed as vocabulary words indicating negation rather than as evidence that children have acquired the operation of adding *do* when an auxiliary is absent. The negatives *won’t* and *isn’t* also occur in children’s early productions although less frequently than *don’t* and *can’t*.

Negatives can be used to express a number of different concepts (Tager-Flusberg & Zukowski, 2008). For example, with negative utterances, we can reject (“I don’t want any”), deny (“That’s not a red car”), or signify nonexistence (“It’s not here”). Table 2.7 presents six functions of negatives in a suggested developmental sequence and provides examples of each (Bloom & Lahey, 1978). The syntactic representation of these negative functions appears to follow this same sequence. That is, children at a specific developmental level will express nonexistence in a fairly complex way (“It isn’t here”) while at the same time signifying denial in a less sophisticated manner (“That not a ball”).

**Acquisition of Questions.** Preschoolers’ acquisition of interrogative, or question, forms tends to lag somewhat behind their negative utterances. However, before discussing the development of questions, we need to review two types of question forms that can occur in English:

**TABLE 2.7 |** Suggested Developmental Sequence for Negative Functions

Negative Function	Example and Explanation
Nonexistence/disappearance	"No ball" (The ball is not in the toy box where it belongs.)
	"No milk" (The milk is all gone.)
Nonoccurrence	"No pull" (The toy is stuck and cannot be pulled.)
Cessation	"No turn" (The top has stopped spinning and has fallen over.)
Rejection	"No juice" (I do not want any more juice.)
Prohibition	"No go" (The child is telling Mommy not to leave.)
Denial	"No doggie" (Having been told the Great Dane is a dog, the child does not believe it belongs to the same class as the toy poodle at home.)

Source: Bloom and Lahey (1978).

1. Yes/no interrogatives, characterized as follows:

- Are labeled as such because the answer to such a query is *yes* or *no*.
- Involve moving, or transposing, a copula or auxiliary verb to the beginning of the sentence, as in changing the basic sentence "The boy is running" to "Is the boy running?" Transposing reverses the usual sequence of subject and verb; the term *interrogative reversal* is also used to refer to this process.
- If there is no auxiliary or copula verb in the basic sentence to transpose, as in the sentence "The girl rides the bike," one needs to be added in the form of *do* and then transposed to form the question "Does the girl ride the bike?"

2. "Wh-" questions, characterized as follows:

- Request information.
- Require that a "wh-" word, such as *what* or *who*, be added to the beginning of an utterance, which is a process called *preposing*.
- Need to use "wh-" words that reflect the correct meanings of the utterances, for example:

What is the boy riding?

Where is the boy riding?

When is the boy riding?

How is the boy riding?

- Usually involve both a transposing operation and a preposing process ("The boy is riding" → "What is the boy riding?").

In the early stages of learning to ask questions, children mark their yes/no queries only by using rising intlections, such as "mommy go ?." These children may also use a limited set of "wh-" questions, although the utterances are not yet in adult form ("What that?" and "Where Mommy going?"). Children learn to prepose with "wh-" words before they learn to transpose verbs. This is a particularly logical pattern, because children are not yet using copula and auxiliary verbs in these early stages; therefore, they have nothing in their utterances to transpose.

Even though children learn to add copula and auxiliary verbs to their basic sentences, their yes/no questions may continue to be marked by rising intonations ("Mommy is gone ^"), although some children may begin with correct transposing. The children do prepose for their "wh-" questions, but they still do not transpose, so their queries sound something like "What Daddy is doing?" or "Where Mommy is going?" If we examine these forms, we see that the children are using a basic sentence that includes the auxiliary *is* and are simply adding the preposed "wh-" word to the beginning. Gradually, the children begin to transpose for their yes/no questions ("Is the girl eating?"). At this stage, however, they may still fail

to transpose copula or auxiliary verbs in their “wh-” questions (“What the girl is eating?”). Children’s attempts at negative questions demonstrate the same patterns. Transposing occurs in yes/no questions (“Can’t we go?”) but not in “wh-” questions (“Why Daddy can’t go?”). Finally, children learn to transpose in their “wh-” questions (“What is the girl eating?” and “Why can’t Daddy go?”).

The choice of which “wh-” word to use in “wh-” question forms requires children to apply semantic concepts (Tager-Flusberg & Zukowski, 2008). *What* and *who* reflect concepts that differentiate between people and things; *where* involves the concept of location. These semantic concepts develop fairly early in children, and, not surprisingly, the “wh-” words reflecting them are among the first to be used in “wh-” questions. Children use *when* and *how* in their questions somewhat later since time and manner concepts are acquired after the three early-developing concepts. Causal relations develop even later. As a result, “wh-” questions with *why* are among the last to be used meaningfully. The word “meaningfully” is used here because children may ask “Why?” as an attention-getting device before they truly understand the concept of causality and use it accurately in “wh-” questions.

**Acquisition of Compound and Complex Sentences.** The use of a *compound sentence* (a sentence containing more than one independent clause) or a *complex sentence* (a sentence that contains at least one independent clause and at least one dependent clause, also referred to as a subordinate clause) involves the expression of two or more ideas or propositions in the one sentence. (A clause, in contrast to a phrase, contains a subject and verb.) These more advanced sentence forms are created by joining two or more clauses together, often with a linguistic form such as a conjunction or a relative pronoun. This clausal joining process usually begins sometime between 2 and 3 years of age, when a child’s MLU reaches about 3.0 morphemes. This approximates Brown’s Stage IV (Brown, 1973). The first conjunction that children learn to use is *and*, which usually appears when a child is a little beyond 24 months of age, although it might initially be used for serial naming (“baby and kitty”). For clausal joining, some data suggest that this conjunction is initially employed to conjoin two independent clauses in utterances such as “You do this and I do that” and “The boy runs and the boy jumps” (Tager-Flusberg & Zukowski, 2008). These types of sentences simply require the children to add on to existing utterances in their language. This addition operation is among the earlier transformations that children acquire. However, because many coordinated sentences with *and* contain redundant information, as in “The boy runs and the boy jumps,” the redundant elements can be deleted to form sentences like “The boy runs and jumps.”

Utterances that contain object complements appear to be the first types of complex sentences that children use. In sentences with object complements, a second basic sentence or clause is used as the object of the verb in the first sentence or clause. For example, in the sentence “I think I have it,” the clause “I have it” operates as the object of the verb *think* in the clause “I think.” Often included in discussions of object complements are sentences that contain certain types of infinitives. (An *infinitive* is a form of a verb that typically appears with *to*, e.g., “to run,” “to go,” and the verb itself is unmarked for tense and number, thus appearing in its root form.) In these sentences, an infinitive and its associated words are used as an object of a verb, as in “I want to run fast.” Both object complement forms—those with a second basic sentence and those with an infinitive—appear in children’s utterances at about the same time. Complex sentences in which a second clause is introduced with a “wh-” adverbial word are acquired shortly after object complement sentences. Examples of these sentence types are “I remember where Mommy is” and “Daddy knows when Mommy comes home.” Children tend to use clauses conveying time and location before other “wh-” clauses.

*Relative clauses*, which are clauses serving as modifiers for nouns (and are therefore a type of adjectival clause), develop somewhat later. A relative clause is often introduced by a relative pronoun, such as *what*, *who*, *which*, *whose*, or *that* (“I see the boys who are running” or “The dog that has the bone is growling”). However, in some instances, the relative pronoun may be omitted (“That’s the bed [that] we sleep in”). Children initially use relative clauses to modify predicate nouns (“That is the balloon that I like”) and objects (“I see the boy who wears glasses”). They later begin to modify subjects with relative clauses (“The girl who wears glasses sees better”). We see a pattern in which children add to the ends of

their sentences before rearranging or adding elements within the sentences (Tager-Flusberg & Zukowski, 2008). The latter process, termed *embedding*, is one of the later-developing transformational operations. Although Limber (1973) indicates that 3-year-old children demonstrate the use of clauses with object complements, “wh-” adverbials, and object relatives, Paul (1981) suggests that the use of all these clause types may not be demonstrated until children are closer to 4 years of age. Embedded relative clauses, having already been identified as later developing, are not used by children at these ages. Embedding usually emerges sometime about kindergarten and is a syntactic operation that continues to develop into adolescence and shows further increasing use into 12th grade (Hass & Wepman, 1974; Loban, 1976). A major shift to the use of clausal constructions occurs at 10 years of age, about the time that students enter secondary school and transition from concrete operations to formal operations cognitively.

Because the construction of compound and complex sentences usually requires the use of connective devices such as conjunctions, accurate use of these sentences involves both the syntactic operations to combine clauses and the selection of appropriate conjunctions to express the correct meanings. In some instances, the semantic task may be more difficult than the syntactic task. We indicated earlier that the conjunction *and* is the first to be acquired by children. Beyond *and*, the exact sequence in which children learn other conjunctions and the ages at which they acquire them are difficult to report. Authors have investigated the use of different conjunctions by children at varying ages and have reported their data in different ways. However, we do know that the frequency with which children use different conjunctions may be related to their knowledge of and facility with the different conjunctions. Thus, the frequency with which conjunctions occur in children’s language may provide a clue to their developmental sequence.

In addition to the studies focusing on preschoolers’ acquisition of conjunctions, the use of conjunctions by first graders has been examined. In an early but still relevant study, Menyuk (1972) found that, although 95 percent of kindergarten children in her study produced well-formed sentences with the conjunction *and*, only 35 percent of them used adequate sentences with *because*. The conjunctions *if* and *so* were more difficult. Only 20 percent and 19 percent of the first graders produced well-formed sentences with *if* and *so*, respectively. These results certainly suggest that children continue their acquisition of conjunctions past the first grade and into middle and late childhood.

## Pragmatics

There are many factors involved in how people use language and what influences their communicative choices in various speaking situations. In this section, we look at children’s developing skills in several of these areas—their changing abilities in the functions for which they use language and what they intend to accomplish by its use, their competencies in maintaining a topic and taking turns during a conversation, their uses of presuppositions, their fluency in delivering their messages, and their evolving discourse skills.

**Functions of Language.** By age 3, children’s utterances consistently contain more than one function. This is the third, adultlike stage, and the functions that Halliday (1975) has identified in children’s communications in this period are the *interpersonal purpose* (used to relate to other people), the *textual purpose* (used to relate to preceding and following utterances in a dialogue), and the *ideational-experiential purpose* (used to express ideas or events to others).

As we know, the true intentions and functions of some speech acts do not always match the forms of the utterances or their propositional content. As noted in Chapter 1, these are the indirect functions and intentions of speech, and common uses of these indirectives hide the true purposes of utterances in syntactic forms created for the sake of politeness (the interrogative, “Can you open the door?,” instead of the imperative, “Open the door”) or hint at a purpose by employing content different from the true intent (a child’s utterance to a babysitter, “My mommy always lets me stay up late on Fridays,” or an adult’s remarks, on wishing to have a window closed, “My, it’s chilly in here,” with no direct reference to the window). In some ways, children’s ability to understand and use these indirect speech acts

depends partly on their skills in making presuppositions about communicative situations, a topic we discuss in the next section. However, intentions and functions of speech acts are certainly involved.

After about age 3½, children employ these polite devices and hints in their utterances, and they steadily improve with age in their ability to regard requests that contain *please* as more polite than those without it. However, their skill at judging interrogative forms as polite (e.g., “Could I have some candy?”) develop later than their skill with *please*. When the children are asked to determine whether a request in the form of an interrogative with *please* (“Could you give me a nut, please?”) is more polite than a request in the form of an imperative with *please* (“Give me a nut, please.”), even children in the early grades can have difficulty. Use of the polite form—interrogative with *please*—increases steadily between 3 and 7 years, suggesting it takes at least 4 years more after they first start to use indirect polite forms for their use to have many adultlike elements.

**Presuppositions.** Speakers make presuppositions about what knowledge is shared between speakers and listeners and about what information listeners need to understand messages, and effective speakers modify the form and content of their utterances on the basis of their presuppositions. From this perspective, the use of indirectives, hints, and polite forms can be viewed as part of the presupposition aspect of language use.

For some time, it was believed that children’s egocentrism would prevent them from taking a listener’s needs into account as they formulated their messages. Surprisingly, however, there is some evidence that, even at the single-word stage, children adapt what limited language they have for their listeners. And, children between ages 3 and 4 change the amount of information they give to listeners relative to their listeners’ prior knowledge of communicative topics and ability to share in immediate communicative contexts. The ages of children’s communicative partners also influence how preschool children encode their messages. Children at this age use shorter and less complex sentences when talking to younger children than when speaking to their peers or adults.

How children differentially encode new and old information in their utterances is another aspect of presupposition. When this occurs through the use of pronouns, it is referred to as *anaphoric reference* (Tager-Flusberg & Zukowski, 2008). The following example of sequential utterances illustrates what happens as new and old information occur in the content of a message:

I got new shoes. They’re brown and white. But Billy doesn’t like them. He liked the black ones.

New information is linguistically emphasized (i.e., named, as in *shoes*), while old information is linguistically deemphasized (i.e., pronominalized). Children in the single-word to approximately the three- or four-word-utterance stages of language learning omit old information in their speech and verbalize information that is new or changing about a situational. As children increase the length of their utterances to approach five words or morphemes, they begin to use pronouns in referring to old information and to name specifically new information.

Use of the definite (*the*) and indefinite (*a* and *an*) articles is also related to the ways in which new and old information is encoded. Although we see children using articles when their MLUs are about 3.5 and they are approximately 2½ to 3 years old (Brown, 1973), accurate use of articles varies, depending on the contexts in which they occur, the amount of shared information between listener and speaker, and whether the information is new or old. In a sequence of utterances, the indefinite article is used to introduce a new referent, and the definite article is employed to encode a previously introduced referent. The following example illustrates this variation:

I bought a new dress. The dress is red with ruffles.

Because of the shifting use required for articles, we might anticipate that complete acquisition evolves over a number of years. In a classic study, Warden (1976) investigated the developmental changes that occur in the use of articles in children 3, 5, 7, and 9 years old and compared their performances to those of adults. All the children and the adults showed a

consistent preference for using the definite article to refer to previously introduced referents. However, the 3-year-old children randomly used either the definite or the indefinite article for introducing initial referents. From 3 years on, there was an increase in appropriate use of the indefinite article for initial referents, but it was not until 9 years of age that the children demonstrated a true preference for using the indefinite article for initial referents. In contrast, adults consistently introduced initial referents with the indefinite article.

***Turn Taking, Topic Maintenance, and Revisions.*** Two aspects of engaging in effective dialogues involve taking one's turn appropriately and helping to maintain the topic of conversation. It appears that children even before the age of 9 months demonstrate rudimentary turn-taking skills in the form of reciprocal interactions. By the time children are 18 to 24 months old, they have learned to participate in dialogues and demonstrate ability in applying rules of turn taking in their dialogues. However, children younger than 5 years have a fair amount of overlap in their conversations with others, but by the time children reach 6 to 8 years they have generally learned how to time their turns so that they occur at appropriate places in dialogues with only a few miscues resulting in overlaps. It is possible classroom experiences in the early grades influence children's learning turn taking skills.

Beyond turn taking, a person's response must relate in some way to a speaker's previous utterance if a topic of conversation is to be maintained. Sometime before age 2, less than half of children's responses to adults' utterances typically maintain the topic of conversation set by the adult. This proportion increases steadily to about 3 years when they can continue a topic in about 50 percent of their responses. However, it is not until approximately age 3½ to 4 that children demonstrate skills in maintaining topics through a number of adjacent comments in a dialogue (Bloom, Rocissano, & Hood, 1976). Brinton and Fujiki (1984) reported that the average number of utterances that even 5-year-old children produced on a single topic during a conversational interchange was five. Additionally, these children covered, on the average, 50 topics in 15 minutes of conversation. The type of activity/context may, however, influence children's ability to maintain topics. Schober-Peterson and Johnson (1989) found that 4-year-old children were able to maintain one topic over as many as 13 to 91 utterances during activities that involved enacting, describing, and problem-solving conversations. Although these children demonstrated considerable topic maintenance skill during activities that promoted these forms of discourse, 75 percent of their topic maintenance utterances were still relatively short.

Not only do children show developmental patterns in their turn-taking skill and topic maintenance ability, they also demonstrate changes with age in the devices they use to maintain topics. As children grow older, they increasingly add new information to a topic to maintain it. Before age 3, children tend to use *focus/imitation* topic maintenance devices (Bloom et al., 1976; Keenan, 1975). That is, they attend to focus on one or more of the words in a previous utterance and repeat or imitate those portions in their succeeding responses. As children approach age 3, their use of focus/imitation devices decreases, while their use of substitution/expansion operations increases (Bloom et al., 1976; Keenan, 1975). In *substitution/expansion*, children add information to the topic of a previous utterance or modify the previous utterance in some way.

Unfortunately, not all utterances in a conversation are understood by listeners. When this occurs, effective speakers revise their messages. Children at about 2 years of age are able to modify their original utterances when their listeners misunderstand, but their modifications typically involve use of phonetic modifications (changing word pronunciations) in attempts to clarify their messages. As children mature, they change their revision strategies and use more word substitutions to modify their communicative attempts. As they approach 5 years of age, they tend to increase the length of subsequent utterances when they know that their listeners have not received the messages adequately. Conversely, they also decrease the length of utterances when they are aware that their message has been understood. The intent of children's messages when there has been a communication failure may affect how successfully the children resolve the communication breakdown. For example, children between 3½ and 5½ years of age may be more successful at resolving their communication failure when the intent of their message was a request than when it was an assertion (Shatz & O'Reilly, 1990).

**Fluency.** All speakers revise phrases, repeat words, hesitate, use fillers such as “uh,” and make false starts in the delivery of messages. These disruptors are often referred to as *mazes*. In fact, preschool children typically go through a period of normal dysfluency. However, most children outgrow this period of normal dysfluency, and once they enter school, the degree to which messages are delivered with a smooth, easily flowing series of words often becomes one of the factors people use, consciously or unconsciously, to evaluate the language proficiency of children (Loban, 1976).

Contrary to what we might expect to see, the overall occurrence of mazes in children’s spoken language seems not to decrease with age (Loban, 1976). In fact, as length and complexity of utterances increase with age, so does the number of maze behaviors, although there may be erratic increases and decreases in the number of maze behaviors at different times and during different tasks.

**Discourse.** As we saw in Chapter 1, there are several forms, or genres, of discourse. Conversation is the earliest occurring form, and our discussion above was focused on children’s development of several conversational components. Narratives are a common part of language use but they are not limited to relating information about movies or storybooks. We use narratives when we describe to officials what happened in an automobile accident or when we recount events that occurred during our summer vacation. Narratives are monologues that place heavy demands on logical structure, temporal and causal sequencing, cohesion, and presuppositional abilities. As such, successful narrative ability is a later-developing language skill in children. Narrative discourse emerges in children in the preschool years, but children generally are not successful at producing full narratives until the early school years. In reaching the ability to produce full, cohesive narratives, preschoolers pass through several stages in developing the ability to produce true narratives.

Applebee (1978) proposed six levels of narratives; from least to most complex, these are heaps, sequences, primitive temporal narratives, unfocused temporal chains, focused temporal or causal chains, and proper narratives. Although children between the ages of 2 and 3 years begin to tell fictional narratives and briefly describe what has happened to them (Hughes, McGillivray, & Schmidek, 1997), these narratives are considered to be protonarratives and are characterized by what Applebee (1978) refers to as *heaps*. These are series of unrelated, unsequential statements. Little if any concern for the listener’s informational need is present, and beginnings and endings are not obvious. These heaps gradually evolve to sequences (Applebee, 1978). The information in *sequences* is presented in an additive but not temporal fashion.

From about 3 to 5 years of age, children begin to relate narratives that show some concern for temporal sequencing of events. Initially, children’s narratives represent what Applebee (1978) terms *primitive temporal narratives*. Although these narratives still do not contain plots or evidence causality, they do present information in a rudimentary temporal sequence and are focused around a central event. These primitive temporal narratives are gradually replaced with narratives characterized by *unfocused temporal chains*. Narratives of this type contain concrete relationships chained in temporal order. Applebee (1978) suggests that the next narrative level is that of *focused temporal or causal chains*. Narratives of this type typically have a main character, and events are presented in a chained manner around the character. Initially, events are chained in a temporal order (Lahey, 1988). Causal chaining generally does not emerge until the early school years, or about 5 to 7 years of age. Focused causal chain narratives are the forerunners of true narratives, which appear at about 7 to 8 years of age (Lahey, 1988).

*True narratives* not only have central themes and/or characters but also generally include multiple causal chains as well as temporal organization (Lahey, 1988). When children achieve the true narrative level, the narratives have defined episode structure(s) made up of the multiple focused causal and temporal chains referred to above (Stein & Glenn, 1979). Typically, by about 9 years of age, children produce narratives that conform to story grammar structure (Stein & Glenn, 1979). This means that their stories include the following:

- Setting statements
- Initiating event(s)

- Internal responses of characters
- Internal plan(s) to resolve the dilemma(s) in the story
- Attempts at resolution
- Direct consequences
- Reactions

However, children continue to develop in their ability to include more multiply embedded episode structures. We see, then, that children's narratives evolve from those present at about 2 years of age, which are characterized by heaps of unrelated statements, to those produced in the first 2 or 3 years of school, characterized by several embedded episodes containing causal and temporal patterns (Hughes et al., 1997).

When children begin school, they begin to be exposed to a more complex form of discourse, that of exposition. As we know from Chapter 1, expository discourse is designed to inform. It is also a major avenue for children as they acquire increasingly competency in reading and writing. Children read expository discourse to acquire information and children produce written discourse and participate in spoken discourse to demonstrate and share what they have learned. As we will see in subsequent chapters, and particularly in Chapter 4, there is significant reciprocity between spoken discourse, reading discourse, and writing discourse, and as children develop their abilities in one, they develop their skills with the others.

Chapter 1 introduced readers to several of the genres of expository discourse. There is no consensus among authors regarding the number of expository discourse genres or the names for the various genres. And, there is no one requisite organizational format that guides the structure of each genre, unlike narrative discourse which, as we saw above, has a broad organizational framework, for example, a setting, episodes, and temporal orientation. Longacre (1983) used two features, temporal sequence and agent orientation, to explain the overarching frameworks of four types of discourse—procedure, explanation, narrative, and behavioral. Table 2.8 shows the relative prominence of the combinations of the two features for these four genres. For example, narrative discourse has strong emphases on agents (or characters) as well as temporal sequences of events, hence + temporal sequence and + agent orientation. In contrast, explanatory discourse, which consists of texts, such as how dyes work or how keystones function in arches, is less concerned with the who (or agents) and sequences of actions in the provision of the information, hence – agent orientation and – temporal sequence. Campaign speeches, which have a large focus on candidates' promised actions but less focus on the when of the actions, are examples of behavioral exposition and categorized as + agent orientation and – temporal orientation. Lastly, procedural exposition involves considerable attention to sequences of actions in informing about a procedure but generally less concern about the agent of the actions, thus mostly – agent orientation but + temporal orientation.

In contrast to the four genres in the Longacre (1983) example above, Ukrainetz (2006) presented six types of expository discourse: description, enumeration, procedure, explanation, comparison/contrast, and persuasion. We know that conversational and narrative discourse emerges earlier than expository discourse, and that exposition discourse

**TABLE 2.8 | Broad Organizational Frameworks for Four Discourse Genres**

		Temporal Sequence	
		+ Temporal Sequence	– Temporal Sequence
Agent Orientation	+ Agent Orientation	Narrative	Behavioral*
	– Agent Orientation	Procedure	Explanation

\*Connected texts such as campaign speeches, sermons, and some advertisements.

Source: Based on Longacre (1983).

is generally considered to be a more advanced form of discourse and associated with formal schooling. There does not, however, appear to be a clear developmental sequence in which school children acquire ability to produce the different forms of expository discourse. Beyond broad frameworks, such as that provided by Longacre's (1983) example, each occasion of producing each type of exposition requires students to bring together their knowledge of the topic with many sophisticated language skills, such as complex sentence use with a repertoire of conjunctions to convey precision in organization of content and meaning, and presupposition about the intended audience's prior knowledge of and interest in the topic in order to cast the information appropriately. This means each piece of exposition is relatively uniquely created. These features and requirements of expository discourse support the notion that it is a later developing language skill. Students continue their growth with expository discourse into, throughout, and likely beyond adolescence.

**Metalinguistics.** Young children who are initially learning language do not understand that what they are saying can be something separate from what they are doing. They do not know that they can talk about language, analyze it, see it as an entity separate from its content, and judge it. They are simply learning language to communicate. When they begin to ask what an object's name is, comment that they have forgotten the word for something, repair their utterances spontaneously, practice words or sounds, rhyme words spontaneously, or say that somebody did not say something correctly, they are showing early metalinguistic awareness.

There is some thought that true metalinguistic skills do not appear until the early school years, suggesting the influence of the educational process in helping children become aware of language as something that can be manipulated and used in learning. Metalinguistic skills develop well into if not throughout high school and possibly even into adulthood.

## THE ADOLESCENT YEARS

In contrast to several decades ago when there was a widely accepted belief that the important aspects of spoken language development were complete by about 7 or 8 years of age, we now know that some very interesting aspects continue to develop into and through the adolescent years. We also know that the changes that occur with many of these aspects of adolescent language growth may be gradual, slow, and subtle (Nippold, 2007); become evident only when "the performance of nonadjacent age groups is compared" (Reed, Griffith, & Rasmussen, 1998, p. 166); and/or show up as "spurts and regressions or fluctuations in performance" (Reed et al., 1998, p. 176). In the next sections, several aspects of language that show developmental growth into adolescence are highlighted.

### Form

**Length of Utterance.** Length of utterance is one aspect used to estimate language performance of older children and adolescents. However, unlike measures of utterance length using counts of morphemes that we see used with youngsters, length is typically measured in words when language of adolescents is being investigated. A language sample is also generally segmented into either C-units or T-units.<sup>2</sup> Length of spoken utterance continues to increase up to and during adolescence and even into adulthood (Nippold, Hesketh, Duthie, & Mansfield, 2005; Nippold, Mansfield, & Billow, 2007; Nippold, Mansfield, Billow, & Tomblin, 2008, 2009; Reed, 1990).

2. A C-unit is defined as one independent clause and all dependent/subordinate clauses attached to it. C-unit segmentation of language samples permits inclusion of fragments that occur as the result of conversational interchanges. The definition of T-unit is identical to C-unit, but segmentation of language samples omits fragments for analysis purposes.

Loban's (1976) longitudinal study, which remains, according to Larson and McKinley (2003), "one of the most extensive studies to date" (p. 58), examined a variety of aspects of spoken language development from grades 1 through 12 (about 6 to 7 to 17 to 18 years of age), including utterance length (measured in words).<sup>3</sup> Because of the comprehensive nature of Loban's research, we draw considerably from his work in our discussion of adolescents' syntax.

Loban presented data for three groupings of students. One consisted of students whom teachers identified as having advanced language skills, the second was a group whom teachers identified as having poor language skills, and the third was an artificially contrived grouping created by randomly selecting students from the advanced-language and poor-language groups and pooling the results of their performances. Loban suggested that this last group represented "average" or typical language users. Given what we now know about language impairment in students, knowledge that was not available during the years when Loban collected his data, it is likely that many of the students in Loban's poor-language group might today be identified as having language impairment.

With regard to utterance length, Loban's (1976) results revealed a relatively stable pattern of increasing length throughout the grades for all three groups, a pattern he discounted as resulting from simple verbosity, that is, "an increased use of language without any significant increase in meaningful communication" (p. 25). In his study, utterance length was closely associated with overall syntactic complexity. Additionally, those students whom teachers rated as having advanced language skills consistently used longer statements than their less language-proficient counterparts. By 12th grade, the mean length of utterance (words) for the average-language group was 11.70, compared to the higher mean length of utterance of 12.84 for the advanced-language students and the low mean length of utterance of 10.65 for the poor-language students.

The length-of-utterance data that Loban (1976) reported was collected from language samples of adolescents engaged in conversation and interviews. Nippold et al. (2005, 2007, 2008, 2009) used three different tasks to elicit language samples from the adolescents in their studies—conversation, an expository task involving explanation of a favorite game or sport, and an expository task involving discussion of peer conflicts. Across the different tasks, length of utterance was longer for the older adolescents and/or in the expository tasks, with an advantage for the task involving peer conflicts. Clearly, increasing length of utterance is an indicator of advancing syntax in adolescence, but length can vary as language elicitation tasks vary, an important consideration of assessment of language performance of adolescents.

**Dependent/Subordinate Clauses.** Complex sentences (which readers will recall contain at least one dependent/subordinate clause in addition to an independent or main clause) are also of interest in adolescent language development, in part because of their importance in acquiring competency with spoken and written expository discourse. Growth in several aspects of complex sentence usage is particularly characteristic of older children and adolescents. Distinguishing features of older students' language include the following:

- Embedding (placing linguistic elements, such as a dependent clause, in the middle of utterances rather than at the end, as in "The man *who came to dinner* ate a lot" versus "The man ate a lot *when he came to dinner*")
- Using multiple embedding (having more than one dependent/subordinate clause in the middle of utterances, as in "The man *who came to dinner that began quite late* ate a lot")
- Increasing use of clauses located toward the beginning of utterances, such as "*When he came to dinner*, the man ate a lot" compared to clauses toward the ends of utterances, such as "The man ate a lot *when he came to dinner*"

Loban's (1976) work provides us with additional information about other aspects of dependent/subordinate clause usage that continue to develop into the adolescent years:

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3. Loban used C-units for utterance segmentation and analyses.

- More dependent/subordinate clauses per utterance with advancing age
- Increase in the percentage of words used in the dependent/subordinate clause portions of utterances from 12 to 35 percent between grades 1 and 12

This last finding means that in grade 12, approximately one-third of the words in an adolescent's utterances are part of the dependent/subordinate clauses in their utterances. As Loban (1976) stated, "With increasing chronological age all subjects devote an increasing proportion of their spoken language to the dependent clause portion of their communication units" (p. 41). Nippold et al. (2005, 2007, 2008, 2009), in exploring syntactic growth during adolescence, also found increasing use of dependent/subordinate clauses. Findings that adolescents use more conjunctions in their utterances than younger school-age children, including conjunctions that conjoin clauses (Reed et al., 1998), add support for both Loban's and Nippold's findings.

The information above tells us that increasing use and length of dependent/subordinate clauses, especially those embedded in or starting utterances, are characteristics of language development during adolescence. There is, however, another aspect to complex sentence use that is a significant developmental characteristic of adolescent language. This relates to changes in the types of dependent/subordinate clauses used with advancing age. Loban (1976) found that for the "average" language group (i.e., randomly grouped students), the proportion of *noun clauses* (those functioning as nouns in utterances, as in "Ice cream is *what he wants*" or "*What he wants* is a job") increased from grades 1 through 12, while the proportion of *adverbial clauses* (those functioning as adverbs, as in "She will eat *when she comes home*") decreased and the proportion of *adjectival clauses* (which can also be termed *relative clauses*) remained the same from grades 1 through 12. These findings are shown in Table 2.9. By grade 12, about 50 percent of the clauses used were noun clauses, with adjectival and adverbial clauses each accounting for about 25 percent of dependent-clause usage. Recall that object complement clauses are early developing, and object complements function as nouns. Therefore, the fact that the majority of clauses were noun clauses should not be surprising.

Also apparent in Table 2.9 is the different pattern of development for adjectival clauses for the group of students with advanced language skills. These students increased their use of adjectival clauses from grades 1 through 12, in contrast to noun or adverbial dependent clauses. This increase clearly separated language-proficient children and adolescents from those with average and poor language. Loban (1976) concluded that "the evidence seems clear that an exceptional speaker . . . will use a progressively greater percentage of adjectival clauses in oral language, whereas the nonproficient speaker . . . or average speaker . . . will show no such percentage increases in the use of adjectival clauses" (p. 48). He pointed out that the greatest increase in the language-proficient students' uses of adjectival clauses occurred mainly during grades 7, 8, and 9.

**TABLE 2.9 |** Percentages of Different Clause Types Used by Advanced-, Average-, and Poor-Language Students in Grades 1 through 12

Language Group	Noun Clauses		Adjectival Clauses		Adverbial Clauses	
	Grade 1 Students	Grade 12 Students	Grade 1 Students	Grade 12 Students	Grade 1 Students	Grade 12 Students
Advanced	46%	43%	23%	33%	31%	24%
"Average" (random)	41%	50%	26%	25%	32%	25%
Poor	34%	45%	19%	21%	47%	34%

Source: Loban (1976).

The relationship of adjectival clauses to adverbial clauses also seems particularly revealing about the language development of advanced- versus poor-language students. Although the proportion of adverbial clauses used by the poor-language users decreased from grades 1 through 12, as it did for the advanced-language users, across the grades the poor-language users maintained an overall greater use of adverbial clauses than the advanced-language students. For the poor-language users, their decrease in use of adverbial clauses was paralleled by an increase in the proportion of noun clauses they used. This contrasts with the increase in adjectival clause usage across the grades of the advanced-language users. By grade 12, approximately 33 percent of the dependent/subordinate clauses of the advanced-language users were adjectival clauses compared to about 20 percent for the poor-language users. This is an important difference when use of complex sentences with precise meanings in expository discourse is considered.

Loban's research suggests the importance of increasing use of adjectival (relative) clauses in development of highly proficient language but also shows relatively stable patterns of growth for the "average" language group. However, the combined findings for different types of clause usage, including noun and adverbial clauses as well as adjectival/relative clauses, associated with increasing age during adolescence is less clear from the research of Nippold et al. (2005, 2007, 2008, 2009) on the syntactic development of adolescents. Variations in methodology, particularly the tasks used to sample language, likely contributed to some of the differences. Nevertheless, the importance of knowing the nature of clausal growth in adolescence for assessment and intervention indicates a need to investigate this area further.

**Adverbial Connectives.** Another characteristic of adolescent language development is the increasing use of linguistic structures that occur relatively infrequently in spoken language (Scott & Stokes, 1995). Adverbial connectives are one category of low-frequency linguistic devices. *Adverbial conjuncts* (forms that indicate a logical relation between utterances, such as "Nevertheless, the burned cake was eaten") and *adverbial disjuncts* (forms that indicate an attitude or comment about the utterance, such as "There was, of course, some debate about the issue") are two types of these connective devices that link utterances but do so outside of the internal syntactic structure of clauses. The work of several researchers (Crystal & Davy, 1975; Nippold, Schwarz, & Undlin, 1992; Scott, 1984; Scott & Rush, 1985) has contributed to our knowledge of adolescents' uses of these advanced language forms:

- Adolescents use a greater variety of adverbial connectives, use them more frequently, and are more successful at metalinguistic tasks involving them than younger students.
- Teenagers use adverbial conjuncts more frequently than adverbial disjuncts.
- Disjuncts tend to be used by older rather than younger students.
- Adolescents' frequency of use of these forms is less than that of adults.
- Ability in dealing with adverbial conjuncts continues to improve from early adolescence to early adulthood.
- Not all adults achieve full mastery of adverbial conjuncts, especially in written language.

## Content

In this section, we will consider the content of language, that is, semantics, or words and meaning. We will take a look at some of the aspects of words, word meanings, and figurative language that continue to develop during the adolescent years.

One obvious measure of semantic development to think about is the number of words in an individual's vocabulary. However, vocabulary size is only part of the picture about adolescents' semantic development. Other parts of the picture involve what types of words they learn and what they do with the words and their meanings. For example, adolescents know more words with abstract meanings than younger children do (e.g., *oppression*, *simulate*, *divestiture*) and are able to use words in many more contexts (e.g., *hot* as in "hot food" and "hot topic" or *imperial* as in "imperial persona" and "imperial family"). Recall that morphologically complex words also represent an area for semantic growth during adolescence. A morphologically complex word is one that is derived from attaching prefixes and/or suffixes (bound morphemes) to a root word to form a different word but one that has semantic links

with the root. In Chapter 1, an example used was the adjective *gentle*, which was altered into the morphologically complex forms *gently*, an adverb; *gentleness*, a noun; and *ungentlemanly*, an adverb. Derived nouns (*gentleness*) and derived adjectives (*biologic*) are common in texts used in upper elementary and secondary grades (Nippold & Sun, 2008). The comprehension of morphologically complex words of eighth graders, approximately 13/14 years old, has been reported as significantly better than that of fifth graders, approximately 10/11 years old, indicating increasing growth in understanding these types of words with increasing age (Nippold & Sun, 2008). For both age-groups, the derived nouns were more difficult than the derived adjectives. The degree of familiarity, as indicated by their frequency of occurrence in third- through ninth-grade reading materials, was associated with the adolescents' comprehension of the words.

There are several reasons for much of the semantic growth into and during adolescence—educational exposure, life experiences, and cognitive shifts into formal/hypothetical thought levels. As Nippold (2007) points out, these mean that, compared to younger children, adolescents are better able to learn new words and their meanings by doing the following:

- Picking up on cues that morphological markers provide for deciphering meaning of unfamiliar words (*piano, pianist*)
- Using context to decipher meanings of unfamiliar words (“The 80-year-old man enjoyed being referred to as an octogenarian.”)
- Taking in the direct instruction to which they are exposed in school and the vocabulary associated with it (e.g., *pyrolytic, trochaic*)

During adolescence, there is a continuing, qualitative refinement in lexical knowledge that is in addition to quantitative growth in the size of the lexicon.

Although vocabulary growth is an important aspect of later language development, there are other, equally important areas of semantic development during adolescence and even into adulthood. These include the characteristics of definitions provided for words, the ability to complete verbal analogies (“feet are to socks as hands are to \_\_\_\_”), and skill in detecting and deciphering statements that are ambiguous (“Pressing the suit led to unpredicted problems”). Adolescence is also a peak period for the use of figurative language, and a number of areas of figurative language feature in the language changes that occur in the teenage years. Among these are verbal humor, idioms, metaphors and similes, and proverbs. Table 2.10 provides a summary of these important areas of semantic growth in adolescence.

Competence in figurative language use is generally not thought of as critical to everyday survival. It is, however, important to adolescents in their academic and social lives. Students across grade levels, including adolescents, frequently encounter figurative language in their classrooms and textbooks, especially in the language arts. According to Lazar, Warr-Leeper, Nicholson, and Johnson (1989), as early as the kindergarten year, about 30 percent of teachers' utterances contained at least one occurrence of a multiple-meaning expression. Five percent of their utterances contained at least one idiom. By eighth grade, 37 percent of teachers' utterances contained at least one occurrence of a multiple-meaning expression, and, of particular interest, the occurrences of utterances containing idioms increased to 20 percent. Success in school has also been found to be associated with students' levels of skill with aspects of figurative language, in particular their ability to comprehend proverbs (Nippold, Uhden, & Schwartz, 1997; Nippold, Hegel, Uhden, & Bustamante, 1998). Additionally, the use of slang and jargon, for which adolescents are renowned, is based primarily on figurative language. In fact, the ability to comprehend and use the slang and jargon of the peer group has been linked to peer acceptance and the ability to establish friendships during adolescence. In discussing later language development of children and adolescents, Nippold (2007) even suggests that “gaining competence with all types of figurative language is an important part of becoming a culturally literate and linguistically facile individual” (p. 17). An adolescent's ability to understand and use figurative expressions *should not be sold short* (to use a figurative expression) as a measure of language development.

**TABLE 2.10 |** Important Areas of Semantic Growth in Adolescence

Words and Word Meanings	Features
Defining words  <i>Wing to bird: Fin to _____</i>	<p>Categorical definitions used with increasing frequency (“<i>Wombat</i>: an animal”); children’s definitions more commonly consist of functions (“<i>Spoon</i>: something you eat with”) or descriptions (“<i>Wombat</i>: A wombat is brown”; “<i>Wombat</i>: eats plants”) or are idiosyncratic (“<i>Ball</i>: the thing Jimmy has”)</p> <p>Gradually become more categorical with age  (“<i>Cat</i>: like a dog”)</p> <p>More advanced forms likely to include a superordinate category and include one or more descriptors (i.e., Aristotelian definition) (“<i>Wombat</i>: a nocturnal marsupial”)</p> <p>May include more than one feature or definition type (“<i>Ball</i>: a round, three-dimensional object often used in competitive games”)</p> <p>Ability associated with adolescents’ reading ability</p> <p>Ability for different word types may develop differently with different patterns (e.g., nouns vs. verbs vs. adjectives)</p>
Verbal analogies  <i>Playing cards can be expensive.</i>  <i>The glasses were smeared.</i>	<p>Ability increases from childhood into adolescence but may be a skill not fully acquired until late adolescence or even adulthood</p> <p>Some fifth to eighth graders may approach verbal analogies as free association tasks (“<i>Wing</i> to <i>bird</i>: <i>Fin</i> to <i>swim/water/scales/fish</i>”)</p> <p>Ability associated with level of academic performance and word/vocabulary knowledge (“<i>Top</i> to <i>apical</i>: <i>Bottom</i> to _____”)</p> <p>Ability associated with world/cultural knowledge  (“<i>Democrat</i> to <i>Republican</i>: <i>Labor</i> to _____”) (U.S. and Australian political parties)</p> <p>Increase in ability to deal with more complex relationships  (“<i>Misfeasance</i> to <i>malfeasance</i>: <i>Misdemeanor</i> to _____”)</p> <p>Relationship between cognitive and semantic factors in these tasks not clear</p>
Ambiguities  <i>Playing cards can be expensive.</i>  <i>The glasses were smeared.</i>	<p>Statements with more than one meaning that, without context, may be interpreted inaccurately</p> <p>Four types:</p> <ul style="list-style-type: none"> <li>■ Phonological ambiguity = homophones (“He saw three pears [pairs]”) (Shultz &amp; Pilon, 1973, p. 730)</li> <li>■ Lexical ambiguity = words with multiple meanings (“She wiped her glasses”) (Wiig &amp; Semel, 1984, p. 343)</li> <li>■ Syntactic or surface structure ambiguity = words in a statement can be grouped in more than one way; interpretation depends on recognition of subtle differences in stress and juncture (“He told her baby//stories”; “He told her//baby stories”) (Kessel, 1970, pp. 86–87)</li> <li>■ Deep structure ambiguity = more than one set of linguistic relationships are possible between words of a statement</li> </ul> <p>(“The duck is ready to eat”) (Shultz &amp; Pilon, 1973, p. 728) (The duck is going to eat, or the duck has been prepared and someone is about to eat it.)</p> <p>(“I find visiting relatives tiresome”) (The act of going to visit relatives is tiresome or relatives who come to visit are tiresome.)</p> <p>Developmental sequence in ability to detect these types in the order listed above</p> <ul style="list-style-type: none"> <li>■ Phonological ambiguities: greatest growth rate between 6 and 9 years of age; remains a superior skill compared to other types, at least through grade 10, or about 15 years of age</li> <li>■ Lexical ambiguities: detected at approximately 10 years of age, although some children in the early elementary grades may respond correctly; remains superior skill to later developing types</li> </ul>

TABLE 2.10 | Continued

Words and Word Meanings	Features
	<ul style="list-style-type: none"> <li>■ Syntactic and deep-structure ambiguities: marked development at age 12; little or no skill evidenced earlier</li> <li>■ Ability to detect syntactic ambiguity may somewhat precede ability to detect deep-structure ambiguities</li> <li>■ Estimated ages of acquisition: syntactic ambiguities at about 12 years; deep-structure ambiguities at about 12–15 years</li> <li>■ Some 15-year-olds may continue to have difficulties with both types</li> </ul> <p>Often a basis of advertisements (ad for a new car traveling on a highway, “Designed to move you”) (Nippold, Cuyler, &amp; Braunbeck-Price, 1988, p. 473)</p>
Figurative language	
Verbal humor	Often based on ambiguities
	Developmental pattern similar to that for ambiguities
Idioms	Expressions that have both a figurative and a literal interpretation
<i>Raining cats and dogs</i>	Comprehension of the figurative meaning of idioms improves with age
<i>Slap in the face</i>	Gradual growth in understanding into and throughout adolescence
	In early grades, children may understand literal meaning of idioms; some may also comprehend some of the figurative interpretations
	Ability associated with reading comprehension level
	Consistent ability to comprehend figurative meanings not evidenced until adolescence
	Even older adolescents may not demonstrate complete mastery of idiomatic interpretation
	Several factors influence idiom comprehension:
	<ul style="list-style-type: none"> <li>■ Frequency of exposure to specific idioms; familiarity; more familiar are more easily understood</li> </ul>
	<ul style="list-style-type: none"> <li>■ Manner in which understanding is assessed</li> </ul>
	<ul style="list-style-type: none"> <li>■ Degree of supporting contextual information</li> </ul>
	<ul style="list-style-type: none"> <li>■ More easily understood when presented in context (e.g., short stories)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Harder to understand in isolation (e.g., pointing to pictures depicting the meaning)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Providing explanation of idiom is also difficult</li> </ul>
	<ul style="list-style-type: none"> <li>■ Transparency; the more transparent, the easier to understand</li> </ul>
	<ul style="list-style-type: none"> <li>■ Culture (“Kangaroos in the top paddock,” an Australian idiom meaning much the same as “Bats in the belfry”) (Reed, 1991, p. 11)</li> </ul>
Metaphors and similes	Employing an attribute to describe an entity or to compare entities not literally or typically associated with the attribute or each other
<i>She is a hard person</i> (metaphor)	Requires acknowledgment of similarities between domains usually seen as dissimilar
<i>The wind was like an arrow looking for its bull's-eye</i> (simile)	Common metaphors referred to as <i>frozen forms</i> ; less common termed <i>novel forms</i>
	Similes: variations of metaphors; inclusion of <i>like</i> or the phrase <i>as (adjective) as</i> ; makes comparison or association explicit
	Comprehension and use linked to age, cognitive growth, culture, the syntactic forms used to express the metaphor/simile, schooling, semantic growth, and exposure to the forms
	Similes sometimes thought to be easier than metaphors because of the explicit syntactic form similes employ; research has not fully supported this conclusion
	Metaphoric comprehension
	<ul style="list-style-type: none"> <li>■ At 7 years of age, children understand some metaphors; appears intuitively based</li> </ul>
	<ul style="list-style-type: none"> <li>■ As children enter the concrete operations stage, skill improves considerably</li> </ul>
	<ul style="list-style-type: none"> <li>■ Continued improvement into adolescence and the formal thought stage</li> </ul>

(Continued)

**TABLE 2.10 | Continued**

Words and Word Meanings	Features
	<ul style="list-style-type: none"> <li>■ In one study (6- to 14-year-olds), only the adolescents understood the metaphors (Winner, Rosenstiel, &amp; Gardner, 1976)</li> <li>■ Novel forms more difficult than frozen forms</li> </ul> <p>Metaphoric use</p> <ul style="list-style-type: none"> <li>■ Likely a U-shaped developmental pattern</li> <li>■ Young children's metaphors generally conventional or frozen forms; any novel forms usually stem from inaccurate perceptions or limited cognitive and linguistic realizations</li> <li>■ Use of metaphors increases up to the elementary grades</li> <li>■ In elementary grades, use declines; conforming to educational expectations?</li> <li>■ Use increases again into adolescent years</li> <li>■ Adolescence a peak in use of metaphoric productions</li> <li>■ Frozen forms, not novel forms, predominant even in adolescence</li> </ul>
Proverbs	Most difficult form of figurative language
<i>A rolling stone gathers no moss</i>	Later developing than similes, metaphors, and idioms
<i>Don't put all your eggs in one basket</i>	Rudimentary figurative comprehension possibly as young as 7 to 9 years of age if task provides supporting contexts or a receptive task used Proverb explanation a more difficult task Consistent ability in proverb comprehension develops during adolescence and into young adulthood Several factors affect ability:
	<ul style="list-style-type: none"> <li>■ Frequency of exposure; more familiar proverbs easier ("A leopard cannot change its spots" likely easier than "Scalded cats fear even cold water") (Nippold, 2007, p. 218)</li> <li>■ Word knowledge and word definition ability</li> <li>■ Culture ("The lion went to the jungle because it ate a deaf ear," a Masai proverb) (Wiig, 1989, p. 7)</li> <li>■ Amount of formal education, including amount of postsecondary education</li> <li>■ Degree of concreteness or abstractness of nouns in the proverbs; proverbs with concrete nouns easier</li> </ul> <p>Ability associated with level of reading ability</p>

Sources: Achenbach (1970); Armour-Thomas and Allen (1990); Fowles and Glanz (1977); Gardner (1974); Gardner, Kircher, Winner, and Perkins (1975); Johnson and Anglin (1995); Kessel (1970); Nippold (1988, 1991, 1993, 1994b, 1995, 1999, 2000, 2007); Nippold, Allen, and Kirsch (2001); Nippold et al. (1988); Nippold, Hegel, Sohlberg, and Schwarz (1999); Nippold et al. (1998); Nippold, Leonard, and Kail (1984); Nippold and Martin (1989); Nippold, Moran, and Schwarz (2001); Nippold and Rudzinski (1993); Nippold et al. (1992); Nippold and Taylor (1995, 2002); Nippold, Taylor, and Baker (1996); Nippold et al. (1997); Pollio and Pollio (1979); Power, Taylor, and Nippold (2001); Shultz and Horibe (1974); Shultz and Pilon (1973); Spector (1990, 1996); Wiig (1989); Wiig, Gilbert, and Christian (1978); Wiig and Semel (1984); Winner et al. (1976).

## Use

Several studies provide indications of developing pragmatic skills in adolescents. Our discussion here focuses on five components of language use: (1) the ability to adapt and modify language, depending on the status of the conversational partner; (2) the various speech acts and functions occurring in communication; (3) ways in which topics are and are not maintained; (4) the paralinguistic features employed; and (5) the nonverbal communicative characteristics of adolescents.

An adolescent who is a competent communicator effectively adapts language to suit the situation (Reed, McLeod, & McAllister, 1999). That is, the adolescent uses code switching and different forms of communication based on the conversational partner's characteristics. Adolescents seem quite aware of the need to place greater importance on certain

aspects of communication with particular communication partners than others. In the study by Reed and her colleagues (1999), when grade 10, normally achieving adolescents were asked to rank the order of importance of 14 communication skills in their own communication when they were interacting with their teachers or their peers, communication skills associated with discourse management (e.g., clarification or communication repair for unclear messages) tended to be ranked as more important for interactions with teachers, whereas communication skills associated with empathy and considered to be addressee focused tended to be ranked as more important for communication with adolescent peers. In Larson and McKinley's (1998) longitudinal study, the language development of normally achieving male and female adolescents from grade 7 (12 to 13 years old) through grade 12 (17 to 18 years old) was tracked as they conversed in two situations, one with a same-aged peer and the other with an unfamiliar adult of opposite gender. In adolescent-adolescent conversations, the teenagers used more question types, engaged in more figurative language, introduced more new topics (i.e., evidenced more topic shifts), and used more abrupt topic shifts than in adolescent-adult conversations. These findings support Wiig's (1982) observation that by 13 years of age, adolescents evidence the ability to change from *peer register* to *adult register* and from *formal register* to *informal register*.

Besides being able to adapt their messages according to communicative situations, adolescents should have full use of all communicative functions and speech. The frequency with which adolescents employ different functions and acts appears to vary as a function of both the conversational partner's age and the age of the adolescent speakers themselves. When communicating with peers, adolescents have been described as using more functions designed to entertain and to persuade their peer to feel/believe/do something than when conversing with adults (Larson & McKinley, 1998). Recall from our previous discussion that persuasion has been identified as one type of expository discourse. Although persuading their conversational partner was more evident with peers than adults, when their performance with both conversational partners was pooled, the teenagers showed a pattern of fluctuations in the frequency with which they used persuasion across the grades. Even with the ups and downs in the occurrences of persuasion, the frequency with which this communication function occurred in grades 7 through 12 was actually quite similar. In contrast, the frequency of use of the function of describing an ongoing event increased from grades 7 through 12.

Describing ongoing events can be related to narrative discourse. Nippold (2007) has summarized aspects of narrative ability that improve during the school years and through adolescence. Among these are attempts by older children and adolescents to include more information about the emotions and motivations of the individuals involved in their narratives and to embed episodes or subplots within episodes of the narratives. Johnson (1995) cautions, however, that trying to identify norms for narrative skill is complicated by the fact that there are many different contextually related factors that affect what and how individuals produce narratives.

Other aspects of conversations have been found to change during adolescence. For example, in Larson and McKinley's (1998) longitudinal study, the number of new topics that the adolescents introduced during their conversations decreased from grades 7 through 12, as did their use of abrupt topic shifts. The teenagers did, however, show increases in the number of interruptions during their conversations. For the most part, these findings are consistent with what Nippold (2007) has suggested the literature identifies as characteristics of increasing conversational expertise into adolescence. These include staying on a topic longer, engaging in extended dialogues with conversational partners, and shifting to new topics gracefully.

Although with advancing age adolescents may not increase the frequency with which they use the communication function of persuading the listener to feel/believe/do something (Larson & McKinley, 1998; Nippold, 1994a, 2007), reviews of the literature suggest that there may be refinements in adolescents' execution or application of persuasion. These include greater ability to generate several reasons, rationales, and arguments for a proposition; to control the interactions and discourse; and to use less immature persuasive approaches, such as begging or whining. Other more advanced characteristics of persuasion that Nippold

(2007) identified (i.e., anticipating counterpoints and arguments, adjusting the persuasive strategy to suit listener characteristics, and proposing positive reasons or advantages) relate to the increasing ability of adolescents to adapt their communication to their partners and to see the world from the perspective of their communication partners, which is, in part, related to presupposition. Adolescents' recognition of the importance of being able to take their communication partner's perspective was identified in the Reed et al. (1999) study. These authors found that, although adolescents attached different degrees of importance to specific communication skills depending on whom their communication partners were, the one skill that ranked as relatively important for communication with both teachers and peers was the ability to take the communication partner's perspective. There are several indications in the literature that adolescents' social perspective taking abilities show continuing development during adolescence and that their abilities to consider more fully the perspectives of others in peer relationships become more refined from the period of middle adolescence to later adolescence (Burnett Heyes et al., 2015; Burnett & Blakemore, 2009; Van den Bos, Westenberg, van Dijk, & Crone, 2010).

From Chapter 1, we recall that maze behavior of children—revisions, repetitions, hesitations, and false starts—does not decrease with age. Loban (1976) found that the proportion of maze behavior was the same for children in both grade 12 and grade 1. This was true for all three groups of students—the advanced-, “average-,” and poor-language users. Nevertheless, Loban noted erratic increases and decreases in maze behavior in the fourth through ninth grades. Larson and McKinley (1998) found similar fluctuations in grades 7 through 12 and, like Loban, found a similar number of mazes used by adolescents in grade 7 as by those in grade 12. Of particular interest with regard to language impairment was that the poor-language users in Loban's (1976) study exhibited more maze behavior across all grade levels than the “average” language users and much more maze behavior than the advanced-language users.

Findings such as these confirm that there is considerable growth in pragmatic language skills in adolescence. It is during adolescence that teenagers gain adultlike language competency to use in their interactions with others.

## LANGUAGE, LITERACY, AND EDUCATION

Language and language-related skills make up the majority of the curricula in school and across all grades. In the early grades, with an emphasis on reading and writing, children's abilities in spoken language, including phonological processing skills, underpin their progress in learning to read and write. With advancing grades in elementary school, children practice their reading and writing, gradually beginning to use these skills for learning content. Learning content exposes the students to more and new language, which as the children progress into adolescence and secondary grades, is used to acquire more content. Along the way students are asked to do increasingly more independent reading and writing with less support from teachers in the process of learning to read and write. Language is, therefore, the primary foundation of literacy and the educational process.

As we have seen, when children enter school, often at the kindergarten level, they typically bring with them a solid base in the spoken (auditory-oral) language system. We know that their spoken language system is wholly developed by age 5, but children beginning kindergarten have usually had 5 years of listening experiences and 4 years of talking experiences. We know that they use fairly well-formed, complex sentences to express their ideas and needs and to ask questions; have a large expressive vocabulary; and understand between 20,000 and 24,000 words. This competence in the spoken language system is a significant factor in learning to read and write. As we will see over and over in this text, children whose listening and speaking skills are well developed most often have better reading and writing skills than those whose spoken language systems were less advanced. Conversely, elementary schoolchildren who struggle in school have regularly been found to have poorer language skills than their academically achieving peers. Oral language development in the preschool years prepares the child for formalized education, and it is integrally related to literacy. As we will see in see later in this text, multiple studies have

documented that children's abilities at the end of second, third, or fourth grades in a variety of reading, writing, and reading-related skills, such as decoding printed words, have been predicted by a number of different language skills when the children were toddlers or preschoolers.

### Emergent Literacy, Preliteracy, and Reading

Achieving literacy in Western societies is no longer seen as only acquiring the abilities to read and write. Rather, literacy is viewed as engaging in literate behaviors. These include reading spontaneously for pleasure and for learning; writing to convey analyzed and synthesized thoughts and ideas; listening and speaking to argue, persuade, discuss, and plan; and even using computers and the internet to communicate and acquire information. Recent views of literacy have also discarded the notion that literacy begins when children go to school and learn to read and write (Justice & Ezell, 2002). The acquisition of literacy is now seen to begin basically at birth, and toddlers and preschool children are considered to be in the process of becoming literate. *Emergent literacy* and *preliteracy* are terms that have been applied to the development occurring during the preschool years in children's early environments that leads to literacy. These are prereading and prewriting behaviors and skills that develop into conventional reading and writing abilities.

Several factors have been associated with emerging literacy skills in children. One of these is what goes on in preschoolers' homes and their family environment (Justice, Weber, Ezell, & Bakeman, 2002; Skibbe, Justice, Zucker, & McGinty, 2008; Snow, Burns, & Griffin, 1998; van Kleeck, Gillam, Hamilton, & McGrath, 1997). Characteristics of home and family environments that promote literacy include the following:

- A variety of print materials in the environment
- Writing instruments (crayons or pencils) and paper easily available
- Adults who are responsive to the child's attempts to read and write
- Reading and writing as integrated and embedded activities in daily family routine as regular activities of living, such as making lists, writing thank you notes, reading books at bedtime
- Adult-child storybook reading that does the following:
  - Is a social, interactive event
  - Contains routinized dialogue cycles
  - Varies differentially to allow children to take more responsibility for the reading as their language skills grow

Factors such as these are seen as helping to prepare young children for the more formal learning activities they will experience during their elementary and secondary school years. These young children begin school knowing that print represents oral language and, therefore, that it is meaningful and serves a variety of functions. They may even know something about the visual-graphic symbols associated with printed material, including speech sound-to-letter correspondence. Combined with metalinguistic skills, these developmental factors play important roles in children's learning the literacy skills (reading, writing, and spelling) that allow them to engage in literate behaviors, that is, to become literate individuals.

### School

The educational system is divided into the elementary and secondary school grades. The primary emphasis of the elementary grades is acquisition of basic learning skills (reading, writing, spelling, and arithmetic abilities), although as children progress into the upper elementary grades, somewhat more importance is placed on using basic skills for content learning. In secondary school, emphasis shifts dramatically to acquiring content-area information, with dramatically increasing expectations for independent learning. At this level, basic skills are assumed to have been acquired.

**Stages in Learning to Read** The progression that children go through on their route to learning to read has had numerous descriptions. One of those is that of Chall (1996), who described children learning to read as progressing through five stages beginning with formal schooling at entry into kindergarten through high school into adulthood. The following highlights characteristics of these stages.

**Stage 1.** This stage can be thought of as the “Initial Reading” or “Decoding Stage” in her five-stage framework. This stage corresponds to kindergarten and ages 5 to 7 years. Students learn to associate phonemes in words with the graphemes representing the word in print. Phonics is, therefore, a prominent feature of the stage. Although students likely make word substitution errors, the nature of their errors gives clues as to what they have learned about reading in this initial stage. Initially, as they attempt to read short strings of connected text, they may substitute words that could be semantically possible and fit syntactically, as in reading aloud *The girl is pretty* for the target printed sentence *The girl is throwing*. This type of substitution reflects what linguistic knowledge the student is bringing to the reading task. As students learn more about grapheme-phoneme correspondence as a result of the instructional process, we may see a shift in the emphasis the children put on reading words so that a visually similar word might be substituted for the target but the word substitution might not make sense, such as *The girl is thing*. Gradually a student begins to merge linguistic knowledge with increasing decoding knowledge so word substitutions might be visually similar, semantically plausible, and syntactically acceptable, such as *The girl is three* for the target *The girl is throwing*.

**Stage 2.** Three accomplishments comprise Stage 2—fluency, confirmation, and ungluing from print. Stage 2 corresponds to grades 2 and 3 and ages 7 through 8 years. Students refine their decoding abilities and practice their reading. As they practice, they encounter redundancies in familiar printed texts, which helps them recognize more quickly and easily words that occur with high frequencies. They experience confirmation in their reading. The practice also increases their reading speed, and because they are better with their decoding skills, they can decipher unrecognized words more quickly. They become more fluent readers as they use greater visual processing. In doing so, they can begin to allocate more of their resources to gleaning meaning from what they are reading and less to the process of deciphering printed words. Thus, they unglue from reading and move toward reading to learn, the next stage.

**Stage 3.** This stage is the “Reading to Learn” stage. From grades 4 through 8 (possibly 9), corresponding to about 9 to 14 years, students are asked to direct their reading skills to learn information from printed texts and, therefore, learn academic content. The period for Stage 3 covers the upper elementary grades (i.e., grades 4 through 6) and middle school grades (grades 7 through 8/9) and Piaget’s concrete operations and formal operations stages of cognition.

Chall considered Stage 3 might more precisely be divided into two substages or periods, with the first corresponding to the upper elementary grades and ages 9 to 11 years. Students are expected to acquire the ability to read relatively long texts typical of adultlike length. However, the reading difficulty level is generally more consistent with grades 4–6. One method of estimating text reading difficulty is a measure known as a “Lexile®” (Stenner, Burdick, Sanford, & Burdick, 2006), which is a metric derived as part of the Lexile® Framework for Reading (Stenner, Burdick, Sanford, & Burdick, 2007). This framework measures students’ reading ability as well as measuring the difficulty of text material so that readers can be matched with reading material appropriate for their reading level. The target is for text that the reader can comprehend 75 percent of, which means it is not so difficult that the reader becomes frustrated but is sufficiently challenging that the reader advances in reading ability. In measuring text difficulty, the metric considers both sentence length and the difficulty of the vocabulary in the text.

As students advance into middle school, they enter the second substage of Stage 3. This substage corresponds to approximately ages 12 to 14 years and grades 7 to 8/9. Students improve their reading to learn abilities so that they can typically read text that is adultlike both

in length and complexity. At this level, students not only read to learn content but the process also helps them advance their language skills, especially those related to higher level abstract vocabulary, morphologically complex vocabulary, and complex sentences. It is also in these grades and at this reading stage that students start to encounter the challenges of reading expository text associated with different disciplines of the academic areas. The students need to become strategic readers, which means they need to address their reading knowing their purposes for reading the particular material and selecting how they are going to approach their reading. They begin to become “meta-readers.” The challenges of dealing with discipline-specific expository texts are discussed in more detail below.

*Stage 4.* This stage can be thought of as the “Multiple Viewpoints” stage. It corresponds to the high school grades and ages 14 through 18. Students increase in the difficulty of the texts they read and the concepts they encounter. And, as the name implies, students are asked to recognize alternative opinions and contradictions in the material they read. They need to deal more ably with the different ways in which written material is presented in the content areas. That is, they need to become capable “reading code switchers” across the different disciplines.

*Stage 5.* This stage corresponds to college-level reading, sometimes referred to as the “Construction and Reconstruction—Worldview” stage. Readers read selectively, purposefully, and strategically, choosing what to read, how to read it, and what sections to read. While in Stage 4, they needed to begin to recognize multiple points of view in their reading; in this stage they are expected to analyze and synthesize the viewpoints to construct their own perspectives and viewpoints. Proficient Stage 5 readers deal effectively with their code switching in reading across discipline areas and many are able to even analyze metalinguistically and metacognitively the differences in their reading material across the disciplines. These readers are highly self-controlled readers.

***The Elementary Grades: A Brief Overview*** As readers approach the following information, it would be helpful to keep our immediately preceding information about stages of reading in the fore.

*Kindergarten.* Kindergarten is often considered as a “readiness” grade to prepare children for the learning experiences to come in first grade. Because of the influence that listening and speaking skills have on reading and writing abilities, kindergarten learning activities frequently focus on further developing the children’s spoken language skills. Although kindergarten may emphasize the listening and speaking skills, most children are also introduced formally to reading and writing skills. Kindergartners may learn to recognize the printed words for the days of the week, their classmates’ printed names, or the names of printed letters. Learning activities may involve having the children formulate their thoughts and dictate them to the teacher, who writes them for the children. Such an activity emphasizes the relationship between the spoken and printed word and is an initial stage in the development of written composition skills. The children’s early experiences with the sensorimotor processes of the visual-graphic language system typically include learning to write the letters of the alphabet and their names and matching sounds to graphemes. The children may also be shown how to improve their drawings of circles and lines, important elements of writing. In some schools, limited formal instruction in reading and writing may be introduced in kindergarten. In other schools, formal instruction in reading and writing is not introduced until first grade.

Another important feature of kindergarten is acculturating children to the scripts and routines of formal group instruction, that is, learning to listen in groups, knowing when to talk and when to be quiet, knowing how to ask and answer questions, and learning how to work quietly alone and to cooperate in groups. Classrooms have a unique discourse style to which students need to acculturate if they are to be able to succeed. This discourse style consists of *IRE* exchanges (i.e., initiate, typically the teacher’s role; respond, typically the children’s role; and evaluation, typically the teacher’s role) (Doell & Reed, 2007; Sturm

& Nelson, 1997). Teachers ask questions to which they obviously already know the answers; students are expected to respond quickly and briefly with answers to these questions if having been given permission to answer; teachers evaluate the quantity and quality of the students' answers. It is within this discourse pattern that orientation and formal instruction in reading typically occurs. Students are challenged, therefore, by the demands of learning not only to read but also to do so in a context that may be quite different from the literacy environment they have experienced at home.

*First Grade.* Formal reading and writing instruction typically begins in first grade. Children learn to use word recognition skills, acquire information from printed words, distinguish among beginning sounds of spoken words, and read for meaning. In writing, children learn to form both lowercase and uppercase letters and to print short words. Skill levels in writing, however, usually lag behind reading. Although the primary emphasis on language skills in first grade may shift from the auditory–oral system to the visual–graphic system, learning activities continue to involve listening and speaking skills. The children are encouraged to dictate letters and stories; because their writing skills are still limited, the teacher acts as a scribe. Such experiences further demonstrate to children the relationship between the spoken word and the written word and encourage them to learn to write the words they say.

*Second Grade.* Second-grade curricula emphasize increased skill in listening, speaking, reading, and writing. Children may be asked to rhyme words, follow sequences of orally presented directions, write short stories, increase their spelling vocabularies, and improve printed forms. In reading, the emphasis turns to independence. Students are expected to develop independent word recognition and reading comprehension skills; typically, the curriculum also encourages the children to spend time in independent reading. Learning activities move from concrete, hands-on experiences to abstract, language-related experiences.

*Third Grade.* Third grade is a transition grade. Increased attention is given to independent reading, with emphasis on reading more complex, longer stories. Instruction in cursive writing typically begins, although printed forms may continue to be used in situations where speed is expected. Children are asked to answer questions by writing sentences and to write increasingly complex paragraphs. Continued emphasis is placed on increasing spelling vocabularies. Children in third grade are also typically expected to proofread and correct their written work. Oral activities include participating effectively in group discussions and making presentations.

*Fourth, Fifth, and Sixth Grades.* Between third and fourth grade, there is a huge jump in the language demands of school. This transition is one of several points in the course of going to school when students who might have been able to cope with marginal language skills start to experience academic struggles. It is also a time when students who have previously been identified as having language problems may need extra support in order to cope with the language of school. Professionals need to watch children carefully for signs that their language may not be a match for the demands of the curriculum.

The curricular emphases in these upper elementary grades continually shift from learning activities directed to building skills in the auditory–oral and visual–graphic language systems to using these language skills for acquiring content-area information. Students gain information through class discussions and short teacher lectures and demonstrations. Students may even be given independent reading assignments and be asked to write short reports about what they have read. They are expected to use their language skills to seek out information from resources. Without the necessary underlying basic skills in both the auditory–oral and the visual–graphic system, we can see how children can be at risk for failure. We will see a number of times in later chapters how children's early language abilities impact their subsequent success or failure in school.

*The Secondary Grades: A Brief Overview.* The shift from elementary to secondary education generally occurs somewhere around sixth or seventh grade. The shift from elementary school

to middle school is another high-risk transition for students with language problems because the bar for language demands of school is suddenly raised by leaps and bounds. Another risky transition for language demands occurs between middle school and high school. Again, professionals need to be particularly on top of students' performances to make sure they are providing appropriate support and intervention at these points in students' academic progression.

Lectures as the means of instruction become more common, and students are increasingly expected to be able to take written notes on the lecture content. Additionally, students may have different teachers for different subjects. This means that students need to adjust to varying lecture delivery, assignments, and teaching styles. In addition to idiosyncratic language patterns that all language-proficient individuals have, including teachers in their teaching, teachers' language reflects characteristics of the language of their content areas. We see here the influence of discipline-related discourse features in how students need to approach comprehension of content material. Ehren (2010) has delineated several reasons expository text is generally difficult for students, and especially difficult for those who struggle with language:

- Unfamiliarity with the genre of expository text—we have already seen that students typically do not encounter this genre until formal schooling, unlike the experience they might have had prior to school with narrative genre
- Discipline-specific expository genres and even variations in form within a discipline—we have already encountered this issue in how these variations can increase difficulty for students
- Complexity of expository discourse—this includes issues related to, for example:
  - Increased length of material
  - Organizational patterns, often a logical pattern versus the more common temporal order of narratives
  - Impersonal presentation of the text
  - New information presented in the text
  - Technical vocabulary, often in the form of morphologically complex words
- Requirements for considerable inferencing on the reader's part, especially if the author has misjudged readers' prior knowledge of the content; Ehren used the term "considerate texts" (p. 217) to describe expository discourse in which an author has made a concerted effort to presuppose readers' prior knowledge and match text presentation accordingly
- Conceptual density of information crowded into expository texts, an issue escalated in difficulty if students are reading an inconsiderate text with considerable technical and new vocabulary

Independence in all forms of learning is stressed, and teachers expect students to be able to seek out and organize information for themselves. The emphasis is on learning content and on demonstrating what information has been acquired. Acquiring vocabulary associated with specific content areas (e.g., photosynthesis, alliteration, and quadrilateral) is an essential language skill for secondary school success and a major avenue for students being able to increase the sizes of their vocabularies. The larger their vocabularies and the more they can pull apart morphologically complex words into their roots and affixes, the easier it is for them to access additional academic content and increase their vocabularies further. There is also a significant increase in the use of the written mode for demonstrating knowledge, and performance on written tests of content knowledge takes on greater importance.

Children's language skills evolve dramatically from kindergarten on. Although the development is a complex process, with listening, speaking, reading, and writing skills closely related to and interacting with one another, a large part of the early educational achievement in reading and writing depends heavily on the children's abilities with the auditory-oral language system. Later educational achievements depend on both the auditory-oral and the visual-graphic language system and the essential reciprocal interactions between them.

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**SUMMARY**

In this chapter we have seen that

- Babies are born communicating, and before infants use their first words, they engage in many behaviors (e.g., smiling, laughing, and gazing) that convey communication intent and exhibit a range of prelinguistic vocalizations.
- In the one- and two-word stages, children learn the names for objects and relations in their environment; vocabulary growth begins slowly, spurring ahead between 18 and 24 months of age.
- Children's early utterances systematically develop into basic kernel, negative, and question sentences and later into compound and complex sentences.
- Semantic as well as syntactic factors are involved in sentence development.
- Several patterns influence word learning, and there seem to be several principles that apply to children's word learning.
- Children acquire specific grammatical morphemes in a developmental sequence related to increasing mean length of utterance.
- The functions and intentions of language use change as children get older; utterances change from those containing one function to those containing more than one function.
- Young children adapt the form of their language for their listeners; this ability to adapt grows more refined as children become better able to make accurate presuppositions about their listeners. Turn-taking, topic maintenance, and revision skills improve gradually throughout the preschool years and into the school years.
- Children's narratives develop from those produced at about 2 years of age, characterized by heaps of unrelated statements, to those produced in the first 2 or 3 years of school, characterized by multiply embedded episodes with causal and temporal patterns.
- Children learn to deal with expository discourse when they enter school and continue to expand their abilities with this particular form of discourse. Skill with expository discourse is essential for academic success.
- Reading proficiency is acquired throughout the educational experience and progresses through several stages.
- Success throughout the school years depends on a robust language system that continues to develop across the grades.

As this review of normal language development illustrates, there are a great many skills that children must acquire, with the ultimate aim that they will be able to succeed in school, personal relationships, and vocational endeavors. We have seen that the process often follows developmental patterns. These developmental patterns frequently become a basis for planning intervention programs for children who have impaired language skills. These same developmental sequences also provide one way of identifying children who are not progressing appropriately in acquiring their language.

PART **2**

# Children with Language Disorders

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# 3

# Toddlers and Preschoolers with Specific Language Impairment

## LEARNING OBJECTIVES

After reading this chapter, you should be able to

- Discuss issues related to identification of young children with language impairment
- Provide an overview of specific language impairment
- Detail the language characteristics of young children with specific language impairment
- Discuss implications for intervention for young children with specific language impairment

This chapter is about toddlers and preschool children who evidence language problems in the apparent absence of other clearly identifiable problems, such as those indicated in the titles of many of the chapters that will follow in this text (e.g., intellectual disability, autism spectrum disorder, hearing impairment, and acquired language impairment). The children we will discuss in this chapter appear on the surface to be essentially typically developing, except for their language acquisition, which does not match that of their peers. Because we cannot attribute their language-learning problems to an identifiable condition, most individuals who work with and study these children have chosen to use the term *specific language impairment* (SLI) to refer to these children, hence the chapter title. Hadley and Short (2005, p. 1344) defined SLI as “a condition characterized by extreme difficulty in language acquisition in the presence of otherwise typical development.” Leonard (1998) described these children as those

who show a significant limitation in language ability, yet the factors usually accompanying language learning problems—such as hearing impairment, low nonverbal intelligence test scores, and neurological damage—are not evident. This is a real curiosity, especially in light of the many language acquisition papers that begin with a statement to the effect that “all normal children” learn language rapidly and effortlessly. The only thing clearly abnormal about these children is that they don’t learn language rapidly and effortlessly. (p. 3)

Part of the decision to use the term *specific language impairment* in the chapter title was guided by a desire to distinguish as much as possible the topic of this chapter from other chapters in this text. Using the phrase was not, however, a completely easy choice because of several unresolved issues about these children. Among these are whether the children’s

language problems are, in fact, specific only to language and whether the language problems of these children reflect language delay or disorder. Another is the possibility that there may be subgroups of these children, in which case SLI might not be one condition but instead several distinct conditions that share some but not all symptoms. How we approach these issues affects what we label the problem. Here is the dilemma about the chapter title. Other issues concern the prevalence data for preschool children with language impairments without obvious concomitant problems, how we identify children who have these language-learning problems, our abilities to predict who will and will not outgrow early language delays, and the intervention implications of these issues. These are topics we address in this chapter. We also discuss some of the language characteristics seen in these young children and introduce assessment and intervention considerations. There is no longer any question that language problems of children in their preschool years signal the real likelihood of later academic, vocational, and social failures, topics taken up further in the two subsequent chapters. *SLI is an insidious, lifelong disability. And, its prevalence rate makes it the most frequently occurring of all communication disorders, and it is one of the “most commonly occurring neurodevelopmental disorders”* (Redmond, 2016b, p. 63).

However, before moving too far into discussion of toddlers and preschoolers with SLI, some consideration of the issue of identifying children with language impairment more generally is appropriate. This topic is relevant for many of the children with language disorders whom we will discuss in this text as well as the children with SLI who are the focus of this chapter.

## IDENTIFICATION OF CHILDREN WITH LANGUAGE IMPAIRMENT

It may seem strange to think of identifying children with language problems as a major issue. One might think that identifying these children would be straightforward. Certainly, a child whose language performance does not correspond to that of children the same age might be considered to have language problems. However, several questions arise. We know that children who are acquiring language normally can show marked variability in language development. If a child's performance does not correspond to that of other children of the same age, does the difference reflect normal variation or a problem? How do we determine if the difference is normal variation or problematic? If the difference is considered not to be a reflection of normal variability, how much of a difference from expectations constitutes a real problem versus a slowed pattern within normal limits? If a child demonstrates above-average development in areas other than language, such as cognition/intelligence or motor skills, but only average development in language, should we consider the child to have a language impairment? A related issue is how we think about infants who are preverbal, so that oral language performance cannot be observed, or about children who at a particular point in time seem to demonstrate adequate language skills but who have intrinsic factors that may place them at risk for later language performance. Should these children be considered to have language impairments? These are only a few of the questions. The answers to these questions influence which children, as Lahey (1990) writes, “shall be called language disordered” (p. 619) and who may and may not, therefore, receive intervention and what might be the forms of intervention.

Given normal variability in children's language development and in their language performances from one communicative context to another, the standard to which we compare an individual child's performance and the conditions under which we observe that performance are important factors in identification. This latter factor requires that a child's language performance be observed in a variety of contexts, a topic that will be discussed later in this book. Although language developmental milestones provide relevant information about whether a child's performance is similar to or different from these milestones, they provide very little information about the significance of any variations that might be observed. It is the significance attached to the variations that leads to identification of a

child as having a language problem. However, deciding on the significance of the variations depends, in part, on the standard to which we compare the performance and how we measure performance.

### Mental Age, Chronological Age, and Language Age

The two standards of comparison that have commonly been used are mental age (MA) and chronological age (CA). MA refers to the age level at which a child is functioning on cognitive/intellectual tasks, that is, intellectual level generally measured by intelligence tests. An intelligence quotient (IQ) is often a psychometric indicator that relates a child's MA to CA. In using MA as the standard, children's language performances are compared to those of children with similar MAs. The assumption is that normal children's language performance does not generally differ markedly from their cognitive abilities. When language performance is lower than MA, a language impairment is presumed to be present. That is, there is a gap between MA and language age (LA). Using this standard of comparison raises the controversial issue often referred to as *cognitive referencing*, which is related to the strong cognitive hypothesis discussed in Chapter 1. This means that children's levels of language skills are viewed in terms of their cognitive prowess. There are, however, several problems with this approach, among them:

1. The exact relationship between cognition and language has not been established (see Chapter 1). Therefore, it cannot be assumed that cognitive abilities will necessarily always set the limits for or determine language performance.
2. It is generally agreed that there is a reciprocal relationship for most children between cognition and language.
3. Some, but not many, children may have language skills higher than their cognitive skills.
4. There may be different types of intelligence, and a theoretical relationship between these and language has not been demonstrated.
5. From an assessment and intervention perspective, it is possible that many children with intellectual disabilities do not get identified as having a language disorder because there may be little or no gap between their MA and LA. As a result, these children may not receive language intervention services even though they might benefit from intervention.

There is, however, one advantage of this approach. Children who have above-average cognitive skills but language skills significantly below their cognitive levels might be seen as having a language impairment.

A related issue to using MA as a standard of comparison is how a child's cognitive/intellectual abilities are tested in order to determine MA. What we measure as indicators of cognition and language, how we measure them, and when we measure them in children's development impact what we find out about the children's levels in each area of functioning. If intelligence is assessed with a test that includes types of items involving language ability, such as verbal analogies (*Wing to bird; Fin to \_\_\_\_\_*), the test measures a child's language ability as much as intelligence. An accurate indicator of MA is, therefore, not possible, and it is not possible to separate language ability from intellectual ability. A verbal IQ (VIQ) score is confounded with both language and intelligence. There are some methods of assessing intelligence that minimize the language component, such as tasks requiring recognition and completion of visual patterns as in block designs. A nonverbal IQ (NVIQ) score, or performance IQ (PIQ) score, which is a term also used, is less confounded by language and better reflects intelligence without the language confound. Some intelligence tests are highly verbal in nature, others have tasks that attempt to tap verbal intelligence and nonverbal/performance intelligence separately, and others are primarily nonverbal in nature. In using MA as a standard of comparison when the issue of interest involves language ability, it is essential to know how MA was assessed.

The second standard to which language performance is compared uses CA. Fey (1986) explained it well when he wrote that "with CA referencing, language impairment is defined

as a clinically significant departure from what is expected for children of the child's own CA" (p. 36). That is, there is a gap between CA and LA (and MA is not considered). Although this approach resolves the concern about the still unestablished relationship between cognition/MA and language performance, it has certain problems:

1. Children whose cognitive levels exceed their CA but whose language performances correspond to their CA may not be identified as having language problems. These might be very bright or gifted children whose language abilities may prevent achievement at the level that could be expected from their cognitive level.
2. The number of children identified as having language problems may be so large that it strains the professional resources available to serve them. This approach implies, as Fey (1986) explains, that the ultimate goal of intervention for any child identified as language disordered "would be to bring the child's communicative abilities to an age-equivalent level. . . . Unfortunately, this is frequently an unrealistic expectation for many of the children" (p. 36).

Despite the problems associated with the CA-LA gap approach to identifying the children, these may be less serious than those related to the MA-LA comparison. *Of these two standards of comparison, CA is generally the preferred and recommended standard for comparison.* In fact, more recent federal legislation regarding serving children in schools has indicated that the MA-LA comparison (i.e., cognitive referencing) should not be used to qualify children for services in schools and it not considered "best practice" with regard to children with language impairment.

We now return to the issue of what constitutes an important variation from the standard we use. Even in light of our previous discussion, there is justified concern about using age-equivalency measures, such as LA referred to in the preceding discussion. One reason for this concern is that the same delay in terms of age-equivalent performance may not have the same importance for children of different ages. For example, a 1-year delay in language performance for a 10-year-old child may not likely carry the same significance as a 1-year delay for a 3-year-old child. Lahey (1990) argues that a more appropriate approach describes a child's "relative standing with peers" (p. 615) so that normal variability from an average is considered.

### Normal Variation, Normal Distribution, and a Statistical Approach

The approach of using normal variability to decide which children's language performances are sufficiently different from their peers' to constitute an impairment is based on concepts surrounding the normal distribution of performance in samples of children of the same age with particular demographic characteristics. It is rooted in statistical approaches to distribution so that the metrics of mean and standard deviations (SD) are considered. Using concepts of normal distribution (i.e., normal curve), we know, for example, that if we measured the receptive vocabulary size of lots of 3-year-old children, about 68 percent of them would have scores falling between -1 standard deviation (SD) below the mean score and +1 SD above, with approximately half on either side of the mean. This range, -1 to +1 SD, is generally considered the "normal" range of performance, and a score below the -1 SD point is often the point at which some unease about a child's performance might occur. Approximately another 13.5 percent of the children would have scores between -1 SD and -2 SD, leaving about another 2.5 to 3 percent of the children having scores below -2 SD. Concern about a child's performance generally escalates the greater the child's score is below the -1 SD point.

Questions are:

- Which cutoff tells us that a child's receptive vocabulary (or any other aspect of language we measure in this way) is sufficiently poor to indicate language impairment?
- What cutoff tells us when the child's performance will cause academic and social difficulties for the child?

In essence, the cutoffs that are frequently used are relatively arbitrary because, as Rice (2000) explains, “there is no intrinsic criterion for where to draw the line between ‘normal’ and ‘affected’” (p. 20). Recall also that if we make the cutoff  $-2$  SD below the mean, there will be only 3 percent of children who will be considered to have impaired language. Bishop (1997) reminds us of the “inherent circularity of statistical definitions” because “if you define a language impairment as a score in the lowest 3%, then 3% of the children will be language-impaired” (p. 23).

Besides standard deviations, other descriptions of language performance based on normal variation, normal distribution, and related statistics include standard scores, percentile ranks, and stanine scores. These are metrics often seen with norm-referenced language tests. To provide some point of reference as to how these metrics correspond to each other, a  $-1$  SD deviation cutoff is commonly about equal to a standard score of 85 (when the SD is 15 and mean is 100), a 17th- to 18th-percentile rank, and a stanine of 3. With regard to identifying children with SLI, a standard of comparison or cutoff at the 10th percentile has been considered as a plausible cutoff for identifying a child’s language to be sufficiently problematic to be language impaired. A 10th-percentile rank equates to about  $-1.25$  SD and a standard score of about 80 to 81 (again assuming an SD of 15 and a mean of 100 on the test used to measure the language). This standard of comparison has been shown to have good agreement with speech-language pathologists’ judgments of children’s language abilities as being impaired (Tomblin, Records, & Zhang, 1996).

However, any test score provides only an estimate of a child’s “true” language performance. Assessment and measurement involve errors because humans and their functioning are inconsistent, as are the environments in which we assess and measure, and the instruments that we use are imperfect. Therefore, we need to expect measurement error, which makes any test score an estimate. Better psychometrically developed norm-referenced tests account for measurement error by including a *standard error of measurement (SEM)*. A range (confidence interval) around an obtained standard score can be determined with the SEM by both adding and subtracting the SEM to the obtained score. The larger the range around the obtained standard score, the greater our confidence is that it would include a child’s true score. For example, if we want to be 95 percent confident (95 percent confidence level) that a child’s true score was within a particular range, the test would provide a metric for the 95 percent confidence level for us to use to determine the confidence interval (e.g., SEM for 95 percent confidence level =  $\pm 8$ ; child’s obtained standard score on the test = 79; 95 percent confidence interval = 71 to 87). If we are prepared to be less confident, for example, 68 percent confident, about the range within which the child’s true score falls, the test might provide a smaller SEM to use in determining the 68 percent confidence interval (e.g., SEM for 68 percent confidence level =  $\pm 4$ ; child’s obtained standard score on the test = 79; 68 percent confidence interval = 75 to 83). If we have decided that a standard score of 80 to 81 is our cutoff for determining that a child’s language is impaired, both confidence intervals in our example here leave open the possibility that the child’s language is not impaired because of the upper limit in the two ranges (87 with the 95 percent confidence level and 83 with the 68 percent confidence level) as well as leaving open the possibility that the child does have impaired language. This example illustrates why best practice requires the use of multiple forms of language assessment in making decisions about a child’s language status and decisions do not depend solely on norm-referenced tests.

We have another issue to consider when we think about using common metrics to decide when language performance is or is not impaired. In the introduction to this chapter, we noted in Leonard’s (1998) description of children with SLI that they would not have low nonverbal intelligence scores. That is, their NVIQs would be at or above the normal level, typically considered to be no lower than  $-1$  SD, or commonly 85 standard score. As we will see in Chapter 6 on language and intellectual disability, the common intelligence test cutoff score for intellectual disability is  $-2$  SD, or 70 standard score. However, some children have NVIQ scores between  $-1$  SD and  $-2$  SD and have language abilities falling below normal (i.e.,  $-1$  SD). While these children are unlikely to be considered as having an intellectual disability using the common criteria, they are also unlikely to be seen as having SLI because of their NVIQ level. Because these children have impaired language but do not neatly fall into either

the intellectual disability or the SLI classification, some have begun to use the term *nonspecific language impairment* (NLI) to refer to these children to describe these children in assessment and intervention and in research (Catts, Fey, Zhang, & Tomblin, 2002; Leonard, Miller, & Finneran, 2009; Nippold, Mansfield, Billow, & Tomblin, 2009). In providing services to children with language impairment, professionals need to be alert that these children with NLI do not drop through the cracks.

### Social Standard

Scores such as percentile ranks and standard scores still do not tell us how much a child's language abilities might interfere with academic and/or social achievements. Using the above cutoff of the 10th-percentile rank, a child whose language performance is at the 10th percentile would be considered language disordered, whereas one whose performance is at the 15th-percentile rank might not. However, it could be that the child at the 15th-percentile rank will experience just as many or more difficulties because of language problems as the one at the 10th percentile. An approach that focuses on variance scores also has the danger of leading professionals to depend too heavily on norm-referenced, standardized tests of language for identifying language-disordered children, a topic discussed in Chapter 13.

There may be a third standard of comparison to consider, that is, a social standard. In using this standard, societal values placed on the degree of language facility and on the degree of success for life functions that are dependent on language facility (e.g., educational success and social success) become important in identifying children (Brinton, Fujiki, & McKee, 1998; Johnson et al., 1999; Leonard, 2014; Rutter, 2008; Silliman & Wilkinson, 2014). Children whose language performances are evaluated as being sufficiently poor to cause potential problems in succeeding within the conditions of societal values could then be seen to have language impairments.

From an educational perspective for school children, this standard has taken root in the requirement that impairments need to have negative academic impact for children to receive services in schools. The odds suggested by research documenting outcomes for children in adolescence and adulthood who were identified with language impairment during preschool years (which readers will encounter in Chapter 5) make it unlikely that the young children will fully escape future negative educational and/or social effects of the impairment. The research now provides professionals with strong predictive abilities about the future for toddlers and preschoolers with SLI. This gives considerable strength to the social standard, especially as a preventative strategy, that is, early identification of (and intervention for) children with SLI to mitigate future negative effects.

Although this standard is harder to measure in numerical terms, it may overcome some of the difficulties inherent in the other standards for identification discussed so far. This may be particularly true if a social standard is used in combination with one of these more traditional standards. It also has the potential to provide a framework for approaching language and language impairments in linguistically-culturally diverse children.

### Clinical Markers for SLI

Research attempting to identify clinical markers of SLI in young children may help us in knowing which children have SLI. A *clinical marker* is a behavioral feature or characteristic or a combination of particular features or characteristics that children with SLI have. Because it is either present or absent, a clinical marker is independent of the normal distribution of language ability across the population, and it correctly identifies those children with SLI (i.e., affected children) and does not incorrectly identify other children with normal language as affected. An analogy might be that people with a particular medical condition have a unique combination of hormones in their bodies (i.e., the hormone combination is the clinical marker) that people without the condition do not have. The presence or absence of the hormone combination is not dependent on a normal distribution in the population. When genetic factors are believed to underlie a clinical marker, the term *phenotype* may be used to refer to the clinical marker. Children's abilities with verb tense morphology, nonword

repetition (NWR), and sentence recall are three of the directions that the search for an SLI clinical marker has taken. Abilities with one or more of these may have possible genetic bases, so it is possible that they could be phenotypes.

English-speaking children with SLI are renowned for their persisting difficulties with grammatical forms and in particular those related to tense marking on verbs (for example, Leonard, Deevy, Miller, Charest, & Kurtz, 2003; Redmond & Rice, 2001). Rice and her colleagues (Rice, 2000; Rice & Wexler, 1996; Rice, Wexler, & Hershberger, 1998) have reported that tasks examining 5-year-olds' verb form marking abilities correctly identify 97 percent of children with SLI and 98 percent of typically developing children. Findings have also indicated that the longitudinal developmental course of verb tense marking for SLI children is protracted and does not reach adultlike levels of accuracy by 8 years of age. This contrasts with normally developing children, who make almost no errors at that age. At the toddler level, 2-year-olds at risk for SLI have been found to show later onset of tense marking in their language development than even normally developing peers with language development at lower language levels, and toddlers and preschoolers have been shown to be slower to develop tense marking than reported in the literature for normally developing children's language development (Gladfelter & Leonard, 2013; Hadley & Rice, 1996; Hadley & Short, 2005). Verb morphology is a strong candidate as a clinical marker. Given that tense marking should typically emerge in children between 2 and 4 years of age, there is potential that verb morphological skills can be assessed in quite young children, increasing its power as a possible clinical marker useful with toddlers and preschoolers.

The second direction that the search for a clinical marker of SLI has taken is NWR. NWR also appears in the literature with the acronym of *NRT*, which stands for *nonword repetition test/task*. NWR focuses on aspects of children's processing abilities and requires children to repeat nonsense words of varying syllable length and phonological complexity (e.g., Archibald & Joanisse, 2009; Chiat & Roy, 2013; Conti-Ramsden, 2003; Dollaghan & Campbell, 1998; Ellis Weismer et al., 2000; Gathercole, Willis, Baddeley, & Emslie, 1994; Gray, 2003a). Children with SLI generally perform much worse than normally achieving children of the same age and younger children with similar levels of language. And, children's performances on the tasks tend to separate the children with good accuracy into a group without language impairment and those with poor accuracy into a group with language impairments. NWR is a strong candidate as a clinical marker of SLI (Coady & Evans, 2008; Graf Estes, Evans, & Else-Quest, 2007).

As promising as NWR might be for identifying SLI in children, tasks designed to assess this ability in children have been restricted mostly to children 5 years of age and older because of the complexity of performing the tasks (Graf Estes et al., 2007). However, more recently, NWR tasks have been used with children younger than 5 years of age, with some children as young as 2 years old (Chiat & Roy, 2007, 2013; Deevy, Wisman Weil, Leonard, & Goffman, 2010; Gray, 2003a; Roy & Chiat, 2004; Stokes & Klee, 2009; Thal, Miller, Carlson, & Vega, 2005). Because, as we will see later in this chapter, some preschoolers with SLI also have speech sound errors, use of NWR with these children has not been valid and reliable since the tasks generally require accurate production of the sounds making up the syllables in the nonwords. For this reason, Shriberg et al. (2009) developed an NWR test, *The Syllable Repetition Test*, which uses only four consonants, all of which normally developing children acquire early, and only one early developing vowel. Because of the efforts of these and other researchers, there are now nonword repetition tasks that appear to be relatively "toddler and preschooler friendly."

Sentence recall has also emerged as a possible clinical marker of SLI. Sentence recall is sometimes referred to in the literature as *sentence repetition* and *sentence imitation*. Sentence recall has appeared as a task in assessment tools for a long time, including the first American version of the Stanford-Binet intelligence test in about 1916. When the length of a sentence exceeds children's short-term auditory memories but is within the children's comprehension levels and contains morphosyntactic structures also within the children's repertoire, they will generally be able to imitate correctly all elements in an adult's spoken presentation of the sentence. The same children would not, however, be able to repeat a series of random numbers (digits) containing the same number of elements as the sentence because

length exceeds the children's short-term memory and presumably because the number series carries no meaning, so there is nothing other than short-term memory to assist the children. The premise with regard to sentence recall tasks is that, in order to perform correctly, children need to rely on their morphosyntactic knowledge in long-term memory (Riches, 2012). If a long sentence contains grammatical elements, for example embedded relative clauses or complex verb forms ("would not be skiing"), that are beyond the children's level of language development, children will typically produce the sentence only with elements that are consistent with those they know. This means they may omit certain grammatical elements or change the elements to fit their language level. Several early tests of syntax for children, for example the Carrow Elicited Language Inventory (CELI) (Carrow, 1974) and the Northwestern Syntax Screening Test (NSST) (Lee, 1971), used a sentence recall format, as do some current child language tests, for example, Clinical Evaluation of Language Fundamentals – 5 (CELF – 5) (Wiig, Semel, & Secord, 2013). Children's performances on sentence recall tasks have suggested that the task is reasonably good at identifying children who have SLI or at predicting those who are at risk for SLI from those who do not or are unlikely to demonstrate later language impairment (e.g., Archibald & Joanisse, 2009; Conti-Ramsden, Botting, & Faragher, 2001; Redmond, Thompson, & Goldstein, 2011; Riches, 2012).

Children's performances in these areas may not serve only as clinical markers of SLI that help identify the presence of SLI. It is also possible that they can serve the role as risk factors for SLI. That is, there may be concern that young children whose performances do not meet the levels of their same-age peers are at risk for SLI, and there may be merit in exploring further the children's language abilities. Thus, tasks incorporating verb tense marking, NWR, and sentence recall might be good at: (1) identifying young children who have SLI; (2) separating young children who have SLI from children who have other conditions, such as ADHD; and (3) predicting which children are at risk for continuing language impairment and which might "outgrow" early language delay.

### Challenging and Changing the Child's Language Performance

Among the conundrums facing professionals working with children with possible language impairment is that some toddlers and preschoolers with language impairment that can potentially interfere with academic performance or social interactions might appear at superficial glance to communicate adequately. These children might even attain scores on some norm-referenced language tests that place them within normal limits. However, in such cases their test scores are probably at the lower end of normal limits, and when compared to the scores of their typically developing peers, their scores may be significantly lower, suggesting that their language is not really the same as their peers (Girolametto, Wiig, Smyth, Weitzman, & Pearce, 2001; Paul, 1996; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998). They may also be able to engage in casual, relaxed conversational interchanges (Lahey, 1990), but they may experience difficulties with academic skills closely related to oral language abilities, such as reading, spelling, and writing, and with high-level, demanding discourse language skills, such as narratives (Girolametto et al., 2001; Johnson et al., 1999; Paul, 1996; Stothard et al., 1998; Ukrainetz & Gillam, 2009). These factors have implications for the procedures we use in identifying the children. For this reason, Lahey (1990) suggests that identification should be made under conditions that include stressing or challenging the child's language performance "so that difficulties with performance would most likely be evident" (p. 618).

Children with language impairment should also have more difficulty acquiring particular language skills under conditions of focused instruction than their peers without language problems. Degree of difficulty in learning language targets can be measured in terms of the speed with which new language skills are learned, the amount of teaching effort that is needed, or the accuracy of performance, that is, the quantity of learning. Children with language disorders should therefore require more tries to learn a language target and/or need more and varied stimuli to learn the targets and/or use the targets correctly less often than their typically developing counterparts. These suppositions suggest that another way in which children with language disorders can be identified is by determining how well or

poorly they respond to “trial language instruction” or, to be consistent with the terminology currently used in the literature, how well they respond to dynamic assessment. Dynamic assessment is an essential part of the assessment process, and its use is raised in several subsequent chapters and discussed in more detail in Chapter 13.

### Risk Factors for Language Problems

Identification also involves predicting which children will ultimately experience problems related to language. There are very young and therefore primarily nonverbal children (e.g., below 1 or 1½ years of age) who may be at risk for language development problems, and there are preschool and school-age children who may not have observable language problems at a specific time but who have a history or other problems that place them at risk for the emergence of later identifiable language difficulties. Tomblin, Hardy, and Hein (1991) suggest that it might be possible to assign neonates to an “at risk for language problems” category based on criteria related to prenatal and perinatal events. The children’s development could then be monitored and intervention begun as soon as any problems with language emerged. It might also be possible to institute “preventive intervention” for these children through parent/caregiver training programs even before actual language problems are identified. For older children who have histories or other problems that place them at risk for the emergence of language difficulties, preventive intervention through parental and/or teacher training programs might also be effective.

These approaches depend, of course, on determining what factors place children at risk for language disorders. Some birth factors (e.g., anoxia, hyperbilirubinemia, and kernicterus), chromosomal syndromes (e.g., Down syndrome), and known neurological or physical conditions (e.g., cerebral palsy, hearing loss, and cleft palate) have been linked to potential language problems. Additionally, risk for language problems has been associated with socioeconomic factors and environmental deprivation although these are not always independent of other factors, such as familial or genetic factors. Some have suggested that prematurity may place an infant at risk for later language problems, although this is not always the case. Some of these risk factors are related more to language problems when other conditions exist (e.g., intellectual disability, hearing loss) but are not necessarily known to be risk factors for SLI per se.

There are factors other than these that may more accurately place very young children at risk for later being identified as having SLI. Among those suggested in the literature are (1) a family history of literacy problems and/or communication problems, particularly among members of the immediate family; (2) birth order, with later birth indicating a greater risk; and (3) parents’ levels of education, particularly mother’s level of education (e.g., Choudhury & Benasich, 2003; Dollaghan et al., 1999; Felsenfeld & Plomin, 1997; Hart & Risley, 1995; Newbury & Monaco, 2010; Plomin, DeFries, McClearn, & McGuffin, 2001; Rice, 2013; Tomblin et al., 1991). Gender of the child, with males appearing to be more at risk than females, is often also cited as a risk factor for SLI. There are, however, conflicting data about whether boys are at greater risk for SLI. Studies using clinical samples of children may tend to show more males as having SLI, whereas studies using population studies may tend to show more equal distribution across genders (Law, Rush, Schoon, & Parsons, 2009). It may be that boys are more frequently referred for assistance with their language than girls. The jury on gender is still out. In a previous section, we also suggested that ability with verb morphological learning, sentence recall, and NWR could be viewed as risk factors for SLI.

Missing from this list of possible risk factors is socioeconomic status (SES). Many children from lower socioeconomic families have language problems, and some of these problems are due to SLI. However, low SES by itself may be an indirect risk factor rather than a core risk factor since SES is often an outcome of some of the risk factors noted above (e.g., lower educational level of mother leading to lower SES and/or family history of literacy/communication problems leading to lower educational level leading to lower SES). Some of the confusion related to the role of SES arises from imprecise differentiation in the literature between language delay and language disorder. Few disagree that low SES is a risk factor for language delay in children, but the question of interest here is about the relationship of SES as a risk factor for impaired language, that is, language disorder.

Caution is important in interpreting these possible risk factors. It is likely that not all factors have been fully determined, that the factors just listed are not invariably associated with language difficulties, and that their interrelationships with other factors have yet to be fully explained. Language learning and language performance are complex human behaviors influenced by multiple factors, so the factors that place children at risk for language impairment are more than likely going to reflect complex interactions. However, in their study of a variety of prenatal and perinatal risk factors for SLI (e.g., parental education, family history of language and/or learning problems, tobacco smoking), Tomblin, Smith, and Zhang (1997) found that, in contrast to risk factors considered to occur during the perinatal period of the children or during their fetal development, SLI in children was more likely to be associated with factors related to their parents that were present before the children were conceived (e.g., parental education, family history of language and/or learning problems). When we think about the implications of these findings, we see the probability of familial transmission of SLI in children.

Despite the limits on the current information, Tomblin et al. (1991) suggest that using an at-risk procedure that places children in a developmental monitoring program in combination with a language screening procedure may aid the identification process. However, if we apply Lahey's (1990) idea, the screening procedure should include tasks that stress the child's language performance. The notion of using high-risk factors with monitoring combined with screening programs is consistent with her suggestion that perhaps two identification categories should be devised. One would be for those children who show problems with language and the other for children at risk for language problems. Using the findings from Tomblin et al. (1997) noted above, it might be possible to begin considering weighting the degree of risk associated with various risk factors.

Table 3.1 summarizes some of the issues we have raised with regard to identifying children with language problems. Although the issues remain, Fey (1986) has offered a practical definition of "who shall be called language disordered" (Lahey, 1990) that is based on one presented in 1983 by Tomblin:

A child may be viewed as language impaired when the pattern of communicative performance exhibited enables a clinician to predict continued deficits in language development *and* in the social, cognitive, educational or emotional developments which rely heavily on language skills. Furthermore, infants who have biological or behavioral conditions that are commonly associated with future impairments in communicative functioning (e.g., Down's

**TABLE 3.1 |** Issues in Identification of Children with Language Problems

Issues	Explanations	Considerations
Standards of comparison	Mental age (MA): language performance compared to expectations for child's mental (cognitive) age	Children with language performance higher than MA Relationship between cognition and language not fully established Different forms of intelligence and relationship with language not established Children with intellectual disabilities potentially excluded from being considered language impaired
	Chronological age (CA): language performance compared to expectations for child's CA	Potentially excludes children with above-normal cognitive abilities but with average or below-average language performance from being considered language impaired Too many children identified as having language problems for resources available Implication that goal of intervention is always to achieve age-equivalent language performance

**TABLE 3.1 | Continued**

Issues	Explanations	Considerations
Measures of performance	<p>Social standard: degree of social value attached to verbal ability and aspects of performance linked to verbal ability (e.g., academic achievement and social relationships) and degree to which language problems therefore negatively affect achievement</p> <p>Age equivalency (language age [LA])</p>	<p>Hard to measure numerically</p> <p>Not a one-to-one relationship between variance score (e.g., standard score) of language performance and degree of impact on child's current and future life</p> <p>Involves prediction with regard to future problems child might have</p>
Clinical markers of SLI	<p>Variance measures (e.g., standard scores, percentile ranks, standard deviations, and stanines)</p>	<p>Same amount of delay in terms of age equivalence not equally important at different CAs</p> <p>Normal variation in language performance not considered</p>
Identifying underlying language problems	<p>Verb tense marking development, nonword repetition, and/or sentence recall as possible clinical markers of SLI, and maybe phenotypes of SLI</p>	<p>Cutoff point not descriptive of actual problems in real-life language functioning</p> <p>Danger of excessive dependence on norm-referenced, standardized language tests</p>
Predicting future language problems	<p>Stress/challenge language performance</p> <p>Identifying children at risk for language difficulties; supplement with screening programs</p>	<p>Assessment tools and procedures to use with very young children still being developed</p> <p>Reasons for verb tense marking, nonword repetition, and sentence recall difficulties not fully known but presumed to have underlying neurological bases, likely of genetic origins</p> <p>Other clinical markers may be identified</p> <p>Casual language performance and/or norm-referenced language performance may appear normal unless performance stressed to reveal underlying but real language problems</p> <p>Subtle problems can affect language-related academic skills (e.g., reading and spelling)</p> <p>At-risk factors not completely identified</p> <p>Relationships between factors not fully understood</p>

syndrome, profound hearing impairment, autistic symptoms) may be viewed as language impaired even before the age at which language forms typically begin to appear. The degree of confidence that a clinician can place in this prediction will determine the severity rating for the child's impairment. (p. 42)

We would add that children with other factors that may place them at risk for language impairment would be identified as, as Lahey (1990) writes, "at-risk for language-related problems" (p. 618) and placed in language developmental monitoring programs.

## AN OVERVIEW OF SPECIFIC LANGUAGE IMPAIRMENT

### Delay versus Disorder

To say that a child demonstrates a *language delay* implies that language skills are slow to emerge or develop. It also often implies that the order in which the child acquires the skills corresponds to the sequence seen in normal children and that the degree of delay is basically the same for all features or aspects of language so that a child's profile in the different areas

of language is relatively flat. There is sometimes the implication that a child with a language delay might overcome the delay and catch up. In contrast, the term *language disorder* denotes a deviance in the usual rate, trajectory, and/or sequence with which specific language skills emerge. This deviance can include differences in the rate of acquisition for skills within one aspect of language (e.g., semantics or syntax), inordinate difficulties with certain features within one aspect of language (e.g., grammatical morphology), differences in the rate of acquisition among various aspects of language (e.g., pragmatic development related to syntactic development), and/or age-appropriate skills in one or more aspects with lags in the acquisition of one or more other aspects of language. Because of asynchrony in the rate of acquisition within and across various language parameters, normal developmental sequence is disrupted. With the term *language disorder*, there may be less of an inference that children might just catch up with their language, with or without intervention.

Despite the differences in these definitions, some have referred to these children with language-learning problems as having a *language delay*, while others have used the term *language disorder* to refer to children with similar language characteristics, frequently without justifying why one phrase has been used over the other. In discussing SES as a risk factor for SLI above, the issue of imprecision in and undifferentiated use of “delay” and “disorder” among professionals has contributed to some of the cloudiness in knowing how SES functions as a risk factor or causal factor for SLI. And the research involving various aspects of language (pragmatics, semantics, syntax, and morphology) has often yielded conflicting interpretations and certainly has not clarified the issue for us (Bishop, 1997; Leonard, 2014). Here and in later chapters, we have tended to use *impairment* and *disorder* interchangeably but have tried to be careful to use *delay* to mean only a lag in development without necessarily implying a disorder.

One reason for these conflicting interpretations of whether language-impaired children show us delay or disorder in their language behaviors is that a problem with any one aspect or component of language will negatively affect other aspects so that the entire language performance appears disturbed. Although we may talk about the components of language separately, in actuality components interact at one time, with one component affecting others (e.g., Hadley et al., 2016; Masterson, 1997; Reed, 1992; Storkel, 2003; Tomblin & Zhang, 2006). What we typically see, however, in children’s language is their total performance, and trying to factor out the many aspects of language that can be interacting at any one time is exceedingly challenging (Tomblin & Zhang, 2006). Leonard (2014, p. 41) has recently questioned the “value of continuing the delay-deviance debate.”

In light of issues surrounding delay versus disorder, the usefulness of SLI as a construct has been called into question. The language abilities seen in children with SLI might simply represent abilities that are at the lower end of a continuum of normal variation (Leonard, 1987, 1991, 2014; Rutter, 2008). Rather than having a language disorder, the children simply are not as good at learning and using language as other children in the same way that other children might not be as good at learning and using musical skills, for example. Children on the low end of language skill performance would be seen not to have a disorder but rather to reflect the concept of normal variation within and across individuals. Some children are just better at some things than other things, and different children are different in what they are good or weak at learning and doing. From this perspective, it is only because language abilities are so highly regarded in Western societies and because language abilities are so intimately tied to the Western process of formal education and academic success, which are also highly regarded in Western societies, that weaker skills in language could be seen to represent a disorder.

Most researchers and practitioners who work with toddlers and preschoolers who have inordinate language-learning problems in the absence of explicable conditions for language problems reject this position. Leonard (2014, p. 47) has summarized the debate, suggesting that the language patterns the children present make “it apparent that the delay-deviance [referred to in our discussion as ‘disorder’] dichotomy is an oversimplification, and can even be misleading.” He adds that such a dichotomy “does not adequately describe the various ways children with SLI can differ from typically developing children” (p. 41).

Both the 2013 *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) (American Psychiatric Association, 2013) and the 2016 *International Statistical Classification of Diseases*

*and Related Health Problems – 10 (ICD – 10)* (World Health Organization, 2016) include conditions (e.g., “expressive language disorder” and “mixed expressive-receptive language disorder” as subcategories of “specific developmental disorders of speech and language”) that could be considered generally, but not exactly, descriptive of and similar to SLI. The position that SLI is a condition differentiated from other conditions that include disruptions of language performance suggests that the exceptional problems that some children have in learning and generalizing certain language skills and the continuing difficulties with language that they demonstrate cannot be viewed simply as anything but a disability. The evidence that such children have language and literacy problems that extend into adulthood, as we will see later in this chapter and certainly in Chapter 5, indicates that SLI is not only a childhood disability but rather a lifelong disability. However, one of the problems that confounds the discussion of delay versus disorder is the variety of language problems these children can display, that is, their heterogeneity.

### Subgroups of Young Children with Specific Language Impairments

Children with SLI are generally described as a heterogeneous group because of the variation in language performance seen from child to child. It may be that, to understand young children with SLI more fully, we need to consider the possibility that subgroups of these children exist. If this is the case, we need to ask what the relevant subgroups might be.

Some children described as having SLI have difficulties with both language comprehension and expression (Tomblin, Zhang, Buckwalter, & O'Brien, 2003). Other children seem to have problems with language expression but apparently relatively unimpaired comprehension. Two likely subgroups have been implicated, although the relative degrees of difficulties (e.g., lexical retrieval, syntax, and morphology) can vary from child to child:

1. Both comprehension and expression difficulties (i.e., receptive-expressive language disorder)
2. Expression difficulties (i.e., significantly less impaired receptive language with a sizeable gap between it and the more severely impaired expressive language)

Few professionals and little research suggest that children could have comprehension difficulties without exhibiting expression problems, although for some years there was a proposed third group, comprehension-only difficulties. This may still show up as a subgroup in some literature.

This two-group model for subgroups is likely, however, too simplistic, if not inaccurate (Leonard, 2009; Tomblin & Zhang, 2006). The notion that children could have problems with expression in the absence of some comprehension problems has come to be challenged (Leonard, 2009; Tomblin, Mainele-Arnold, & Zhang, 2007; Tomblin & Zhang, 2006). Even though assessment of the children's abilities might not reveal problems with comprehension, as Leonard (2009) writes, “there seems to be no theory of expressive language problems that does not also assume a limitation in language knowledge or a problem in processing language input” (p. 121). The fact that comprehension problems might not be identified in assessment likely speaks more to either our methods of assessing comprehension and language processing (e.g., what we assess and how we assess) or the limited number of available sensitive assessment tasks/tests for assessing quite young children (Leonard, 2009). In addition to issues related to comprehension and expression of language, phonological problems have also been found to co-occur with language problems (Shriberg, Tomblin, & McSweeny, 1999). Additionally, gestures representing symbolic play or used for communicative purposes have been associated with early language difficulties (Thal, Oroz, Evans, Katich, & Leisure, 1995; Watt, Wetherby, & Shumway, 2006), and others have found a relationship between early language deficits and socialization characteristics (e.g., Paul, Looney, & Dahm, 1991).

If we consider only the potential deficit areas mentioned thus far (comprehension, expression, phonology, socialization, and symbolic play gestures), we can see in Table 3.2 some but not all of the combinations that might lead to possible subgroups of children. If we break down expression into the possible specific aspects of language (e.g., semantics,

**TABLE 3.2 | Examples of Areas of Deficit Leading to Some Possible Subgroups of Children with Specific Language Impairments**

Subgroups	Expression	Comprehension	Phonology	Socialization	Gesture
1	X	X	X	X	X
2	X	X		X	X
3	X	X	X		X
4	X	X	X	X	
5	X	X	X		
6	X	X			X
7	X	X		X	
8	X	X			

pragmatics, syntax, and morphology) that might be problematic, we see even greater complexity in the combinations that could be possible. However, it might not be valid to separate some of these factors because of the overlaps, interrelationships, and associations that are known to operate across linguistic components and among and across other behaviors (e.g., relationships between measures of socialization and use of communicative intentions/functions). Our factors or areas of deficit might not be correct and/or discrete. Other factors and associations have also been implicated with SLI (e.g., behavioral difficulties). Additionally, we would likely need to take account of the relative degree of skill (or deficit) in each of the possible areas. It is possible that the combinations could change in an individual child as CA changes (Conti-Ramsden & Botting, 1999). Our present knowledge has not yet allowed us to overcome the complexity of the task of identifying any valid subgroups, even for what might seem the relatively simplistic expressive-receptive and expressive subgroups. However, developments in the area of the genetics of SLI might yield sufficient information to identify reliable and valid groupings, groupings that might help explain the heterogeneity we see in these children we currently label as SLI. In drawing on the writing of Bishop (2006), Leonard (2009) states that it “is possible that meaningful subtypes might be identified through genetic studies of potential ‘endophenotypes’ (clusters of related abilities) that arise from theoretical proposals of causal factors in language impairment” (p. 120). The topic of genetic factors as possible causes of SLI will be raised again in the next section. For now, however, we have not been able to identify distinct and stable subgroups.

### A Label for It and Reasons for It

In the introduction to this chapter, the dilemma regarding how to title the chapter was raised. Many terms have been used in the literature to label the condition in which language difficulties appear to be the sole problem of these children. Among these terms are SLI, specific language disability, specific language disorder, developmental aphasia, developmental dysphasia, congenital aphasia, language delay, developmental language disorder, expressive and/or receptive language delay, clinical language disorder, language disorder, and slow expressive language development, although this last term tends to be used with toddlers more frequently than with older preschool children. A number of scholars has begun to refer to SLI as a neurodevelopmental disorder. When these children go to school and their language problems begin to cause academic difficulties—a situation that is highly likely to occur—the children may be referred to as learning disabled, language-learning disabled, or specific learning disabled, as we will see in the next chapter.

Without obvious hearing, intellectual, emotional, neurological, or notable environmental deficits, the question of why these children have such a hard time acquiring language is

an important one. The search for explanations has sometimes turned to other, less superficial reasons for the existence of the language difficulties.

**Neurological Bases.** Some authors and researchers have proposed that, in the absence of gross neurological problems, the children's language difficulties must stem from central nervous system dysfunction, and the terms *minimal brain dysfunction* and *minimal brain injury* have been suggested, terms that have also been associated with learning disabilities. In the past, it has been difficult to identify conclusive links between abnormal findings of brain function measurements and the language problems exhibited by children. The general superiority of the left cerebral hemisphere over the right in adults' language functioning has been well established, but we know that early damage to the left hemisphere in children has not been shown to account for the severity or persistence of their language impairments. However, there are many ways in which brain structure and function can vary to disrupt language acquisition.

Most scholars working in the area of SLI agree that there must be neurological correlates and/or substrates for these children's difficulties in language learning and performance. Advances in technology leading to continuing improvements in neuroimaging (e.g., magnetic resonance imaging [MRI], functional magnetic resonance imaging [fMRI]) and event-related neurophysiological procedures (e.g., event-related potentials [ERPs]) have resulted in some of these techniques being used with children with language impairments (e.g., Ellis Weismer, Plante, Jones, & Tomblin, 2005; McArthur, Atkinson, & Ellis, 2009; McArthur & Bishop, 2005; Trauner, Wulfeck, Tallal, & Hesselink, 2000). Using these and other technologies, some differences between individuals with SLI and normally functioning individuals with regard to, for example, neurophysiological measures during auditory and speech processing tasks and semantic and grammatical processing tasks and fMRI/MRI findings for brain morphology and cerebral functioning. These approaches seem to hold promise in unraveling the puzzle, but not all studies have found differences between groups. Cautious optimism seems appropriate; with refinements in technologies and research methodologies together with developments in the area of genetics of SLI, the etiological roots of SLI are likely to be identified. We might not be surprised, however, if multiple neurological (and genetic) roots of SLI are identified. Repeatedly the group of children with SLI is described as heterogeneous with different children showing different language profiles and the same children showing different profiles at different times.

There are two more recent and exciting directions the study of the neurobiology of SLI has taken, although the quantity of research to date is still relatively small. One direction involves using neurophysiological techniques with quite young children to look at the possibility of identifying neurological bases that might eventually be used for early diagnosis of SLI (e.g., Friedrich & Friederici, 2006). The other direction involves examining possible neurological changes occurring as a result of language intervention with children with SLI (Popescu, Fey, Lewine, Finestack, & Popescu, 2009), that is, documenting at a biological level the effects of language intervention.

In thinking about abnormal brain structures and functioning underlying SLI, it is important to realize that these can be related to other findings about possible causes and associations presented in the literature. One of these is genetic bases of SLI, which could lead to altered brain structure and function. We take up discussion of genetic transmission related to SLI later in this chapter. The state of the science is such that we have not yet unraveled the relationships among prenatal neurological development, genetics, postnatal brain morphological development, and even endocrinology. Attempts at unraveling the puzzle continue to be the focus of research.

**Language Knowledge and Access to Language Knowledge.** Another proposition as to why these children have language problems is that the children have difficulties abstracting from their language-learning environment the requisite implicit language rules, demonstrate incomplete learning of rules, and/or have problems accessing language information that they already know (e.g., Connell & Stone, 1992; Gopnik, 1990; Leonard, Nippold, Kail, & Hale, 1983; Messer & Dockrell, 2006; Rice & Wexler, 1996). That is, the children can take

in, process, and acquire at least part of the requisite language information, but they have trouble getting to it and bringing it forward to use it consistently, or they acquire incomplete knowledge of the language rules. The observations that children with SLI are often inconsistent in what they can do with their language lend support to this proposition. For example, children can use appropriate tense-marking morphemes sometimes but not always, or they may sometimes have difficulty retrieving a word to use but at other times are able to use the same word quickly and easily with no latency. But these are observations at a behavioral level about language functioning. The more significant question related to a cause for SLI is what causes these problems in learning their language knowledge in the first place. At best this is a surface account of causation.

**Cognitive Deficits.** Cognitive abilities of children with SLI have also been the subject of investigation as to the reason for the children's language problems. As we have seen previously, a criterion of SLI is the absence of intellectual disability as the reason for children's language problems. As we saw earlier, a common way in which the intellectual level of these children is established is via tests of nonverbal intelligence, referred to as NVIQ, or performance IQ tests (PIQ). Because the classification of SLI excludes children with intellectual disabilities, children with SLI supposedly demonstrate normal nonverbal intelligence skills.

Nevertheless, deficits in particular aspects of cognitive functioning, such as symbolic play, hypothesis formation and testing, and representational thought, have been associated with SLI in children (e.g., Ellis Weismer, 1991; Johnston, 1994; Rescorla & Goossens, 1992). If the language impairment of these children is, in fact, linked to deficits in their cognitive functioning, the terms *specific* language impairment, *specific* language disability, and *specific* language disorder may be inappropriate. However, deficit cognitive functioning has also not always been substantiated in language-impaired children. The question also arises as to how testing of cognitive ability, particularly NVIQ, can be completely devoid of the influences of language ability (Johnston, 1994). While it might be possible to separate some intelligence measures from language ability in young children, it appears that as children with SLI mature, their language problems have been seen to affect their measured NVIQ. Thus, language impacts nonverbal functioning. And, the measured NVIQ of older children, adolescents, and even adults with SLI has been shown to decline from the previous levels seen in their younger years (Conti-Ramsden, Botting, Simkin, & Knox, 2001; Johnson et al., 1999; Stothard et al., 1998; Tomblin, Freese, & Records, 1992). Of course, if there are cognitive deficits associated with SLI in children, there is the recurring question about the underlying reasons for the deficits.

**Information Processing Deficits.** Although somewhat related to the notion of cognitive deficits presented above, another direction that the explanation for a causal factor has taken has involved how children process information, that is, an information processing account of SLI (Ellis Weismer & Evans, 2002; Evans, Viele, & Kass, 1997). The basic premise of this explanation suggests that SLI in children stems from problems in how well the children can deal with (process) incoming stimuli and/or use the stimuli in order to learn language and/or acquire information. The general premise is that the children are limited in how much information and/or how quickly they can process the information so that they fail to take in sufficient information in sufficiently complete forms in order to acquire language adequately.

Two broad lines of thought within the information processing account have predominated. One focuses on more generalized information processing limitations. These involve reductions in the speed with which information can be processed and/or constraints on what the children can hold in their working memories in order to process and make sense of incoming stimuli (e.g., Dick, Wulfeck, Krupa-Kwiatkowski, & Bates, 2004; Ellis Weismer, Evans, & Hesketh, 1999; Montgomery, 2005). Working memory is also sometimes known as short-term memory. Some findings have implicated weaknesses in processing nonlinguistic information as well as linguistically based information (e.g., Miller, Kail, Leonard, & Tomblin, 2001). However, not all children show the same weaknesses to the same degree for similar tasks, which certainly confounds conclusions about possible reasons for the language problems and at the same time reinforces the idea that SLI is "multifactorial" (Leonard, 2014, p. 218) in nature.

The second line of thought proposes that the children's information processing problems are more specific to particular processes, such as the temporal processing of rapidly changing auditory stimuli or phonological processing (e.g., Corriveau, Pasquini, & Goswami, 2007; Gathercole, Hitch, Service, & Martin, 1997; Merzenich et al., 1996; Montgomery & Windsor, 2007; Tallal et al., 1996). However, weaknesses in verbal working memory, per our discussion in the preceding paragraph, could relate to observed difficulties with rapid auditory processing or phonological processing. Information processing accounts of SLI have been one of the factors for the emergence of NWR as a possible clinical marker of SLI. The question remains, however, about the possible reasons for the information processing problems; the answers seem to take us back to the possibility of issues related to neurological functioning, per our discussion above.

Behaviorally, many young children with SLI are described as being inattentive, often especially inattentive to spoken language, compared to typically developing, same-age peers. And, logically, children need to attend reasonably well to the stimuli presented to them during NWR tasks in order to perform adequately on the tasks. It is possible that their poor performances on such tasks stem from problems maintaining attention to the auditorily presented nonsense words. Problems with auditory attention have, in fact, been suggested as reasons for the language problems seen in children with SLI.

Using neurophysiological techniques (ERPs) and a narrative discourse task, Stevens and colleagues (Stevens, Fanning, Coch, Sanders, & Neville, 2008; Stevens, Sanders, & Neville, 2006) documented that the children with SLI in their studies, who were instructed to listen to one and not a second narrative presented at the same time, did not differentially attend to the target narrative but instead attended to both. However, the typically developing children did differentially attend to the target auditory stimuli. This suggests that children with SLI may not be able to attend selectively to language-based auditory stimuli. This could make it hard for young children to pick out important elements in the auditory stream of language they hear in order to find the linguistic patterns and abstract these to learn language.

Another way of thinking about the role of attention problems as reasons for young children's difficulties learning language relates to the topic of (*Central*) Auditory Processing Disorder [(C)APD], which readers will encounter in the next chapter and again in Chapter 8 on auditory impairment and language. As readers will see there, this disorder has been the subject of considerable controversy for decades, including its relationship to language impairment in children. The information processing problem related to deficits possible in temporal processing of rapidly changing auditory stimuli, referred to in the preceding paragraph, is a form of auditory processing. One intervention (i.e., Fast ForWord) that has been reported to be effective in improving the language performances of children with language impairment purportedly rooted in this supposed auditory processing deficit (Tallal et al., 1996) has also met with considerable controversy. In considering the outcomes research on the Fast ForWord intervention, Leonard (2014) has suggested that noted improvements in performances of children with language impairment who took part in the intervention are probably more linked to improving the children's attention than remediating language deficits specifically. In a related theme, results of Moore's (2011) line of research investigating (C)APD has led him to propose that the poor listening performances of most children presumed to have (C)APD are due to reduced working memory or problems with attention.

Attention has been implicated in SLI in still another way—*attention deficit/hyperactivity disorder (ADHD)*. ADHD has been reported to have a sizeable co-occurrence rate with SLI, with wide-ranging estimates of co-occurrence as high as about 75 to 95 percent co-occurrence to under 5 percent (e.g., Gualtieri, Koriath, Van Bourgondien, & Saleeby, 1983; Redmond, 2016a; Snowling, Bishop, Sothard, Chipchase, & Kaplan, 2006; Walsh, Scullion, Burns, MacEvilly, & Brosnan, 2014). However, the majority of studies examining co-occurrence rates of language impairment and ADHD have reported more moderate, centric estimates, such as about 30 to 60 percent (Redmond, 2016a). Concerted research efforts are being directed to trying to tease out the relationship between SLI and ADHD (e.g., Redmond, 2016a, 2016b; Redmond & Timler, 2007), but teasing out those relationships is currently a work in progress.

As with many of the other possible reasons for the inordinate difficulties toddlers and preschoolers with SLI have in learning language, we ask the same question. That is, what has

led to the reason? A reason, such as a possible information processing deficit, must logically have a causal underpinning, which again implicates brain functioning, although children's language-learning environments have also been suggested as reasons for the children's language difficulties.

**Language-Learning Environment.** Children's exposure to language in their environment, or rather the lack of appropriate types of exposure, has been suggested as a reason for the language problems of children with SLI. However, we need to be clear about what we mean about the language-learning environment because we can think of the environment for learning language in terms of quantity or quality of exposure. We know that normally developing children can acquire language without a lot of language stimulation. The point is made fairly clearly with hearing children of deaf parents; most of these children seem not to have difficulties acquiring spoken language if there is a relatively small amount of regular exposure to it. On the other hand, we noted previously that maternal education is sometimes considered a possible risk factor for language disorder. The immediate conclusion might be that this is because of the reportedly greater amount of language stimulation that mothers with more education provide to their children (Hart & Risley, 1995). However, if there are impacts with regard to quantity of maternal input to children's language development, these appear to affect semantic (vocabulary) development rather than other aspects of language ability that are particularly problematic for children with SLI, such as grammatical morphology (Dollaghan et al., 1999; Rice, Spitz, & O'Brien, 1999; Rice et al., 1998). Quantity of language exposure in the environment seems insufficient by itself to be a reason for SLI in children (Bishop, 1997), although it might affect both normally developing and language-impaired children's performances on common measures of language, such as those involving lexical density (size of vocabulary) and length of utterances (Dollaghan et al., 1999). And we need to keep in mind that one of the several criteria that are used to exclude children from being identified as having SLI is severe environmental deprivation such that the deprivation can account for the disruption in language development. Children with SLI generally do not live in environments where insufficient amounts of stimulation for learning language alone can be deemed to be a reason for the children's problems. And there are many studies on preschoolers with SLI that have included children from families with middle and upper-middle socioeconomic status.

In contrast, results of studies looking at the quality of language interactions between mothers and children with SLI give a somewhat mixed picture as a potential reason for the children's problems, at least at first glance. There have been suggestions that mothers of SLI children do not engage in as many of the language interactions with their children that are known to facilitate children's language learning—that is, many of the characteristics of "motherese" and other behaviors such as responses to questions, imitations, or self-repetitions. However, mothers of children with SLI have been found to talk in a similar manner to their younger children whose language is developing normally (e.g., Conti-Ramsden & Dykens, 1991; Warlaumont & Jarmulowicz, 2012), so attributing the reason for children's language learning problems to mothers' communicative interaction styles seems not to stand up consistently to empirical scrutiny. It appears that where differences have been identified, these may be because mothers have adjusted their language levels to those of the children. That is, because the language of children with SLI seems more like that of younger, normally developing children, mothers seem to modify their language and interactions to accommodate their less language-able children. In this way, characteristics of the children seem to drive the language input they receive.

There has been, however, one finding that might point to children with SLI having different language-learning interactions with their mothers than other children. This deals with mothers' use of recasts. *Recasts*, as we will see elsewhere in this book, are responses to a child's utterance that are semantically contingent and include language elements the child used but add or modify the child's utterance in some way that makes it more complex or complete, as in the following:

**CHILD:** That my teddie.

**MOTHER:** Yes, that is your big teddie. We'll take it in the car.

Mothers have been found to use recasts with children with SLI differently, including using them less frequently (Conti-Ramsden, 1990; Conti-Ramsden, Hutcheson, & Grove, 1995; Nelson, Welsh, Camarata, Butkovsky, & Camarata, 1995). However, even here it is not clear that the direction of influence is from mother to child as opposed to from child to mother. Mothers of normally developing children reduce their use of recasts as children get older. It could be that, for use of recasts specifically, mothers are responding to the older ages of their children with SLI or their nonverbal cognitive levels rather than the children's lower language levels (Nelson et al., 1995). It is also possible that children with SLI are sufficiently less communicatively interactive with their mothers, so the mothers have fewer interchanges with their children in order to provide recasts. Again, there is the possibility that characteristics of the children affect their language-learning environment as much as if not more than their language-learning environment leading to their language problems. However, this does not rule out a reciprocal interaction in which some of the modifications that mothers make to their children's impaired language inadvertently become less facilitating for the children's language development.

Overall, language-learning environment is not viewed as a probable reason for SLI. Factors in the environment may lead to delays in language learning, particularly vocabulary, but not result in the impairment in language learning that is seen in SLI. Nevertheless, language-learning environment can interact with the intrinsic language-learning abilities that a child brings to the task either to moderate the effects of the child's language-learning impairment or to exacerbate them.

**Genetic/Familial Bases.** Previously we noted that a family history of language, communication, and/or literacy problems is a risk factor for a child having a language impairment. Recall also the findings from the study by Tomblin and his colleagues (Tomblin, Smith, et al., 1997) that suggested that SLI in children was more often associated with risk factors related to their parents' status before the children were even conceived than with various fetal or perinatal risk factors. Among the parental factors were levels of education and family histories of language and/or learning problems, two factors that are not independent of each other.

There is now no question that language impairment has a tendency to run in families and that language-learning environmental influences alone are insufficient to explain the children's language-learning problems (e.g., Bishop, Price, Dale, & Plomin, 2003; Choudhury & Benasich, 2003; Felsenfeld & Plomin, 1997; Flax et al., 2003; Plante, Shenkman, & Clark, 1996; Viding et al., 2003). That is, in many cases there is a likely heritable, genetic basis for the impairment (Conti-Ramsden, Falcaro, Simkin, & Pickles, 2007; Rice, 2013; Rice, Smith, & Gayán, 2009; Vernes et al., 2008). In twin studies, two of the possible clinical markers noted previously (nonword repetition and verb tense marking) have been found to have heritable bases for risk for SLI (Bishop, Adams, & Norbury, 2006).

Twin and adoption studies, along with advances in multivariate genetic analysis, behavioral genetics, and molecular genetics, are moving our knowledge ahead rapidly in this area. For example, longitudinal genetic studies of SLI utilizing growth curve modeling for acquisition of certain language skills have some promise in helping us clarify our perspectives about what leads to SLI (Rice, 2012, 2013). These tie genetic timing mechanisms at a molecular level in brain development to longitudinal acquisition of specific language skills. The timing mechanisms are considered as genetic triggers for starting (onset), speeding up (acceleration), and slowing (deceleration) brain development leading to development of particular behaviors in children. Rice (2013) indicated that the research to date has identified three regulatory genes—*KIAA3019*, *CNTNAP2*, and *FOXP2*—as candidate genes in the etiology of SLI. Growth curve modeling approaches compare typically developing children's acquisition of a variety of language skills over time to their counterparts with SLI. Rice (2012, 2013) suggests that for a number of language skills, including verb morphology, the modeling shows that children with SLI start their learning of the language skills later than their peers without language impairment (i.e., delayed onset), then appear to acquire the skills at the same rates as their peers (i.e., same rate of development once triggered to start), but then experience a leveling or

plateau (i.e., deceleration in learning) before reaching adult-level competency. In other words, the children with SLI start but show a delayed start (for some language skills, 2 years late), then show the same acquisition pace as language-normal children in the acceleration stage but do not catch up because there is no exceptional acceleration, and then they experience deceleration without achieving competency. Rice (2013) writes that studies of these three regulatory genes

collectively suggest potentially complex interactions among genes along the causal pathway, although definitive evidence is not available to establish regulatory gene effects as part of the aetiology of SLI. The chain of evidence does, however, support the plausibility of such a claim. (p. 230)

We anticipate that the work in the area of genetics in the next several years will add considerably to our understanding. Because SLI overlaps with several other disorders (e.g., speech sound disorders, reading disorders), research directions are exploring if there are particular problematic abilities or clusters of problematic abilities (e.g., verbal short-term memory problems resulting in nonword repetition limitations, attention problems, etc.) that underpin other skills known to be problematic (e.g., verb morphology) that are influenced by a specific gene variation or combination of gene variations.

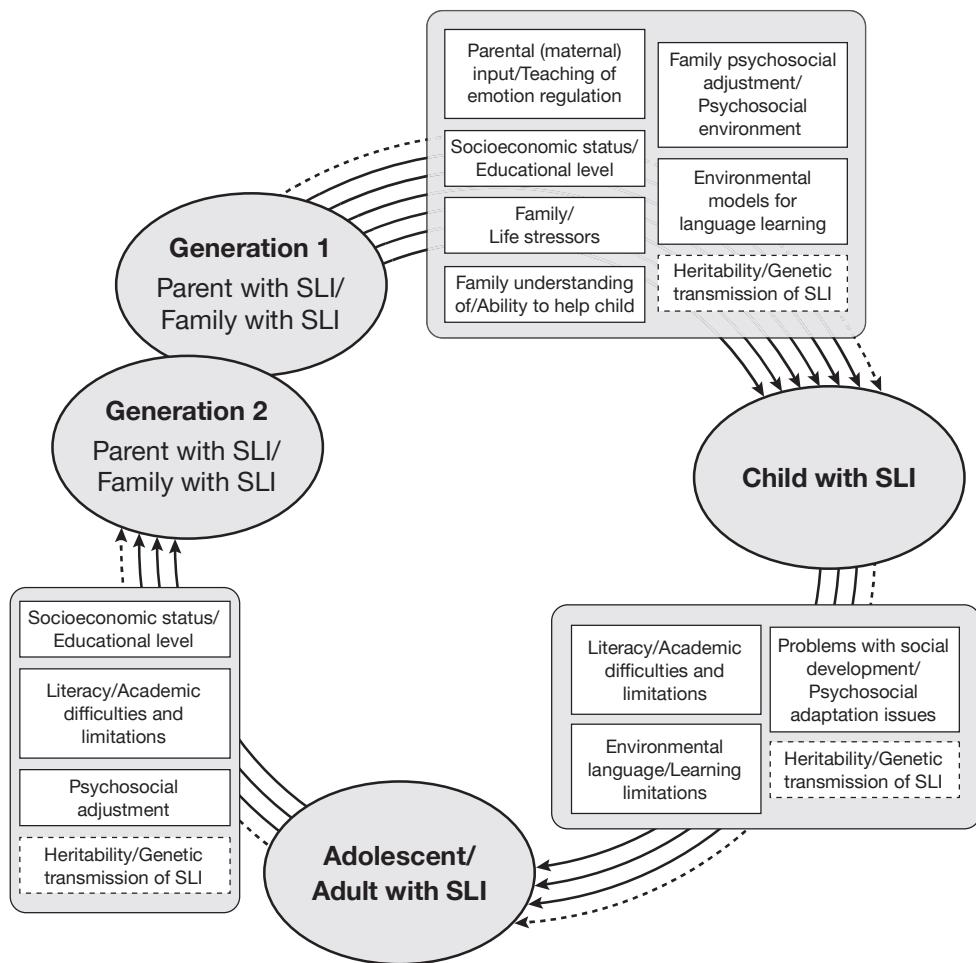
We have to keep in mind that genetic variations can impact, among other things, development of brain structures and, therefore, brain functions, which might account for some of the differences in brain morphology and functioning seen in the literature, per our previous discussion. Here we see the need to tease out levels of causation and symptomatology in our thinking about what leads to SLI and how it manifests. For example, we might hypothesize that something (genetic variation perhaps?) causes (a level 1 cause) affected children's brains to develop differently than unaffected children (a level 2 cause) and therefore function differently (a level 3 cause), possibly in areas of verbal working memory and/or attentional capabilities (a level 4 cause and level 1 symptom), leading to language-learning difficulties (a level 2 symptom), which might then cause (language-learning problems now a level 5 cause) affected children to have social interaction problems and/or reading difficulties (level 3 symptoms). Importantly, this example is hypothetical, but it does illustrate that our thinking about causation of and reasons for SLI needs to eschew simplistic explanations and to aspire to clarity even in the context of still incomplete knowledge. As part of trying to be clear in our thinking about SLI, we are careful to note that not all children with SLI have positive family histories or evidence of genetic transmission, and not all children in families with a history of language problems will themselves have language impairment. Nevertheless, positive family histories of language and/or literacy problems do increase the odds of the children having language problems. Although these situations have several possible sources, which can be consistent with genetic principles, other variables can be implicated. As Bishop (1997) points out, "genes do not act in isolation to cause behaviour" (p. 49), and notions of genetic determinism are, according to Plomin and Dale (2000), "based on misconceptions about genetic research, and on a lack of appreciation of the way complex traits and common disorders are influenced by *multiple genes* [emphasis added] as well as *multiple environmental factors* [emphasis added]" (p. 49).

There are several ways to conceive of environmental factors in combination with genetic transmission of SLI. On the one hand, a child may have one or more predisposing genes for SLI, but the child's environment is one that provides a buffer for the genetic predisposition and limits the emergence of the disabling characteristics of SLI. In another situation, an inherited trait for SLI might be moderated by inserting language intervention into the environment so that it counters the inherited trait and lessens its influence (Bishop, 1997). On the other hand, a child with an inherited SLI predisposition might grow up in a family in which one or both parents also have language impairments, associated literacy problems, difficulties with psychosocial aspects of behavior (which we will see later are often a part of language impairment), and resulting lower socioeconomic conditions. For this child, the environment may exacerbate the inherited trait or, at least, not serve to counter it. Goodyer (2000), in discussing "psychosocial disadvantages" (p. 232) related to

the family environment of children with SLI and “environmental adversities” (p. 232) that can therefore impact on the children, writes,

It may be that there are common genetic components that will be expressed as a familial effect. Also, language and cognitive deficits in a parent may limit the direct help they can give their children. (p. 232)

Figure 3.1 illustrates how genetic and environmental factors might come together to affect a child’s language abilities and even continue to have effects in subsequent generations. Plomin and Dale (2000) remind us of the concepts of *assortative mating* and *additive genetic variance*. These concepts refer to the increased likelihood that individuals with similar characteristics or traits tend mate and that the factor of similar cognitive abilities, particularly verbal abilities, has particularly strong influences in selecting mates, more so than behavioral or physical characteristics. This means that, if one adult is particularly strong in verbal ability, that adult will likely mate with another who is also strong in the ability. Over generations, the children of such matings are likely to be high in verbal ability also. This assortative mating, according to Plomin and Dale (2000, p. 48), “increases a particular type of genetic variance called additive genetic variance, which is caused by the independent effects of alleles<sup>1</sup> that ‘add up’ to affect the trait.”



**FIGURE 3.1 | Schematic Representation of Some of the Interactions and Effects of Genetic/Familial and Environmental Factors in SLI** (© 2002 Vicki A. Reed)

1. Any of alternative forms of a gene (e.g., either the wrinkled-pea gene or the smooth-pea gene) that can occur at a given locus.

Where SLI is concerned, it is probably a mistake to think of the effects of nature (genetics) and nurture (environment) separately and more accurate to consider them as interacting. Language is a complex behavior, so a simplistic explanation about what is wrong in the condition of SLI is unlikely. And the more complex a behavior, as with language, the greater should be our expectations for more interactions among factors. Caution against adopting simplistic explanations of SLI is warranted.

### Prevalence

Some young children start off slowly in their language development and then appear to catch up. Other children start off slowly and continue to lag behind and to have problems. Still other children start off slowly, seem to catch up for a while, and then either fall behind again or show problems in different areas related to language, such as literacy and numeracy. Therefore, we may see different prevalence figures at different ages, and these figures are likely affected by what and how we are measuring language.

Vocabulary development is one of the first obvious indices of language growth in very young children. One of the earliest signs that a child may have problems with language is that the first word is used late or that not very many additional words are acquired after the first word.

**At 18–24 Months of Age.** Between 18 and 24 months of age, signs that a child may have language problems include absence of a vocabulary growth spurt, failing to combine words into two-word utterances, and/or generally talking very little. About 10 to 15 percent of 2-year-old children fit this picture (Klee et al., 1998; Rescorla, 1989; Rescorla, Hadicke-Wiley, & Escarce, 1993). For children at 24 months of age, concern generally focuses on an expressive single-word vocabulary of fewer than 50 single words and no two-word combinations. Yet some of these toddlers do catch up later. The children who catch up are often referred to as *late bloomers*. However, some of the toddlers who demonstrate *slow expressive language development* (SELD)<sup>2</sup> in their first 2 years continue to lag behind in their language development as they grow older. Some longitudinal studies give us hints as to how many of these children continue to lag behind in their language throughout the preschool years and into the school years.

**At 3 Years of Age.** In reviewing her work and that of others, Paul (1991, 1996) suggests that between about 20 and 75 percent of children who were slow in language development at 2 years of age moved into the normal range on measures of expressive language at 3 years of age (Paul, 1991, 1993; Rescorla, 1993; Whitehurst & Fischel, 1994), the age at which language skill begins to be measured as much by syntactic and morphological abilities as by vocabulary. For twins, however, Dale, Price, Bishop, and Plomin (2003) report that about 45 percent of 2-year-old twins with language delays showed persisting language difficulties at 3 years of age. Together, these results mean that 25 to 80 percent of these SELD 2-year-olds continued to show expressive language delays at 3 years of age.

The difference between 25 percent and 80 percent is very large. One of the reasons for the big range is the wide variance in what is “normal” in very young children. For example, one parent report measure of young children’s expressive language at 2 years of age has a vocabulary mean of 300 words but a standard deviation of 175 (Fenson, Dale, Reznick, Hartung, & Burgess, 1990), more than half the mean. Consequently, any vocabulary size above 125 would be considered normal or above, and a vocabulary size of zero or more would place a child at or above the -2 SD point. Other reasons for the big range are the different tools that have been used to assess the children’s language, including the varying degrees of specificity and sensitivity of the tools, the aspects of language that were measured, and the

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2. The current literature on toddlers has so far refrained from using the term *specific language impairment* to refer to these young children. Rather, *slow expressive language development* (SELD) has been the preferred descriptor. In keeping with this trend, SELD will be used in this section of the chapter.

degree to which language performance has or has not been challenged in the children. Other reasons are the heterogeneity of the groups studied and the children initially being identified at 2 years of age on the basis of their expressive vocabulary size, with some but not all of them having presumably normal comprehension abilities (Ellis Weismer, Murray-Branch, & Miller, 1994; Girolametto et al., 2001; Kelly, 1998; Olswang, Rodriguez, & Timler, 1998; Paul, 1997; van Kleeck, Gillam, & Davis, 1997). Language comprehension of young children is notoriously difficult to assess in toddlers in valid and reliable ways (Leonard, 2009), and the notion that expressive-only language problems actually exist in children with SLI without some degree of receptive problems has been challenged (Leonard, 2009; Tomblin & Zhang, 2006; Tomblin et al., 2007). Prevalence figures might be different if we had accurate information about the children's comprehension.

Of particular note is that vocabulary size of some 2-year-olds with SELD who continue to have language problems in areas other than vocabulary (Paul, 1993; Rescorla, 1993; Whitehurst, Fischel, Arnold, & Lonigan, 1992), even though low vocabulary size was a primary criterion used to identify the children as having delayed language at age 2. What this means is that at 3 years of age, expressive language skills other than vocabulary are below normal expectations. These are often aspects of language related to form, that is, syntax and morphology. As children age, vocabulary size, at least as measured by many norm-referenced tests, is a less reliable indicator of SLI than other language measures.

Others have provided different estimates of continuing language delay in 3-year-olds. Klee et al. (1998) suggest that one-fifth (20 percent) to one-third (33 percent) of 2-year-old children who could be considered as having SELD at 2 years of age continue to be clinically concerning at age 3 years. Paul (1991) reports that 40 to 50 percent of 2-year-olds may continue to have expressive language delays at age 3 years. If we calculate 40 to 50 percent of the 10 to 15 percent figure given for the proportion of 2-year-olds with SELD, we arrive at a 4 to 7.5 percent prevalence figure for expressive language problems in the 3-year-old group. If we use the 20 to 33 percent figure of Klee et al. (1998) to calculate the proportion of the 10 to 15 percent of 2-year-olds with SELD who have problems at 3 years of age, we arrive at a 2 to 5 percent prevalence figure, and if we use the 25 to 80 percent figure, we arrive at a 2.5 to 12 percent prevalence figure for language delay at 3 years of age.

**At 4 Years of Age.** What is the language of 2-year-old children with SELD like when they are age 4? In compiling the results from her study (Paul, 1991, 1993) and others (Rescorla, 1993; Whitehurst & Fischel, 1994), Paul (1996) has reported that about 45 to 85 percent of 2-year-olds with SELD received scores within normal limits on measures of expressive language at 4 years of age. In another study, at 4 years of age 71 percent of children who had been late talkers had mean lengths of utterance (MLUs) above the 10th-percentile rank (Rescorla, Dahlsgaard, & Roberts, 2000). Reversing the figures from both of these reports, this means that 15 to 55 percent of the 2-year-olds did not move into the normal range at 4 years of age. We need to keep remembering that these figures are proportions of a proportion of the population of 2-year-olds, that is, the 10 to 15 percent of 2-year-olds who have SELD. Therefore, to estimate general prevalence of language impairment at age 4, we need to look at 15 to 55 percent of 10 to 15 percent, or 1.5 to 8.5 percent, which we see is still a considerable range. From a slightly different perspective, in tracking 28 toddlers who had previously been slow to develop their expressive language, Paul and Smith (1993) found that 57 percent of these children had persisting expressive language deficits related to narrative skills at 4 years of age. As Paul (1991) points out, this "finding is particularly significant because narrative skills in preschoolers have been shown to be one of the best predictors of school success" (p. 8). Extrapolated to the general 10 to 15 percent of 2-year-olds with SELD, this estimates that 6 to 9 percent of 4-year-old children might have problems with their narrative skills, a possible portent of coming academic difficulties for these children. Readers might want to keep this 6 to 9 percent estimated prevalence figure in mind.

The language status of preschoolers at 4 years of age and even more so between 4 and 5 years of age likely foreshadows their later language and literacy outcomes. Several authors have noted that children whose language abilities are behind those of their peers at 4 years of age may be in for long-term problems. By "long-term," we mean problems that extend

into the elementary and secondary school years and even into adulthood (Rescorla & Lee, 2001; Stothard et al., 1998). It is possible but not confirmed that these children will have demonstrated language comprehension problems in addition to their expressive language weaknesses when they were 4. As we have noted, expressive syntax and morphological abilities are two areas that frequently show particular weaknesses if language problems persist in children to the age of 4, often more so than a vocabulary deficit, which was used to first identify the children as SELD.

***At 5 Years of Age.*** How many of these SELD children will continue to show language problems at 5 years of age? From the results of one study (Whitehurst, Fischel et al., 1991), 5-year-olds who had been slow in their early expressive, but not obviously in their receptive, language development evidenced expressive vocabulary performances and general verbal fluency skills that were not notably different from normally developing 5-year-olds. Given that syntax and morphology are particular problems for most children with SLI and, as we will see later, that many of these children also have problems in interpersonal interactions and psychosocial difficulties, it is unfortunate that this study did not include measures of syntactic or pragmatic abilities. However, the authors reported that, if any problems in the areas of syntax at 5 years of age did exist, they were "subtle and not apparent" (p. 67). These findings might suggest that the children had caught up to their normally developing peers. However, while Bishop and Edmundson (1987) found that many preschool children with language deficits (without nonverbal intelligence deficits) appeared to catch up by 5½ years of age, Conti-Ramsden, Crutchley, and Botting (1997) pointed out that about an equal proportion (40 percent) did not. Paul (1996) reported that, in kindergarten, 75 percent of her 2-year-old toddlers with SELD had moved into the normal range on most measures of language, including achieving syntax scores on samples of their spontaneous language (i.e., their Developmental Sentence Score) that placed them above the 10th-percentile rank. However, 25 percent still exhibited delays in their syntax as well as with other aspects of language. In Rescorla's (1993) study of toddlers with SELD, whom she followed for several years, 15 percent of the children performed poorly on a test of expressive grammatical ability at 5 years of age and were therefore considered to show impaired language, compared to the 85 percent who demonstrated more age-appropriate language performance (Rescorla, 2002). Girolametto et al. (2001) reported that when their 21 children who had expressive vocabulary delays at 2 years of age reached 5 years of age, three of the children (14 percent) scored below the normal range on norm-referenced measures of language. We need to remember that these studies differed on the proportions of the children in the groups who had receptive language problems in combination with their expressive language impairments.

It could seem that most children who have early histories of language delay seem to catch up by the time they are 5 years of age. There may, however, be some real dangers in accepting these findings without more information. Although most of the SELD children in the research of Paul and colleagues (Paul, 1991, 1996; Paul, Murray, Clancy, & Andrews, 1997) scored within normal limits on norm-referenced tests of language at 5 years of age, most of their scores were in the lower range of normal and were significantly lower than their peers who did not have a history of slow language development. Their narrative performance both in kindergarten and in grade 1 continued to be notably poorer than that of the children without histories of language problems (Paul, 2000; Paul, Hernandez, Taylor, & Johnson, 1996; Paul & Smith, 1993). Recall from our previous discussion that Lahey (1990) has suggested that our identification procedures need to examine children's language abilities under conditions that stress the language system. Narrative tasks do just that. The 5-year-old children in the study of Girolametto et al. (2001), most of whom scored within normal limits on norm-referenced measures of language, also performed significantly poorer on these tasks than their peers and had particular problems on higher-level language tasks, such as narratives and perspective-taking language tasks. The SELD children in Rescorla's (2002) research, too, generally performed within normal limits on most language measures at age 5, but their performance was significantly poorer than their peers, and they continued to show poorer performance through to 9 years of age. There was also evidence of emerging reading problems at ages 8 and 9. The children in the Bishop and Edmundson (1987) study who had appeared

to “resolve” their early language problems by 5½ years of age had measurable and noticeable academic and language problems at 15 years of age, and their skills with the higher-level language skills of narratives at age 5½ seemed particularly important in terms of what their outcomes were. A picture that emerges suggests that norm-referenced language tests, particularly those that do not tap higher level language abilities or syntax and morphology under conditions that stress children’s language abilities, are not the best tools for identifying language impairment. And, when young children with documented language comprehension problems are considered, the chances of continuing language problems at age 5 or beyond increase (Ellis Weismer, 2007). All may not be rosy for these SELD children as they mature, even though some of their test scores might place them in the normal, albeit often lower normal, range.

These outcomes seem to reinforce the concerns expressed by some that early expressive language delay portends the likelihood of future language problems and language-learning-related problems and, therefore, warrants early intervention (Girolametto, Pearce, & Weitzman, 1996; Nippold & Schwarz, 1996; van Kleeck et al., 1997). Those who adopt this position stress the importance of early intervention that tries to take advantage of the neurological plasticity of brains of children younger than 5 years. Rice (2000), in summarizing the work of Dale et al. (1998) on genetic contributions to slow vocabulary development in 2-year-old children and speculating on its implications for later language development, writes that

the children whose early vocabularies are small, compared to other children, in effect have a qualitatively different status than the children with more robust vocabularies; they are not just at the low end of the normal distribution. In other words, the emergence of first vocabulary items may function much like a clinical marker in affected [i.e., having language impairment] children, although whether or not vocabulary status retains this marker function for older children remains to be seen. It may be that first vocabulary acquisition serves as a valuable indicator of the fact that affected children’s language emerges late relative to unaffected children. (p. 28)

The work to develop other markers of SLI in young children with SELD, such as that of Hadley and Short (2005) looking at the onset of verb tense marking in 2- and 3-year-old children and Stokes and Klee (2009) attempting to develop a nonword repetition task able to be used with young children, will likely give us better tools to use with children with SELD, which in turn may help us make more informed decisions about which children with SELD need intervention because their SELD is an indicator of SLI.

Others have suggested that such children should be monitored closely and intervention provided if the children do not appear to be catching up well and early (Paul, 1996, 2000), that is, a “watch-and-see” policy (Paul, 1996, p. 15). From this perspective, SELD should be viewed as a risk factor for SLI but not a disorder (Paul, 1996, 1997; Whitehurst & Fischel, 1994).

Some of the findings about 5-year-olds who as toddlers and preschoolers had slow language development could be interpreted as suggesting a relatively low prevalence rate for children of kindergarten age. However, the experience of professionals who have worked with young children tells us that this may not be true (Johnson et al., 1999). In a large-scale and well-controlled epidemiological study of kindergarteners, Tomblin and his research team (Tomblin, Records et al., 1997) reported that the prevalence of SLI among children in their first year of school, between about 5 and 6 years of age, was 7.4 percent. (This is why readers were earlier asked to keep the estimated prevalence figure derived for 4-year-olds in mind.) As Leonard (1998) comments, “There is no reason to believe that the prevalence of 7.4 percent is artificially high” (p. 20). In fact, Johnson et al. (1999) arrived at an estimate of 6.7 percent. Because children’s language abilities at 4 and 5 years of age are quite predictive of what their language, literacy, and numeracy skills will be like as they mature (Catts et al., 2002; Donlan, Cowan, Newton, & Lloyd, 2007; Rescorla & Lee, 2001; Stothard et al., 1998; Tomblin, 2014; Tomblin et al., 2003) and SLI likely does not “get cured” but remains as a lifelong disability with considerable negative consequences (Brownlie et al., 2004; Clegg, Hollis, Mawhood, & Rutter, 2005), it is reasonable to believe that about 6.5 to 7.5 percent of students during their school years, including high school years, will have SLI.

The prevalence rate of about 7 percent is now the commonly accepted rate. This makes the condition the most prevalent of all communication disorders and comparable in

prevalence to another, well-recognized neurodevelopmental condition, ADHD. Despite its prevalence, however, preschoolers and kindergarteners with SLI often go unidentified, with any problems they might display attributed to other conditions. Redmond (2016a) comments that SLI has been

largely unrecognized outside of the research literature and SLI represents a demonstrably under-resourced clinical entity.... Longitudinal studies indicate further that the risk of undertreatment rather than overtreatment is more likely for individuals with SLI because the majority of participants did not receive intervention during their academic careers. (p. 134)

A quotation from Rice (2013), describing the children who participated in her longitudinal genetic study of SLI, foreshadows what we will see in the next section and in the next two chapters:

Most of the . . . [children] were recruited from school clinical caseloads when they were 3–7 years old, in school districts geographically distributed across a wide region. Although they were receiving speech-language therapy at the outset of their participation in the study, ongoing monitoring of the services they were receiving . . . shows that the children were likely to be dropped from speech pathology services by age 7–9 years, although they were likely to receive services for reading or other academic limitations after their speech-language pathology services were discontinued. . . . Thus, there was no common approach to speech-language therapy. (p. 224)

**Considerations and Implications.** One consideration about trying to determine prevalence is that language deficits may change in their manifestations as children get older, thereby showing effects on language performance differently for certain aspects of language behavior. As we indicated previously, syntax and morphology may be problematic, as might higher-level language skills, such as narrative, even when delays in early vocabulary size might seem to have resolved. We also know that nonword repetition skills, ability to recall sentences, and language comprehension abilities have a high probability of being affected. These factors suggest that tasks, such as complex sentence usage and narrative skill in situations that challenge children's language performance and language processing and language comprehension, need to be utilized with older preschool children to tap their levels of language competency.

Another concern relates to a pattern of normal language development in which 5-year-old children seem to plateau in their language but show a growth spurt again between ages 6 and 7 (Scarborough & Dobrich, 1990). Because normally developing peers may plateau at about 5 years of age, 5-year-old children with histories of SELD may, on the surface, appear to catch up in language use in unchallenging situations. However, when their peers' language skills move ahead again a year or two later, the children with SELD histories may be left behind at a time when acquisition of literacy skills, which are heavily dependent on oral language abilities, becomes critically important in school for future academic success. These children might experience a subsequent growth with particular language skills, but for some children and for some skills, the plateau might mean some of these language behaviors "get stuck" at the plateaued level (Rice, 2013). Certain aspects of language behavior may also plateau at different ages (Rice, 2013; Scarborough & Dobrich, 1990). Therefore, for some children we may see what is an illusion of recovery from early language delay and for different language skills at different times, that is, "illusory recovery." This would create the impression of differing profiles of language adequacy in different children at different ages.

An additional concern relates to what other skills children with SELD might not be learning while they are trying to catch up that their normal language-learning peers have the opportunities to learn because their learning resources are not having to be directed to learning more basic language skills. A "Matthew" effect might operate (Stanovich, 1986), in which case those children who are better at language are better able to take advantage of language-learning opportunities to learn more language, but those who are not good fall further and further behind, and the gap between the language able and language limited children widens with time. It is possible that (1) children with histories of SELD give the illusion of recovery and then relapse; (2) if subgroups of young children with language difficulties exist, children in different subgroups will evidence different patterns of language growth,

recovery, and relapse; (3) some language skills may “catch up” but others do not, and findings may depend on which skills have been measured and how these were measured; and (4) SELD children expend learning resources and learning time on trying to catch up, and therefore they “miss out” on other learning—learning that may eventually affect their school performances. Paul (1991) writes that the interpretation of findings suggesting these children “catch up” by 5 years of age needs to consider the following:

- Whether the full range of language skills that are important at this age—and not detectable in measures of expressive vocabulary size, general verbal fluency, or unstructured conversation (such as complex sentence use and narrative skill)—is evaluated
- Whether any recovery that does appear to be completed by age 5 is stable or will again be outpaced by development in normal children over the course of the next year or two, when their rate of language growth accelerates, in conjunction with the acquisition of literacy skills
- Even if oral language skills do appear to remain eventually within the normal range by the end of the preschool period, whether the underlying processes that slowed them down at first continue to operate, now influencing primarily the learning of reading, writing, and spelling, as seems to be the case for so many youngsters with a history of language delay (pp. 9–10)

It is clear that preschoolers with continuing language problems in the apparent absence of other problems run the risk of encountering academic difficulties when they enter school (e.g., Catts et al., 2002; Johnson et al., 1999; Stothard et al., 1998; Zhang & Tomblin, 2000). In fact, in Chapter 5 we shall see that the difficulties created by language problems first evident in the preschool years can continue into and through adolescence and even into adulthood (e.g., Clegg et al., 2005; Snowling et al., 2006). Prevalence data on the occurrence of language problems in school-aged children are, however, conflicting, with some suggesting a fairly dramatic decrease in the prevalence of language impairments in school-aged children (U.S. Department of Education, 2009). Academic difficulties stemming from language deficits frequently lead to school-aged children being referred to as “language-learning disabled” or “learning disabled,” a topic taken up in more detail in the next two chapters. As well as an apparent false recovery period for oral language skills in the early school years, this relabeling may account for what Snyder (1984) observed several years ago was the “great disappearing act” (p. 129). That is, once in school, children with SLI may no longer be seen as language impaired in “head counts” of children having disabilities. Rather, they are counted in a different category, most often specific learning disabilities. Recall the quote from Rice (2013) previously in this chapter about children with SLI being dismissed from speech-language services at about 7 or 8 years of age.

### Predicting Spontaneous Recovery from Early Language Delay

Which of the children we have been discussing in the previous section are the ones who seem to “outgrow” their early language delays, that is, spontaneously recover from their early delay without intervention, and which do not? This is an important question because, given the insidious and long-lasting effects of language impairment, we want to provide early intervention to those children who need it but do not want to waste professional resources providing intervention to those children who will “outgrow” their delays and do so with no residual negative effects. Intervention with toddlers and preschoolers has positive effects on their language and accelerates their language, but we also know that intervention does not “cure” SLI. The situation may be much like many medical conditions or other disabilities; they do not go away even with the best of practice and intervention, but the effects of the conditions can be moderated with intervention so as to lessen negative impact. As important as it is to be able to predict which toddlers and preschoolers will and will not spontaneously recover from early language delay without negative residual effects, we are not yet very good at doing so with absolute certainty. Dollaghan and Campbell (2009) write, “Findings from a small but growing number of investigations in which predictive accuracy of a variety of early

indicators of developmental deficits [language] has been studied directly and found wanting” (pp. 363–364).

Professionals who work with children with SLI become concerned about advice to parents of 2-year-olds who are not talking very much that they should not worry about their child because the child will probably outgrow the early delay. From the previous discussion, we know that such advice might have about a 50/50 chance (splitting the difference on the range of estimates) of being right. For the children for whom the advice was wrong, valuable intervention time has been lost. For 3-year-old children whose language does not match that of their peers, we become even more concerned about such advice, and by 4 years of age, the odds of spontaneous recovery are against the child. However, predicting which children will eventually outgrow their early language delay is not an exact science because we have not yet pinpointed all the factors that affect spontaneous recovery or identified how various factors interact at different ages (Kelly, 1998; Olswang et al., 1998; Paul, 2000). The risk factors for SLI discussed previously in this chapter may provide, perhaps in combination, some direction for professionals in making relatively accurate predictions. However, we have yet to fully investigate the predictive accuracy of these factors in various combinations. Nevertheless, Olswang et al. (1998), in their review of the literature, write that “we know a lot” (p. 23) that can be used to help us make educated predictions so that we lower the odds of being wrong. Table 3.3 lists several of the factors that might provide predictive information about toddlers and preschoolers at risk for continuing language problems.

The possible clinical markers that we have previously referred to also as possible risk factors are listed in Table 3.3 because these might additionally function as factors that can help in predicting which toddlers with SELD might or might not spontaneously recover from their early language delay (Pawlowska, 2014). If 2-year-olds do not seem to be showing the same developmental trajectory for acquisition of early verb morphological markers that is shown by same-age peers without concerns about their early language delay (Hadley & Short, 2005), this could be a signal that the toddlers with SELD may be at risk for experiencing spontaneous recovery. With the development of nonword and even word repetition tasks that may be appropriate for use with toddlers and preschoolers (Chiat & Roy, 2007; Deevy et al., 2010; Gray, 2003a; Shriberg et al., 2009; Stokes & Klee, 2009; Thal et al., 2005), youngsters’ performances on such tasks might also add to our ability to predict ongoing language problems for the children. Chiat and Roy (2008) have used a repetition task to predict at 3½ to 4 years of age the language outcomes for toddlers age 2 to 2½ years and have obtained promising results regarding the task’s predictive value.

In light of some of the information about comprehension that has been presented so far in this chapter, comprehension skills deserve some special mention. There is increasing evidence that children with delayed expressive language development who also have more notable comprehension deficits are likely to demonstrate poorer outcomes, even into adolescence. For toddlers, Watt et al. (2006) found that comprehension skills of 2-year-old children were significant factors in predicting their receptive and expressive language abilities at 3 years of age. For preschoolers, comprehension deficits may have more impact on peer interactions or parents’ reports of their young children’s conversational skills than expressive language problems (Gertner, Rice, & Hadley, 1994; Girolametto, 1997). Given the more recent concerns that expressive language deficits may not exist in the absence of some degree of comprehension problems (Leonard, 2009; Tomblin & Zhang, 2006; Tomblin et al., 2007), comprehension abilities of toddlers and preschoolers may need to be seen as having considerable predictive importance. Olswang et al. (1998) have commented that

the consensus suggests that toddlers with significant expressive and receptive language delays of 6 months or more are more at risk for continued language delay. Further, for those children delayed in both comprehension and production, the larger the comprehension—production gap, the poorer the prognosis. (p. 25)

Language comprehension delays likely play important roles in predicting continuing language deficits in children. Furthermore, toddlers and preschoolers with language comprehension problems are at risk for under-identification, and language comprehension problems in toddlers and preschoolers are at risk for under-identification. Yet, language

**TABLE 3.3 |** Some Factors Potentially Predicting Continuing Language Problems

Factors	Explanation
<b>Family history</b>	<ul style="list-style-type: none"> <li>■ Greater risk for children with family member with a history of language, speech, or literacy/learning problems</li> </ul>
<b>Mother's education/family SES</b>	<ul style="list-style-type: none"> <li>■ Lower SES but large proportion of SES level reflected by mother's education</li> <li>■ Lower educational level of mother implicated for lower vocabulary development but maybe not syntactic complexity and grammatical morphology, except perhaps for implications for assortative mating (Plomin &amp; Dale, 2000)</li> </ul>
<b>Communicative intentions, symbolic gestures, and play</b>	<ul style="list-style-type: none"> <li>■ Production of symbolic gestures in familiar script routines (e.g., bathing a teddy bear) reduced</li> <li>■ Ability to produce symbolic gestures positively related to comprehension vocabulary level</li> <li>■ Less frequent use of gesture generally (may be related to reduction in frequency of communicative intentions produced gesturally)</li> <li>■ Range of communicative intentions used appropriate, but frequency with which they are used is reduced</li> <li>■ Reduction in frequency with which comment/joint attention communicative intentions used</li> <li>■ Less use of representational, communicative gesture</li> <li>■ Greater use of complementary gesture (same meaning as word) and less use of supplementary gesture (add meaning)</li> <li>■ Grouping and manipulation of play objects but less thematic/combinatorial play</li> </ul>
<b>Babbling and phonology</b>	<ul style="list-style-type: none"> <li>■ Less language growth for children with higher occurrences of vowel babble and greater language growth for children with consonantal babble</li> <li>■ Greater language growth related to greater babble complexity</li> <li>■ Less complex syllable structure (e.g., CV versus CVC versus C<sub>1</sub>VC<sub>2</sub>V)</li> <li>■ Fewer consonants in phonetic repertoire, with less than four to five at 24 months and limited vowel repertoire</li> <li>■ Phonological patterns at 36 months that include vowel errors, glottal stops or /h/ substitutions for consonants, many occurrences of initial consonant and final consonant deletion, and back-consonant substitutions for front consonants</li> </ul>
<b>Socialization and behavior</b>	<ul style="list-style-type: none"> <li>■ Possible deficits in social skills (e.g., smiling appropriately, playing social games)</li> <li>■ More passive communicators who initiate communication and nonverbal interactions less</li> <li>■ Possibly overactive and difficult to manage; seemingly short attention span</li> <li>■ Less language growth in children with behavior problems</li> </ul>
<b>Comprehension</b>	<ul style="list-style-type: none"> <li>■ Comprehension language delays accompanying expressive language delays</li> <li>■ Comprehension delay with large gap between expressive and comprehension abilities</li> </ul>
<b>Clinical markers</b>	<ul style="list-style-type: none"> <li>■ Slower-than-expected acquisition of early verb morphological markers during second year of life</li> <li>■ Poor performance on nonword and possible word repetition tasks, particularly those that account for early phonological acquisition</li> <li>■ Difficulties with sentence repetition (sentence recall) tasks</li> </ul>
<b>Verb vocabulary size and growth</b>	<ul style="list-style-type: none"> <li>■ Low proportion of verb words in early vocabulary</li> <li>■ Slower than expected growth in verb vocabulary</li> <li>■ Fewer verb words that occur less frequently in the language</li> </ul>
<b>Responsiveness to trial intervention/dynamic assessment</b>	<ul style="list-style-type: none"> <li>■ Evidence of limited learning of a new, targeted language skill under conditions of short-term, intensive learning trials</li> </ul>
<b>Narrative production</b>	<ul style="list-style-type: none"> <li>■ Recounts of experiences shorter than expected for age</li> <li>■ Difficulties with temporal sequencing of events in stories or experiential recounts</li> <li>■ Recounts of experiences or story retells more difficult for listener to follow than expected for age</li> </ul>
<b>Severity of delay</b>	<ul style="list-style-type: none"> <li>■ Greater language delay indicating less optimism for spontaneous recovery</li> <li>■ Very low expressive vocabulary size (zero to eight words) at 2 years of age</li> </ul>

comprehension problems may more severely impact children's later academic and social functioning than expressive language deficits.

It is also probably worth a bit more discussion of the early vocabulary of toddlers with early language delay. One aspect of early vocabulary that might inform about the probability of spontaneous recovery is the composition of the vocabulary, particularly for verbs. Olszwang et al. (1998) identified several "red flags" (p. 25): (1) a relatively small verb vocabulary compared to other types of words, particularly nouns; (2) reliance on GAP (general all-purpose) verbs, such as *look* or *want*, rather than more specific verbs, such as *walk* or *clap*; and (3) fewer intransitive (not requiring a direct object) and ditransitive (able to either have or not have a direct object) verbs than transitive verbs. Hadley, Rispoli, and Hsu (2016) found that the size of toddlers' verb lexicons was a significant predictor of their syntactic skills about a year later when they were preschoolers, whereas their noun lexicons had much less predictive value for their later syntactic skills. Additionally, the diversity of toddlers' verb vocabulary appears to have some degree of predictive value for later grammatical production (Rispoli & Hadley, 2011). However, Hadley et al. (2016) remind us that the semantics of a particular verb choice often govern the syntactic structure in which it can occur. The authors (Hadley et al., 2016, p. 46) provided the example of the verb *put*, which requires a direct object as well as a locative, i.e., "I put the book on the table." In contrast, the verb *sleep* places no demands on what syntactic structures must follow, i.e., "I sleep" is complete, although there is the option of adding predicate structure, such as "I sleep in the bed." Verb lexical development is not, therefore, divorced from syntactic growth, and syntax is often a particularly deficient component of language for SLI children.

Some verbs occur more frequently than others, for example, *sleep* versus *doze*. We suspect that children who use fewer of the less frequently occurring verbs are more at risk for continuing language problems than those whose verb lexicons include the less frequently occurring verbs. More specific verbs also tend to be less frequently occurring than GAP verbs, as noted above.

There may also be more precise information about size of a child's expressive vocabulary at 2 years of age that might increase our predictive abilities. Although the criterion of using fewer than 50 single words at 24 months of age has been a major guideline for identifying toddlers with SELD, the work of Dale et al. (1998) on the heritability of early vocabulary development suggests that we might need to be more specific about vocabulary size. In this discussion, we need to keep our perspective with regard to the single-word vocabulary size of 2-year-olds, which is somewhere around 130 to 300 (Fenson et al., 1990; Rescorla, Alley, & Christine, 2001). When the vocabulary size of at least one of 2-year-old twin pairs was in the lowest 5 percent of the distribution on a parent report measure, the MacArthur Communicative Development Inventory (Fenson et al., 1990), there was a substantial genetic contribution to the vocabulary size, but the influence of shared environment was found to contribute very little to the vocabulary size (Dale et al., 1998). A vocabulary size of zero to eight words placed the 2-year-old children in the lowest 5 percent. What this suggests is that very low vocabulary size at 2 years of age may have genetic contributions operating that then decrease the probability of spontaneous recovery of the early delay. Professionals might be wise to treat a 2-year-old with very low vocabulary development differently from one with a vocabulary size closer to the 50-word criterion.

This discussion of severity of impairment is also consistent with some evidence that the severity of a child's language delay may also be predictive of recovery (Law, Tomblin, & Zhang, 2008; Olszwang & Bain, 1996). That is, the greater the degree of the child's language delay, the less optimistic we might be about spontaneous recovery for the child.

Two other factors might assist us with the task of determining which children will spontaneously recover from early language delay. Previously in this chapter, we noted that children with language impairments would be predicted to be relatively slower to respond to trial language instruction (dynamic assessment) than children without language impairment but with delayed language development. We have also mentioned stressing a child's language ability via narrative production tasks. Narrative skills of children with language impairments have regularly surfaced as one of the areas of considerable and persisting

difficulty. Tracking children's developing abilities in narrative production may also help in predicting spontaneous recovery.

Olswang et al. (1998) summarized the current level of knowledge:

Research has revealed robust trends about language learning in toddlers who are typical and atypical in their language development. These trends have brought to light characteristics that allow us to decide whether we should be seriously concerned about a toddler's actual and potential language growth. The argument being made from this literature is that the magnitude of our concern should directly translate to our recommendations. To our way of thinking, . . . this is not only a reasonable position, but also an ethical and intellectually defensible one. (p. 29)

Using the medical profession's risk factor model may be a way to judge the degree of concern (Thal & Katich, 1996; Whitehurst & Fischel, 1994). This is an additive approach in which the degree of risk for the occurrence of a condition increases with an increase in the number of different known risk factors that are present. The more factors present in or associated with a young child that point to the possibility of future language problems for the child, the greater the concern and, therefore, the more likely that intervention is an appropriate recommendation for the child.

## LANGUAGE CHARACTERISTICS OF CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT

In this section, we review a number of the language characteristics observed in toddlers and preschool children with SLI. The preceding sections in this chapter have served to foreshadow some of the characteristics we will discuss. And, we need to be aware that not all children will necessarily demonstrate all of these problems and that a problem with one aspect of language can result in problems with other aspects. One example of this was seen in the previous section about the relationship between the semantics of specific verb choices and associated requisite syntactic forms for them. The potentially diverse patterns reemphasize the fact that children with SLI are a heterogeneous group. Additionally, we need to be aware that some of the same types of problems can be observed in school-aged children and adolescents with language disorders, albeit at different levels.

### Some Language Precursors

Recognition of and attention to environmental change are important to language acquisition because, without these, a child will not develop the underlying concepts of language. Furthermore, children need to learn that they can be the agents of change. Unless children realize that what they do results in modifications of objects or people's behaviors, they will be unlikely to learn that language is one of the most effective ways of producing change.

Several of the factors listed in Table 3.3 referred to or involved concerns about behaviors and abilities that can be considered precursors to language development, for example, use of symbolic gesture and communicative intentions. As well as participating in reciprocal interactions, establishing joint reference with an adult appears to be important for language acquisition (Delgado et al., 2002; Watt et al., 2006). Early child-adult behaviors of give-and-take play routines and repetitive games such as patty-cake may be prerequisites of conversational turn-taking skills. Some preschoolers with SLI seem to have difficulty participating in these reciprocal routines. These children may also not engage frequently in joint attention or learn to utilize cues provided by joint reference with an adult. With regard to communicative intents, these may be encoded by children with SLI more via gestures and vocalizations than by verbal means, and in particular, as we see from Table 3.3, reduced ability to produce *symbolic* gestures reflecting script routines may predict longer-term language problems.

The relationship between babbling and the production of first words is not fully understood, although the phonetic content of babbled vocalizations likely affects children's early lexicons and may even be a distinguishing feature of some children with language

problems. In order to produce a variety of single words, children need to have several different consonants in their repertoires and use these consonants in different distributions and in combinations with different vowels. In this way, the syllable structure of babble might be a precursor to use of first words. When we review Table 3.3, we see that reduced occurrences of certain types of babbling and particular patterns of early phonology might be early indications of language impairment. The impact of limited forms of babbling on language ability beyond 12 months of age was described in a large-scale study by Oller, Eilers, Neal, and Schwartz (1999). In their study of 3,400 infants at 10 months of age, the “infants with delayed canonical babbling had smaller production vocabularies at 18, 24 and 36 months than did infants in the control group” (p. 223).

### Phonology

Given the preceding discussion, it is probably not surprising that toddlers and preschoolers with SLI frequently have concomitant phonological problems. The reverse is also true. For example, Shriberg and colleagues (Shriberg & Kwiatkowski, 1994; Shriberg et al., 1999) have reported that most children identified as having phonological problems also have language impairments. Normally developing children are moderately intelligible by about 2 years of age. In contrast, it is not unusual to find 3- and 4-year-old children with SLI who are difficult to understand. However, phonological problems are more likely than language problems to resolve as children mature, and children with speech sound difficulties have been reported as having better long-term academic, social, and vocational outcomes than those with language impairments (e.g., Johnson et al., 1999; Shriberg, Gruber, & Kwiatkowski, 1994; Whitehurst, Fischel et al., 1991).

Some have proposed that problems with phonological acquisition are simply reflections of more general language-learning problems. Others suggest that phonological problems may be characteristics of subgroup membership within the larger, heterogeneous group of specifically language-impaired children. Whatever the relationship between SLI and phonological problems, we know that young children with SLI acquire more quickly single words that begin with consonants they use correctly in other words than words that begin with consonants not yet produced correctly (Leonard, Schwartz et al., 1982). This relationship between phonology and lexical acquisition is consistent with a developmental pattern seen in normally developing toddlers (Schwartz & Leonard, 1982). We also know from one study that about 20 to 30 percent of the preschool children who experienced phonological difficulties apparently not related to concomitant problems in other areas received special education services when they entered school, even though many of the children no longer showed obvious evidence of phonological difficulties at the time of entering school (Shriberg & Kwiatkowski, 1988). This may reflect what we know about phonological problems in the preschool years affecting children's abilities to achieve academically in areas related to linguistic skills, possibly because of phonological processing difficulties.

### Semantics

We have indicated that a delay in using the first word (usually emerging at about 12 months of age) and being slow to add lots of words to their vocabularies are frequently the first signs of possible language problems. On the other hand, we have also indicated that vocabulary may be one of the areas in which children who are slow to talk seem to catch up first. However, we must be clear that this does not mean that children with SLI do not have semantic difficulties because many, if not most, have some degree of problems with words and their meanings. These problems are seen most clearly with words and expressions with abstract, nonliteral meanings and those related to the more literate aspects of semantics. Several areas of semantic acquisition that characterize some of the problems young children with SLI exhibit have been identified in the literature and are presented in Table 3.4.

With regard to vocabulary size, we have seen that a delay in using the first word (usually at about 12 months of age) and failing to show a spurt in single-word lexical acquisition

**TABLE 3.4 |** Several Areas of Semantic Difficulties Experienced by Children with SLI

Areas of Semantic Difficulty	Problems
Size of the lexicon	Smaller vocabularies
Rate of growth of the lexicon	Slower vocabulary acquisition Less lexical diversity
Robustness of word meaning	Less depth of knowledge about word meanings Less known about the meaning of individual words Only partial meanings of a word known
Speed of new word learning	Difficulties learning new lexical items quickly More exposures to a new word in context needed to abstract the meaning of the word
Word finding	Difficulties retrieving words from the cognitive store to use them in quick flow of connected speech The word on the “tip of the tongue”

after emergence of the first word are possible early signs of SLI. Other early delays in semantic development have also been described. Examples of some of the delays that have been reported for young late talkers and children with SLI are the following:

- On average, using their first word at about 23 months of age (Trauner, Wulfeck, Tallal, & Hesselink, 1995), almost a year late in this report compared to normally developing children
- At 24 months of age an expressive vocabulary size of about 17 words compared to 128 to 193 for normally developing children and at 36 months a vocabulary size of 197 words, similar to that of normally developing children at 24 months (Rescorla et al., 2001)

Rescorla et al. (2001) also reported on the composition of the vocabulary of 3-year-olds who were late talkers and whose expressive vocabulary size was approximating that of normally developing 2-year-olds. These authors comment that although the children seem to acquire many of the same words as normally developing children, they also learn some different words that appear to reflect that they are older and, therefore, are experiencing different events in their environments, for example, words associated with toilet training. And, as we saw previously, children with SLI also seem to have more difficulty acquiring a wide variety of verb words than noun. These findings raise a point that we need to keep in mind. Early delays in vocabulary acquisition may well result in children with SLI having qualitatively different as well as quantitatively different vocabularies. This possibility has important implications for what we might be able to assume about their continuity of language development compared to that of children without language problems, about what concepts and world knowledge these young children are building up along their developmental path, and about what the cumulative effects might be that somewhat unusual concepts and knowledge might have on later academic and language learning.

As we saw earlier in this text, when words and their meanings join with other words and their meanings in multiword utterances, composite meanings evolve. Similar to their delay in early vocabulary, young children with SLI are typically slower to begin to use two-word semantic relations. Trauner et al. (1995) reported that the children with SLI in their study did not begin to use two-word combinations until about 3 years of age, which compares to normally developing children beginning to use these combinations sometime between 18 and 24 months. Although children with SLI may be slower to acquire the range of semantic relations expressed in two-word combinations than normal

language-learning children, they seem generally to acquire the same range expressed by their language-normal peers.

In the previous chapter, we discussed normal children's abilities to learn a lot about a word's meaning from very few and fleeting exposures to the word in context. We referred to this ability as "fast mapping" or "quick incidental learning." Young children with SLI have been found to demonstrate some abilities to fast map the meanings of words, particularly in structured learning situations, but they have been found to comprehend meanings of fewer new words when the learning task involved challenging tasks of discerning the meanings embedded in ongoing narratives. Overall, preschool children with SLI seem to learn new words more slowly than their normal-language peers (Gray, 2005) and "may need to hear a new word twice as many times as a child with [normal language] before comprehending it" (Gray, 2003b, p. 56) and may need an additional doubling in opportunities to use it while continuing to hear it before the word becomes a permanent part of their vocabulary (Gray, 2003b). This means that the SLI child will have needed quadruple the opportunities to hear the new word than a child with normal language in order to use it independently.

Even if children with SLI are successful in gleaning meanings of words, this does not necessarily result in them using the words. One suggestion for this limitation is that the children have difficulties accessing or retrieving the words for production rather than a failure in storing the words in memory. Another reason proposes that difficulties using words that seem to be known in the lexicon are a result of knowing only incomplete or partial meanings of the words. McGregor and her colleagues (e.g., McGregor, Newman, Reilly, & Capone, 2002; McGregor, Oleson, Bahnsen, & Duff, 2013; Sheng & McGregor 2010a, 2010b) suggest that the children may have a mental representation of a word, but it may not be a fully developed representation and may therefore be fragile. As McGregor, Friedman, Reilly, and Newman (2002) write, the fragileness of the meaning makes the word more susceptible to "retrieval failure" (p. 332).

The observation that many children with language problems have difficulties in retrieving known words (word-finding problems) is not new (e.g., German, 1979; Kail, Hale, Leonard, & Nippold, 1984; MacLachlan & Chapman, 1988). In fact, many children with SLI are described as having word-finding problems, with most children having deficits with a number of other language skills as well (Dockrell & Messer, 2007). The word-finding difficulties can show up when children are asked to name pictures, particularly in timed naming tasks, and in their connected speech (German, 2000; McGregor, 1997). What is not clear is if the word-finding problems children exhibit are due to less complete and stable mental representations of the words, an indication of reduced speed of processing proposed as one of the possible information processing deficits seen in children with SLI, or both factors. The connected speech of children with language problems is also often characterized by hesitations, dysfluencies, reformulations, word substitutions, and fillers, features that are regularly interpreted as being related to difficulties generating language, including possible word retrieval difficulties. Additionally, the children may use a substantially higher number of words without clear referents, such as *thing*, *this*, *that*, *here*, and *there*.

It does not appear that children with SLI have semantic difficulties in the absence of problems with other aspects of language. In describing the children they had followed from 2½ to 5 years of age, Scarborough and Dobrich (1990) have written that when the children reached age 5, "no child ever showed a purely lexical deficit. Instead, residual phonological and syntactic problems, in combination and in isolation, were seen in most cases" (p. 80). To the extent that these findings are correct, we suspect that most if not all children with SLI with semantic difficulties will also have deficits with syntax and morphology, and we suspect that the children will have comprehension problems as well.

### Syntax and Morphology

As we saw earlier in this chapter in the discussion of possible clinical markers of SLI, these children are known to have inordinate difficulty with the morphosyntactic aspect of language, and it is doubtful that any child with SLI escapes at least some problems in this area.

Deficit syntactic and morphologic skills are almost “classic” characteristics of preschoolers with language impairments (e.g., Leonard, 2014; Menyuk, 1964; Riches, 2016). Lahey’s (1988) insightful comment of several years ago continues to describe accurately young children with SLI, stating that “by far the most outstanding characteristic of this group of children and one that they all share, is late and slow development of form with better development of content and use interactions” (pp. 59–60).

Notwithstanding Hadley and Short’s (2005) findings documenting the emergence of verb tense marking in children between 2 and 3 years of age, it is generally at about 2 ½ to 3 years of age that evidence of syntactic and/or morphological problems can be more confidently identified, as children’s MLUs, sentence complexity, and use of morphological markers are expected to increase greatly. As examples of the difficulties that are observed in these children in the preschool years, we tend to see the following:

- Shorter length of utterances (MLU) than same-age peers
- Syntactically simpler sentences, including limitations in the types of transformations used and limited use of subordination
- Omissions and/or confusions of grammatically obligatory elements, such as articles and noun plural morphemes
- Subject case marking problems, as in *him* for *he* and *her* for *she* when the pronouns are to serve as subjects of sentences
- Failure to consistently mark verbs for tense and number, with particular difficulties with both regular and irregular past-tense marking

Table 3.5 provides a list of some of the common problematic morphemes for children with SLI.

Because, as we have seen, verb morphology is particularly vexing for children with SLI, their abilities in this area have been the subject of considerable study. One consistent but frustrating observation about the morphosyntactic performances of these children is the inconsistency in their use of morphological markers (e.g., Leonard et al., 2003; Miller & Leonard, 1998; Rice, Wexler, & Cleave, 1995). Their inconsistency means that sometimes they treat a finite verb (one that needs to carry tense and number, such as “The girl runs” or “The boy jumped”) as a nonfinite verb (an infinitive form or bare stem form, such as “The girl run” or “The boy jump”). Overall, however, they make many more verb morphological errors than their typically developing peers. Other patterns with regard to their use of grammatical

**TABLE 3.5 |** Some Troublesome Grammatical Morphemes for Children with SLI

Morpheme	Examples
Plural - <u>s</u>	boys; coats
Possessive -' <u>s</u>	baby' <u>s</u> ; cat' <u>s</u>
Regular past - <u>ed</u>	played; liked
Third-person singular - <u>s</u>	plays; likes
Articles <u>a</u> and <u>the</u>	<u>a</u> boy; <u>the</u> cat
Copula	The baby is big
<u>On</u>	<u>on</u> the floor; put <u>on</u> the coat
Auxiliary <u>be</u>	The baby is crying; The girls are playing
Irregular past tense	ate; went; drank
Complementizer <u>to</u>	I'm going <u>to</u> (go); gonna <u>(go)</u>

Source: Leonard, McGregor, and Allen (1992).

markers for verbs have also been observed. These, along with the pattern of inconsistent use, are shown in Table 3.6.

Two alternative explanations for why these children demonstrate inordinate difficulties with verb morphology have featured prominently in the literature. One is referred to as the *surface account* (e.g., Leonard, Eyer, Bedore, & Grela, 1997; Leonard, McGregor, et al., 1992) because it focuses on the phonetic features, that is, the morphophonological characteristics

**TABLE 3.6 | Patterns of Verb Morphological Problems of Children with SLI**

Patterns	Descriptions and Examples
Inconsistent errors	Bare stem verbs (“The girl run”) used frequently but not always Sometimes verb marked correctly (“The girl runs”)
Errors of omission common	Likely to omit grammatical markers (“Baby sleeps” or “Baby sleeping”) Likely to omit auxiliaries, which mark the number and tense (“Baby sleeping”)
Errors of commission infrequent	When verbs marked for tense and number, they tend to be marked correctly (“Baby is sleeping,” not “Baby are sleeping”)
Regular past-tense verbs problematic	Inconsistent use of finite or infinitive (bare stem) verb when finite form required (“[yesterday] Boys jump” instead of “Boys jumped”) Perform at level worse than younger normal children matched for overall language level
Irregular past-tense verbs problematic	Frequently overgeneralized (“Kitty runned” instead of “Kitty ran”) Bare stem used (“Kitty run” instead of “Kitty ran”) Perform at levels similar to younger normal children matched for overall language level when percent correct versus percent incorrect metric used (“Kitty run” correct vs. “Kitty runned” incorrect) Perform at levels similar to those for regular past tense (i.e., worse than younger, language-matched children) when percent correct marking for knowledge of past tense used as the metric (percent correct for finiteness) (“Kitty runned” credited as correct for knowledge of need to mark tense) More likely than CA-matched peers to judge bare stem forms as correct (“[yesterday] Birdie fly off” deemed okay) More likely than CA-matched peers to judge overgeneralized forms as correct (“[yesterday] Birdie flied off”)
Case marking on pronouns related to verb marking	<p><b>An early suggestion:</b></p> <ul style="list-style-type: none"> <li>■ A potential developmental link between verb form acquisition and pronoun case development</li> </ul> <p><b>More recent suggestions:</b></p> <ul style="list-style-type: none"> <li>■ Incorrect use of objective case pronouns (<i>him, her, them</i>) as subjects (<i>he, she, they</i>) related to occurrence of verb tense marking</li> <li>■ Greater likelihood of objective case when verb unmarked for tense/number (“Her jump” more likely than “Her jumps”) or auxiliary omitted (“Her jumping” more likely than “Her is jumping”)</li> <li>■ Likely to include rather than omit auxiliary if child used an auxiliary in immediately preceding utterance (“Mommy is sleeping” instead of “Mommy sleeping” if previous sentence included auxiliary, e.g., “Babies are crying”)</li> </ul>
Inclusion of auxiliary verbs potentially susceptible to structural priming effects	

Sources: Bishop (1994); Connell (1986); Leonard, Bortolini, Caselli, McGregor, and Sabbadini (1992); Leonard, Eyer, Bedore, and Grela (1997); Leonard, Miller et al. (2002); Loeb and Leonard (1991); Marchman, Wulfeck, and Ellis Weismer (1999); Montgomery and Leonard (1998); Oetting and Horovch (1997); Rice and Wexler (1996); Rice et al. (1995, 1998); Wexler, Schütze, and Rice (1998).

of the problematic grammatical morphemes. Leonard and his fellow researchers (Leonard, McGregor, et al., 1992) point out that these morphemes have “low phonetic substance” (p. 1077). The morphemes have shorter durations in connected speech than adjacent morphemes. They are also unstressed, nonsyllabic segments. Some of them also have lower fundamental frequencies and amplitude, meaning that they may seem to be lower pitched and less loud. These features mean that they may be auditorily less salient than surrounding morphemes. This account suggested by Leonard et al. (1997) “assumes a general processing capacity limitation in children with SLI but assumes also that, in the case of English, this will have an especially profound impact on the joint operations of perceiving grammatical morphemes and hypothesizing their grammatical function” (p. 743). That is, the children with SLI have inefficient processing mechanisms that interfere with their abilities to take in these particularly brief, often faint elements of the language and analyze them fast enough during the ongoing flow of language and environmental activity in order to figure out what they mean and what the patterns and rules are in order to use them. We encountered some of the discussion about processing capacity limitations earlier in this chapter. The surface account does not explain why children with SLI might have processing limitations that lead them to have difficulty acquiring verb morphology that typically developing children do not exhibit.

The second, the *extended optional infinitive account* (e.g., Rice, 2013; Rice & Wexler, 1996; Rice et al., 1998; Rice, Wexler, Marquis, & Hershberger, 2000), is a knowledge-based account. According to this account, children with SLI, like very young normal children, do not know that marking verb tense and number is obligatory and treat it as a rule of language that is optional to use. Where children with SLI differ from their normal counterparts is that they continue to treat verb marking as optional for an extended period of time, whereas normal children by about the age of 5 years figure out that they need always to mark tense and number on finite verbs (main verbs in clauses) rather than treat them as infinitives (bare stem verbs). While children with SLI know about finiteness of verbs and the concepts of present and past tense, they do not know they are obligated to mark tense on verbs in main clauses. We also know that by 8 years of age, while the frequency of failure to apply verb marking has declined considerably, children with SLI still are inconsistent—some suggesting about 10 to 15 percent of the time (Rice et al., 1998)—whereas normal children achieve this level of consistency at 5 years of age and by age 8 almost always use appropriate verb marking. We also know that older children and adolescents with language impairments continue to have more difficulty with verb morphology than their peers (e.g., Leonard et al., 2009; Miller, Leonard, & Finneran, 2008; Reed, Conrad, & Patchell, 2006; Reed & Patchell, 2010; Reed, Patchell, & Conrad, 2006; Rice, Hoffman, & Wexler, 2009). With regard to the reasons for the verb morphological difficulties of children with SLI, brain development with genetic bases that govern timing for acquiring finite verb marking, as discussed previously in this chapter, has been suggested (cf. Rice, 2012, 2013). There are several other accounts of the reasons children with SLI have such inordinate difficulties with grammatical morphology and verb morphology in particular. One of these accounts is based on limited linguistic knowledge. This account proposes that children have difficulty abstracting the implicit rules that govern grammatical morphology (Gopnik, 1990; Ullman & Gopnik, 1994), hence the term *implicit rule deficit account* (Leonard et al., 1997). A variation on this account suggests that children with SLI learn the rules about verb marking but have difficulties accessing them (Connell & Stone, 1992). While this account has less empirical support than the surface or extended optional infinitive accounts as far as verb morphology is concerned (Leonard et al., 1997), it is still considered among the various possible reasons children with SLI have language-learning difficulties more generally.

It is conceivable that these three accounts are not mutually exclusive. If a child has processing limitations for auditorily less perceptual and salient features of language, the child might not be able to acquire sufficient representations and knowledge regarding the features in order to manage the quite complex and thorny features of English such as regular and irregular verb forms. This incomplete knowledge might manifest both as slowed acquisition of this morphological feature and as inconsistent use of verb forms and verb tense marking that extends beyond the developmental periods shown by normally developing children.

Children with SLI may not achieve the same level of automatic verb form use that their peers achieve and might continue to show struggles and hesitations in their language when they attempt to tense mark verbs.

Two other accounts, the *dual mechanism account* (Oetting & Horovov, 1997) and the *connectionist account* (Marchman et al., 1999), have also been proposed. However, these have been subjected to comparatively less empirical study in trying to explain the grammatical morpheme problems—and in particular the verb morphological difficulties—of children with SLI.

One question that has been raised is that if children with SLI have weaknesses in their verb vocabularies, as we have noted previously, then it might be possible that their difficulties with verb morphology relate to their vocabulary. The work of Watkins and Rice (1991) explored, in part, one aspect of a possible relationship between vocabulary and verb morphology in their study of verb particles and prepositions. Certain prepositions (e.g., *in*, *up*) also occur as part of a verb (e.g., a multiword construction that functions as a verb, such as *climb up*), that is, a verb particle. These authors proposed that since the same word (the preposition) in these two different grammatical functions has the same meaning and carries similar levels of auditory salience (phonetic substance), any differences in children's acquisition should be primarily grammatically or morphosyntactically based. In their study, children with SLI did, in fact, have more difficulty with verb particles than prepositions, leading these authors (Watkins & Rice, 1991) to suggest that "multiple sources of vulnerability for mastery of grammatical form classes" (p. 1139) may be involved. Leonard, Miller, and Gerber (1999) took a different approach to the question of the relationship between verb vocabulary and verb morphology and looked at what children with SLI did with verb marking as a function of their lexical diversity. The findings suggested that even with greater verb vocabularies, the children's ability to deal with the grammatical marking of verbs did not keep pace, in contrast to the pattern seen for normally developing children. The findings led these authors (Leonard et al., 1999) to comment that "the lag in finite-verb morphology use in children with SLI may become more striking as vocabulary expands" (p. 687). The findings also indicated that the problems the children had with their verb morphology were "not a matter of having an inadequate number of lexical items . . . but they were simply not making use of the associated grammatical morphology" (p. 687). It appears, therefore, that children's verb morphological problems cannot be attributed wholly to vocabulary deficits.

### Pragmatics and Conversational Interactions

Many children with SLI have difficulties with pragmatic and conversational aspects of language. It is not clear whether these are the result of the children's problems with morphosyntax and possibly semantics or whether these difficulties are problems in their own right and represent another area of deficit for some of these children. There are several possibilities about how pragmatic and/or conversational problems relate to other aspects of language. Among these are the following:

- Pragmatic and/or conversational problems are discrete but interacting aspects of SLI, like problems with morphosyntax, phonology, and semantics.
- Children with pragmatic and/or conversational problems form a particular subgroup of children with SLI or possibly a separate group of children (Ash & Redmond, 2014; Tomblin, 2014), which in the latter case may be referred to as a semantic-pragmatic disorder (Bishop, 2000).
- The pragmatic and/or conversational problems exhibited by children with SLI represent difficulties that are part of an autism spectrum disorder.
- The pragmatic and/or conversational difficulties that children with SLI demonstrate are the result of their unfortunate adaptations to their failures in trying to use a deficit language system to communicate and establish relationships with others.

Regardless of how pragmatic and conversational problems should be conceptualized with regard to the language problems of children with SLI, we know that children with SLI typically

have problems with their relationships with others and in using language with others for expressing and understanding various functions and intentions. They can also demonstrate issues with their conversational skills, and as we will see later in this chapter and in subsequent chapters, in effectively using different discourse genres, such as narrative and exposition.

Study of the pragmatic abilities of young children with language impairments has slowed somewhat in recent years with the surge in interest in their morphosyntactic problems, but the 1980s, prompted by some work in the mid- and late 1970s, was a particularly fruitful decade for learning about the various aspects of these children's pragmatic characteristics. This is particularly true for explorations into the functions and intentions used by these children and, somewhat later, looking at the conversational patterns of children with SLI. A number of these findings is summarized in Table 3.7.

**TABLE 3.7 | A Summary of Pragmatic Difficulties of Children with SLI Compared to Typically Developing Children**

Areas of Pragmatics	Features
<b>Functions and Intentions</b>	<ul style="list-style-type: none"> <li>■ Fewer occurrences of communicative initiations, including gestural and vocalized initiations</li> <li>■ Fewer occurrences of functions that initiate (child initiated) than those that involve responding</li> <li>■ Greater uses of the answering function</li> <li>■ Fewer uses of the following:           <ul style="list-style-type: none"> <li>■ Declarative and imperative functions</li> <li>■ Statement functions involving naming</li> <li>■ Descriptive functions</li> <li>■ Acknowledging functions</li> <li>■ Joint attention or comment</li> </ul> </li> </ul>
<b>Conversation and Discourse</b>	
<i>Initiating Verbal Interactions</i>	<ul style="list-style-type: none"> <li>■ Initiate conversations           <ul style="list-style-type: none"> <li>■ With inappropriate/ineffective methods to gain listener's attention</li> <li>■ At the wrong times</li> </ul> </li> <li>■ Difficulty gaining access to existing conversation</li> <li>■ Less responsive to peers' attempts to initiate conversations</li> </ul>
<i>Responding to Others' Verbal Interactions</i>	
<i>Sustaining Verbal Interactions</i>	<p>Difficulties sustaining topics over several conversational turns, in part due to</p> <ul style="list-style-type: none"> <li>■ Problems timing turns and interrupting</li> <li>■ Inserting noncontingent, irrelevant comments</li> <li>■ Switching topics abruptly</li> </ul>
<i>Clarifying and Repairing</i>	<p>Frequent breakdowns in conversational interactions, in part due to above conversational behaviors</p> <p>In seeking clarifications:</p> <ul style="list-style-type: none"> <li>■ Tend not to indicate lack of comprehension overtly and/or with verbal/vocal signals</li> <li>■ Eye-contact behavior may signal degree of comprehension; may look at interactant's face rather than other stimuli when a message is not understood</li> <li>■ Tend not to ask for clarification even though may recognize lack of comprehension</li> </ul> <p>In making repairs:</p> <ul style="list-style-type: none"> <li>■ Tend to revise previous utterances when not understood</li> <li>■ Use more limited repertoire of revision strategies</li> <li>■ Rarely use revisions involving substitutions of one syntactic or semantic element for an equivalent</li> </ul>

(Continued)

**TABLE 3.7 | Continued**

Areas of Pragmatics	Features
<b>Adapting Messages/Code Switching</b>	<p>Problems seen in</p> <ul style="list-style-type: none"> <li>■ Not verbally encoding the most informative elements of messages</li> <li>■ Conveying both uninformative and informative elements of messages equally</li> <li>■ Interpreting and using polite devices (indirect requests with and without <i>please</i>)</li> </ul> <p>Evidence of some ability to adapt by attempts to</p> <ul style="list-style-type: none"> <li>■ Modify messages on basis of interactant's age</li> <li>■ Revise messages to better suit interactant's language ability</li> </ul>

When we look at the pattern reflected in the intentions and functions section of Table 3.7, it seems not only that youngsters with SLI demonstrate differences in their use of functions when compared to normal language-learning children but also that their differences suggest a passivity in their interactions. Paul (1991) has commented that the toddlers with language problems that she examined simply appeared to be "less interested in interacting with others, even nonverbally" (p. 6). The information in Table 3.7 also suggests that children with SLI may not respond as readily as normally developing children to the initiation attempts of others. Hadley and Rice (1991) found that in the peer interactions of the preschool children in their study, the children with SLI were less likely to respond to their normal language-learning peers' initiations.

Fey's (1986) interactionist approach might be a useful way to think about what we see as pragmatic patterns for these children. Fey (1986) has proposed two continua related to conversational variables. One continuum deals with children's degrees of *assertiveness* in conversation, that is, the degree to which they initiate conversational acts or turns. The second refers to the degree of children's *responsiveness* to their conversational partners' needs. For both of these continua, children can be high (+) or low (-) on the variable, depending on the pattern they display in their interactions with others. Four patterns arise:

1. + assertiveness and + responsiveness, or children who are active conversationalists
2. + assertiveness and - responsiveness, or children who are verbal noncommunicators
3. - assertiveness and + responsiveness, or children who are passive conversationalists
4. - assertiveness and - responsiveness, or children who are inactive communicators

The characteristics in Table 3.7 suggest that youngsters with SLI are more like the group described in #3 or #4, that is, passive conversationalists who are nonassertive in initiating but may respond if others do the initiating or inactive communicators who neither initiate readily nor respond easily.

Breakdowns in the conversational interactions of children with SLI are, unfortunately, common. Rice, Sell, and Hadley (1991) found that preschoolers with SLI tended to address their communicative attempts to adults more than to their peers in a preschool classroom, possibly because of their histories of unsuccessful communicative interactions with their peers and/or because of their histories of having had their communicative initiations ignored by their peers. Another finding of the Hadley and Rice (1991) study was that normally developing preschoolers were less likely to respond to the attempts at initiation of their classmates with SLI, a finding similar to that of Craig and Gallagher (1986). The preschoolers with SLI tended also not to be nominated by their normal-language counterparts as favored playmates and not to have, among their classmates, a friend without language difficulties (Gertner et al., 1994). Of particular note was that the children with receptive language involvement in addition to their expressive language problems fared worse in their peer relationships compared to the children with only expressive

language problems. Rice et al. (1991) suggest that “children are sensitive to their relative communicative competence, or incompetence, at an early age” and that “as young as 3 years of age, children adjust their social interactions to take into account their communication abilities relative to those of others” (p. 1304). According to Hadley and Rice (1991), the early breakdowns in communicative interactions may be the beginning “of a negative interactive spiral generated by a child’s history of communicative failure wherein a child becomes less likely to respond as he or she experiences failure in peer interactions and peers become less likely to attend to the child’s initiations” (p. 1315). The long-standing failures in and problems with peer interactions that have been well documented for language-impaired children, adolescents, and adults (e.g., Asher & Gazelle, 1999; Beitchman, Wilson, Brownlie, Walters, Inglis, et al., 1996; Brinton & Fujiki, 2014; Clegg et al., 2005; Fujiki, Brinton, Hart, & Fitzgerald, 1999; Jerome, Fujiki, Brinton, & James, 2002) seem to have their roots in early childhood.

Findings about the friendships of preschoolers who have *not* been identified as language impaired provide some support for this proposition. Communicative characteristics of preschoolers less well liked and/or rejected by their young peers include the following (Black & Hazen, 1990; Black & Logan, 1995; Hazen & Black, 1989):

- Making more irrelevant comments
- Making fewer contingent responses
- Being less responsive to peers
- Taking longer turns in conversations
- Interrupting more
- Engaging in more talking over or talking simultaneously

These characteristics sound remarkably similar to the problematic pragmatic characteristics of children with SLI listed in Table 3.7, and the discussion provides a good transition to the next topic.

### Socialization and Psychosocial Factors

Recall that at the beginning of the previous section on pragmatic characteristics, we noted that we could not be certain whether pragmatic problems are the result of children’s linguistically based deficits or whether they are separate components. Similarly, it is difficult to separate pragmatic difficulties from socialization and psychosocial factors that are associated with SLI and to know “what’s what” when we look at how youngsters with SLI behave. Although SLI has been described as occurring in the absence of *severe* emotional disturbances, there has been, for quite some time, a recognition of a relationship between some degree of psychosocial involvement and language impairment (e.g., Baltaxe & Simmons, 1988; Beitchman, Wilson, Brownlie, Walters, Inglis, et al., 1996; Beitchman, Wilson, Johnson, et al., 2001; Mack & Warr-Leeper, 1992; Prizant et al., 1990). Examples of findings from some of the older well-known research studies illustrate this point:

- Of 40 consecutive admissions to a child psychiatric unit, 50 percent of the children had language problems (Gaultieri et al., 1983).
- Of approximately 300 successive intakes of children to a community-based speech and language clinic, 95 percent of the children with expressive language problems had some form of psychosocial difficulties according to 1980 criteria used by the American Psychiatric Association (Baker & Cantwell, 1982).
- Sixty-seven percent of the children consecutively admitted because of behavioral/emotional problems to an inpatient facility failed a speech and language screening (Prizant et al., 1990).

In some respects we may have a “chicken-and-egg” dilemma. Communicative failures may result in psychosocial difficulties, psychosocial difficulties may be a part of the syndrome of SLI, or early psychosocial difficulties may manifest themselves in terms of language

problems. We would, at least, suspect a reciprocal, if not a cyclical, relationship. As Rice et al. (1991) write,

To the extent that experiencing success in social interactions is central to a child's sense of self-esteem and social role, children with communication limitations are at risk for the development of social competencies. Limited social interactions would in turn limit their opportunities to learn communication skills from their peers, especially in the development of discourse skills. (p. 1305)

Findings from several studies may shed some light on the issue. Rescorla, Ross, and McClure (2007) found that language delay in children between ages 18 and 35 months was not associated with behavioral/emotional problems. Similarly, in Rescorla's research with Achenbach (Rescorla & Achenbach, 2002), no significant association was found between toddlers about 2 years old who were evincing slow expressive language learning (i.e., fewer than 50 single words or no two-word combinations) and scores in the problematic range on a parent-rating protocol of their child's behavior, the Child Behavior Checklist for Ages 2–3 (Achenbach, 1992), leading the authors to conclude "no link between expressive language delays and behavioral/emotional problem" (p. 742). These authors suggest that "significant behavioral/emotional problems may be more likely when children have been delayed in language for many months (i.e., after 36 months)" (p. 742). Redmond and Rice (1998) might agree with the view that behavioral/emotional problems of children with SLI are likely to emerge after children have lived with language impairment for some time. Redmond and Rice propose a social adaptation explanation of psychosocial difficulties exhibited by these children based on the findings of their study. The children with SLI in the study were rated as being within the normal range on the Child Behavior Checklist (Achenbach, 1991a) by their parents and by their teachers on the Teacher Report Form (Achenbach, 1991b), but the children's ratings were significantly poorer than those of their age-matched peers without language impairment. Teachers tended to identify more behavioral/emotional problems in the children than parents did, which the authors attributed to the situations in which the children were observed. According to the researchers (Redmond & Rice, 1998), a social adaptation model would expect "differences between teacher and parent ratings of sociobehaviors when children with SLI go to kindergarten and are experiencing the extensive social adjustments that appear at the time" (p. 696). The social and emotional behaviors reflect an overlay associated with their struggles with their language skills. Paul (2000), in reporting on the outcomes of the 2-year-olds with SELD when they were in second grade, noted that the children with histories of early language delay were significantly more shy than their normal counterparts, a finding basically consistent with that of Fujiki et al. (1999) in their investigation of withdrawn and sociable behaviors of children with SLI. Withdrawn behavior was also the one aspect of behavioral/emotional behavior that emerged as possibly associated with language delay in the toddlers in the Rescorla et al. (2007) study. Although not part of any of these studies, one wonders, assuming that a social adaptation model is accurate, if preschool experiences for these children in which they need to interact regularly with their typically developing peers might accelerate an onset of an overlay of psychosocial issues, a thought not wholly disassociated from a position raised in a somewhat different way by Paul (2000) and Paul et al. (1996). It is also possible that, with additional research, withdrawn behavior may indeed prove to be a commonly observed socioemotional characteristic of children with SLI.

Together, these studies hint at one possible scenario, one in which children with SELD or SLI begin life with their socioemotional systems basically intact but their difficult and/or negative experiences trying to use their deficient language system to interact with their environments and others in their environment lead them to adopt less than positive social behaviors and to acquire negative emotional responses. The relationship between socioemotional development and language impairment is complex, and this is, admittedly, a simplistic scenario. It fails to consider the many other important factors that affect development, such as children's basic temperaments, heterogeneity across children, or levels of language comprehension. For example, the children in the Rescorla and Achenbach (2002) study had only documented expressive language problems, whereas the children in the Redmond and Rice (1998) study had both receptive and expressive language deficits. Keep in mind that

children with documented receptive language impairments seem not to fare as well as those for whom only expressive language has been documented deficient (e.g., Beitchman, Wilson, Brownlie, Walters, Inglis, et al., 1996; Beitchman, Wilson, Brownlie, Walters, & Lancee, 1996; Gertner et al., 1994). It also does not consider research on how children's emotional reactions to situations might be able to be mediated through teaching and modeling.

Studies of self-esteem and emotion regulation in school-age children with SLI (e.g., Fujiki, Brinton, & Clarke, 2002; Jerome et al., 2002) shed some light on what children with SLI face as they mature. In a preliminary study, teachers' ratings of elementary school children with SLI indicated that these children demonstrated behaviors consistent with less sophisticated management of their emotions than their typically developing counterparts (Fujiki et al., 2002). Results of another study suggested that the self-esteem of children with SLI declines with age. Younger children (6 to 9 years) with and without SLI were found not to differ in how they perceived themselves with regard to social acceptance, behavioral conduct, and academic ability. In contrast, older children (10 to 13 years) with SLI perceived themselves more negatively than their peers in each of these areas. Although the subjects in these studies were school-aged children, the findings can help us understand what might be longer-term psychosocial issues for preschool children with SLI as well the possibility that psychosocial problems likely escalate for these children as they mature. In subsequent chapters, we will see more about psychosocial issues. Baker and Cantwell (1983) summarize the discussion well for us:

Since language is a uniquely human quality, it is therefore not unexpected that a disorder in language development might have far reaching consequences for other areas of early childhood development. (p. 51)

### Narratives

We have already seen that skill in relating understandable, complete narratives is an important factor in school achievement, and children with language problems frequently have difficulty in telling good narratives. We know that preschoolers engage in early forms of narration, and by the time children enter school, their narratives usually include most of the elements of a basic narrative, e.g., setting, resolution, although there may be only one or two episodes included. They relate rudimentary accounts about things that have happened to them, and they retell favorite stories from children's books that they have been read.

We have already learned that toddlers with SELD have been shown to have problems with narrative skills in the kindergarten years (Girolametto et al., 2001), and preschoolers with SLI often demonstrate difficulties with narrative skills. The narratives of children with SLI tend to contain less information than those of preschoolers with normal language skills and, according to Applebee's (1978) narrative stages, are less mature (Paul, 1996; Paul & Smith, 1993). One explanation for youngsters' limitations on the information they encode may relate to the linguistic features the children are able to bring to the task. An efficient method to encode more than one proposition per utterance is complex sentence usage. Children whose language is limited to simple sentences or even to compound sentences are not efficient in their expression of multiple pieces of information. Contrast "When he hit the water, he started to sink so he closed his mouth" with "He hit the water. He started to go down in the water. He closed his mouth." Good, tightly composed narratives also depend on the use of high-content words with appropriate semantic choices to signal old and new information. Children with difficulties with certain abstract words, such as temporal words and deictic words, or children who have difficulties retrieving words quickly and who instead use low-content words (e.g., *thing*) will also encounter problems in producing narratives.

Production of narratives challenges most aspects of a language-impaired child's language system at the same time so that difficulties with one aspect of language may overload the child in such a way that other aspects of language break down or the whole system breaks down. Children with weak language skills have considerable difficulty juggling the multiple linguistic demands of narratives, including even the demands of those stories the children know well. For this reason, preschoolers who to the "naked ear" may appear to

have adequate conversational language skills or who score within normal limits on norm-referenced language tests may evidence even quite concerning language problems when they are asked to relate narratives.

## IMPLICATIONS FOR INTERVENTION

### Assessment

SLI in toddlers and preschoolers appears to be manifested in different ways at different times. It follows, therefore, that assessment considerations may need to differ at different times. Additionally, many of the issues and the characteristics of young children with SLI that we have discussed in previous sections of this chapter lead to logical implications for assessment, which readers will see in the next several sections.

#### *Toddlers*

*Predictive and Risk Factors in Assessment.* Previously in this chapter, we reviewed several of the factors that can place infants and toddlers at risk for language impairment and those that can place a toddler with slow expressive language development (SELD) at risk for continuing language problems (Table 3.3). These factors need to be considered as part of an assessment process, in particular, (1) socialization; (2) phonological composition of vocalizations and babbling as well as verbalizations; (3) use of gestures, particularly symbolic play gestures expressing script routines and those gestures and behaviors associated with joint attention; (4) behavior; and (5) nonword repetition abilities now that there are a few tasks that appear appropriate for use with older toddlers. Assessment of toddlers needs to be multifaceted.

The increasing evidence about comprehension abilities leads us to conclude that comprehension skills need to be included as an important part of an assessment process. The evidence suggests that expressive language deficits probably do not exist in the absence of disruptions to receptive/comprehension/processing abilities (Leonard, 2009; Tomblin et al., 2007; Tomblin & Zhang, 2006) and that a substantial number of toddlers with expressive language problems have comprehension problems even though on superficial observation they may appear to understand quite well. Information about a toddler's comprehension skills can help inform about possible long-term language and learning outcomes, is important in planning intervention, and can provide additional assessment documentation of language problems.

Young children's uses of communicative intentions produced through gestures and vocalizations can be assessed even before they use their first words. Coggins (1991) provides ideas about how to manipulate the assessment environment to identify children's uses of linguistic and nonlinguistic communicative intentions. He suggests that the children's performance should be assessed under conditions of both minimal and maximal support for producing intentions:

1. Cuing (linguistic): Manipulate for minimal support using indirect model; manipulate for maximal support using elicited imitation
2. Activities (nonlinguistic): Manipulate for minimal support using novel activities; manipulate for maximal support using known event routines and scripts
3. Interactor (nonlinguistic): Manipulate for minimal support using clinician; manipulate for maximal support using mother/caregiver
4. Materials (nonlinguistic): Manipulate for minimal support using no toys or props; manipulate for maximal support using familiar objects/toys and those with thematic base (e.g., doll, bottle, and/or diaper)
5. Interaction (nonlinguistic): Manipulate for minimal support using naturalistic child-adult interactions; manipulate for maximal support using contrived tasks (e.g., desired food item in transparent, tightly sealed container)

Differences in the children's performances under these conditions can be identified, with differences possibly indicating the children's potential for change (Coggins, 1991;

Olszwang & Bain, 1996; Platt & Coggins, 1990). A toddler's ability to modify communicative behavior relatively quickly under various conditions of support often has prognostic value, as we know from dynamic assessment practices, discussed more fully in Chapter 13, and can provide valuable insights about strategies that might be included in intervention plans.

*Early Language Milestones.* Early language developmental milestones provide additional guidelines for assessment. Many of these were highlighted in the previous chapter and even in earlier parts of this chapter. Of particular import for assessing toddlers are milestones related to prelinguistic developmental behaviors, early expressive vocabulary development, early and later multiword utterances, early emerging grammatical morphemes, and early sentences.

Tracking toddlers' progress from single-word to multiword utterances requires assessment measures that are sensitive in picking up what are important developmental patterns. Of particular importance is knowing that toddlers are moving toward productive, rule-based combinations so that these become generative in order that novel utterances using the rules can be produced as context and meaning warrant. A normally developing toddler takes about 4 to 5 months to move from the emergence of the first two-word combination to the use of many new and unique word combinations (Ingram, 1989). Ingram's (1989) work indicates that during these months, when the toddler manages to have produced about 100 novel two-word utterances, the child is likely to demonstrate a "syntactic spurt," suggesting that the child has learned about grammatical productivity, that is, the generative basis of syntax. This typically happens at about 2 years of age. At this point the toddler is, in essence, "off and running" with regard to syntax and grammar. Two assessment procedures can be particularly helpful in tracking toddlers' progress toward their use of productive two-word utterances. Long, Olszwang, Brian, and Dale (1997) developed a procedure to observe and analyze the generative productivity of the types of two-word utterances showing up in young children's language as they move from using single-word utterances to word combinations, that is, MLUs slightly over 1.00.<sup>3</sup> Their procedure looked at "utterance level productivity (ULP), which reflects general positional rules for word combinations; and grammatic level productivity (GLP), which reflects specific rules based on semantic consistency" (p. 36). These authors (Long et al., 1997) reported that the children with SELD in their study who achieved grammatic-level productivity as a result of intervention were the ones who showed greater progress. Hadley's (1999) approach was to analyze the spontaneous language of children with MLUs between 1.00 and 2.00 (Brown's Stage I) over time for changes in the number of *unique syntactic types* the children use. A unique syntactic type is "a combination of two or more words with syntactic status that could fit into the phrase structure of a more grammatically complete adult utterance" (p. 263). Hadley (1999) found that her procedure was highly correlated with children's performances on the Index of Productive Syntax (Scarborough, 1990) and their MLUs. As Hadley (1999) states, the procedure was designed for "tracking the progress of children in this early stage of grammatical development" (p. 269). Both of these procedures appear to help professionals more precisely distinguish between toddlers who are displaying progress toward using generative, productive multiword combinations and those whose word combinations seem stalled and/or nonproductive for expansion.

Another aspect of early language development that needs to be assessed—and one that is related both to the ideas noted here about tracking toddlers' early acquisition of grammatical features and to those associated with verb morphology as a possible clinical marker—is children's acquisition of early verb morphemes between 2 and 3 years of age (Hadley & Short, 2005). Probes can be developed to explore children's use of these forms, and a comprehensive language sample that includes analyses of children's verb forms is an essential aspect of assessment for toddlers. Additional information about language sampling is included in Chapter 13.

3. Recall that an MLU of 1.00 means only single words without any grammatical morphemes attached, whereas an MLU of 1.50 suggests single words with grammatical morphemes and/or equal numbers of single-word utterances with no grammatical morphemes and two-word combinations with no grammatical morphemes.

*Assessment Instruments and Parental Report.* A number of developmental instruments has been available for several years to assess infants and toddlers. Among these are the Bayley Scales of Infant and Toddler Development—III (Bayley, 2006), The Capute Scales: Cognitive Adaptive Test and Clinical Linguistic and Auditory Milestone Scales (Accardo et al., 2005), and the Vineland Adaptive Behavior Scales—III (Sparrow, Cicchetti, & Saulnier, 2016). This list is by no means complete, and new instruments are regularly developed and existing ones updated. These instruments examine a range of developmental areas (e.g., gross motor, fine motor, personal-social), including items that address communication skills. In addition to these more general assessment tools, several instruments that focus on communication skills are available for professionals to use during assessment sessions with toddlers. Space precludes providing a comprehensive list of these, and such a list would be outdated as soon as it were compiled. However, some of the more commonly used instruments over the years are The Rossetti Infant-Toddler Language Scale (Rossetti, 2006), the Early Language Milestone Scale (ELMS – 2) (Coplan, 1993); Communication and Symbolic Behavior Scales – Normed Edition (CSBS – Normed) (Wetherby & Prizant, 2003) and its shortened version, the Communication and Symbolic Behavior Scales—Developmental Profile (CSBS – DP) (Wetherby & Prizant, 2002); the Sequenced Inventory of Communication Development—Revised (Hedrick et al., 1984); the Preschool Language Scale—5 (PLS – 5) (Zimmerman, Steiner, & Pond, 2011); the Receptive-Expressive Emergent Language Test—Third Edition (REEL – 3) (Bzoch, League, & Brown, 2003); and the Test of Early Language Development – 3 (TELDS – 3) (Hresko, Reid, & Hammill, 1999). The procedures for a number of these instruments include some degree of parental report as well as direct professional-child interaction.

The use of parental reports of young children's communicative behaviors is an invaluable tool as a means of assessing toddlers' language abilities. Although there were initial concerns about validity and reliability when instruments based on parental reports were first developed, findings from subsequent research have allayed many of the concerns. Parental report has several inherent features that make it an attractive method of assessment. These include that (1) the parents have had more opportunities to observe their children's language, so they typically know more about what the children do with their communication than a professional can learn in an assessment session; (2) parental report can be obtained prior to professionals seeing the children and can, therefore, help professionals plan assessment sessions; and (3) it is cost effective.

Parental report procedures can be systematized, standardized, and structured, reducing some of the problem about accuracy of the procedure. A common approach, therefore, is a recognition format that presents parents with communicative behaviors and asks them to identify those that apply to their children. Two such parental report instruments using this technique that are designed specifically to tap toddlers' communication skills are the Language Development Survey (LDS) (Rescorla, 1989) and the MacArthur-Bates Communicative Development Inventories – 2 (CDI – 2) (Fenson et al., 2007). Of the two instruments, the latter is the more extensive, taking parents about 30 minutes to complete. In contrast, the LDS, according to its author (Rescorla, 1991), was designed "as a quick and efficient . . . screening tool for the identification of language delay in 2-year-old children" (p. 17). The LDS takes about 10 minutes for parents to complete. Both instruments provide parents with a list of vocabulary items (or phrases) and ask them to indicate which of the words their children use. Both have been used in the early identification of toddlers with language delays and have demonstrated good validity and reliability in assessment.

A slightly different approach to parent report was taken by Girolametto (1997) in his development of a parent report measure to profile the conversational skills of children between the ages of 1 and 3 years. This protocol is based on Fey's (1986) assertiveness-responsiveness continua used to describe children's conversational interactive style, which was discussed previously in this chapter. It asks parents to rate the degree to which each of 25 statements, reflecting various responsive or assertive conversational behaviors, describes their child. Advantages of the tool are its ease of administration and speed of completion and its ecological and social validity. According to Girolametto (1997), "The rating scale profiles the strengths and weaknesses of individual children and provides unique information that is unavailable from other assessment sources" (p. 32).

General aspects of assessing children's language and factors involved in selecting and using standardized instruments are discussed in Chapter 13.

*Parent/Caregiver-Child Interactions.* An important part of assessment involves the interactions between primary caregivers and their children. As we know, parents'/caregivers' interactions with their language-impaired children are, for the most part, not terribly different from the interactions of other parents/caregivers with younger normal language-learning children. That is, the parents/caregivers seem to respond more to the child's language level than the child's chronological age. The few problematic areas that have sometimes been noted generally relate to (1) the degree of directiveness in the parents'/caregivers' interactions, with parents/caregivers of language-impaired children tending to use more directive language to their children, such as commands, rather than responses to their children's initiations, and (2) the frequency with which parents/caregivers provide semantically contingent responses (recasts) to their children's utterances. Somewhat related to this latter factor is the quickness with which parents/caregivers respond. Roth (1987) has suggested that a 1-second interval between a child's production and the parent's/caregiver's response is the time frame in which a 1-year-old child can pick up on the contingency of the parent's/caregiver's response.

There need to be caveats on interpreting these findings. Recall we have indicated that a child's language behavior itself may modify an adult's mode of communicative interaction so that interactions may be less appropriate and stimulating. The communicative interactions likely have reciprocal effects. However, some of these adult behaviors, once established possibly because of previous adult-child interactions, may maintain slowed language development in a child. The purpose of assessing parent/caregiver-child interactions is not to judge the adult. Rather, it is to identify possible factors in the interactions that can be modified or included in interactive routines to enhance and facilitate a child's language learning.

### **Preschoolers**

*General Guidelines.* For preschoolers, many more norm-referenced language instruments are available. It is also easier to obtain reliable assessment results from preschoolers than from toddlers. However, professionals still need to be alert to the fact that considerable variability can occur in preschoolers' communicative performance. As with toddlers, it is also important with preschoolers to assess caregiver-child interactions and a variety of behaviors. Language developmental milestones continue to be important guidelines, although as preschoolers mature much beyond 3 years of age, MLU may no longer be a consistently reliable indicator of language growth (e.g., Eisenberg, Fersko, & Lundgren, 2001). Additionally, gross measures of expressive vocabulary size may be less reliable indicators of language skill with preschoolers than with toddlers. Recall that we previously suggested that delays in expressive vocabulary acquisition may appear to resolve during the later preschool years. This is not to say that expressive vocabulary should not constitute part of the assessment process. Care should be taken to ensure that procedures include assessing: (1) a child's use of words with more abstract meanings and (2) the size and diversity of the growth of the verb vocabularies of children transitioning from toddlerhood to preschooler status (i.e., about 2 years of age). With regard to the latter, recall there is emerging evidence that characteristics of young children's verb vocabularies may be predictive of their levels of grammatical development in later preschool years (Hadley et al., 2016).

Language comprehension abilities would also be essential aspects of language behavior that need to be assessed. Assessment of comprehension needs to extend beyond just assessment of single-word receptive vocabulary, and any assessment of single-word receptive vocabulary needs to include abstract vocabulary words. Comprehension assessment needs to examine understanding whole units of language (not just individual words) and understanding across multiple utterances, that is, comprehension of discourse, and examine a child's ability to infer meaning.

Because syntax and morphology are especially troublesome areas for preschoolers with SLI, children's performances in these areas should be thoroughly assessed. Of particular importance are children's uses of complex sentences and the emergence of grammatical

morphemes, especially their use of verb tense grammatical marking. Children's developing skills with both micro and macro aspects of narrative production are also major parts of assessment. These areas for assessment are consistent with our previous discussions in this chapter, so none of this should be surprising. However, all measures need to be fine grained rather than global and general. Chapter 13 has information that applies to the assessment of preschool children.

An area of assessment of preschool children that is particularly important is their ability in areas associated with literacy development, given our understanding of the relationship between children's early language levels and their learning to read and write. Catts (1997) suggests that many of the problems associated with reading disabilities can be observed in children before they begin formal reading instruction. This means that, in addition to preschoolers' language and their abilities with narratives and phonological processing, as discussed below, their knowledge about letter names, print concepts including being able to write their first names (Cabell, Justice, Zucker, & McGinty, 2009), literacy terms, and rhyme need to be assessed. Results can assist in identifying those children at risk for reading difficulties so that early intervention aimed at reducing the odds of reading failure can be provided.

**Illusory Recovery.** If preschoolers can appear to recover from deficits in certain aspects of language behavior at different times, this has implications for assessment. Language performance needs to be assessed in such a way that overcomes the possibility of obtaining *false negative* results—that is, results indicating that no problem exists when, in fact, it does.

One way to address the problem of illusory recovery is to ensure that assessment is comprehensive, that is, that many aspects of communication are assessed, as well as behavioral aspects known to be associated with SLI. Table 3.3 provides a guide to areas that would be included in a comprehensive assessment. Comprehension abilities are a major clue to whether a child's expressive abilities are demonstrating an illusion of recovery or whether a language impairment continues to be present. It may also be appropriate to assess over several sessions and in a variety of settings, including in a child's home and in situations where the child interacts with other children (Hadley & Schuele, 1998).

Another way to address the problem is to stress or challenge the child's language performance. It is not enough to know what a child *does* with language. We need to know what a child *can do* with language. Earlier we indicated that narrative production particularly challenges a child's language performance. Asking a child to relate a narrative should probably be a standard part of a preschooler's language assessment not only to stress the system but for its predictive value as well. However, professionals should avoid basing any decisions about a child's language abilities only on production of stereotyped narratives such as fairy tales. These may be "rehearsed" narratives for a child because they have occurred frequently in the child's environment. Rather, novel narratives should be elicited using one or more of the several ways described in Chapter 13 and considering the various advantages and disadvantages of the various methods.

Previously in this chapter, we discussed the possible clinical markers of SLI—nonword repetition, use of verb tense morphology, and sentence recall. We indicated that for toddlers, there was information that permitted assessment of these areas of performance. For preschoolers, we are more confident in our assessment of these abilities. These are areas that are essential to include in assessment and to be assessed thoroughly. Findings can help to overcome some of the issues related to illusory recovery. Preschoolers' performances in these areas may have value in predicting which children are likely to have SLI and/or are at risk for continuing language deficits. Various formal and informal methods available to assess children's abilities in these areas are presented in Chapter 13.

**Social Communicative Interaction.** Part of assessing language performance involves assessing children's communication in social, interactive situations. For preschoolers, this goes beyond assessment only with the primary caregiver. Ideally, children should be assessed as they interact in a group with other children, some of whom are normal language-learning children. As Rice, Sell, and Hadley (1990) point out, however, most systems designed to

measure children's social communicative interactions are inordinately complex and cumbersome to render them impractical for routine assessment.

To provide "a quick way of obtaining clinically relevant information about the use of language in natural settings along the social dimension" (p. 7), Rice et al. (1990) developed the Social Interactive Coding System (SICS). This instrument focuses on Fey's (1986) assertiveness/passiveness conversational dimension and examines a child's interactions with peers during a variety of activities that typically occur in preschools, such as art, dramatic/symbolic play, and free play with toys. Each turn a child takes in an interaction, the nature of each turn (e.g., initiation, response—verbal, response—nonverbal, ignore), and the number of turns in the interaction are recorded on a standardized protocol that also allows for the addressee of the child's interactions to be recorded. The tool incorporates a real time observational technique in which the professional records all of the child's interactions in a 5-minute period and then takes a 5-minute break to update notations on the protocol. The "5-minutes-on/5-minutes-off" procedure is repeated three times for a total of four observational segments. The advantages of the SICS include that (1) it can be completed in the classroom, (2) it is easy to learn, (3) minimal equipment is necessary, and (4) results are immediately available for interpretation. The authors caution, however, that the SICS should be used not as a sole assessment procedure but rather as a supplement to other forms of assessment.

Chapter 13 provides additional information about assessment of children's language in general. The information in that chapter is relevant to language assessment of toddlers and preschoolers and should be used in conjunction with the information presented here.

## Intervention

**Decisions about Intervention.** The issue of predicting which toddlers and preschoolers will outgrow their early delays in acquiring language without assistance and which will not leads to a main consideration for intervention. That is, under what conditions is intervention recommended, when is intervention recommended, and what is the nature of the intervention—monitoring, indirect intervention, or direct intervention carried out by a professional? There are no hard-and-fast answers to these. The philosophical and theoretical positions of the professional, the philosophical and procedural positions of the organization in which the professional works, and the attitudes and wishes of the caregivers affect the decision. Professionals' decisions are influenced by information about identification of language impairment and standards to which a child's language performance is being compared, predictive and risk factors relevant to a specific child, and the long-term implications of unresolved language impairments. To this, information about a child's potential for language change and the factors important in facilitating the change are added.

A word of caution is warranted. The quality of input into decision making about recommending or not recommending intervention, whether it is the professionals' or parents' input, is only as good as the information and understanding that these individuals have about associations among language, literacy, and socialization. Whether to intervene or not seems more related to what professionals observe in the expressive language of behaviors of young children rather than what abilities the children have with regard to language comprehension. As Zhang and Tomblin (2000) write in describing the findings of their study that "intervention receipt was more closely related to expressive language than to receptive language" (p. 352) and that the "aspect that is most available to the listener has the greatest effect on the child's receipt of clinical services" (p. 354). In contrast, language problems had the greater negative effect on academic and social variables compared to speech sound production problems. These results indicate that professionals need to be alert to what factors of children's communication abilities they are judging with regard to intervention recommendations. The results also indicate that professionals need to provide individuals who have had fewer opportunities to know about the potential impact of language ability on other areas of children's development and achievement with the information they need to participate in deciding what to recommend about intervention.

An important principle is that, whatever initial decision is made, it is reassessed regularly as a child's behavior does or does not change. If direct intervention administered by

a professional is not recommended initially, it is possible to implement indirect methods, such as parent training and/or preschool enrollment, and monitor the child's progress. If the anticipated progress is not seen in a specified period of time, a decision to intervene directly can be made. If direct intervention is the initial decision, the child's progress is also monitored regularly. If progress is rapid, the professional and parents may decide to discontinue direct intervention, implement indirect intervention programs to maintain the level of progress, and monitor the child's behaviors at regular intervals. If progress is not continued, direct intervention can be reinstated. Ongoing monitoring, regular measurements of a child's language performance across many parameters, consistent follow-up, and flexibility in moving from one form of intervention to another are critical in providing effective intervention.

***Indirect Intervention.*** As indicated above, one aspect of intervention is deciding on the way in which services for a specific toddler or preschooler are delivered, that is, direct intervention provided by a professional interacting with the child or indirect intervention provided through consultation and collaboration with others. Both methods may also be employed either simultaneously or consecutively. The decision will differ for each child. No one service delivery model is suitable for all youngsters with SLI or SELD. However, parents/caregivers play a large role in the early language learning of toddlers and preschoolers, and their participation in intervention is essential. Furthermore, a common recommendation for youngsters with SLI is placement in a preschool program.

***Parents/Caregivers.*** Toddlers and preschoolers spend most of their time interacting with parents/caregivers. Therefore, these adults are potentially powerful sources of change in children's communicative behavior. Involving parents/caregivers in intervention not only is mandated by federal education laws but generally makes good sense as well. As Olswang and Bain (1991) point out, the "question is not should the parent be involved in the intervention process, but how" (p. 77). The "how" usually takes one of two approaches. The parents/caregivers can augment, expand, and supplement the intervention provided directly by a professional, who is the primary agent of change, or they can serve as the primary agents of change, with the professional serving to develop the initial directions and methods for change and to monitor both the process and the progress. Whichever strategy is chosen for an individual child, the parents/caregivers need education and training. This generally focuses on two objectives: (1) creating or enhancing the child's environment to facilitate change in the child's language and (2) responding within that environment in a manner that optimally facilitates language change.

At least two primary aspects are involved with regard to changing or enhancing the child's language-learning environment. One aspect focuses on helping the parents/caregivers recognize and take advantage of language-learning opportunities that occur in a child's daily activities. This approach stresses seizing opportunities and capitalizing on language-teaching moments. These moments can occur during dressing, interactive play, meal or snack time, story time, or any other time during a day when the child's attention is focused on a specific action, object, or event. The parents/caregivers are shown how to identify these moments and how to structure their language and gestural input accordingly. The second aspect involves creating opportunities for language learning. The parents/caregivers are shown how to set up moments in the environment to facilitate a child's use of specific language behaviors and how to encourage the child to use these behaviors during those periods. These moments may or may not be specified, allocated periods. In some instances, the parents/caregivers may be able to observe a situation and know that if they make an immediate and sometimes small change, they will be able to facilitate a desired language behavior. In other instances, short periods may actually be set aside for creating the opportunities to facilitate certain communicative behaviors in the child. As with the "opportunistic" approach, the parents/caregivers are shown how to structure their communicative behavior so as to enhance the child's learning.

In helping parents/caregivers respond to the children in ways that best promote language learning, it is important to remember that the aim is likely to help them do more of

some things they already do and perhaps less of others. In most instances, it may simply be a matter of changing the frequency of certain behaviors, such as increasing how often they use expansions and recasts of the children's utterances and encourage imitation. These are language-facilitating techniques described in Chapter 14, where more specific information about intervention is presented.

Earlier we indicated that most parents/caregivers of children with SLI provide language interactions that are similar to those of parents of normally developing children, but there may be two or perhaps three adult behaviors that are worthy of particular attention. One may involve helping the parents/caregivers reduce the frequency with which they use directive speech acts, including commands and demands for responses from the children, and increase their use of (1) responsive speech acts, (2) information-seeking questions for which the information presumably is not known to the adult, (3) confirmation requests that are used to affirm that the adult understood the child correctly, and (4) simple recasts and expansions of the child's utterances that serve to maintain the content of the child's utterances but do so in a form that modifies slightly that used by the child. Both Fey and his colleagues (Cleave & Fey, 1997; Fey, Cleave, Long, & Hughes, 1993; Fey, Krulik, Loeb, & Proctor-Williams, 1999) and Girolametto and his colleagues (Girolametto et al., 1996; Girolametto, Weitzman, Wiigs, & Pearce, 1999) describe parent-training programs that teach parents how to engage in these behaviors with their children. Both groups of researchers have reported positive effects of their programs in helping to advance the language of toddlers and preschoolers with SELD and/or SLI.

Another area in which parents/caregivers may be able to facilitate children's language learning is to increase the frequency with which they respond to what the child says and to do so with semantically contingent statements (Girolametto et al., 1996). These responses again maintain the content of the child's utterances and serve as comments about the content of the child's utterance. For example, to the child's utterance "big doggie," the adult might say, "Yes, it is a big doggie." A third possibility for enhancing further a child's language learning may focus on helping parents/caregivers provide quicker responses to the children's utterances, that is, reduce latencies in parents'/caregivers' responses.

*Preschools.* Preschool experiences are often recommended for youngsters with SLI in order to provide a stimulating language-learning environment and opportunities for social communicative interactions for the children. Peers have been shown to be able to facilitate the language development and social interaction skills of children with SLI or SELD (e.g., DeKroon, Kyte, & Johnson, 2002; Robertson & Ellis Weismer, 1997). However, the simple presence of normal language-learning children in a preschool does not guarantee that these children will be effective facilitators for children with SLI. Special attention may have to be given to how the aims of such an approach can be achieved.

One problem that has been observed is that normal and language-impaired youngsters together in preschools do not particularly spend very much of their time in communicative interactions with each other (Hadley & Rice, 1991; Hadley & Schuele, 1998; Rice et al., 1991; Weiss & Nakamura, 1992). As Hadley and Rice (1991) point out in their study on the conversational interactions of normal and language-impaired preschoolers,

The implications for intervention are somewhat sobering. It seems that placement of these children [with SLI] in an integrated setting, even one in which adults are highly responsive to and encourage the children's initiation attempts, does not necessarily ensure peer interactions. . . . Preschoolers behave as if they know who talks well and who doesn't, and they prefer to interact with those who do. Therefore, placement of communicatively impaired children in an integrated setting, with normal-language peers and facilitative adults, will not in and of itself establish successful peer interactions in spontaneous interactions. (p. 1315)

It seems, therefore, that the facilitative adults in these settings need to develop strategies that specifically target encouraging successful peer interactions. It cannot be assumed that these will occur without professionals' direct attention and planning.

These adults, too, might benefit from assistance in how to make their interactions more facilitating for children's language learning. Girolametto's research team (Girolametto & Weitzman, 2002; Girolametto, Weitzman, van Lieshout, & Duff, 2000) examined the degree

of responsiveness and directiveness in the language of daycare teachers with training in early childhood education. To track, categorize, and analyze teachers' interactions, the researchers used the Teacher Interaction and Language Rating Scale (Girolametto, Weitzman, & Greenberg, 2000). Results indicated that although many of the teachers' interactions with the children were characterized by language-facilitating behaviors and demonstrated some sensitivity to children's different language levels, there were aspects of their verbal interactions that the researchers identified as directive and less language facilitating. Different instructional contexts (e.g., book reading, play dough activity) resulted in different levels of directiveness. The researchers suggested that training to help teachers reduce some types of directiveness where it is not necessary for direct instruction might enhance children's language learning (Girolametto, Weitzman, van Lieshout et al., 2000).

A final note relates to the involvement of parents/caregivers as part of children's preschool experiences. Marvin and Privratsky (1999) found that, when preschool children left school at the end of a day with "remnants from recent school events, toys, or child-produced art products" (p. 231), the children's talk with their parents in the car on the way home or when they arrived home contained more references to events that had transpired at preschool than when no materials were sent home with the children. These authors suggest that sending child-centered materials home with children at the end of a preschool day may help facilitate their ability with what is a more difficult discourse situation, that is, to talk about events in the past in situations where there is no shared knowledge between narrator (the child) and listener (the parent). In developing preschool plans, part of the routine might be regular child-centered "take-home" materials that parents realize are important to talk about with their children. Another part of involving parents in their children's preschool or day care experience considers the advantages of including parent training in conjunction with their children's attendance at preschool. For example, in one study (Roberts et al., 1989), children who attended a preschool that included regular parent/caregiver education achieved better conversational skills by 5 years of age than either children who did not attend preschool but whose parents/caregivers did receive education or children who neither attended preschool nor whose parents/caregivers received education. This finding suggests that the combination of parent/caregiver education and preschool programs provides more powerful opportunities for enhancing children's language performances than parent/caregiver education alone.

***Direct Intervention.*** Direct intervention for youngsters with SLI can be conducted individually with a child, via group sessions, or a combination of both. However, much of what is discussed in the literature describes group intervention, with or without adjunct individual sessions. Consistent with our discussion, groups have a greater potential to facilitate children's peer interactions, assist them to use language appropriately in social interaction, and provide opportunities for generalization of language skills, and they tend to have more naturalistic environments for language use and are likely to include more events and experiences to talk about and more people with whom to talk. When it comes to characterizing group intervention for toddlers and preschoolers, there are many variations on the theme. Some of these are the following:

- Some programs have smaller numbers of children in them (e.g., four) (Robertson & Ellis Weismer, 1999); others are larger, with as many as 18 to 20 (Bunce, 1995; Rice & Wilcox, 1995).
- Some consist only of children with language delays or impairment (Cleave & Fey, 1997; Robertson & Ellis Weismer, 1999); others have a mix of children with and without language problems (Bunce, 1995; Rice & Wilcox, 1995).
- Some place greater emphasis on acquisition of grammatical forms (Cleave & Fey, 1997), others on vocabulary and early word combinations (Robertson & Ellis Weismer, 1999), and others on a wide variety of aspects of language based on individual children's needs (Bunce, 1995; Rice & Wilcox, 1995).
- As indicated above, some include individual intervention sessions with children as part of the total intervention program (Cleave & Fey, 1997); others use group sessions exclusively (Robertson & Ellis Weismer, 1999).

Despite these variations, there seem to be some commonalities. One is that most of the programs recognized the importance of peer interaction and socialization for the children and addressed these in varying degrees in the intervention programs. Another was the inclusion of routine events and scripts to help children scaffold their language and reduce processing demands for them.

One point that came through from the results of the study by Long et al. (1997) and Hadley's (1999) work was the need to be alert to what particular types of word combinations toddlers are and are not acquiring. Recall that a positive indication is acquisition of word combinations that reflect generative, rule-based, grammatical principles. When facilitating the acquisition of word combinations is a goal of intervention for children, Long et al. (1997) recommend that specific grammatical rules that carry "syntactic status" and can "fit into the phrase structure of a more grammatically complete adult utterance" (Hadley, 1999, p. 269) be targeted directly. These can be equally targeted in group or individual intervention sessions.

### SUMMARY

In this chapter we have seen that

- Characterization and understanding of SLI as a condition is far from complete; nevertheless, SLI should probably best be thought of as a lifelong disability since it does not go away, even though intervention can moderate its effects.
- There is doubt about the existence of expressive language impairment without some degree of receptive language/comprehension/language processing involvement; comprehension is an important part of thinking about SLI in young children.
- Several different labels to describe these children have been used; SLI has gained acceptance.
- Causal factors remain elusive, but information processing, neurological factors, and genetics are promising candidates; these may not be independent causal factors but rather interrelated factors.
- Some children outgrow early delays in acquiring language; others do not. Predicting who will and who will not catch up is an important area of research. Issues related to possible "illusory recovery" need to be addressed. Issues of illusory recovery and prediction impact on assessment strategies and intervention decisions.
- Three aspects of performance, morphology related to verb tense marking, sentence recall, and nonword repetition, are possible clinical markers of SLI.
- Children with SLI can exhibit different combinations of communication problems that can involve some or all parameters of language. One common feature is difficulty with syntax and morphology and, in particular, verb morphology.
- Parental/caregiver involvement is important in obtaining assessment information, and parental/caregiver education is an important aspect of intervention.
- Placement of children in preschools will not necessarily ensure successful social communicative interactions unless these are specifically addressed within the preschool situation.
- A number of different intervention models are available, and which model is used should depend on the needs of individual children and their parents.
- Intervention is a process of ongoing monitoring, regular measurements of the children's language performances, consistent follow-up, and flexibility in moving from direct to indirect intervention modes and vice versa.

There is no question that toddlers and preschoolers with SLI are at risk for academic failure when they begin school. They are also at risk for early social failure. Proper and early identification and intervention are critical if a potential cycle of social and academic failure is to be thwarted.

# 4

# Language and School-Age Children with Learning Disabilities

Geraldine P. Wallach

## LEARNING OBJECTIVES

After reading this chapter, you should be able to

- Explain the relationship between language impairment and learning disabilities
- Describe matches and mismatches between language and academic expectations for school-age children with specific learning disabilities
- Discuss the implications for intervention for school-age children with specific learning disabilities

Medical models of clinical practice suggest that one must have a diagnosis to ensure appropriate and effective treatment. This may be a relevant and applicable approach for many conditions, but language learning and academic problems often fail to fit into neat diagnostic categories. Because the various diagnostic designations (i.e., labels) associated with language learning and academic problems represent heterogeneous groups of children and because the children's problems change over time, "one size fits all" approaches to helping the children require careful consideration. That is, intervention plans that attempt to "match" children's labels need to be evaluated with skeptical, judicious, and critical eyes. Further, the "real world" of schools is steeped in processes defined by federal and state mandates for providing services for children who are struggling in their classrooms (IDEA, 2004). Assessment and intervention for school-age children become further complicated by these mandates, which affect students' eligibility for services and decisions about settings in which they receive services. Of particular relevance for this chapter is the reality that students with diagnostic labels of *language* impairment and those with diagnostic labels of *learning* disabilities overlap for periods during their academic progression but also separate during different periods, thus creating a pattern of intertwining and untwining in nonlinear ways across time (e.g., Catts, Bridges, Little, & Tomblin, 2008; Silliman & Berninger, 2011). To complicate further already complicated issues related to identification and educational placement for children in schools, professionals' perceptions and interpretations of what it means to have a language and/or learning disability may be as diverse as the children who have them.

## THE RELATIONSHIP BETWEEN LANGUAGE IMPAIRMENT AND LEARNING DISABILITIES

To provide readers with a reference point, a review of terminology related to both language impairment and learning disabilities follows. This section begins with a review of the definition of *specific language impairment* (SLI) presented in Chapter 3. It continues with additional definitions of language impairment that appear in the literature and in federal mandates. Finally, definitions of learning disabilities and related terms and conditions are explored. The underlying themes addressed in the section are: (1) the overlapping nature of definitions, (2) the primacy of language in many of the definitions and in learning and academic success, and (3) the challenges facing professionals who must operationalize these definitions in practice.

### Language Disorders/Impairment Terminology

**Revisiting SLI Definitions.** The term SLI is often used more frequently *before* children enter school. As noted in the previous chapter, SLI describes the population of children who have language impairment in the absence of other concomitant primary disorders, for example, autism spectrum disorder, intellectual disability, hearing impairment, and oral structural or oral motor abnormalities (Kaderavek, 2015; Leonard, 1991). Kaderavek (2015) addressed the exclusionary criteria attached to SLI. The term, exclusionary criteria, refers to the absence of many of the possible conditions, such as those mentioned in the previous sentence, before a child can be diagnosed as SLI. We will see that the definitions of *specific learning disabilities* (SLD) as well as definitions of *dyslexia* (or *specific reading impairment*) that follow in this section will start to sound very similar to definitions of SLI due to their use of exclusionary criteria as well as their *language focus*. In her landmark treatise on identification issues in language disorders, Lahey's (1990) question raised in Chapter 3, "Who shall be called language disordered?" remains a current one. Decades ago, she encouraged professionals to review their practices, including two that involve the labeling of heterogeneous populations and the assessment of language abilities separate from the situations and contexts (e.g., classrooms) in which children are having difficulties (Sun & Wallach, 2014).

**A Definition from the American Speech-Language-Hearing Association (ASHA).** ASHA (1993) defines language disorders as follows:

A language disorder is impaired comprehension and/or use of spoken, written and/or other symbol systems. The disorder may involve (1) the form of language (phonology, morphology, syntax), (2) the content of language (semantics), and/or (3) the function of language in communication (pragmatics) in any combination. (doi:10.1044/policy.RP1993-00208)

This ASHA definition provides professionals with a framework that includes the three major components of language—form, content, and use—and importantly, specifies that language disorders can include comprehension and/or use of both spoken and *written* language. While highlighting the components of language, along with spoken and written domains, the ASHA definition does not reference the chronic nature of language disorders and the continuum of language disorders across time.

**The Federal Definition of Language Disorders.** Language disorders are covered under the category of *speech or language impairment* in federal definitions. The Individuals with Disabilities Education Act (IDEA) (2004) includes language disorder as one of several communication disorders,

such as stuttering, impaired articulation, a language impairment, or a voice impairment, that adversely affects a child's education performance (34 C.F.R.; 300.8(c)(11)).

As can be seen, the federal definition is quite broad and offers no specific information about criteria for identifying language impairment or for differentiating speech from language impairment. Guidelines for determining which children meet particular criteria in

order for them to be eligible to receive intervention services are established by state and local agencies and these may include various “cut off” points on formal tests of language that children must score at or below in order to be deemed eligible to receive services. For example, in several school systems in California eligibility requirements for students to be determined to have language impairment specify that they must score at least 1.5 standard deviations below the mean, or below the 7th percentile, for their chronological ages or developmental levels on two or more norm-referenced tests (or approved un-normed but standardized tools) in one or more of the following areas of language development: morphology, syntax, semantics, or pragmatics. By including reference to language performance needing to be below developmental level, this particular example introduces the notion of *discrepancy criteria*, which is sometimes also referred to as *cognitive referencing*.

With cognitive referencing, a child whose cognitive level is below average, such that the child is diagnosed with intellectual disability (ID), but whose language performance is tested to be consistent with the low cognitive level would not be considered as having a language impairment, even though it is also below normal. The child could, therefore, not be eligible to receive language intervention services. However, if a child's language performance is tested to be below what is a reduced cognitive level, there is a discrepancy between language and cognition so the child might be deemed to have a language impairment and deemed to be eligible for language intervention services. The use of cognitive referencing is no longer considered valid or appropriate under federal guidelines, but not all states have moved away from using cognitive referencing, or a discrepancy criteria approach, in deciding which children have a language impairment and should be eligible for language intervention services.

New models for identification and service delivery are evolving, including Response-to-Intervention (RtI) models, which will be addressed later on in this chapter, but implementation of new models is slow and inconsistent across states. And professionals are challenged by the complexity of language disorders in children and the limitations of various definitions and mandates that can drive their services for children.

**A Classic Definition from the Literature.** Bashir (1989) provided professionals with a definition that captures language disorders as dynamic and changing over time. His suggested definition, written over three decades ago, is as timely and relevant today as it was then. It helps professionals appreciate the underlying connection between language impairment in children and learning disabilities and crystallizes the major theme of this chapter. He writes:

Language disorders is a term that represents a heterogeneous group of either developmental or acquired disabilities principally characterized by deficits in comprehension, production, and/or use of language. Language disorders are chronic and may persist across the lifetime of the individual. The symptoms, manifestations, effects and the severity of the problems change over time. The changes occur as a consequence of context, content, and learning tasks (p. 181).

One of the significant concepts expressed in Bashir's definition is that language disorders are pervasive and changing in their form. In addition, the notion that the changes occur “as a consequence of context, content, and learning tasks” takes us into school and classroom contexts and provides us with a reminder of the curricular demands that challenge children with language learning issues (Wallach, 2008).

### Learning Disabilities Terminology

As noted in the introductory comments, professionals with diverse backgrounds and educational preparations may have different perceptions about which students have *language* impairment and which ones have *learning* disabilities (LD). These differences sometimes obscure the connections between and within groups of students; differences in professionals' perspectives also influence intervention directions. As we look to definitions that have been used to identify children with language, learning, and reading disabilities, we note both similarities and differences among them.

Two prominent definitions of learning disability are that of the National Joint Committee on Learning Disabilities (NJCLD, 1991), even though it is now several decades

**TABLE 4.1** | Two Major Definitions of Learning Disabilities (LD)

NJCLD (1991)	USOE as Contained in IDEA (2004) (34 C.F.R.; 300.8(c)(10.i))
<p>Learning disabilities is a general term that refers to a <i>heterogeneous group</i> of disorders manifested by significant difficulties in the acquisition and use of <i>listening, speaking, reading, writing, reasoning</i>, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (sensory impairment, mental retardation, serious emotional disturbance) or extrinsic influences (cultural differences, insufficient or inappropriate instruction), they are <i>not the direct result</i> of those conditions of influence.</p>	<p>Specific learning disability means a disorder in one or more of the basic psychological processes involved in <i>understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell</i> or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. <i>The term does not include</i> learning problems that are primarily the result of visual, hearing, or motor disabilities; of mental retardation; of emotional disturbance; or of environmental, cultural, or economic disadvantage.</p>

old, and that of the United States Office of Education (USOE) as it appears in the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA, 2004). These are shown in Table 4.1. What we can note about the two definitions is, first, that they use different terms to refer to the disability. The NJCLD definition uses the term “learning disabilities,” whereas the IDEA definition uses “specific learning disability” (SLD). A second, and very important, issue is that both definitions are steeped in language. Difficulties in the acquisition and use of language as demonstrated by listening, speaking, reading, and writing problems and other linguistically heavy abilities like spelling and reasoning are highlighted across definitions. Both NJCLD and federal definitions reflect an exclusionary point of view. That is, other conditions (like hearing, emotional disturbance, cognitive delays) must be eliminated before a determination of LD can be made. We have seen previously that these exclusionary criteria are also included in SLI definitions. However, the NJCLD definition helps to clarify the reality that co-existing conditions may and do appear with LD but they are not the primary cause. The NCJLD definition also reminds us of Bashir’s definition of language impairment by emphasizing the heterogeneity within populations and the pervasive nature of language and learning problems across the life span. While recognizing the intrinsic nature of LD (i.e., the existence of a neurological base), both definitions in Table 4.1 fail to emphasize the idea that both language impairment and LD reside both *within* and *outside* of children’s heads (Nelson, 2005), a concept implied by Bashir’s (1989) notion that context, content, and learning tasks change the trajectory of language disorders. In other words, language disorders look different in the school-age years because the linguistic demands of school increase the need for intact and sophisticated language skills and raise the stakes for academic and social failure for students without these language skills. Language disorders at school-age levels often look like those difficulties highlighted in NJCLD and IDEA definitions.

Sun and Wallach (2014) developed the scenario presented in Table 4.2 to help illustrate the common relationship seen between preschool SLI and school-age SLD and the major themes in this chapter. Mom’s question at the end of the scenario is a common one. Professionals and parents often think of *language* impairment and *learning* disabilities as separate or different problems. The definitions offered by federal and state mandates also confuse the issue. As we have seen, terms can overlap but often address similar elements of language and learning difficulties. A classic quote from Bashir and his colleagues (Bashir, Kuban, Kleinman, & Scavuzzo, 1984) puts the primacy of language into any discussion of learning disabilities. They ask professionals to think about Tim’s problem as an ongoing problem with language, not a new problem that surfaces at an older age. They ask:

**TABLE 4.2 | A Language Impairment and Learning Disability Scenario**

A parent of a child who has been attending a speech-language-hearing clinic for a number of years is pleased with her child's language development. The child began his intervention journey in this particular clinic at about 2½ years old. He presented as a child with delayed language in both comprehension and expression in all areas of content, form, and use. There was a suspicion of "autism" initially (before he attended the clinic) because of his difficulty relating to people, among other misinterpreted behaviors, but he was diagnosed ultimately as a child with SLI. By second grade, he had continuing language problems, particularly with comprehending instructional language and textbook/classroom content, producing spoken and written monologues (i.e., connected text in the form of stories and expository text), and reading and writing. He had many conversational skills, no speech production problems, and was very social. He was, however, struggling to keep up academically. He also looked like a child with an "attention deficit disorder" (ADD). While continuing with his language intervention in the clinic and in school, his mom expressed concern, as did his teacher, about whether he had a "learning disability." The question asked directly by mom to his speech-language pathologist was: "Is it true that Tim [not his real name] has *another problem* on top of his language problem?"

*Source:* Based on Sun and Wallach (2014).

Are we speaking about a group of children, who by virtue of learning context, are called by different names, but who in reality evidence a continuum of deficits in language learning? (p. 99)

Tim's preschool intervention team at the clinic knows that when Tim goes to school he may "look like" a child with a learning disability because his *language* problems are manifesting themselves in *academic* arenas, including the highly language-based abilities of reading and writing. They also know that as preschoolers with early language impairment get older, the challenges they face within school contexts make learning more difficult for them and bring their underlying language problems to the surface. While many of preschoolers with language impairment improve in various aspects of communication, as Tim did, they fall behind their peers quickly as the language realities of classroom and curricular requirements become more demanding (Sun & Wallach, 2014). As a preschooler, Tim's language profile included a delayed mean length of utterance (MLU), morphosyntactic errors and delays, and spoken comprehension and naming issues. By grade 2, as noted in the scenario, he was a fairly good conversationalist and his comprehension was good when contextual supports were strong (e.g., facial, gesture, picture support). By contrast, his comprehension problems were evidenced as difficulties understanding and retaining new curricular content and instructional language (i.e., dealing with unfamiliar topics couched in more complex language forms and abstract language without contextual support). While continuing to have spoken language gaps, which were not as overt as they were when he was a preschooler, Tim had difficulty learning to read and write language.

We have seen that several terms appear in the literature to refer to LD. Another often encountered term is *language learning disability* (LLD). In 1982, the ASHA Committee on Language Learning Disabilities (ASHA, 1982) suggested use of this term to acknowledge the interwoven and overlapping nature of language and learning disabilities. While not an official diagnostic category, the term appears throughout the literature and is used by many SLPs including the author of this chapter (Sun & Wallach, 2014; Wallach, 2008). The thread throughout this chapter is that *the majority of learning disabilities are a manifestation of ongoing, or newly diagnosed, language impairment*. Interwoven within this basic premise is the idea that language is the embedded curriculum of school. Likewise, becoming literate incorporates both spoken and written language.

Which terms are used are mostly a matter of preference and in some instances represent professional perspectives of the users, as is the case with ASHA's suggestion above. It seems sensible, however, at this point in the chapter to make a stab at reducing potential terminology confusion for readers. Although the author clearly embraces the strong language base of most LD and prefers the term, LLD, the term that will be used in this chapter from this point forward is *specific learning disability* (SLD). From the author's perspective, this term is more frequently used in general and special education. It also complements and parallels the term, *specific language impairment* (SLI). However, readers are encouraged to keep a language focus in the forefront of the term, SLD, throughout the chapter.

From these discussions of the various definitions of language impairment and learning disabilities readers have hopefully arrived at this key concept:

Preschool children with specific language impairment (SLI), like Tim in our scenario, are likely the same children who get different labels (e.g., SLD) when they become school-age students because their language problems manifest themselves differently than they did in the preschool period.

A challenge some professionals may have is understanding the ongoing language needs of our students, regardless of their labels, and recognizing that spoken and written language competence underlie and influence school learning (Ehren, Murza, & Malani, 2012; Sun & Wallach, 2014). School-age language impairment may “look like” SLD “as a consequence of . . . [the changes in] . . . context, content, and learning tasks” (Bashir, 1989, p. 181).

### Related Terms and Conditions

**Dyslexia.** When we look at the two definitions of SLD, we see that reading problems are part of both definitions. Because of the prevalence of reading difficulties in SLD—and SLI—populations, it is helpful to review an influential and widely-used definition of *dyslexia*, or specific reading disability. Lyon, Shaywitz, and Shaywitz (2003) cite the definition of the International Dyslexia Association (IDA):

Dyslexia is a *specific learning disability* that is *neurobiological* in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in *the phonological component of language* that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge (*emphases added*). (pp. 1–2)

In both SLD and dyslexia definitions we see again a recognition of various aspects of language. The dyslexia definition makes the case for a language base for reading problems by focusing on the role of the phonological component in the reading process. Likewise, both SLD and dyslexia perspectives suggest a central nervous system basis (intrinsic to the individual) for the difficulties. While the term, dyslexia, is used more often in medical settings, school-based professionals are more likely to categorize students as those with *specific reading disabilities* under the general label of SLD as indicated in the IDA definition (Catts & Kamhi, 2012). If readers are wondering if the populations we have been discussing—children with ongoing language impairment, children with SLD and/or those with reading disabilities/dyslexia—frequently represent overlapping populations, they are correct (Wallach, 2008). The exclusionary approach used to identify these populations (i.e., it is not cognition; it is not sensory impairment; it is not instructional impairment, etc.) and the attempts to make fine distinctions among groups (i.e., Is it language impairment? Is it SLD? Is it reading disabilities/dyslexia?) are ongoing challenges for professionals who serve these children, as well as researchers who attempt to better understand the disabilities and the children who have them.

Catts and Kamhi (2012) provide us with a framework that addresses a way to talk about reading disability subgroups functionally. They call this framework “The Simple View of Reading.” They suggest looking at the interactions among word recognition and listening comprehension as a strategy for understanding poor readers. They propose four subgroups (all of which are supported by research).

- Subgroup 1: These are children with problems in word recognition alone (sometimes referred to as decoding) without concomitant listening (language) comprehension issues. They are often identified as having *dyslexia*. Again, they have difficulty decoding words phonologically and also have difficulty developing a sight-word vocabulary.
- Subgroup 2: These are children who have problems with word recognition (decoding) as well as problems with listening (language) comprehension. They have spoken and written language difficulties.

- Subgroup 3: These are children who have problems with listening (language) comprehension but who have normal or above-average word recognition (decoding) abilities. They are sometimes called children with *hyperlexia*.
- Subgroup 4: These are children with good word recognition (decoding) and listening (language) comprehension skills but who have reading comprehension problems that are unspecified or that cannot be accounted for by the Simple View model. Reading comprehension is an extremely complex process. It is heavily dependent on metalinguistic abilities, which include underlying language skills. But it involves more. Keenan's (2014) current and innovative work sheds light on the complicated nature of reading comprehension problems, indicating that world knowledge, the tools used to assess language comprehension, and the linguistic demands of different texts influence what we view as a reading comprehension problem.

By now, readers are hopefully aware that language, learning, and reading disabilities represent complex and interacting problems. Professionals can get caught in the trap of spending too much time testing and looking for clean diagnostic categories and not enough time helping students acquire and use the language and learning skills and strategies needed to survive and thrive in the classroom and in life. What professionals must, however, be alert to is not overlooking core issues with language that so many of the children have so that their needs for help with the language components of learning and reading fail to be professionally addressed. In one of the most pointed and poignant statements regarding the search for a distinct population of children who are "learning disabled," Christensen's words (1992) echo through the decades. She wrote:

Thirty years of psychometric approaches have failed to provide satisfactory answers to the learning disabled dilemma. A continuation of such a quest . . . [for a distinct group] . . . should not be conducted without addressing the serious social, ethical, and moral issues involved in the pursuit of this select group. (pp. 276-277)

These are strong words. Christensen addresses the importance of finding a balance between testing (and labeling) and teaching children. This notion of balance is certainly evidenced in newer RtI (Response to Intervention) models of service delivery that provide several tiers of instruction and support before more formal, diagnostic testing and placement in special education occurs (e.g., Wixson, Lipson, & Valencia, 2014). Although professionals live in the real world of eligibility criteria for determining services and diagnostic categorizations of students, they need to incorporate descriptive approaches into their assessments that account for classroom and curricular demands, that is, the contexts in which students are required to use language to read and learn (Sun & Wallach, 2014; Wallach, 2008). We have seen that children change over time, as do their language and learning needs. This notion of interactive ability (and disability) leads us to a discussion of two additional terms used commonly to describe students with language and learning disabilities.

***Central Auditory Processing Disorder (CAPD).*** The relationship between language ability and the processing of auditory information remains a topic infused with long-standing controversy. Chapter 8 provides a more comprehensive discussion of issues related to CAPD, so the discussion here will be a brief overview and give a peek at some of the issues.

As described by the American Speech-Language-Hearing Association (ASHA) Working Group on Auditory Processing Disorders (2005), auditory processing and its disorders relate to:

the perceptual processing of auditory in the CNS . . . and the auditory mechanisms that underlie the following abilities or skills; sound localization and lateralization; auditory discrimination, auditory pattern recognition; temporal aspects of audition, including temporal integration, temporal discrimination, temporal ordering, and temporal masking; auditory performance in competing acoustic signals and auditory performance with degraded acoustic signals. (p. 2)

School psychologists, speech-language pathologists (SLPs), parents, and other professionals may recognize symptoms of what might look like an auditory processing disorder,

sometimes referred to as a *[central] auditory processing disorder ([C]APD)* to distinguish this condition from a peripheral hearing impairment, in students who have difficulty with auditory sequencing, auditory figure-ground, auditory blending, and other similarly defined auditory-focused tasks. From Rees's classic article (1973) to a more recent forum in the journal, *Language, Speech, and Hearing Services in Schools*, that addressed various aspects of auditory processing (Richard, 2011), researchers and professionals have batted around the value and functionality of CAPD as a separate diagnostic category for students with language learning and academic difficulties (e.g., DeBonis, 2015). Many see CAPD as a symptom, not a cause, of broader language comprehension issues (e.g., Wallach, 2011). Professionals on this side of the argument question intervention goals and objectives that target auditory skills specifically and separate them from language comprehension goals. To further complicate the issue, there is lack of consensus about definition, assessment, and intervention routes among audiologists. Burkard (2009) reminds us to think about the following each time a diagnosis of CAPD is suggested:

There is currently great divisiveness in the field of audiology concerning CAPD. There is no broadly accepted definition of CAPD. No one really knows what causes CAPD. Despite lofty claims to the contrary, there is no clear consensus concerning the battery of tests that lead to a diagnosis of CAPD. Similarly, there is no widely accepted auditory (re)habilitation program that has been conclusively shown to help those with CAPD. (p. vii)

Until undisputed empirical evidence answers the question posed by the debate about the relevance of CAPD as a diagnostic entity to be assessed and treated specifically (see Vermiglio, 2014), we do know that the interactions among language ability, processing accuracy, and the demands of a situation (Wallach, 2014) need to be accounted for. We also need to account for how the symptoms of a CAPD relate to authentic tasks and situations that children face.

***Attention-Deficit/Hyperactivity Disorder (ADHD).*** In 1980, the American Psychiatric Association adopted the term *attention deficit disorder (ADD)* and described it in two forms: *attention deficit disorder with hyperactivity (ADDH)* and *attention deficit disorder without hyperactivity (ADD without H)*. In the late 1980s the distinction was dropped and the term *ADHD* was adopted (American Psychiatric Association, 2000). Recall that ADHD was introduced in the previous chapter as part of the discussion of toddlers and preschoolers with SLI.

Although there are different ADHD symptoms described along a continuum of behaviors across time, students with ADHD generally have difficulty in directing and sustaining attention and, therefore, have difficulty managing the language-heavy instructional language of the classroom and the abstract and unfamiliar content of core area subjects. They are also likely to interfere with the activities of those around them. For this reason, the American Psychiatric Association considers ADHD to be one class of disruptive behavior disorder.

Two major categories of ADHD are: (1) inattention and (2) hyperactivity/impulsivity. Children with inattention may have difficulty following through with tasks such as the details required to complete homework without mistakes, sustaining attention in the classroom (especially as the curriculum becomes more demanding), and failing to listen when spoken to directly. These children may also have difficulty organizing tasks and may be distracted easily, among other characteristics. By contrast, children with hyperactivity/impulsivity are the ones who have difficulty sitting still. They may leave their seats in the classroom at inappropriate times and have difficulty engaging in activities quietly or reflectively. They are the children who may raise their hands before instructions are completed or attempt to answer questions too soon. In some cases, turn taking is an issue for them because they cannot wait to get into the discussion or conversation. They may participate in conversations with irrelevant utterances and interruptions. Tim, our student from the earlier scenario, demonstrated attention problems related to his language comprehension difficulties that included waiting for instructions to be completed before responding, answering his teacher too soon, and interrupting his classmates.

As with CAPD, ADHD may be the tip of the iceberg (Wallach, 2011; 2014). That is, ADHD may be a symptom—part of a bigger picture. In other words, we might ask: Are attention disorders the *cause* of a student's language and learning problems or are they, at least a

percentage of them, the *result* of language and learning problems (Catts & Kamhi, 2012)? We might reflect on how difficult it is to attend to an unknown language for long periods of time. Similarly, we might think about how long many of us might last listening to an advanced lecture on theoretical mathematics or metaphysics (or any other subject about which we know little)? Clearly, children who have spoken (and written) language comprehension impairments may show symptoms of ADHD because it is difficult for them to maintain attention to linguistic structures and content that are above their ability levels (Keenan, 2014). Considering the other side of the coin, however, we must also recognize reciprocity between attention and language. Children who have difficulty attending to language may create a reality that sets limits on what language they learn. Finding ways to bridge the attention-language/learning gap creates a challenge for professionals who serve these students. As we saw in Chapter 3, there are currently concerted research programs to discover the degree to which SLI and ADHD are discrete conditions and the assessment methods that might assist in differentiating between the two (e.g., Redmond, 2016a; 2016b; Redmond, Thompson, & Goldstein, 2011).

### Prevalence and Who's Who

We now know that the distinction among populations (i.e., children with SLI, SLD, and/or specific reading disabilities) is not always clear. Consider these numbers:

- 50 percent of students in special education are identified as students with SLD; 80 percent of those students have primary difficulties in the *language-based skills* of reading and writing (U.S. Department of Education's [2006] estimate, as cited in Paul & Norbury, 2012); the majority of students characterized as "learning disabled" in schools are at risk for academic failure due to weak literacy foundations and various aspects of language (Mason, Meadan, Hedin, & Corso, 2006).
- A smaller portion (20 percent) of students in special education are identified as SLI (U.S. Department of Education, 2006; 2007; Moore & Montgomery, 2008); additional findings have indicated that at least about half of children with SLI populations studied have poor reading abilities and the majority read below their grade levels (e.g., Catts, Fey, Zhang, & Tomblin, 1999; McArthur, Hogben, Edwards, Heath, & Mengler, 2000); as noted in Chapter 3, there is at least a 7 percent prevalence of SLI within the kindergarten population; as a chronic and life-long challenge, children with SLI continue to have ongoing language learning needs and, as noted, may be labeled as children with SLD when their language problems manifest themselves in academic areas (Bashir et al., 1984; Sun & Wallach, 2014).
- Tomblin and his colleagues (Tomblin, Zhang, Buckwalter, & O'Brien, 2003) reported that 60 percent of their kindergarteners with SLI continued to show persistent language impairments through fourth grade; going beyond fourth grade, Stothard, Snowling, Bishop, Chipchase, and Kaplan (1998) found that children who are diagnosed with SLI at young ages (kindergarten or younger) continued to experience language and academic difficulties as adolescents *even for those whose language difficulties seem to have resolved early*; as we shall see in Chapter 5, language, literacy, and learning problems remain a persistent and lifelong challenge.

While students with language impairment improve in many areas across time, longitudinal research, both old and new, suggests strongly that children with early language disorders fail to "outgrow" these difficulties or catch up with their typically developing (TD) peers.

Prevalence numbers are dynamic and ever-changing depending upon how a problem is defined. Professionals often bring different perspectives to the identification table. McArthur and colleagues (2000) emphasized the importance of evaluating written, including reading, and spoken language skills for children regardless of whether they present as having specific reading disabilities or SLI. With an understanding of the reciprocity between spoken and written language systems, we now know that poor readers, regardless of their diagnostic designations, are doubly challenged. They are at risk for

spoken language and learning difficulties without the benefit of a solid written language system, or a “reading to learn” system, and also challenged in the absence of a “learning to read again” option. The “learning to read again” option relates to the level of literacy needed to access content area subjects, such as social studies, history, science, mathematics, and language arts.

Poor writers are also at a tremendous educational disadvantage for other reasons. Writing is a primary way that students demonstrate what they know, especially as they move beyond third grade. Reciprocally, writing improves reading and helps students gain employment and communicate in multiple ways (Dockrell, 2014; Graham & Herbert, 2010; Sun & Wallach, 2014). Reminding professionals of the language learning and learning disabilities connections, Dockrell (2014) notes that many students have difficulties putting their thoughts on paper, completing homework assignments, and taking notes in class, among other writing-heavy school tasks, but these problems are exacerbated for students with SLD, likely because of the language impairment underlying their learning abilities. Writing problems are commonly reported for students with ongoing language problems, as well as for those students with so-called “resolved” language problems, per Stothard et al., 1998, findings. Dockrell (2014) hypothesizes that “written language . . . [issues] . . . can be conceptualized as a window into residual language problems” (p. 511). She adds that distinctions between SLI and SLD populations are often determined by “arbitrary cutoffs” that are “insufficient . . . to guide intervention” (p. 513).

## LANGUAGE AND ACADEMIC EXPECTATIONS: MATCHES AND MISMATCHES

### On Becoming Literate

**Defining Literacy.** We have seen that children, like Tim in our earlier scenario, who are diagnosed as SLI in the preschool period, are more likely than not to have reading and writing problems as they encounter school and to be classified as SLD. Importantly, however, SLD often leads to problems acquiring higher levels of *spoken language* comprehension and expression. Higher level spoken language comprehension and expression, such as listening to and understanding lectures and engaging in debates, are considered aspects of literacy, and acquiring competencies with these skills is considered an aspect of becoming literate (e.g., Nippold, 2007; Scott & Balthazar, 2010; Suddarth, Plante, & Vance, 2012; Ward-Lonergan & Duthie, 2012). Literacy is not just learning to read and write, and mastery of higher levels of language influences higher levels of academic success.

School learning means mastery of more formal, connected discourse abilities in spoken and written language as part of becoming literate. These linguistically based discourse abilities include things like completing formal presentations in class, interpreting the relations among events in social studies, explaining the reasons why characters in a story made certain decisions, summarizing the steps of a science experiment (e.g., Nippold & Scott, 2009; Wallach, Charlton, & Bartholomew, 2014). In addition, as children move through the grades, their performance is measured predominantly through written, not spoken, renditions (Dockrell, 2014). Academic success is clearly influenced by many factors, but understanding the language underpinnings of school tasks (Ehren, 2013) helps us to understand what is meant by SLD.

**Developing three tiers of literacy.** School-age students are challenged to acquire not one, but three tiers of literacy: foundational literacy, content literacy, and disciplinary literacy (e.g., Fang, Schleppegrell, & Moore, 2014). *Foundational literacies* include skills like basic reading and writing, being able to engage in conversations, and telling and writing simple stories. *Content literacies* include learning to make predictions, form inferences, and read expository text, that is, the formal language of textbooks. *Discipline-specific literacies* include those language skills needed to access curricular information (i.e., the ability to read science, history, mathematics) (e.g., Ehren, Murza et al., 2012; Shanahan & Shanahan, 2012). Thus, acquiring

literacy goes way beyond decoding and reading fluency (Fang et. al., 2014). Research suggests that late-emerging poor readers who demonstrated adequate foundational literacy in the early school years may start to show reading problems around third or fourth grade when content and disciplinary literacy skills become more predominant (e.g., Catts, Compton, Tomblin, & Bridges, 2012). *This is often the period when language impairment and SLD become especially difficult to distinguish.* Thus, one of the many challenges facing special and general education professionals is to recognize the literacy-learning patterns and gaps that occur before children arrive at school as well as to evaluate the language knowledge, skills, and strategies that underlie literacy learning and academic success (Ehren, 2009; Wallach, 2008).

*Using literate language styles.* The demands placed on first graders are significantly different from the demands placed on fourth graders. In her now classic discussion, Westby (1994) conceptualized some of the changes in language learning demands as a continuum that moves from oral to literate styles. The continuum stretches from the most informal types of communication exchanges, like chat and conversational language, to the more formal types of communication, like planned written discourse/planned academic language. In between chat and conversational discourse and formal discourse are language events like narratives, keeping personal journals, and writing letters to friends (Wallach, 2008). Children need to master different language styles, as well as learn where and when to use them. For example, informal language might work when writing emails to close friends. On the other hand, such a language style does not work for a school report. Engaging in academic endeavors means that children must become more proficient in using and processing language that is formal, planned, impersonal, and written. Children must also shift their oral presentation styles to fit the “formality” required in school settings. They not only have to learn to read but they also need to learn to “*talk like books*” (Wallach, 2008, p. 36).

*Mastering the language of textbooks.* Although narratives remain a significant aspect of language learning throughout life, we saw in previous chapters that *expository discourse* is the predominant text of school; it is the language of textbooks, instructions, classroom lectures, and technical papers. Expository text is a form of nonfiction and non-narrative text that conveys information about the natural or social world (Duke, 2004) through facts, technical or content-specific vocabulary, opinion, analysis, persuasion, classification, or examples (Ness, 2011). Chapter 2 introduced readers to several classifications of expository discourse types. Another classification of the types of expository text includes: *comparison* (compare/contrast), *causation* (cause/effect), *procedural* (temporal sequence), *problem/solution*, *collection/description* (descriptive), and *enumeration* (Ward-Lonergan & Duthie, 2012). Children have to learn to manage the structural variations of expository text, along with all the technical and formal vocabulary and sentence structures that are part of the expository text landscape (Nippold & Scott, 2009). For example, words and phrases like *similar to*, *different from*, *except for*, *the cause of*, *as a result of*, *in addition to*, *prior to*, among many other transitional words, must become part of students’ spoken and written repertoires. Transitional words often become clues to the listener or reader about which text structure is being presented (Nippold & Scott, 2009). Classroom textbooks also include many features that accompany written expository text, such as illustrations, photographs, diagrams, tables, charts, margin notes, bolded words, maps and other features such as headings, subheadings, indexes, and page numbers (Duke, 2004). These text features are provided to facilitate comprehension, but they may be distracting or confusing for students with SLD (Duke, 2004) or even not be noted by students with SLD as features designed to be helpful. The ability to comprehend informational text plays a pivotal role in academic and lifelong success (Duke, 2004; Ward-Lonergan & Duthie, 2012).

*Acquiring metalinguistic ability.* As we know from previous chapters, the ability to reflect upon language consciously, make judgments about language, manipulate language segments and put them back together, among other language tasks, involves metalinguistic skill, or language awareness. In her early work on metalinguistic development, van Kleeck (1994) noted that the ability to think about language and treat language as an object “frees both language

and thought from the immediate context and fosters the development of abstract, decontextualized thought" (p. 53). Thus, when trying to understand children with language learning and academic problems, we need to consider the role of metalinguistic development and ability in the process. Van Kleeck reminds us to think about a two-tiered process in language learning and disorders—the spontaneous layer of language use and the meta-layer of language. In social situations, including those that involve casual conversations, listeners and speakers tend to be in spontaneous and automatic mode. They do not "stop to think" about every word and sound unless a problem (perhaps an unknown word or a heavy accent) arises. Likewise, proficient readers do not analyze every word of text, especially when they are reading familiar or less demanding text (e.g., *People* magazine). We step into meta-mode when we have to analyze or regroup linguistically. Textbook language, for example, places metalinguistic demands on students, among other demands. Many commonly used language assessment and intervention tasks, as well as classroom tasks, have metalinguistic components. Consider the following examples (adapted from Wallach, 2008):

1. Do these words sound the same or different: *rope-robe; thief-leaf; king-ring; lake-lake*?
2. Circle all the pictures that begin with the /s/ sound: *sing, ship; Sue; soda, church, star*
3. I'm going to say a word; tell me how many sounds are in the word: *bat, ship, cowboy*
4. Is this a "good" (or grammatical) sentence? "*The men is waiting for the check.*"
5. Underline the sentence that tells us the main idea in the paragraph.
6. Your assignment is to write a current events report.

These tasks are familiar to special educators, SLPs, and classroom teachers. All the tasks tap into metalinguistic knowledge and skill. The first three relate to phonemic awareness (i.e., the conscious manipulation of and making judgments about sounds), the fourth example includes a grammaticality judgment, and the last two interface with higher level meta-abilities that relate to connected text. As both spoken and written text becomes more demanding, and as classroom tasks require more thinking and planning, the meta-load increases. That is, the listener/reader/learner has to analyze and evaluate language on a more conscious level. This is a reality of academic learning. While metalinguistic ability relates specifically to language awareness, another meta-component related to academic success is *metacognitive ability*. Metacognitive skills relate to the ability to think more consciously about thinking. They include self-talk, self-monitoring, and planning, among other skills (Singer & Bashir, 2012).

***Summary Thoughts on Becoming Literate.*** Two points summarize our discussion:

- Literacy is a broad concept that goes beyond the acquisition of reading and writing (sometimes referred to as print literacy and expanded upon in our next section). Becoming literate means many things, including the ability to use formal styles of language in speaking (e.g., presenting at a conference; presenting in class) and in written reports for school.
- Students must master the intricate and interactive aspects of literacy, including foundational, content, and disciplinary literacies.

It follows that professionals working with students with SLD are challenged to evaluate the components of their assessment and intervention tools and techniques. Do they take into account broader definitions of language learning and literacy?

Longitudinal studies show individual variation among and within groups, as discussed throughout this chapter, and a recognition of various subgroups that reflect the spoken-written language relationship in different ways across time. Some children might have spoken and written language difficulties that "play off" one another; others might have reading and writing difficulties in what might seem like an absence of overt spoken language difficulties (Catts & Kamhi, 2012). An issue is how we examine spoken language to identify difficulties that might not be obviously explicit. Looking at word recognition only versus comprehension patterns sometimes forms a basis for differentiating subgroups, but background

knowledge, metalinguistic ability, and the nature of the tasks tapping literacy-based skills must weave their way through assessment and intervention choices. In the main, however, the sobering situation is that:

- *children who are failing to read by the end of first grade almost never catch up in elementary school* (Catts, Fey, Zhang, & Tomblin, 2001), and
- *75 percent of children who are experiencing reading failure in third grade will continue to have reading problems in ninth grade* (Lyon, 1998).

These data clearly indicate the need for effective and early intervention for children who show difficulties in the foundational stages of reading (decoding and comprehending simple texts) and preparation in the very early elementary years for the skills required for “reading to learn,” as well as for those skills and strategies related to “learning to read again” (Ehren, Murza et al., 2012).

In the section that follows, we will take a closer look at learning to read. The section has two major subtopics: (1) Learning to read: Making the transition from spoken to written language; this section introduces some basic challenges facing children as they advance from talking to reading; and (2) A consideration of two models of reading that provide insights into how children move from being nonreaders to readers. Again, readers of this chapter are reminded to keep broader definitions of literacy in mind as these affect our notions of what it means to be a proficient reader.

### Learning to Read

**Transitioning from Spoken to Written Language.** While we have recognized the interplay among spoken and written language systems throughout this chapter, we also recognize that the two systems, while intimately connected across development, are not mirror images of one another. Harkening back to discussions in previous chapters and in this chapter, we know that conversational language is generally more informal and contextualized. When we speak in conversation, we use facial, gestural, and other nonlinguistic cues to get the message across. We take advantage of the physical context and listener knowledge to patch up deficiencies in vocabulary. Deictic words, such as *these* and *here*, work perfectly well in conversation, especially when they are accompanied by an appropriate gesture. In addition, spoken language is unsegmented. That is, words and sounds flow together. The unsegmented nature of spoken language is exemplified by listening to a foreign-language speaker. We often cannot figure out where one word begins and others end. Written, academic language is, by nature, more formal and decontextualized. In written language, connections cannot be made by vague words (*these*, *here*) accompanied by gestures. Connections are made linguistically through specific words that signal meaning. Thus, when an author uses words or phrases like *George Washington*, followed by *the general*, *he*, *the leader*, the reader has to understand that these words are connected in the text and that they refer to the same person. Deictic words, or unclear referents, cannot be used to overcome a lack of vocabulary. In conversational speech, some allowance is made for the use of vague words. We all say *thing*, *stuff*, *guy*, and *sort of* and allow others to do the same. In writing, however, more precise communication is expected. Words must be carefully evaluated for subtle differences in meaning. And since this is the expectation for writing, it follows that children will confront more sophisticated vocabulary when they read. Finally, unlike spoken language, written language is segmented. That is, there are spaces between words in sentences and letters within, which are part of the conventions of an alphabetic writing system.

In written language, the components of spoken language (phonology, morphology, semantics, syntax, and pragmatics) are represented in print. However, children learning to read must come to terms with the stylistic and functional differences between spoken and written systems. Younger and beginning readers must acquire phonemic awareness skills (i.e., those *metalinguistic skills*), including identifying letter-sound correspondences, the number of sounds in words, and segmenting and blending sounds, that relate to foundational/decoding skills required to reconcile the unsegmented and segmented differences

between speech and print. Difficulties with various elements of these spoken-to-written transitions are found in children with language-learning, reading, and writing difficulties (Troia, 2014). In addition to managing speech-to-print differences (i.e., *learning to decode*), novice readers have to move from managing a contextualized form of language to managing a decontextualized one (i.e., where words and sentences create meaning in the absence of nonlinguistic cues). They also have to learn to manage syntactic forms like embedded relative clause sentences, passive sentences, other complex syntactic forms, and curricular words (e.g., *prewar, postwar, democracy, evidence for*) that may be less predominant in spoken language (e.g., Nippold & Scott, 2009; Scott & Balthazar, 2010). Thus, the interplay among decoding skills, word knowledge, semantic-syntactic proficiency, and connected-discourse savvy, not to mention a reader's background knowledge and experience, come together to create competent readers (e.g., Keenan, 2014).

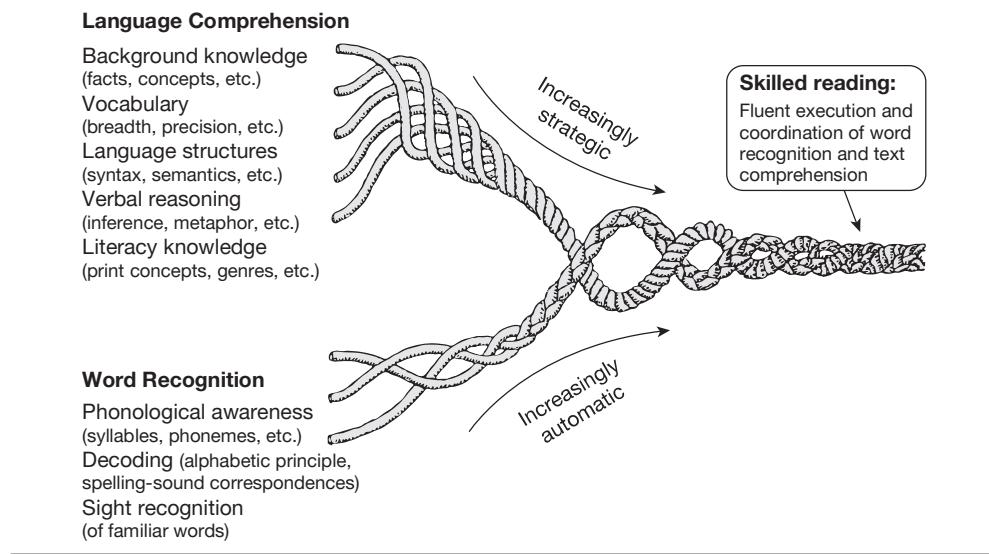
Kamhi (2009) reminds professionals that they must consider reading processes that take into account both word recognition and comprehension. The ultimate goal of young readers, including children with SLD, is to learn to do some things with increasing automaticity so that they are able to focus on comprehending and interpreting text (Keenan, 2014; Wallach et al., 2014). Going even further, Keenan (2014) notes that

the “click of comprehension”—the abstraction of meaning—is a multi-faceted and complex series of interactive processes that relate to both the learner and the assessment and/or instructional and intervention tools chosen to determine what that learner “knows” about a subject. (p. 469)

Keenan's last point about “what the learner knows about a subject” encourages us to separate background knowledge (prior information about a subject) from linguistic knowledge (i.e., syntactic ability, semantic ability, metalinguistic ability) when considering reading comprehension difficulties. As an example, we might think about the experiences we have had with children before and while we attempt to comprehend a chapter on child language development versus our prior experiences with quantum physics. Keenan (2014) reminds us that background knowledge, while insufficient for comprehension alone, has a significant effect upon a reader's ability to process, retain, and understand text, which is the ultimate goal of proficient reading.

***Two Models of Learning to Read.*** There are multiple models that attempt to explain the processes involved in learning to read and how children navigate those processes. Each model reflects the theoretical perspective of its developer and none completely and fully adequately explains all aspects of what is an extraordinarily complex learned human behavior—and only humans do it. Two models are presented here. These explain many of the elements of learning to read and the challenges that children with SLD face. These models present with somewhat different perspectives, differences that are important for professionals to consider as they work with children with SLD.

Scarborough's (2003) “Reading Rope,” shown in Figure 4.1, illustrates two major strands of the reading process: language comprehension and word recognition. At the bottom of the model are Word Recognition Strands. These include the awareness of sounds within words, the idea that the alphabet represents sounds, letter patterns within words, and recognition of familiar words. At the top of the model are Comprehension Strands. These include use of background knowledge, semantic and syntactic information, knowledge of connected text structures, and inferencing skills. As young readers get better at word recognition (i.e., decoding) and as word recognition becomes more automatic (as with more proficient readers), decoding words is accomplished seemingly without much energy or focus, allowing the reader to attend to comprehension and interpretation of text—the Comprehension Strands. The fluent and *integrated* execution of the two strands is reflected in the tightening of the rope as *skills become increasingly automatic* and as *comprehension becomes more strategic*, two critical concepts of reading that inform our intervention with students with SLD. In other words, one of the many challenges for professionals is to help students develop increasingly more automatic abilities (e.g., more automatic word recognition), so that they can put more attention into methods that facilitate “getting to” an author's meaning and purpose.

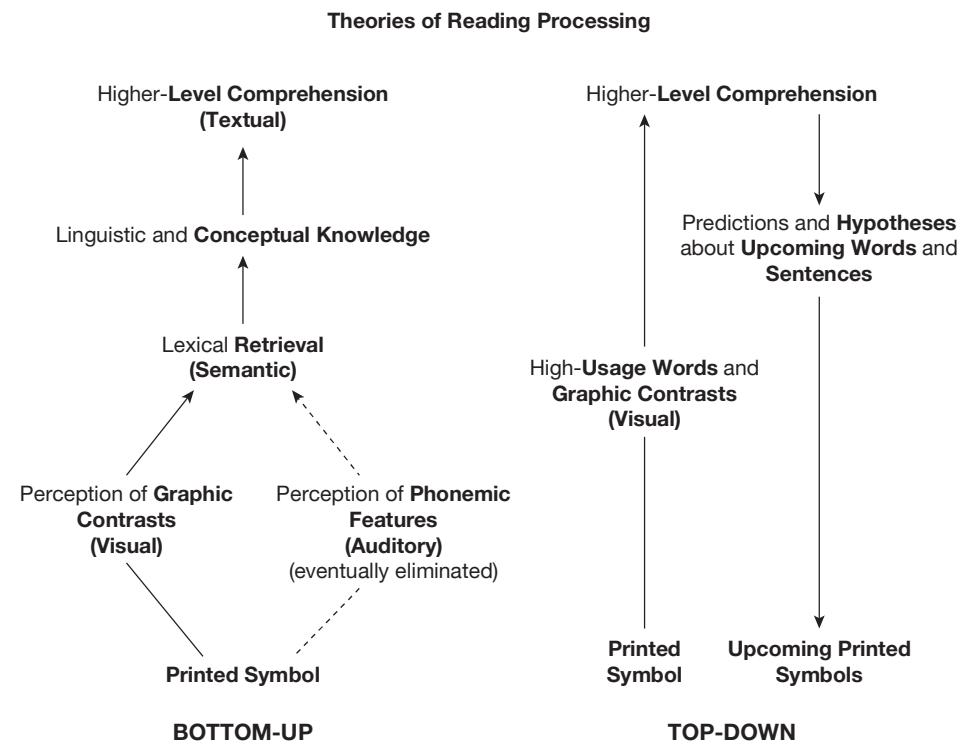
**FIGURE 4.1 |** The Reading Rope

Source: Scarborough (2003).

Proficient readers do many things poor readers do not do (or have difficulty doing). For example, they use background knowledge and linguistic knowledge to get to meaning. They visually scan words quickly and stop to think (e.g., being more “meta” by rereading a passage) only as needed. Indeed, they may check word recognition when facing unfamiliar words, use context to get to the meaning of words they do not know, and look up word meanings in the dictionary. Good readers use their spoken and written language knowledge—using structural cues and phrases like *by contrast*, *similarly*, titles, and other textual clues (like the type of expository text being used)—to comprehend text (e.g., McKeown et al., 2009). They engage in both literal and inferential comprehension strategies. Good readers also modify their approach to printed text by considering the differential demands placed upon them. For example, the energy and concentration exerted reading *People Magazine* would be different from the energy and concentration exerted, not to mention linguistic knowledge required, reading a university-level science text. Reading a language arts assignment versus reading an historical piece demand different levels of linguistic savvy (Fang et al., 2014). Indeed, proficient readers continue to “learn to read again” (ala Ehren et al., 2014) by learning to understand the requirements of a text’s genre and the level of knowledge, skills, and strategies employed to successfully comprehend and interpret written text.

Owens’ (2016) approach, shown in Figure 4.2, mirrors some of Scarborough’s thinking about the components of reading and its processes. Owens conceptualizes “bottom up” and “top down” processes. As part of the “bottom up” processes (Scarborough’s Word Recognition Strands), “reading is translating written elements into speech” (p. 364). Knowledge of both perceptual features of letters and grapheme-phoneme (letter-sound) correspondences, plus lexical access, form the word recognition subcomponents in decoding. By contrast, “top down” or problem-solving, cognitive, comprehension elements work toward formulating meaning (Scarborough’s Comprehension Strands). Reiterating the complex elements of comprehension and the reader’s role in interpreting text, Owens (p. 364) notes: “A reader generates hypotheses about written material based upon his or her knowledge, the content, and the syntactic structures used.”

Very young, beginning readers and children with SLD have challenges on the path to automatic word recognition and, ultimately, being able to focus on comprehending an author’s message. We know that pre-readers often “recognize” visual symbols in what is called the logographic stage of reading (Catts & Kamhi, 2012). They recognize holistic patterns by



**FIGURE 4.2 |** Theories of Reading Processing

Source: Owens (2016).

“reading” the McDonald’s sign, the “CocaCola” pattern, and like symbols that get them to meaning. Eventually, they have to use phonological awareness and phonemic segmentation and blending skills to decode words (Troia, 2014). Coltheart (2005) talked about children’s dual route to learning to read aloud: the *lexical route* and the *nonlexical route*. With the lexical route, says Coltheart, familiar, printed words activate the semantic system, that is, the meaning. Similar to Owens’ thinking, we sometimes call this “sight word reading.” In “sight word reading,” one goes “directly” from print to meaning. According to Scarborough, “sight word” reading means that automaticity has arrived. That is, there is no need to sound out the word. In Coltheart’s nonlexical route, however, when faced with visually unfamiliar words (i.e., those whose printed form is not recognized automatically), children must use grapheme-phoneme correspondences (i.e., sounding out the word) to access meaning.

The relevance of both models is that they show us the multi-layered, complex nature of reading and learning to read. There is a very complicated interaction between fluent word reading and comprehension. Importantly, several processes often occur *simultaneously* in the real world, especially by the time children reach third and fourth grades. Readers must use language and conceptual knowledge, even at the word recognition stage (Owens, 2016). Indeed, a child uses “his or her knowledge to help figure out . . . [a] . . . word—much as in speech, when listening, predicting the next word, phrase, clause” (p. 365). We are also reminded to consider what Keenan (2014) wrote about “the click of comprehension” (p. 469). And Scarborough (2003) reminds us that language impairment weakens the tightness of the “Reading Rope” at different points in time, creating weaknesses in various “top down” or “bottom up” processes, to use Owens’ terms. When we think about students with SLD, we need to consider their spoken language abilities, including their metalinguistic abilities, their life experiences and knowledge, and their abilities with the elements of reading described in the models.

In the next section, we outline some of the significant language patterns reported in school-age children with SLD. The components of form, content, and use are used as a

conceptual framework for the discussion, in addition to considering aspects of connected text that involve an integration of many aspects of the three major dimensions of language. Once again, readers are reminded of the interface of spoken and written language at school-age levels and the interaction among language components.

### Language Characteristics: A Look at Selected Patterns in Children with SLD

Research during several recent decades alone has contributed a large, cross-disciplinary body of information about the communication and language difficulties of children with SLD. The research literature is, however, unfortunately muddled by the various different terms used to refer to the children in the studies. Recall our earlier discussion of terminology. To further complicate the issue, the groups of children in the research may also be described as “reading disabled,” “poor readers,” or “dyslexic.” Nonetheless, after we have waded through the mud of terminology and realize that these are often the same children, albeit with different labels, the body of research provides us with some broad-based information about the differences between children with SLD and their TD peers. For consistency’s sake, this chapter will continue to use the term SLD, even though the authors of some of the studies referred to here might have used different terms in their work.

We must keep some ideas in mind when we are thinking about the information to come.

- Children with spoken and written language learning difficulties represent heterogeneous populations.
- Spoken-to-written and written-to-spoken interactions must be kept in mind when trying to understand academic/learning disabilities.
- Macro (overall structure knowledge and skill) and micro (smaller pieces of text like sounds, words, sentences) aspects of language interact with one another.
- SLD resides inside and outside of children’s heads such that we must understand communication and language problems within the context of classroom and curricular demands.

The discussion that follows integrates spoken and written language components. It is organized in this way: *form issues* related to morphosyntactic and phonological components of language; *content issues* related to “meaning making” in terms of word knowledge, naming, and the comprehension of larger units of text including a consideration of background knowledge; and *use issues* including selected social-pragmatic patterns and connected text patterns. Connected discourse, with a focus on narrative and expository text, will be discussed separately.

**Form Issues.** As we know from previous chapters, morphosyntactic aspects of language include both morphology and sentence structure components. Children with SLD can struggle with mastery and use of the morphological aspects of language. Some of the patterns described for preschoolers with SLI often continue to be seen in school-age children with SLD, but they generally show themselves when language becomes more complicated and demanding (e.g., requiring interpretation across sentences or clauses) and in written language. Many studies suggest that children with SLD lack sensitivity to morphologically based regularities of words. They may also lack morphological awareness or the ability to segment, evaluate, and talk consciously about suffixes, prefixes, and other word building relationships. Difficulties with command of past-tense inflections occurring with both regular and irregular forms, among other forms, are also reported to be problematic for students with SLD.

While not always apparent in simple sentences and less complicated language, problems with morphology may persist in the written language of students with SLD. Written language samples are reported to differentiate TD children from those with SLD. For example, children with SLD may show omission and/or substitution errors in the use of regular past tense, plurals, and verb-subject agreement (Scott, 2014; Windsor, Scott, & Street, 2000). Clearly, difficulties with grammatical morphology that involve decoding the meanings of morphologically complex words in spoken language (those with one root or free morpheme

and one or more prefixes/suffixes or bound morphemes) have an impact upon children's written language acquisition (Carlisle & Goodwin, 2014). Nagy and Anderson's (1984) classic finding that TD children's reading materials include approximately 60 percent of morphologically complex words also emphasizes the importance of morphological development in literacy. Mastery of the science curriculum involves many linguistic skills, including understanding the derivation and categorization of words (Fang et al., 2014).

Syntactic ability is a key element of language/literacy acquisition and academic success (Nippold, 2014; Scott, 2014). Although able to demonstrate acquisition of basic syntactic forms (e.g., using grammatically correct language to engage in conversations, producing simple sentences in spoken or written reports), we know that the majority of school-age children with SLD demonstrate difficulty with multi-clausal/literate-style sentences (Scott, 2014). These students have difficulty using sentences that are generally longer and contain higher-level abstract nouns and metacognitive verbs associated with academic language (Sun & Nippold, 2012). Reminding us of the interactive nature of language components, Sun and Nippold (2012) write about the *lexicon-syntax interface*. Nippold (2014, p. 154), using a seventh grade curriculum example in Language Arts, notes that "the use of later-developing metacognitive verbs (e.g., *infer*) prompts the use of nominal clauses in complex sentences (e.g., 'The reader infers that Zeus was furious when Prometheus defied him')." Thus, word knowledge (semantics) and syntactic proficiency influence one another. Studies that have used structured communication tasks, such as describing unfamiliar objects and summarizing fictional and nonfictional videos, indicate that children with SLD in grades 2, 4, 6, and 8 produce fewer words per T-unit (one main clause with all the subordinate clauses attached to it) and fewer words per main clause than TD students at the same grade levels (e.g., Scott & Windsor, 2000).

Many studies provide information about the syntactic gaps that persist in language learning across time (e.g., Scott & Koonce, 2014) and that cut across success with comprehension and production of connected text (e.g., narrative and expository text) and content-area subjects. Syntactic difficulties in the writing styles among students with SLD are also documented widely (e.g., Dockrell, 2014). Indeed, while complex instructional language that uses sentences like those with subordinate/main clause constructions and multiply-embedded features and with passive voice is challenging for all students, "children and adolescents with . . . [specific learning disabilities] . . . struggle inordinately with these types of sentences" (Scott & Koonce, 2014, p. 287).

Phonological development and phonological disorders are aspects of language focused on the linguistic structure related to the speech sounds of language. Some children who have difficulty being understood have problems expressing language through speech because they have not accurately learned or are not applying the rules governing the phonological system of the language. Their problems are *systemic* and go beyond issues with individual sound omissions or substitutions. These types of phonological problems are considered phonological disorders and are forms of language problems. Other children have fewer, less complex "breaks" in the system that may be specific to one of two substitutions, omissions, and distortions that do not affect intelligibility to the extent that phonological disorders can and often do. These children have *articulation errors*. We refer to these children as having speech problems, rather than language problems. A discussion of this aspect of language and speech is beyond the scope of this chapter, but readers are reminded of topics in Chapter 1. We focus here on phonological and phonemic awareness.

Phonological and phonemic awareness refers to a broad set of skills that are part of evolving metalinguistic development. These skills include the ability to manipulate word, syllable, and sound segments in a conscious way. Phonological awareness sometimes refers to a more general awareness of sounds, including such abilities as rhyming, separating (or identifying) words from sentences, and identifying syllables within words. Phonemic awareness typically has a more specific reference to the segmentation, blending, and making judgments about individual sounds within words. Developmental studies and studies of children with SLD (e.g., Catts & Kamhi, 2012; Schuele & Boudreau, 2008) shed light on the importance of phonological and phonemic awareness on the acquisition of reading, as seen in the Scarborough and Owens models. Many children with SLD, including those described as

poor readers and especially those who are poor decoders, have difficulties with this aspect of phonology connecting sounds to letters and reconciling speech and print differences. As noted previously in this chapter, while speech is *unsegmented* (i.e., words and sounds flow into one another), print is *segmented* (i.e., words and letters have spaces in between them). Thus, moving from spoken to written language (and back again) requires metalinguistic awareness. When we ask a child to “Tell me the first sound in *bat*,” “How many sounds are in the word *bat*?” “Do these two words sound the same or different: *bat-cat*?” “Put the sounds together to tell me the word: /b/ . . . /ae/ . . . /t/ (*bat*),” we are asking the child to segment, judge, blend sounds, and manipulate the sounds of language in a direct and conscious way. This is an aspect of phonological development that requires going beyond using sounds for talking and is one of the language learning factors related to literacy success, at least in the early stages of learning to read (and write) the language (e.g., Catts & Kamhi, 2012; Troia, 2014).

**Content Issues.** Recall that content relates to an area of language also referred to as *semantics*. Describing the semantic skills of TD children and those with SLD is no easy task, especially when we know that helping students derive and express meaning in spoken and written form is the core of academic and life-long learning. Testing the vocabulary size of children using norm-referenced tests has been the most common method to describe the semantic skills of these children. This static measure of semantics is inadequate and can give misleading results about students’ semantic abilities considering the complex nature of word learning and the broader-based nature of the comprehension and expression of meaning in sentences and connected discourse. Thus, when considering the nature of children’s semantic abilities, we need to consider several interactive pieces—word meaning (and retrieval), sentence meaning, and meaning within connected text. A balance between understanding students’ micro (i.e., morphosyntactic, word, and sound components) and macro-level (i.e., connected text) abilities is essential in understanding how students can learn in classrooms.

**Word Level (Lexical) Considerations.** Both observation and controlled experiments indicate that many children with SLD have underdeveloped lexical systems. This is reflected by their difficulties using more elaborated vocabulary in both spoken and written samples (Dockrell, 2014; Wallach, 2008). Reports on students with SLD at school-age levels frequently cite their difficulty with advanced uses of more literate-level vocabulary words (e.g., *moreover*, *nonetheless*, *imperious*) and later developing metacognitive verbs like *infer*, *believe* (Sun & Nippold, 2012; Nippold, 2014). Many children with SLD are commonly found to misunderstand words with multiple meanings and are less proficient at recognizing and using words that are structurally related, such as antonyms, synonyms, superordinates, and subordinates. Poor lexical knowledge is also evidenced in their inability to provide definitions of abstract nouns (e.g., *burden*, *gratitude*, *friendship*) that are precise and reflect essential meaning (Nippold, 2007). “Linguistic glue words,” or smaller language units that hold complex sentences together, words like *although*, *except for*, *if*, also create problems for many students with SLD (Scott & Balthazar, 2010; Wallach et al., 2014). Likewise, the lexicon-specific items in content area subjects often interfere with comprehension. Consider words and phrases like *postwar*, *prewar*, *prior to* in history and the nominalization of words in science like *melting* (e.g., Melting is the process . . .) (Fang et al., 2014; Wallach, Charlton, & Christie, 2010; Wallach et al., 2014).

An even more problematic aspect of semantics for students with SLD is the comprehension and use of nonliteral word meanings. Figurative language, which is language that expresses meanings beyond literal meanings, cuts across word and sentence structure boundaries. This aspect of language, with its long developmental period well into adolescence, is part of metalinguistic development. Most students with SLD perform better on aspects of literal comprehension and expression and have difficulty comprehending and explaining the meanings of figurative language expressions, such as metaphors, idioms, and proverbs, than their TD peers (Abrahamsen & Sprouse, 1995; Nippold, 2007; Wallach, 2008).

The study of word finding, also known as word retrieval, in children with SLD is a complex and multifaceted one. German’s (1994) landmark works, among others’ works, have provided a great deal of information about the word finding problems of children with SLD.

Children's word finding difficulties are generally characterized by repetitions, filled pauses, reformulations, and circumlocutions. Some of the factors that may underlie word finding and, therefore, enhance lexical access, include the frequency of occurrence of words in the language, words that follow typical stress patterns, and words that are acquired earlier so that they are known longer (Newman & German, 2002). In both confrontation naming and spontaneous speech, children with SLD produce a range of behaviors that either are different from those of TD children or occur with greater frequency (Wiig, Zureich, & Chan, 2000).

DeKemel (2003) reminds us that there are many aspects of vocabulary ability and impairment. She talks about *conceptual* (world knowledge related to words), *semantic* (comprehension and recognition of words), and *naming* (phonological representation or production of words) components. For example, a child may know what a *cat* is because he or she has had some experiences with cats, seen cats, and knows what they look like and what they do. The child may recognize the word *cat* when hearing it; the child might be able to point to a picture of a cat after hearing the word. Finally, a child might be able to produce the name, /kaet/. Understanding students' status in terms of their word knowledge and naming and retrieval abilities can be complicated. But DeKemel's (2003) suggestions, among others, encourage us to consider semantic (comprehending words) and phonological (naming) aspects of lexical ability, in addition to conceptual foundations. Use of targeted prompting and scaffolding techniques to facilitate word retrieval is a critical aspect of exploring students' lexical proficiency or difficulty (McGregor & Windsor, 1996). And the role of written language (both reading and writing) is an essential consideration in thinking about lexical deficits in children with SLD. Vocabulary knowledge and use are enhanced by access to print (Catts & Kamhi, 2012; Sun & Wallach, 2014), that is, by spending time reading and writing, hence the importance of the reciprocal interaction between spoken and written language.

*Sentence Level Considerations.* The semantic challenges facing children must go beyond lexical analyses. Overlapping with some of the concepts expressed in the form section covering morphosyntactic issues, comprehending the meanings expressed via complex sentences is another aspect of language that presents difficulties for many students with SLD. Difficulties expressing meanings in writing are also evidenced in their written renditions (Dockrell, 2014; Scott, 2014). Consider this sentence from a grade 5 social studies text (Harcourt School Publishers, 2000):

The Boston Tea Party was the colonists' response to the unfair tax instituted the prior year by the British. (p. 280).

Figuring out the who-did-what-to-whom-when is difficult for several reasons:

- the complex nature of the sentence structure; the “doers” of the action are not explicit in this passive form,
- the number of propositions (ideas in the sentence),
- the embedded nature of clauses and phrases (... *instituted the prior year* ...), and
- likely a less familiar temporal word (*prior*).

Clearly, familiarity with the content, that is, knowing something about the Boston Tea Party and the Revolutionary War, is a critical aspect of “getting to meaning.” The form-content interaction is an important facet of language learning difficulties in students with academic problems.

Scott (2014) reminds us to consider ways that syntactic knowledge and skill interact with semantics. She points out that many factors, including the number of clauses (and propositions) in a sentence, the number of embeddings (clauses that interrupt the flow of sentences or modify parts of sentences), and confusing order (when the who-does-what-to-whom-when is reversed) create problems for students with and without SLD. For example, when a teacher says, “Take out your math books before you start your reading assignment,” the two-clause sentence, consisting of a main clause (*Take out* ...) and a subordinate clause (*before you* ...), is spoken in the order of the events (i.e., math books first, then reading

assignment). By contrast, the sentence, “Before you take out your math books, start your reading assignment,” violates the order of events and may be more confusing (Wallach, 2014). Understanding the meaning of *before* and *after* in this instructional context, as well as the placement of the subordinate clause, influences comprehension. Many structural and contextual elements interact with “meaning making” at the sentence level and present challenges for students with spoken and written language issues throughout their academic careers. We know that preschoolers with early language disorders (e.g., children with SLI), and in the school years those with SLD, not only produce shorter sentences overall but have difficulty comprehending and producing complex syntactic forms in both spoken and written modes (Dockrell, 2014; Nippold, 2014; Scott, 2014). Beyond elementary school, these measures of complex syntax across instructional and curricular materials (e.g., main/subordinate sentences, passive sentences, relative clause sentences) “continue to distinguish adolescents with and without a history of SLI through the eighth and 10th grades” (Scott, 2014, p. 287). What we need to keep in mind is that these sentence-level issues affect both “getting to meaning” and expressing meaning.

**Use Issues.** Problems with language use, that is, pragmatic disorders, rarely appear in a vacuum. The complex interactions among social competence (using language appropriately across contexts and individuals for various purposes), linguistic ability, and emotional growth are complex and layered (Brinton & Fujiki, 2014; Sun & Wallach, 2013). Many school-age children with SLD have been shown to have different levels of difficulty with various pragmatic language tasks including entering conversations, engaging in decision-making in group projects, negotiating with peers, and resolving conflicts via language (Brinton & Fujiki, 2014). As students with SLD move through the grades toward adolescence, pragmatic differences between them and their TD peers continue to change how they are manifested. Donahue (2014, p. 328) points out that many students with SLD show problems with perspective-taking, a pragmatic deficit that may resurface in written language comprehension tasks, and can help “to explain why some readers struggle with making inferences about characters and relationships. . . .” Brinton and Fujiki (2014) agree with Donahue, stating that “literacy emerges within social contexts and transactions” (p. 181).

Communicative ability is the core of social relationships and social interactions within and outside of classrooms. Being able to engage in both social and academic conversations and being successful at creating, maintaining, and nurturing teacher and peer relations are interactive with literacy learning and emotional growth (Brinton & Fujiki, 2014; Sun & Wallach, 2013). Students who are perceived to have problems with social skills are more likely to be rejected by their peers as well as their teachers (e.g., Bryan, Bay, Lopez-Reyna, & Donahue, 1991). As students advance in school, social relationships become more complex along with academic demands. Pragmatic functions also change along the way as written language becomes a vehicle for communication and learning. As noted by Donahue (2014) earlier, students must engage with authors and become writers themselves; they must interpret authors’ intentions, for example, and make the purposes and points of their written renditions clear for readers. They must take the audience into account (Who is the audience? What are their preconceived notions, knowledge?). Students must also learn how to express their feelings and emotions to adults and peers in constructive ways (Sun & Wallach, 2013). Indeed, the long-term effects of ongoing language learning difficulties, including early identified pragmatic difficulties, are important elements to consider when trying to understand emotional issues that influence the academic and social success of students with SLD (Sun & Wallach, 2013).

**Connected Discourse.** One of the most important areas for academic and social success for school-age students with SLD is the comprehension and production of connected text, in both spoken and written modes. It is possible that narrative and expository savvy may be sensitive measures of the pragmatic vulnerabilities of these students (e.g., Hadley, 1998). Form (morphosyntax) and content (semantics) meet within the construction of *narrative* and *expository* text.

*Narratives.* We know that narrative discourse relates to stories and storytelling. Narratives contain at least two utterances, often but not always follow a temporal order about experiences and events, and incorporate specific structures related to the development of theme and plot (Boudreau, 2008). A long history of research has provided us with information about the differences in narrative proficiency between TD children and children with SLD. Boudreau (2008) provides professionals with a review of the research that includes a discussion of the importance of narrative abilities in academic success. She also summarizes the ongoing nature of narrative difficulties for students with SLD, noting that “...discourse abilities appear to represent a key area of linguistic functioning that continues to differentiate children with a history of ... [SLD] ... from TD peers after other aspects of language functioning move to age-appropriate range” (Boudreau, 2008, p. 103). Across studies, children with SLD have been shown to produce stories with limitations in both content (e.g., fewer elaborated and connected episodes with fewer characters and plot twists) and form (e.g., shorter utterances, limited grammatical complexity and accuracy). Aspects of both literal and inferential comprehension influence students’ performances across the grades and across spoken and written texts (e.g., Green & Roth, 2013).

Although a significant relationship exists between some narrative performance and academic success (e.g., use of “linguistic glue” words like conjunctions, creating coherence among events, references to mental states of characters), caution is warranted. When interpreting narrative performance results, one must consider several factors that may influence results. For example, is *production* being used to measure narrative *comprehension*? Additional research is needed to understand fully the relationship between narrative comprehension and production and between spoken versus written proficiency. Likewise, clinicians are reminded to keep macro- and micro-structure elements in mind. Studies suggest that children with SLD may show more uneven patterns compared to their TD peers in content-form interactions in narratives. In other words, some children with SLD demonstrate relative strengths in content elaboration but not in grammatical accuracy; others are stronger in grammar but not content (Colozzo, Gillam, Wood, Schnell, & Johnston, 2011; Scott, 2014).

*Expository text.* We know that expository text is informational text, the main text of school. Unlike narratives, which have a largely chronological structure with events seen through the eyes of characters, expository text is organized based on logically connected relations, signaled by linguistic elements (Scott, 2014). There are many types of expository text (e.g., problem-solution, compare-contrast, procedural, descriptive) through which the curriculum and other formal documents are transmitted. As Scott (2014) writes, “These texts ... are less tied ... [than narratives] ... to personal experience, more often encountered in the written modality, and it takes longer for children to become fluent with them” (p. 148). Expository text challenges students for many reasons:

- it is linguistically dense in terms of its formal and less personal style,
- it is crafted with complex syntactic and literate sentences and connective words, and
- its content is often less familiar.

Studies have shown that students with SLD have difficulty with productivity in terms of number of words used, sentence complexity, and grammatical accuracy in spoken and written expository summaries when compared to their TD peers (Koutsoftas & Grey, 2012; Scott & Windsor, 2000; Ward-Lonergan, 2010). Students with SLD tend to have difficulties writing organized and cohesive paragraphs, creating complexity within paragraphs, and demonstrating grammatical accuracy (Koutsoftas & Grey, 2012; Ward-Lonergan, 2010). As the content of the curriculum becomes more abstract and linguistically heavy and as the demonstration and acquisition of knowledge occur mainly through print, students with SLD remain particularly vulnerable for academic success.

### Language Impairment: Students with SLD Tackling Literacy and Curriculum

We now know that preschool children with SLI come to school with many diverse language learning issues. Their spoken language difficulties follow them into their school years and

contribute to their problems performing the more advanced linguistic tasks of school, such as reading and writing curricular content and tracking and attending to complicated instructional language that appears in spoken and/or written form (Catts, Compton, Tomblin, & Bridges, 2012). Pragmatic and morphosyntactic gaps contribute to difficulties talking with their teachers appropriately, engaging in peer-peer projects effectively, interpreting the intent of a speaker or author, and making long-lasting friendships (Sun & Wallach, 2013). These aspects of school learning, among others, are steeped in linguistic and metalinguistic abilities that challenge students with SLD.

The interactions among form, content, and use across spoken and written modes of communication create reciprocal, intricate relationships that are tied intimately to academic learning. We know that spoken language and written language have a reciprocal relationship. This means that the two systems “play off” one another in different ways at different points in time. Spoken language leads the way to written language (often in the “learning to read” phase) but written language also leads the way to spoken language (especially in “the reading to learn” and “learning to read again” phases). While reading the language helps children learn more spoken language, more spoken language helps students to develop additional metacognitive skills such as using self-talk to organize their thoughts (Singer & Bashir, 2012; Westby, 2014). Clearly, the spoken-to-written and written-to-spoken relationships along the path to academic success represent a continuum of changing demands, sometimes followed by changing diagnostic labels for children struggling with the curriculum (Sun & Wallach, 2014).

As children move through the grades, they are expected to comprehend material that becomes increasingly more complex and to function more strategically and independently (Wallach et al., 2014). Kamhi (2009) helps professionals understand some of the changing demands across time by highlighting Scarborough’s and Owens’s notions about the learning to read process in this way:

By late elementary school and beyond, comprehension ability accounts for almost all of the variability in reading levels. Lack of reading proficiency in the early elementary school years thus reflects difficulty learning to decode whereas lack of reading proficiency in later school years reflects difficulty understanding and interpreting words, sentences, and texts. (p. 17)

So, while difficulties start early for preschool children with SLI in acquiring *foundational literacy*, which involves the early phases of literacy learning including acquiring conversational language, early narrative abilities, and decoding skills for reading, from the time they are in kindergarten, or even younger, these children are often uninterested in shared book reading (Scarborough, 2009). They can be reluctant to read and write either with assistance or independently (Catts & Kamhi, 2012; Hall, 2012; Justice, 2006; Paul & Norbury, 2012). Children with language impairment start with low initial reading abilities and continue with lower reading achievement as they advance in grades (Catts et al., 2008; Scarborough, 2009). The obstacles these children encounter when reading include coming across countless unknown words, having gaps in background knowledge, and encountering complex syntactic forms including embedded and relative clause sentences that further contribute to reading comprehension difficulties and lack of interest in reading (Scott & Balthazar, 2010). But, not only do they spend less time reading, they often read simplified texts so that they do not have exposure to materials that further develop both spoken and written language skills. Ellis’s (1997) classic work reiterates the point that the watering down of school curriculum for problem learners is depriving them of the rich language and literacy experiences needed to achieve academically. This means that while their TD peers begin to expand their background knowledge, sophisticated vocabulary, familiarity with different genre structures, complexity of morphosyntactic use, and appreciation of figurative language through independent reading, students with early language impairment find numerous obstacles in the learning-to-read process and are, therefore, often characterized as having an SLD.

Deficits in language cut across aspects of content, form and/or use. Some students with SLD acquire aspects of foundational literacy. They have conversational skills; they can tell simple stories; they can decode; they comprehend literal text. They acquire aspects of spoken and written language (i.e., foundational literacies), and to observers who are not looking closely or looking at the right things, the children might look as if they have overcome their

early language impairment. Recall from Chapter 3 the problem of illusionary recovery. But the illusion of recovery means the children fall behind again as TD children have another learning spurt. In addition, the lack of or limited proficiency with written language creates a perfect storm (Sun & Wallach, 2013). Students' limited reading proficiency begins to affect their spoken language advancement in several ways we have seen.

As children with SLD advance into later elementary school the limitations on their spoken and written literacy skills lead them to struggle with content and disciplinary aspects of literacy, that is, comprehension and writing within content-area subjects (e.g., Catts et al., 1999; Dockrell, 2014; Ehren, Hatch, & Ukrainetz, 2012; Fang, Schleppegrell, & Moore, 2014; Keenan, 2014). It is evident that the language-learning gaps create a mismatch with the increasingly more advanced academic demands. Their weaknesses producing and understanding connected discourse, especially expository text, which is the predominant language of textbooks (Ehren, 2009; Ehren, Murza et al., 2012; Nippold & Scott, 2009; Scott & Balthazar, 2010; Sun & Wallach, 2014), particularly affect academic success. So, while the language problems of children with SLD show themselves as reading and writing difficulties in the early grades, these evolve to higher levels of both spoken and written language problems as they advance through the grades. In our example of the expository piece about the American Revolution from a fifth grade social studies text, students are expected to learn about its causes, purposes, key characters, battles, and outcomes and summarize the text or answer questions about it. These expectations require a coming together of background knowledge, content knowledge, and linguistic structure knowledge (Hall, 2012; McKeown, Beck, & Blake, 2009). These elements merge to make the social studies task, and other content-area subjects, exceedingly linguistically and cognitively demanding for children with SLD (Wong, Graham, Hoskyn, & Berman, 2008). The large mismatches between their language and literacy proficiency and the advancing curricular requirements result in huge challenges for students with SLD, challenges that become greater with each higher grade.

## IMPLICATIONS FOR INTERVENTION

Assessment and intervention decisions for school-age students with SLD need to be made with an eye to content-area learning (Anthony Bashir, Personal Communication, 2010). This notion goes back to Nelson's idea that language impairment resides *within* and *outside* of children's heads. Thus, we look at what abilities and disabilities children come with to the task of academic learning, as well as the demands of the academic task itself. In a quote that reminds professionals who work with assessing, teaching, and intervening with students who struggle with school or are at risk for struggling, Brozo (2010, p. 278) wrote: "The typical demands of a . . . school curriculum require students to possess sophisticated language tools to explore information and content in area subjects, such as history, mathematics, science, and literature." Connecting both spoken and written language to comprehending and retaining what is seen and heard in classrooms, he added that, ". . . students . . . [can] . . . struggle to make meaning from the complex prose they are confronted with daily" (p. 278). Consequently, in looking at assessment and intervention, professionals must consider both the learner and the relevance of the tools they choose to determine, not only what a student knows (Keenan, 2014), but how the student's language proficiency will allow the student to function within the context of classrooms and the instructional demands. For those of us who are focused on understanding a student's language level and ability, we might return to Lahey's (1990) classic question, "Who shall be called 'language disordered'?" and add the question, *How does that language impairment manifest itself in academic tasks?* (Wallach et al., 2014), a question that serves as a guideline for assessment and intervention.

### Assessment

Whether coming from the perspective of special education, speech-language pathology, literacy and reading, or general education, among other disciplines, professionals should ask several questions that frame the direction of their assessments (Wallach et al., 2014):

- What constitute the “sophisticated language tools” that are necessary to access the curriculum that Brozo (2010, p. 278) was referring to in his quote?
- What are the most valid ways to discover what language tools a student has and does not have to access the curriculum?
- How do we find the best route for helping the student?
- What, if any, norm-referenced assessment tools are sensitive enough to help identify ongoing language-literacy profiles and needs of our students in academic trouble or at risk for academic trouble?
- How do we integrate one-on-one assessment strategies, including formal testing, with observations within the contexts where students suspected of SLD have the most difficulty (e.g., classrooms, content-area subjects)?

We can think back to the scenario presented about Tim earlier in this chapter. We might say that he is “one of the lucky ones.” This is because his language issues were identified before he entered school, so intervention is likely to be ongoing. He is less likely to be at risk for being unserved until he starts to exhibit failure in learning to read and in keeping pace with his peers. Transition of services from a clinical to school setting for him has the potential to be relatively seamless. His professional team (e.g., classroom teacher, SLP, special educator) and his parents have already realized that he is at risk for encountering academic problems so they are alert to monitoring his literacy progress. And he is likely to experience services within a prism of ongoing language learning problems. His language issues have been recognized at the fore, so the educational label of “speech and language impaired” is likely appropriate. He may also receive the educational label of “specific learning disabled,” which means services of SLD and/or reading specialists could be available for Tim, in addition to services of an SLP. Importantly, however, is his receiving appropriate placement and services from all relevant professionals (classroom teacher, SLD/reading specialists, and SLP) within a Response-to-Intervention (RtI) framework, to be discussed later in this chapter.

Some children might not be as “lucky” as Tim. Entering school without having a language impairment identified could mean that a child needs to start to fail before professionals become concerned and initiate an assessment process. This can often be after the child has been unable to keep up with his peers’ learning for a year or two, that is, after grade 2. When this scenario describes what a child is experiencing or has experienced, it reflects a *wait-to-fail model* rather than a *preventative model*. There is now sufficient information available to professionals for them to be good at identifying which children have language profiles that place them at risk for literacy and other academic problems. With this information professionals are in a position to implement services early in order to mitigate as many negative impacts of language impairment as early as possible. Unfortunately, a wait-to-fail model continues to reflect what children with unidentified language impairment often experience when they enter school as kindergarteners.

The results of Zhang and Tomblin’s (2000) study addressed some of the factors that affect which students with language impairment receive services. These authors followed up kindergarteners, who at the time had primarily speech sound disorders, impairment of expressive language only, impairment of receptive language only, or impairment of both expressive and receptive language, when the children were in second grade in order to identify which of them had received SLP intervention. They found that the children with speech-only disorders had a greater likelihood of having had intervention between kindergarten and grade 2 than any of the language impairment groups. Of the language-impaired groups, the children who had expressive language involvement were more likely than those who had receptive language involvement to have had SLP intervention. However, when the researchers associated the academic achievement and socioemotional status of the same students with their speech or language impairments, language impairment was more strongly associated with poorer outcomes in grade 2 than speech disorder. These results suggest that students with language impairment are less likely to receive intervention than those with speech problems, even though language impairment is more likely to be negatively associated with academic and social success than speech problems. The findings have implications for early and accurate identification of children with language impairment in order to

provide appropriate intervention support to stave off as many academic and social failures as possible.

**Language Screening.** Because identification of students with possible language impairment early in their school experiences has significant implications for the students' educational experiences, how kindergarten students are screened for the presence of language problems is particularly important. Most schools screen kindergarteners either prior to their beginning school or soon thereafter for the presence of a variety of risk factors that can affect their success. Speech and language screening is typically included in the screening programs. In light of the high risk for academic struggles language impairment has for students and given research findings such as those of Zhang and Tomblin (2000) about which children are likely to receive intervention, language screening needs to employ procedures that are sensitive enough to quickly separate children at risk for language impairment from those whose language proficiency is likely able to support their learning. Those children at risk can then be followed up with more thorough evaluations that can confirm or reject the screening results.

There are several commercially published standardized language screening tests. Their use, however, needs to be considered with healthy skepticism. A number of factors contributes to the need for a cautionary approach. One is that the norms for several of these tests lead to unacceptably high false positive and false negative results, that is, missing at-risk children or over-identification of children. (Chapter 13 discusses language-test psychometrics in more detail.) A more concerning factor is that most of the screening tests examine children's abilities by asking the children to engage in primarily decontextualized speech and language tasks, such as naming pictures to assess speech sound production and/or expressive vocabulary, pointing to pictures that represent the meaning of individual words, or repeating short sentences. Such decontextualized tasks do not adequately sample the types of synthesized language skills needed to access an academic curriculum or challenge children's language abilities, per Lahey's suggestion (1990). Another concern is that many of the tests focus more heavily on speech than language and on expressive language more than high-level language comprehension.

We know a lot about language characteristics of children with SLI and about how these different characteristics related to language performance negatively impact academic success. Of particular relevance is the discussion of risk factors and clinical markers in the previous chapter and previously in this chapter. This knowledge helps us employ strategic approaches to screening and reduce reliance on norm-referenced screening tests that might have questionable ecological and psychometric validity. Here are some of things we know that can guide our language screening approaches:

- Young children's poor performance with nonword repetition tasks (NWR) is frequently associated with the presence of SLI. Including NWR tasks as part of a language screening seems like a smart, logical, and research-supported strategy. NWR tasks are also typically quite quick to administer.
- Abilities with narrative performance are highly predictive of children's subsequent academic success. Narrative is a discourse type with which kindergarten children are expected to be familiar. Poor narrative ability, therefore, portends academic struggles. Including a narrative task, such as asking a child to tell a story while looking at a wordless storybook, seems like a smart, logical, and research-supported strategy. There is a number of narrative analysis techniques, many of which are relatively easy and quick to use. (Chapter 13 includes a list of commonly used narrative analysis approaches.)
- Kindergarten children with SLI are generally able to converse in casual conversation and to use complete sentences while doing so, albeit typically using sentences that are mostly simple or compound in syntactic structure with limited use of sentences with relative and embedded clauses, that is, use of complex sentences. To tap into possible presence of language impairment, tasks that challenge a child's language proficiency during screening, per Lahey (1990), need to be used. Telling a narrative is a type of discourse that involves connected speech that places challenges on children's language

performance; therefore, including a narrative task in language screening seems like a smart, logical, and research-supported strategy. (This gives two votes for using a narrative task!) There is a number of relatively easy and quick approaches to assess children's complex sentence use, per Chapter 13.

- Children with SLI show continuing difficulties with verb morphology, especially past tense verb morphology, long after their TD peers master these linguistic forms. Sampling children's accuracies/inaccuracies with verb morphology and particularly past tense verb morphology as part of a language screening seems like a smart, logical, and research-supported strategy. A narrative retell task encourages children to use past tense to convey the story, and stresses children's language proficiencies as well. (This gives a third vote for using a narrative task!) Again, there is a number of relatively quick and easy to use analysis methods, including a simple method of tallying opportunities for past tense verb use and tallying if use was correct or incorrect.
- Children's abilities with sentence recall tasks have shown promise in identifying those youngsters at risk for SLI. These tasks are quick and easy to administer and some commercially published, norm-referenced language tests include tasks that target sentence recall. Based on current research, including a sentence recall task as part of a screening seems like good practice. Sentence recall tasks that include some complex sentences with embedded clauses, particularly relative clauses, also provide a glimpse of children's morphosyntactic abilities. Recall that, when sentences to be repeated challenge children's language by exceeding their morphosyntactic skills, the children will use their own morphosyntactic skills rather than roteily imitating the structures in the target sentences.
- Screening for aspects of speech abilities cannot be overlooked, but the prominence of speech screening as part of overall screening procedures needs to be kept in perspective given findings such as those of Zhang and Tomblin (2000) that children with speech disorders tend to be provided intervention more than those with language impairment. A connected speech task, such as that of a storytelling task or sentence recall task, can suffice as a speech screening procedure while also providing important information about a child's language proficiency. (Here is another vote for the utility of a narrative task as a screening strategy!)

It is important to keep in mind that the purpose of screening is to raise red flags about some children's language (and speech) abilities and give "green lights" to the abilities of others, with the idea that the academic performance of the children with the "red flags" will be monitored carefully and/or the children will be provided with subsequent in-depth assessments. The purpose of screenings is *not* to confirm or reject the presence of language impairment. This purpose is left to a comprehensive evaluation that can follow.

There is another bit of knowledge that arises from the research literature that can guide our procedures and that is relevant to screening and assessing children's language. We have learned that young children's success in the early stages of learning to read is highly predictive of their later reading levels and general academic success and that language proficiency is highly predictive of children's success in learning to read. This means that if a child has language problems the child is at risk for learning to read. Therefore, such a child needs language intervention and reading support in the early grades. Waiting until a child is in third grade or later to provide services places the child at high risk for subsequent academic failure. For a child whose performance on language screening tasks is suspect, the child needs to move to a language assessment as soon as possible, and from there to intervention services (language intervention and reading support) as soon as possible if assessment results indicate language problems. This approach is consistent with a preventative strategy rather than a wait-to-fail model.

**Language Assessment.** Given the wealth of information available about the assessment process in other chapters, particularly Chapters 3, 5, and 13, the discussion here will focus on some of the important principles that support the three core purposes of language assessment of school-age children suspected of having SLD. These three purposes are: (1) identifying

a student as having or not having a language impairment; (2) determining the eligibility of a student with language impairment for intervention services; and (3) developing, as part of an interprofessional educational team, an intervention plan for the student. We will embed discussion of issues related to these purposes as we address here several principles of assessment.

*Assessment Principle 1: Understand the difference between identifying a student for services and creating and implementing an intervention program.* There is a difference between identifying a student for services and developing an intervention program for the student. It is critical to be clear about the purpose of the assessment. Working toward a particular placement requires understanding federal and state mandates to make a case for a student, either to receive or not to receive services. It is equally essential to keep in mind what language impairment “looks like” at school-age levels. Implementing an intervention plan cannot be done effectively from a series of norm-referenced tests. Tests and tools may give us some clues but dynamic assessment, which is a combination of assessment and brief intervention, as discussed in Chapter 13, can help professionals make more effective intervention choices (see a classic discussion by Palincsar, Brown, & Campione, 1994).

*Assessment Principle 2: Be aware of the strengths and weaknesses of tools chosen.* Because professionals need to be focused toward curriculum access for students, instructional demands, and teachers’ language styles, assessment tools should connect to the disciplinary literacies embedded in school curriculum and the contexts in which students must succeed. One-on-one testing is not equivalent to group learning in the classroom. However, we can glean information by going beyond what a test says it is testing. For example, results from a combination of subtests that provide information about higher levels of comprehension (e.g., figurative language, multiple meanings, inferring meaning) and expression of syntax (e.g., subordinate-main clause constructions, embedded relative clause sentences, passive sentences) may provide clues into a student’s difficulty with instructional and textbook language. But it is important not to be misled by what tests or tools indicate they are testing. Tests labeled “auditory discrimination” are tapping into phonemic/metalinguistic skills related to early reading, not auditory discrimination (e.g., Schuele & Boudreau, 2008; see Wallach, 2011).

*Assessment Principle 3: Stress the language system.* This point has been made several times because it is such an important one. Tools and approaches that challenge students’ language skills and are sensitive enough to uncover early or ongoing language impairment need to be used. In her landmark discussion about assessment, Lahey (1990) reminded us to “push” the language system to really understand what children can do with language. Tasks that are “too easy” miss underlying language impairment. We need to remember that these children typically talk in sentences and can carry on casual conversations for several dyadic turns. Using timed naming tasks or sampling beyond conversational skills, such as those involving narratives and expository discourse, should be included in assessment batteries.

*Assessment Principle 4: Collect spoken and written samples.* Given the reciprocity of spoken and written language, students’ abilities across systems need to be considered. Discourse analysis is relevant to both spoken and written language. By collecting narrative and expository samples, starting with familiar topics and moving toward less familiar topics and by looking at spoken and written systems together, we learn more about students’ metalinguistic and metacognitive abilities, as well as their linguistic knowledge. Difficulties with print referencing and other early literacy abilities need to be considered as red flags for future academic problems (Justice & Ezell, 2004). Previously in this chapter, three tiers of literacy—foundational literacy, content literacy, and disciplinary literacy—were presented. Students’ abilities with these three literacy tiers should also be part of assessments.

*Assessment Principle 5: Observe in the contexts in which students must survive and thrive.* A significant aspect of every assessment for school-age students with potential or identified language impairment is to observe them in their classrooms. With federal and state mandates, this is now usually a required component of assessment in order to qualify a student for services. Working with general and special education teachers within a collaborative framework is another critical aspect of the assessment process. Observing students in curricular activities or subjects that are the most difficult for them is one way to begin. Evaluating

**TABLE 4.3 | A Language Intervention Scenario**

A group of middle school students (grades 6 and 7), who have knowledge of, and interest in, basketball, are asked to decide what a headline from a current sports section of a local newspaper means and how it could help them figure out what might be in the article. The headline reads: "Jazz Helps Lakers Become Mellow in Victory." The students, who are provided with a structured outline to follow, brainstorm about possibilities. The questions on the outline include: "What I Know," and "What I Need to Know." The clinician writes the words suggested by the students in two columns headed with the two questions. The article is then read by the SLP. The words in the two columns are checked for accuracy and completeness. A third column, "What I Learned," is added after listening to the article. Students are asked to summarize their findings orally, followed by preparing and completing a written rendition with outlines that include overall structure and sentence/word structure support. The same format, with a less predictable script, is followed using a new, but somewhat related, theme (from a current events activity related to social studies) that reads: "Rodman and Players Visit North Korea." The coin is now flipped and students take turns reading the Rodman article and then completing an outline for their peers. Outlines with helpful word/phrase choices are compared and a final rendition is created by the group.

*Source:* Based on Wallach (2014).

the nature of a teacher's instructional style to identify matches and mismatches between instructional language and a student's language abilities, as well as identifying instructional supports for language comprehension that are or are not provided, would be pieces of a classroom observation. Analyzing the language of textbooks and other curricular materials is also included in this aspect of the assessment process (Wallach, 2008).

### Intervention

By way of introducing some of the elements of language intervention at school-age levels for students with SLD, consider another scenario, presented in Table 4.3, that highlights a portion of what Tim's intervention (recall the previous scenario) might look like at sixth or seventh grade. Although an SLP leads the students in the activity, the approaches and strategies illustrated in the scenario provide examples for others to use to scaffold students' learning. It reflects some of the elements of school-age/literacy-focused intervention that incorporate current research findings and practical applications. The language intervention includes helping students with SLD acquire the language *knowledge* (e.g., learning new words), *skills* (e.g., putting together a report), and *strategies* (e.g., figuring out what to do to complete a task) needed to access the curriculum (Ehren, 2009; Ehren, Murza et al., 2012; Ehren et al., 2014). The intervention is steeped in metalinguistic and metacognitive "practice." It integrates spoken and written language components with an eye toward facilitating language that would relate to the social studies' classroom with its inferential, predictive, and interpretive activities. The clever use of familiar content (basketball) *as a start* helps students "practice with" known content and context but with less familiar language and new strategies before they move on to more complicated, curricular-specific content (current events) and language. Taking background knowledge into consideration is a critical component of both spoken and written language comprehension and use of prior knowledge helps to reduce competing demands for resources, that is, avoiding overwhelming students with too much new information. When too many things "compete" for students' attention and memory, "something has to suffer." More sophisticated language, embedded in unfamiliar content and practiced with new strategies, creates competition for resource allocation for students with SLD. One of the several strategies employed in the scenario was the SLP's reading of the text initially to help the students focus on the comprehension and planning aspects of the activity. The scaffolds the SLP provided with visual maps and outlines and her work on macro (expository text) and micro (syntactic/word) levels are integrated within the activity. Clearly, many factors come together—student ability, SLP's choices, content, activities, sequence, timing, and dosage—to create a multidimensional and effective intervention (Wallach, 2014). The scenario illustrates how goals and objectives can be operationalized to provide *strategic* and *curriculum-relevant language intervention* for a heterogeneous group of students.

In the following sections a three-tiered framework for language intervention at school-age levels will be presented. The framework highlights some of the information currently

available from research in speech-language pathology, general and special education, learning disabilities, and literacy, among many other disciplinary sources (Stone, Silliman, Ehren, & Wallach, 2014). We will also consider aspects of language intervention that go beyond working on core language deficits (Sun & Wallach, 2013), an especially important component for children and adolescents with ongoing language literacy and academic issues. We will then turn to a discussion of service models, with a particular focus on Responsiveness-to-Intervention (RtI) models and Common Core State Standards (CCSS).

**A Three-Tiered Framework for Language Intervention at School-Age Levels.** A number of questions help guide our intervention decisions. These reiterate a number of issues addressed in this chapter. For example:

- What language knowledge and skills does the student “bring” to the academic demands facing him/her?
- Will the goals and objectives of intervention help the student to access the curriculum?
- Will the goals and objectives of intervention improve his/her grades?
- Does the student comprehend what he/she is reading (or listening to from a lecture)?
- Does the student write reports and what are the characteristics of the reports?
- How does the student organize his/her thoughts in spoken and written text?
- Is there research to support intervention choices and where do these choices come from (Wallach et al., 2009)?

While only a sampling of questions one might ask, the focus is to keep the changing nature of students’ language abilities (and disabilities) in mind within the context of changing language forms used to transmit curricular content (Ehren, Murza et al., 2012; Fang et al., 2014; Sun & Wallach, 2014).

Three overlapping components of language intervention are: (1) engaging students’ background knowledge and interests into intervention choices as a starting point; (2) matching language intervention choices within the context of the specific requirements of curriculum content-area subjects; and (3) balancing content and structure knowledge in the search for meaning. A strong metalinguistic and metacognitive emphasis weaves its way throughout the discussion (Wallach et al., 2009; 2010; 2014).

**Engaging Students’ Background Knowledge and Interests into Intervention Choices.** Helping students use their prior knowledge to express and reflect upon what they know, as well as to become aware of what they may not know and what they need to know, encourages them to be more actively involved in “attacking” (comprehending) spoken and written text (Wallach et al., 2014). Various research-based frameworks appear in the literature, including the TWA (Think Before Reading, Think While Reading, Think After Reading) paradigm (Mason, Meadan, Hedin, & Corso, 2006) and various renditions of Ogle’s (1986) K-W-L (What I **KNOW**, What I **WANT** to Know, What I **LEARNED**) model, and are highlighted in the intervention scenario (Wallach et al., 2010; 2014). The “What I know” element of Ogle’s (1986) K-W-L model combines *before* and *during* reading (or listening) activities (McKeown, Beck, & Blake, 2009). The “What I learned” is an *after* reading (or listening) activity. A variation of the K-W-L activity has been described by Wallach et al. (2010), using “LL” as the element in the third column to represent “What I **LEARNED** about **LANGUAGE**.” Table 4.4 provides an example using the Korean conflict as the curricular focus. Used as a tool to help students with SLD to develop a strong “meta” approach to tasks, the KWL/KWLL example, and others like it, demonstrates one way to facilitate students’ linguistic and metalinguistic knowledge using curricular content as a backdrop (Ehren, 2013).

While there are many aspects of intervention at school-age levels that focus on specific aspects of content, form, and use components, activation of background knowledge is always a critical component. Using the K-W-LL format (Table 4.4), students are guided in their expression of “known” and “unknown” information. The students also summarize what they have learned about expository text, i.e., how to organize a cause/effect report, how/when to use selected connecting words. The final product will be the completion of a solid

**TABLE 4.4 |** An Example of the KWLL Model

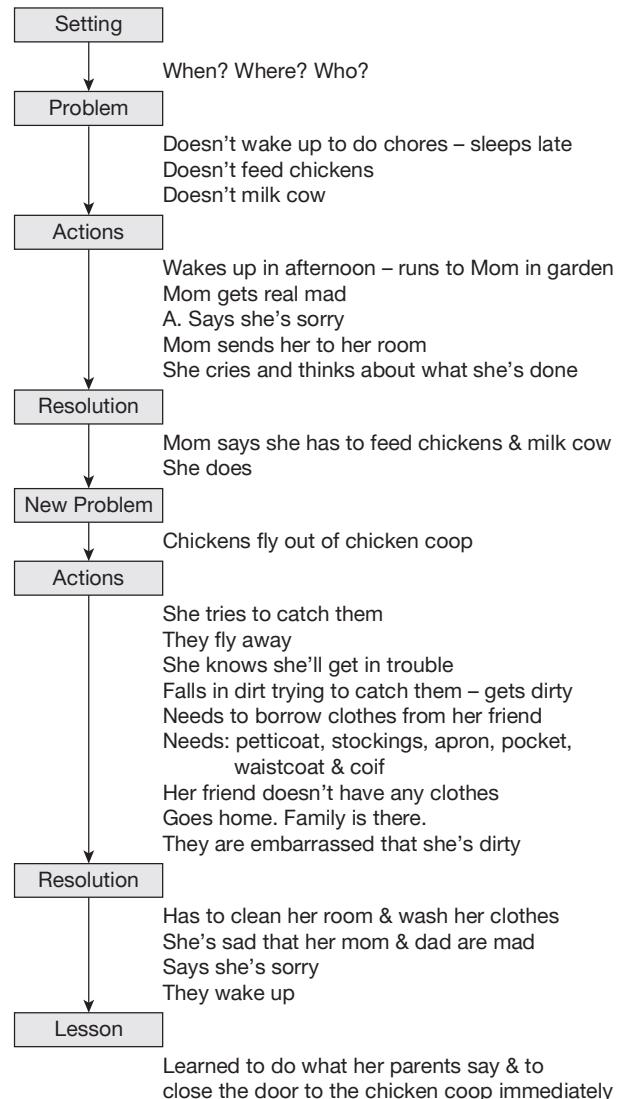
K (What I KNOW)	W (What I WANT to Know)	LL (What I LEARNED about LANGUAGE)
<ul style="list-style-type: none"> <li>■ Conflicts may cause wars.</li> <li>■ The Korean War happened after World War II.</li> <li>■ The country is still separated.</li> </ul>	<ul style="list-style-type: none"> <li>■ What caused this war?</li> <li>■ What does it have to do with current events today?</li> <li>■ What were some key battles during the war?</li> </ul>	<ul style="list-style-type: none"> <li>■ How to organize a cause/effect paragraph</li> <li>■ The use of “connecting” words and phrases like <i>prewar</i>, <i>postwar</i>, <i>was caused by</i></li> </ul>

Source: Wallach (2008). © 2008 Geraldine P. Wallach.

current events report. This approach is not intended to “fill in” students’ gaps in content knowledge, but rather to help students become active in using what they do know, identifying what they do not know, and discovering the metalinguistic and metacognitive strategies for finding their missing information in shared responsibility between general education teachers and specialists (Ehren, 2013).

*Matching Language Intervention to Language Demands of Curricular Content.* With school-age children an overall goal is to pair the foci of language intervention with students’ curriculum content demands, as noted by Bashir in a classic chapter written in 1989. Intervention includes the meta-strategies that relate to those curriculum demands. Looking across curriculum, we see that expository text, complex and embedded syntax, and relational and abstract words and phrases predominate in textbooks and classroom instruction and influence academic success. However, it is important to keep focused on the specific language requirements of different elements of curriculum. For example, social studies and history include managing expository structure and abstract word meanings like *democracy*, *freedom*, *conflict*, in addition to understanding temporal orientation of events noted by temporal linguistic forms, evaluating sources, synthesizing information, and using prior knowledge to fully understand and retain historical information (Fang et al., 2014). Therefore, narrative discourse, with its character focus and temporally connected events, aligns more closely with language arts curricula and often with the social studies/history curricula rather than, for example, science curricula. Science involves managing a challenging quantity of technical terms and interlocking definitions and writing and thinking concisely in cause-effect and problem-solution modes (Fang et al., 2014; Wallach et al., 2014). Therefore, there is a greater alignment of science with, perhaps, procedural and/or explanatory discourse genres.

**Connected Discourse (Macro structure work).** Research in both narrative and expository text intervention suggests that explicit teaching of the overall structure of these genres, within a strong metalinguistic and metacognitive approach, improves their comprehension and use. Helping students understand the differences between narrative and expository text is also relevant as many students with SLD have difficulty organizing and retaining information from connected text and they have a limited understanding of “where to begin” and what is important to attend to when listening and/or writing (Boudreau, 2008; Nippold & Scott, 2009; Ward-Lonergan & Duthie, 2012). Singer and Bashir (2012) emphasize the use of guided practice and “self-talk” to help students with SLD learn to organize, comprehend, and write connected text. The use of a variety of different *graphic organizers* (Wallach, 2008; Ward-Lonergan & Duthrie, 2012; Westby, 1994) can help students to visualize the underlying structure of text while, at the same time, talking about the text. Figure 4.3 illustrates a graphic organizer for use with a historical fiction narrative. Students are taught to identify and use the story grammar elements (e.g., setting, problem) while filling in the important events from the story. The vertical arrangement provides students with a more accurate organization of a written report.

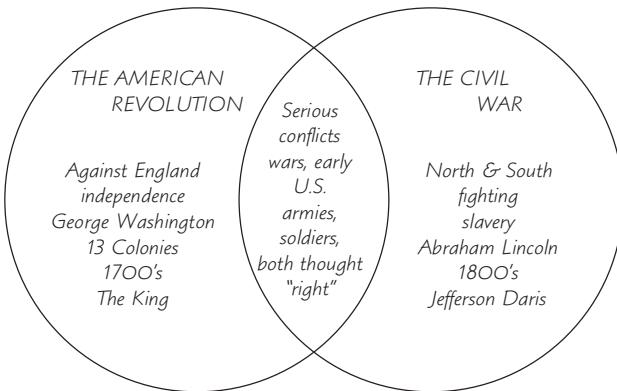


**FIGURE 4.3 |** A graphic organizer representing an accurate visual representation of the text structure of a narrative text.

Source: Singer and Bashir (2004).

Singer and Bashir (2004, 2012) remind us to match the appropriate graphic organizer to the activity and content-area requirements. The organizer in Figure 4.3, which is focused on story grammar for learning a historical fiction, would be inappropriate for learning about expository text. Singer and Bashir (2012) note that a vertical presentation, as opposed to using a horizontal organizer, might be a more accurate representation of what is required of the students, for example, to write a summary and book report. Singer and Bashir (2004) use a strategy they call the *EmPower* strategy to support students' writing. EmPower stands for **E**valuate, **M**ake a **P**lan, **O**rganize, **W**ork (write), **E**valuate (edit), and **R**ework and serves as a mnemonic and language scaffold to help students with SLD follow the steps needed to create summaries and reports.

Wallach (2008) used another type of graphic organizer to help fifth-grade students learn about a sub-genre of expository text, i.e., compare-contrast. Figure 4.4 shows this graphic organizer. Titles, sample sentences, and key words are highlighted, and syntactic and word level components are included in the activity that may span several weeks of work for the

**SAMPLE TITLE FOR MY TOPIC:***Two wars in the United States* (**Facts and Details**)*How I feel about wars* (**Opinions and Feelings**)

**Sample Sentence:** *The American Revolution and the Civil War are similar because they were serious conflicts.*

**Linguistic “Glue” Words*****Different, alike, although, on the other hand, compared******with, rather than, same, similar, but, still, instead of . . .***

A compare-contrast diagram using Grade 5 social studies as a backdrop for learning about expository text.

**FIGURE 4.4 |** A compare-contrast diagram using grade 5 social studies as a backdrop for learning expository text.

Source: Wallach (2008).

students. The scenario in Table 4.3 that introduced this section might start with a comparison activity, using a similar graphic organizer and having the students compare two basketball teams (e.g., the L.A. Lakers and Utah Jazz), before progressing to more complex text with less familiar content, for example, comparing the Korean War and World War II. However, we need to remember that different organizers are used for different text structures, and different tools and activities, some of which were illustrated in the intervention scenario (Table 4.3) with our sixth and seventh graders, for example, predicting what a title suggests about a text, underlining key words from passages, identifying different genres of text, and highlighting main ideas, would be chosen according to students’ needs and abilities (Wallach et al., 2014).

**Syntax, Words, and More (Micro structure work).** In addition to macro-level abilities, intervention needs to include work on complex syntactic forms like passives and multiply embedded clausal sentences that are known to be problematic for school-age students with SLD (Scott, 2014; Scott & Koonce, 2014). Complex syntax permeates school texts and the requirements of writing as students move through the grades (Nippold, 2014), as does complex morphology. Emphasizing the importance of morphological savvy, Scott (2014) notes: “Given the status of verb morphosyntax errors as a clinical marker of young children with SLI, the tendency for these problems to surface in more complex linguistic contexts, as well as the need to relate and adjust verb markers across clauses and sentences in academic discourse, it

makes a great deal of sense to target these forms in language intervention with older children and adolescents" (p. 148). She reminds us of the importance of connecting improvement of morphological ability to the demands of curricular content, not randomly choosing intervention targets from workbooks, as we shall see in our intervention section.

Recall the example previously in this chapter about the Boston Tea Party and the sentence, *The Boston Tea Party was the colonists' response to the unfair tax instituted the prior year by the British*. Wallach et al. (2009) provide examples of sentence combining by selecting the main propositions of the sentence (e.g., UNFAIR TAX/TEA PARTY) and using word banks to highlight key words, for example for the temporal word, *prior*, in the sentence, with choices like *before/prior, after/following, while/meanwhile*, to decide which should be used with the main propositions to unravel the who-did-what-to-whom-when in sentences. Another sentence provides an additional example: *A law was passed saying that no ship carrying colonial goods could leave Boston Harbor until the colonists had paid for all the tea that was destroyed*. Working again on key words (e.g., *until*) helps students understand how to deal with the who-did-what-to-whom-when challenge, but in this sentence there is also the opportunity to expand students' understanding of morphological relations (e.g., *colony, colonists, colonial*), another important element of intervention (Carlisle & Goodwin, 2014; Wallach, 2014). Scott (2014) provides a set of scaffolded interactions between clinicians/teachers and their students that serves to help students acquire higher levels of literate language forms. Although Scott addresses complex syntax, her recommendations can form a template for facilitating word and morphological awareness. Among the scaffolding interactions are:

- Discussion and illustration of the structure and meaning of a complex sentence (or target form). Modeling, reading to students, providing explicit examples, and engaging in other facilitative methods are among intervention techniques that can be used.
- Facilitation of awareness and identification. The students might read in unison and/or repeat sentences or use various computerized examples to "practice with" the targeted form.
- Active manipulation. Sentence combining tasks as above can be used in a type of "cut and paste" activity.
- Examination of text. The student searches for complex forms within a text and bolds or underlines the targeted form.

As per the scenario in Table 4.3, intervention starts with familiar topics and topics of interest and moves to curricular content once students grasp the strategic approach to making meaning.

*Balancing Content and Structure Knowledge in the Search for Meaning.* Language intervention for school-age students with SLD is multi-faceted and complex. It is not possible within the scope of this chapter to cover every approach and technique available. This section has emphasized selected language skills and strategies that related to content and disciplinary levels of literacy and provided a way to consider the integration of spoken and written language with meta-skills and strategies. Although young children with SLD (perhaps third grade and earlier) might need additional help with some of the foundational aspects of literacy, including developing phonological and phonemic awareness skills (Schuele & Boudreau, 2008; Troia, 2014), we need to help the students become more *actively engaged* in learning as they search to "make meaning" out of what they see and hear, regardless of where students are on the learning curve of academic success.

Clearly, developing the ability to manage connected text and acquiring advanced syntactic forms are among the linguistic underpinnings needed to unravel the complexity of unfamiliar curricular content. Likewise, having a repertoire of higher level and abstract vocabulary knowledge and naming ability, coupled with strategies for finding the meanings of unfamiliar words independently, are other elements on the intervention canvas. Because textbooks contain many relational words and phrases (e.g., *before, after, moreover, meanwhile, at a previous time*) and make high use of academic and abstract words (e.g., *evidence, method, integrate, identify, contribute*) (Lesaux, Kieffer, Faller, & Kelley, 2010), focusing intervention on

these words within familiar and unfamiliar contexts and embedding them into connected texts, are additional ways to help students with SLD survive and thrive in their classrooms.

The interactions between structure (form) and content (semantics) knowledge create challenges in finding ways to balance them. McKeown and her colleagues (McKeown, Beck, & Blake, 2009) provide some insights into this complex interaction and balancing act. They divide students as “good” or “poor” readers and describe good readers as those who use background knowledge to interpret text (i.e., to figure out its meaning) and pay attention to the organization and structure of text, especially when topics are unfamiliar and informationally heavy, as those in curriculum. These and other insights (McKeown et al., 2009; Wallach, 2008) provide a picture of good readers that can help guide the focus of intervention:

- Proficient readers use linguistic information, as signaled by key words and phrases, to facilitate comprehension;
- Structural knowledge is especially important when the content is moderately or very unfamiliar to readers;
- Good readers use background knowledge when they have it, but background knowledge is most useful when a text is well structured; and
- Comprehension and retention are especially difficult if both background knowledge and structural knowledge are limited.

The efficacy research of McKeown and colleagues (2009) suggests that focusing on strategies that are directly related to the texts students are reading, i.e., social studies, science, and helping students to understand ways in which structural cues can help them get to meaning are most effective.

***Beyond Core Linguistic Deficits: Keeping the Bigger Picture in Mind.*** We read in the previous chapter about preschoolers with SLI concerns about psychosocial issues. We will see these raised again in the next chapter, as well as here. Implied in our concerns is an underlying question: What are the ongoing effects of language impairment on social and emotional growth? We know that communicative ability is fundamental to building social relationships and social interactions. Being able to engage in both nonverbal (very early developmentally) and verbal dialogues helps to facilitate and nurture relationships with one’s family, peers, and other members of the community (Sun & Wallach, 2013). Developing more nuanced aspects of language, such as discerning a speaker’s intention, taking another’s perspective, understanding different teachers’ classroom rules, and manipulating one’s language to meet the needs of the situation, are abilities that interface with socialization and the formation of peer relationships within and outside of the classroom. In a summary of longitudinal research, Brinton and Fujiki (2014) remind us that many children with early language and persistent language impairment have social and emotional problems that include, among others, trouble joining groups in play and negotiating and resolving conflicts or demonstrating anxiety or antisocial personality behaviors. On the other hand, some children with ongoing language difficulties do quite well. Nonetheless, the interactive nature of language and emotional components becomes apparent for many students within the SLD population. Consequently, Brinton and Fujiki (2014) encourage us to be mindful of the emotional components of SLD, writing that because

. . . of this interactive relationship . . . managing the social and emotional issues associated with . . . [SLD] . . . may be as essential as managing linguistic deficits. (p. 174)

As we will see in the next chapter, these issues continue into adolescence (Wadman, Durkin, & Conti-Ramsden, 2011).

The 2001 World Health Organization’s International Classification of Functioning, Disability and Health (WHO-ICF) provides a framework to think beyond the core linguistic deficits observed in school-aged children with SLD (Campbell & Skarakis-Doyle, 2007; Sun & Wallach, 2013). Implications of the WHO-ICF model point to the importance of an interprofessional team approach to planning and implementing intervention for children with SLD.

Sun and Wallach (2013) identify several guiding points for team members in implementing an interprofessional approach to intervention:

1. *Consider interpersonal interactions, relationships, and social life while assessing and providing intervention for students with SLD.* Assessment and intervention should cut across settings and intervention topics. Students might be observed across classroom, home, and other social settings. Discussions might include, not just topics that address academic content, but those that incorporate topics related to current school news, perspective taking and strategies that facilitate social competence.
2. *Observe and address environmental influences on language and social and behavioral functioning.* Similar to the above-mentioned suggestion, observation and intervention should take place in socially rich and flexible environments such as playgrounds, cafeterias, classrooms, or school clubs. Students' assessments of their own roles in social and academic situations are often helpful. Singer and Bashir's (2012) work in self-regulated learning, while not focusing specifically on social-emotional components, offer guidelines for managing more effectively interpersonal interactions.
3. *Write Individualized Education Programs (IEPs) that combine core linguistic deficits with emotional and social competence.* Information about students' linguistic abilities (e.g., form and content, discourse abilities) needs to be coupled with information about ways to manage communication breakdowns and find solutions, sometimes through language choices, for resolving social conflicts. Helping students develop effective strategies for perspective taking and recognizing their own emotional and social strengths should be weaved into core language goals and objectives.
4. *Offer a continuum of services for students with SLD that are interconnected among school-based professionals (e.g., social workers, SLPs, general and special educators, psychologists, counselors).* As suggested by Campbell and Skarakis-Doyle (2007): "Mutual exchange of knowledge and skills among team members" and "bridging boundaries between disciplines through a sharing conceptual framework and common language" (p. 526) are crucial for collaboration. Team members might share a set of socially relevant goals to provide concurrent and cohesive services to support generalization to other settings and communication partners.
5. *Recognize the role of language proficiency in expressing one's feelings and emotions.* Students with SLD often have difficulty elaborating on events, choosing words to express their feelings, or explaining their behaviors and motivations (Brinton & Fujiki, 2014). Sun and Wallach (2013, p. 62) suggest that "working on mental state verbs including metacognitive (e.g., *realize, understand, imagine*) and metalinguistic verbs (e.g., *explain, argue, agree*)" can help students come to recognize how these verbs play important roles in dealing with interpersonal interactions and improve their social and conversational understanding.

***Changing Directions in Service Delivery and Educational Standards.*** Service delivery models provide guides that help professionals plan and implement assessment and intervention programs for children with SLD both within and outside of their classrooms. In the *traditional service delivery models*, sometimes referred to as "pullout" models, which are still used in many school settings, students leave their general education classrooms temporarily to receive services of specialists whose rooms are elsewhere in the school. Services can be provided individually to a student or to students who might be seen in small groups. In *in-class service delivery models*, sometimes called "push in" or "collaborative" models, services target groups of students within the classroom. In some cases services involve demonstrating sample language-literacy-based lessons, preferably with the classroom teacher, or team teaching during which language elements embedded in the curricular content are highlighted and disentangled. Various *consultative models*, sometimes called indirect service models, include making recommendations to teachers and other interprofessional team members. All models should be focused on providing curriculum-relevant intervention.

Two more recent ideas about serving students with SLD have emerged. These have the potential to increasingly change how students are identified for services and how the services are delivered.

*Response to Intervention (RtI).* The *Response to Intervention* (RtI) model has its foundations in the reauthorization of the Individuals with Disabilities Education Act (IDEA) (2004). With reauthorization, states were permitted to evaluate students' responses to scientific and research-based intervention and instruction before being tested, diagnosed, and/or streamed into special education (Wixson et al., 2014). RtI embraces a *prevention model* approach that contrasts with older models that were based upon school failure. Older models also often employed *discrepancy models*, sometimes called *cognitive referencing* models, which we know from our previous discussion in this chapter and the previous chapter, use IQ gaps between verbal and performance subtests, among other norm-referenced tools, to determine a student's eligibility for services in schools. Recall from Chapter 3 the discussion of standards of comparison. Criticism surrounds use of discrepancy models including the "disproportionate number of students from culturally and ethnically diverse groups of English language learners who are identified as learning disabled . . ." (Wixson et al., 2014, p. 637).

Ehren and Whitmire (2009) think of RtI as a framework for assisting students rather than a single model. In addition to instruction and intervention needing to be evidence based, principles and components of RtI include:

- Only qualified professionals who meet the accepted standards of their respective fields deliver the scientifically based instruction.
- Data on students' baseline performances are obtained and students are reassessed at regular intervals to determine and monitor their responses to instruction.
- Instructional approaches are modified as a result of students' progress data, and instructional approaches are implemented in increasingly intensive approaches if students do progress adequately in response to an earlier implemented instructional approach.

Ideas of "tiers" are commonly used to explain the increasingly intensive levels of instruction. RtI, in the beginning stages of implementation in many school systems, is a three-tiered system (with various modifications in different school districts) of service delivery (Moore & Montgomery, 2008; Roth & Troia, 2009; Staskowski & Rivera, 2005). Table 4.5 summarizes some of the features of each of the RtI tiers.

*Common Core State Standards (CCSS).* Another evolution occurring within school settings is the adoption of a new set of achievement standards across the grades that incorporate a number of specific language-based literacy milestones and expectations for students (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010). As these standards are implemented, in practice, across states, we may uncover new challenges conducting research that links evidence-based practices to our intervention choices for students with SLD (Whitmire, O'Rivers, Mele-McCarthy, & Staskowski, 2014). Because many of the standards relate to language-literacy achievement, SLPs, reading specialists, and special educators with expertise in language and literacy have primary roles as they consult with and advise general educators to create and deliver interprofessional, curriculum-relevant language-literacy intervention to students.

A brief review of selected standards demonstrates their language-loaded nature (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010). Examples include:

- First Grade Common Core State Standard related to Listening and Speaking  
Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly
- Third Grade Common Core Standard related to Reading Comprehension  
Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in text, using language that pertains to time, sequences, and cause/effect
- Fifth Grade Common Core Standard related to Morphology  
Use common grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., photograph)

**TABLE 4.5 |** Features of RtI Tiers

Tiers	Features
Tier 1	<ul style="list-style-type: none"> <li>■ Evidence-based practices typically delivered by general education teachers in their classrooms</li> <li>■ Students are screened for their levels of performance</li> <li>■ Formative assessment approaches used at frequent intervals to monitor progress</li> <li>■ Forms of instruction differentiated for different students with the help of and consultation with other professionals such as speech-language pathologists</li> <li>■ Language and literacy consultation re: strategies to help in the development of effective language and literacy instruction</li> </ul>
Tier 2	<ul style="list-style-type: none"> <li>■ Intervention may be implemented as a result of findings from a screening</li> <li>■ Instruction focuses on each student's specific educational and language literacy needs</li> <li>■ Instruction delivered by a combination of professionals, including, for example, the speech-language pathologist and/or classroom teacher</li> <li>■ Instruction may occur in small groups</li> <li>■ Progress is monitored frequently</li> <li>■ If a student fails to respond in interventions in Tier 2, a more comprehensive assessment may be warranted</li> </ul>
Tier 3	<ul style="list-style-type: none"> <li>■ Targeted intervention and/or specialized treatment occurs in this tier for specific academic needs</li> <li>■ Delivered by any appropriate specialists in consultation with general and special education teachers</li> <li>■ Intervention occurs on an intensive basis often in small groups or individually</li> <li>■ Team consultation continues</li> <li>■ Progress monitored frequently</li> <li>■ Specific language-literacy focused intervention that is curriculum relevant</li> </ul> <p>Some frameworks of RtI consider Tier 3 instruction as a form of special education, whereas other frameworks of RtI have special education as a fourth tier.</p>

Sources: Moore and Montgomery (2008); Roth and Troia (2009); Staskowski and Rivera (2005); Troia (2005).

## Epilogue

The road from language impairment to SLD may be a long and bumpy one for Tim (Sun & Wallach, 2014). The literature is, however, rich with information that provides us with innovative and evidenced-based techniques to improve services for students with SLD. Clearly, understanding the role that language plays in school learning and its impact upon children with SLD is critical to their success. Students with SLD with language learning problems have many challenges, especially as they move from the early grades and the task of learning to read and write to later grades where curricular content becomes more demanding and as they become more aware of their own difficulties.

Clinicians and educators have a shared responsibility on the road to understanding fully the ways that SLI and SLD interact and intersect with one another. Professionals are also challenged to interpret carefully the significance (or not) of co-existing conditions like CAPD and ADHD, and their associated behaviors, in SLI and SLD populations (Shaywitz, Fletcher, & Shaywitz, 1995). It is essential to view behaviors that often surround SLD, like attentional difficulties, impulsivity, and social-emotional problems, as part of the larger context in which they occur. As professionals in regular and special education become more familiar with the CCSS, they will see that integration of basic communicative processes (i.e., language processes and skills) is at the heart of current thinking about academic success (Haager & Vaughn, 2013; National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010). Incorporating techniques into intervention

that help the children become more “meta” and strategic about their choices are pieces of this complex puzzle and particularly as they progress into the secondary grades and later as they transition into the workforce (Ehren et al., 2014). Finally, we must also remember that while labels may be appropriate for shoes, dresses, and other goods, they do not reflect the complex and ever-changing nature of children and the environments in which they must learn. The children need more from intervention.

### SUMMARY

In this chapter we have seen that

- Children with language impairment and learning disabilities are members of overlapping populations. While different terms have been used to refer to these children, such as *Specific Language Impairment (SLI)*, *Specific Learning Disabilities (SLD)*, *Dyslexic*, and *Language Learning Disabled (LLD)*, among others, the primacy of language must be understood across contexts, time, and learning tasks.
- Learning disabilities emerged as a diagnostic category in the 1960s and has since been redefined several times and across different disciplines.
- Children’s labels may change due to the ways language impairment manifests itself once children enter school and to school professionals’ orientations and backgrounds.
- Language impairment shows itself differently across time and learning tasks, across spoken and written language, and across spontaneous and metalinguistic levels of language.
- Spoken and written language form a reciprocal relationship that influences the development of both systems and informs the direction and focus of intervention for students with SLD.
- Language assessment and intervention for school-age students with SLD should be focused on the demands of the academic environment and with emphasis on helping students acquire the language knowledge, skills, and strategies needed to access the curriculum with its changing language demands.
- The demands of different content areas (e.g., science, social studies, language arts) must be understood by specialists, general educators, and special educators so that students with SLD not only “read to learn” but they also “learn to read (again)” to manage the different linguistic requirements of each subject.
- The impact of language upon social and emotional growth and self-concept development (and vice versa) should be a component of assessment and intervention. Many children with SLD have continuing pragmatic language difficulties.
- Educational models of service delivery are evolving with RtI frameworks providing a three-tiered level of services to replace traditional discrepancy models of identification and intervention.
- Common Core State Standards are among the new directions that will drive core curricular and intervention directions with school-based professionals taking on new and exciting challenges.

# 5

# Adolescents with Language Impairment

## LEARNING OBJECTIVES

After reading this chapter, you should be able to

- Explain why adolescents with language impairment are described as an increasingly recognized yet underserved group with significant problems
- Describe characteristics of adolescents with language impairment
- Discuss issues related to assessment for adolescents with language impairment
- Discuss issues related to intervention for adolescents with language impairment

The developmental period known as adolescence is generally described as beginning at about 11 to 12 years of age and, in Western societies, continuing until 18 to 21 years of age, depending on which theory of adolescent development is being used. During these years, considerable cognitive, physiological, emotional, social, and educational changes occur. Language changes too, and the changes in language are both affected by and affect other areas of development. When an adolescent experiences a language impairment, whether the impairment is severe or whether it is less severe so that the adolescent's language is more likely to be shaky or, using Nelson's (1998) words, "almost but not quite" right (p. 223), the teenager is at risk for problems in all areas of development.

Knowledge about adolescents with language impairment remains incomplete, especially for those adolescents whose language problems exist in the absence of other conditions known to affect language, such as specific language impairment (SLI), described in Chapter 3 with regard to preschoolers. What we do know, however, is that young children with SLI mature into adolescents with SLI. As was clear in the previous two chapters, SLI is not a "curable" condition, but it is a manageable condition with appropriate intervention across ages and grades. In the previous chapter on language and learning disabilities, we made the point that many of the children considered to be learning disabled had been preschoolers with SLI (whether or not their language impairment had actually been identified) and that they continued to be SLI (and therefore have language problems) when they entered school even if the label for their problems was changed to "learning disability" or if they retained a label of "language impaired" in addition to "learning disability." These

children grow up and many enter adolescence with continuing language problems and accompanying learning difficulties. In summarizing the results of her study, Rescorla (2009) writes that “slow language development at 24–31 months is associated with a weakness in language-related skills into adolescence relative to skills manifested by typically developing peers” (p. 16).

As we will see in this chapter, adolescents with language impairment do not constitute an inconsequential group, and the problems they encounter because of their language impairment are anything but inconsequential. However, many adolescents with language impairment remain unidentified or underrecognized, unserved, underserved, and/or neglected (Apel, 1999a; Joffe & Nippold, 2012; Nippold, 2010b; Vance & Clegg, 2010). In this chapter, we discuss why this group remains relatively underrecognized, problems related to language impairment in adolescence, and assessment and intervention factors that are particularly relevant to this group.

## AN INCREASINGLY RECOGNIZED YET UNDERSERVED GROUP WITH SIGNIFICANT PROBLEMS

When this chapter on adolescents with language impairment first appeared about 30 years ago in the 1986 edition of this book, the amount of information in the literature about these teenagers was extremely limited compared to what was available about youngsters with language impairment. Some even believed that there was no need for the chapter! Some 30 years later, it is encouraging and refreshing to see the increase in the literature that addresses issues related to adolescents who continue to demonstrate language impairment. Indeed, Joffe and Nippold (2012, p. 438) echoed this sentiment in their prologue, entitled “Progress in Understanding Adolescent Language Disorders,” which introduced the 2012 clinical forum on language and communication disorders in adolescents in the journal *Language, Speech, and Hearing Services in Schools*. In looking back, the title for this section of the current chapter has morphed over the years from the first title, “The Problem,” to “The Continuing Problem” to “A Neglected Group with Significant Problems” to “An Underrecognized Group with Significant Problems” to the current title, “An Increasingly Recognized Yet Underserved Group with Significant Problems.” The changes reflect this increased attention to adolescents with language impairment but also convey that we are “not there yet” in terms of the following:

- The services provided for these teenagers for whom, compared to services for elementary school students, sadly remain either underserved or unserved
- Our preparation of university students to serve, when they graduate, these adolescents—preparation which remains largely hit and miss in universities’ curricula
- Our knowledge from research that helps us to fill the gaps in our understanding about the nature of the adolescents’ language and related problems and how to develop and deliver evidence-based intervention programs

Even today, there may be some readers who are surprised to learn that there are adolescents with language impairment and that the extent of the problems associated with the population warrants an entire chapter devoted to this group of individuals.

### The Shape of Adolescent Language Impairment

The evidence continues to mount that problems associated with language impairment, in the absence of other conditions such as hearing loss, intellectual limitations, and physical disabilities, persist into adolescence and even adulthood or can even emerge during adolescence, with just a few publications in the 1980s (e.g., Aram, Ekelman, & Nation, 1984) and numbers increasing steadily to a fairly consistent stream of publications since the millennium (e.g., Beitchman, Wilson, Johnson et al., 2001; Bryan, Garvani, Gregory, & Kilner, 2015; Mok, Pickles, Durkin, & Conti-Ramsden, 2014). The evidence now is convincing that adolescents’ language problems can affect their personal relationships, academic success during

junior and senior high school, choice of vocational and professional careers, and subsequent earning power. That adolescents with language impairment typically perform poorly academically should come as no surprise because, as we have seen in the previous chapter, language ability is a well-recognized factor in students acquiring basic academic skills, skills that most obviously include learning to read and literacy but that can also include mathematical abilities (Alt, Arizmendi, & Beal, 2014; Donlan, Cowan, Newton, & Lloyd, 2007; Fazio, 1994, 1996; Johnson, Beitchman, & Brownlie, 2010; Nys, Content, & Leybaerta, 2013). In extending the effects of language problems on learning, it should also come as no surprise that these problems affect what, if any, postsecondary education is undertaken (Clegg, Hollis, Mawhood, & Rutter, 2005; Durkin, Simkin, Knox, & Conti-Ramsden, 2009; Hall & Tomblin, 1978; Johnson et al., 2010) and how well an individual is able to achieve independence, to cope, and to achieve in the workplace (Conti-Ramsden & Durkin, 2008; Law, Rush, Schoon, & Parsons, 2009; Whitehouse, Watt, Line, & Bishop, 2009). Clegg and her colleagues (2009) looked at the language abilities of adolescents who were at risk for expulsion from secondary school because of behavior problems and concluded that “for a high proportion of secondary age pupils at risk of permanent school exclusion, language difficulties are a factor in their behaviour problems and school exclusion” (p. 123).

Socioemotional difficulties are a significant issue for adolescents with language impairment. In earlier chapters, we saw how problems with social interactions and even socioemotional difficulties are associated with specific language impairment in preschool years and language-learning disabilities in the earlier school years. These problems are seen in the difficulties students have in establishing and maintaining positive interpersonal relationships, as evidenced in a significant number of publications, among them Asher and Gazelle (1999), Conti-Ramsden and Botting (2004), Durkin and Conti-Ramsden (2007, 2010), Lindsay, Dockrell, and Strand (2007), and Snowling, Bishop, Stothard, Chipchase, and Kaplan (2006), as well as others shown in Table 5.1. Although behavior issues associated with externalizing characteristics (e.g., oppositional behavior, hyperactivity, conduct problems) have sometimes been reported for adolescents with language problems (Beitchman, Wilson, Brownlie, Walters, Inglis, et al., 1996; Botting & Conti-Ramsden, 2000; Clegg et al., 2009; Cohen, Farnia, & Im-Bolter, 2013). It appears that these adolescents may be more apt to demonstrate problematic behaviors related to internalizing difficulties (e.g., withdrawal behaviors, shyness, limited friendship, social phobia, and social initiation problems) (Beitchman, Wilson, Johnson et al., 2001; Conti-Ramsden & Botting, 2004; Wadman, Durkin, & Conti-Ramsden, 2008). Internalizing difficulties have been types of problems reported also in younger school-age children with SLI (Fujiki, Brinton, Isaacson, & Summers, 2001; Fujiki, Brinton, Morgan, & Hart, 1999). In their meta-analyses of research addressing emotional and behavioral outcomes later in childhood and adolescence for children with specific language impairments, Yew and O’Kearney (2013) concluded that “relative to typical children, SLI children experience clinically important increases in the severity of diverse emotional, behavioural . . . symptoms and more frequently show a clinical level of these problems” (p. 516). There are some indications that students with SLI have difficulties with emotion regulation, a psychosocial issue that could be expected to affect interpersonal relationships (Fujiki, Brinton, & Clarke, 2002), as well as other evidence that has begun to document a decline in their self-esteem as the students mature and progress in school (Jerome, Fujiki, Brinton, & James, 2002; Lindsay & Dockrell, 2012; Wadman et al., 2008). Along with language impairment, these socioemotional and behavioral issues can persist across childhood and into adolescence (St Clair, Pickles, Durkin, & Conti-Ramsden, 2011).

In an early study of the relationship between socioemotional problems and language abilities in older children and adolescents, 71 percent of the students (aged 8 to 13 years) in a school setting who had been identified as having mild/moderate behavioral disorders had language scores between one and two standard deviations (1 to 2 SD) below the means for the normative sample (Camarata, Hughes, & Ruhl, 1988). Sadly, none of the students had had language evaluations prior to the data collection for that research project. Even sadder is the reality that students exhibiting a variety of behavioral issues continue not to routinely receive language evaluations, so that their language impairment often goes unidentified (Hollo, Wehby, & Oliver, 2014). As examples, Walsh, Scullion, Burns, MacEvilly, and

TABLE 5.1 | Characteristics of Adolescents and Adults at Follow-Up Who Had Language Impairment Identified in Their Preschool or Elementary School Years

Researchers	Age(s) of First Identification of Language Impairment	Age(s) at Follow-Up Assessment	Language Ability	Characteristics at Follow-Up		
				Reading and Academic Ability	Social/Emotional/Behavioral Characteristics	Other
Aram et al. (1984)	3;5–6;11	13;3–16;10	90% of subjects had language scores in moderately to profoundly delayed range	–More than 50% of subjects below 25th-percentile rank on reading and spelling measures –75% received special academic assistance*	Greater prevalence of behavior problems than peers	
Hall & Tomblin (1978)	Mean ages: 6;1 language-impaired (LI) group 6;4 articulation-impaired (AI) group	Mean ages: 22;3 LI 23;0 AI	50% of LI continued to have language problems as adults; 5.5% of AI continued to have articulation problems	From grades 3 through 12, LI scored significantly lower on composite scores of academic achievement tests than AI at each grade level except grade 3	Less postsecondary education pursued/achieved by LIs than AIs	
Weiner (1974) (case study)	4 years old	16 years old	–Continuing semantic delay –Continuing morphological and syntax problems	–Second-grade reading level –Placed in work-study special education program in spite of normal nonverbal IQ	Ignored/teased by teenage peers	
Beitchman, Brownlie, et al. (1996) Beitchman, Wilson, Brownlie, Walters, Inglis, et al. (1996) Beitchman, Wilson, Brownlie, Walters, & Lancee (1996)	5 years old	12;6 years old	Continued significant delays in receptive and expressive language performance	–Significantly lower educational achievement test scores than subjects without language impairment –About 50% had received special academic assistance	–Increased risk/presence of psychiatric disorder in adolescence –Less participation in extracurricular nonsports activities and organizations –Behavior difficulties more apparent in school environment than at home –Rated as less socially competent –Links to externalizing and internalizing behavior problems	

Johnson et al. (1999) Beitchman, Wilson, Johnson, et al. (2001)	5 years old	19 years old	<ul style="list-style-type: none"> <li>–Continued significant delays in receptive and expressive language performance (means below –1 SD)</li> <li>–Only 50% had received speech/language intervention, even in early school years</li> </ul>	<p>Significantly poorer reading, spelling, and math test scores than subjects with no language impairment at 5 years of age</p>	<ul style="list-style-type: none"> <li>–Elevated rates of anxiety disorder (social phobia the most common anxiety disorder)</li> <li>–Likelihood of antisocial personality disorder</li> </ul>	For language-impaired subjects, a decline in performance IQ with advancing age into early adulthood
Johnson et al. (2010)	5 years old	25 years old	Receptive vocabulary within normal limits but significantly lower than normal (unaffected) peers	<ul style="list-style-type: none"> <li>Compared to unaffected peers, young adults with SLI</li> <li>–Performance IQ within normal limits but significantly lower</li> <li>–Reading comprehension borderline but significantly lower</li> <li>–Arithmetic abilities at lower end of normal and significantly lower than peers</li> <li>–Fewer individuals with SLI completed high school or university levels</li> </ul>	<ul style="list-style-type: none"> <li>–Early parenthood for 35% of SLI adults vs. 15% for unaffected peers</li> <li>–No difference in marital status or living with partner</li> <li>–Fewer with salaries in highest income bracket</li> <li>–No self-perceived difference in satisfaction with quality of life</li> </ul>	<ul style="list-style-type: none"> <li>–Lower socioeconomic status than unaffected peers</li> <li>–Fewer with salaries in highest income bracket</li> <li>–No self-perceived difference in satisfaction with quality of life</li> </ul>
Tomblin, Freese, & Records (1992)	Mean age: 8;6	Mean age: 21;6	L1 young adults significantly poorer than the young adults without early L1 for	<ul style="list-style-type: none"> <li>L1 young adults significantly poorer than the young adults without early L1 for</li> <li>–Receptive single-word vocabulary</li> <li>–Use of well-formed sentences</li> <li>–Confrontation naming speed</li> <li>–Sentence imitation; speaking rate</li> </ul>	<ul style="list-style-type: none"> <li>–Oral and written spelling</li> <li>–Reading comprehension</li> </ul>	<ul style="list-style-type: none"> <li>Socioeconomic status of L1 subjects' families based on their fathers' occupations lower than that of young adults without early L1</li> <li>–Auditory perception of rapid temporal information</li> <li>–Performance IQ</li> </ul>

(Continued)

TABLE 5.1 | *Continued*

Researchers	Age(s) of First Identification of Language Impairment	Age(s) at Follow-Up Assessment	Characteristics at Follow-Up			
			Language Ability	Reading and Academic Ability	Social/Emotional/Behavioral Characteristics	Other
Conti-Ramsden, Botting, Simkin, & Knox (2001)	7 years old	11 years old	<ul style="list-style-type: none"> <li>–Receptive agent-action questions for semantic acceptability</li> <li>–Token test performance</li> <li>–Word fluency</li> </ul>	<ul style="list-style-type: none"> <li>–Receptive and/or expressive vocabulary and/or morphology/syntax below 16th-percentile rank</li> <li>–88.5% still had low language scores (below 16th-percentile rank)</li> </ul>	<ul style="list-style-type: none"> <li>–Two-thirds below the normal range on single-word reading</li> <li>–80% below normal on reading comprehension</li> </ul>	<p>About 25% showed declines in nonverbal IQ to levels below normal</p>
Conti-Ramsden, Durkin, Simkin, & Knox (2009) Conti-Ramsden, St Clair, Pickles, & Durkin (2012) Mok et al. (2014)	7 years old	17 years old	<ul style="list-style-type: none"> <li>–Expressive language scores below –1 SD</li> <li>–Receptive and expressive language lower than unaffected (normally developing) peers</li> <li>–Steady growth in language skills between ages 7 and 17 years although remaining at lower levels</li> </ul>	<ul style="list-style-type: none"> <li>–SLIs reading comprehension below –1 SD level</li> <li>–44% of SLIs achieved at least 1 expected qualification for secondary school credential (approximately a high school diploma); 88% of unaffected peers achieved same level</li> <li>–53% of SLIs achieved low or minimal level qualification compared to 11% of unaffected peers</li> <li>–25% of SLIs did not complete any secondary school credentialing</li> </ul>	<ul style="list-style-type: none"> <li>–About 60% had peer-relation problems beginning in childhood and persisting into adolescence or adolescent-onset peer-relation problems</li> </ul>	<p>–Approximately 33% of SLIs who, at age 7, had lower nonverbal IQ than other SLIs, albeit still within normal limits, showed deceleration in nonverbal IQ over 10 years to age 17</p> <p>–66% of SLIs showed stable pattern of growth from ages 7 to 17</p>

<p>Stothard, Snowling, Bishop, Chipchase, &amp; Kaplan (1998)</p> <p>3;9–4;2 Retested at 5;6 years and groups formed, among them:</p> <ul style="list-style-type: none"> <li>—“Resolved” language delay at 5;6 years</li> <li>—“Persistent” language impairment at 5;6 years</li> </ul>	<p>15–16-year-olds</p> <ul style="list-style-type: none"> <li>—Persistent LI group: all measures below –1 SD and several approaching –2 SD level</li> <li>—Significant decrease in vocabulary between 8 and 15 years of age</li> <li>—“Resolved” language delay group: most delay group: most measures at lower end of normal range; significantly lower than control group (normal language) on four of eight measures</li> </ul>	<p>—Persistent LI group: 95% scored below 12-year level for reading and spelling; performances at –2 SD level; 50% received no special academic assistance, 30% tutoring, and 20% placed in special classes/ schools</p> <p>—“Resolved” language- delay group: 52% scored below 12-year level for reading and spelling;</p> <p>performances mostly at lower end of normal range</p>	<p>—About 50% had limited range of friendships</p> <p>—30% still bullied or teased</p> <p>—25% living with partner at follow-up; ~30% had lived as married for ±1 month</p> <p>—Higher scores on tests of psychiatric morbidity, especially items for social anxiety, no close friends, odd speech</p>	<p>—Performance IQ within normal limits; similar levels to unaffected siblings</p> <p>—60% employed at time of follow up but only 17% had been in continuous employment since leaving secondary school</p> <p>—Two-thirds had periods of unemployment of ±2 years; 18% never had any paid employment</p>
<p>Clegg et al. (2005)</p>	<p>Mean age: 9;11</p>	<p>Mean age: 36;2</p>	<p>—11;9 age equivalent of receptive vocabulary</p> <p>—11;1 age equivalent of expressive vocabulary</p> <p>—No change in receptive and expressive language past early 20s</p> <p>—Significantly lower language than unaffected siblings</p> <p>—Sentence repetition lower than unaffected siblings</p> <p>—Nonword repetition lower than unaffected siblings</p>	<p>—19-year age equivalence for reading and spelling compared to 14–16-year age equivalence for unaffected peers</p> <p>—94% of SLIs did not pass secondary school examinations at expected chronological age of 16 years or at any time thereafter; did not attain a certificate of secondary education (approximately high school diploma)</p>

(Continued)

TABLE 5.1 | *Continued*

Researchers	Age(s) of First Identification of Language Impairment	Age(s) at Follow-Up Assessment	Characteristics at Follow-Up			
			Language Ability	Reading and Academic Ability	Social/Emotional/Behavioral Characteristics	Other
Rice & Hoffman (2015)	Mean age: 6;11	21 years of age	—Significantly impaired theory of mind**	—About 50% subsequently attended adult education course or technical/apprenticeship experience; ~50% no training/education beyond age 16 years	—41% had been dismissed from one or more jobs —40% living independently; others reliant on parents for support	

\*“Special academic assistance” consisted of special education services, tutoring, remedial instruction, and/or special classroom/special school placement.

\*\*Theory of mind is a person’s ability to attribute mental states to themselves and others, allowing people to predict, judge, and explain others’ behavior and understand social interactions.

Brosnan (2014), in their investigation of older children and adolescents with primary diagnoses of attention deficit/hyperactivity disorder (ADHD), reported that “almost three-quarters of the study cohort had *previously undetected language difficulties* [emphasis added], with over 70% of those having both receptive and expressive language difficulties” (p. 59), and Joffe and Black (2012), reporting on the adolescents in their study, wrote that “though underperforming academically, the students’ language difficulties had not previously been recognized and the students were receiving no specialist support” (p. 468).

In other reports focusing on students with problem behaviors, Kauffman (2001) has suggested that these pupils demonstrate difficulties in relating to peers and in making and keeping friends, and Marcon (1998) found that for a group of high school graduates, their kindergarten language abilities differentiated those who had been identified on leaving high school as demonstrating significant maladaptive behaviors from those showing no significant maladaptive behaviors. As expected, those adolescents with the lower early language skills fell mostly into the maladaptive group. A 50 to 70 percent co-occurrence rate of emotional or behavioral difficulties in school-age children and speech and language problems has been suggested in some of the literature (Hummel & Prizant, 1993; Prizant et al., 1990), and in one study the proportion of children who had received treatment for behavioral or emotional problems who also had language impairment ranged from 60 to 95 percent (Cohen, Davine, Horodezky, Lipsett, & Isaacson, 1993).

Not surprisingly, the problems adolescents have in establishing and maintaining positive interpersonal relationships frequently affect their relationships with their peers, teachers, and even with their parents and siblings (Durkin & Conti-Ramsden, 2007, 2010; Lindsay et al., 2007; Mok et al., 2014). Difficulties with peer relationships are particularly concerning for adolescents, for whom having conversations with friends provides important sources of support and influences identity and group affiliation (Thurlow, 2005). There is also evidence that, although the amount of time older children and adolescents spend talking with friends increases into the teenage years, this increase seems not to replace the amount of time they spend talking with family members (Raffaelli & Duckett, 1989). These results suggest that, overall, teenagers spend more time in discourse with others, meaning that conversational abilities take on greater importance as children mature into adolescents and can have increasing implications for the quality of interpersonal relationships.

Several longitudinal studies have followed children, whose language impairment was identified in their early years, into adolescence and even adulthood and reported on how these individuals have fared in their later years. As early as 1984 Aram et al. realized that “language disorders recognized in the preschool years are only the beginning of long-standing language, academic, and often behavioral problems” (p. 240). Some of the academic, language, and social, emotional, and behavioral outcomes for adolescents who were identified first as language impaired either in the preschool years or in the early school years are summarized in Table 5.1.

Parents of adolescents with SLI have expressed a number of concerns about outcomes for their teenagers (Conti-Ramsden & Botting, 2004; Conti-Ramsden, Botting, & Durkin, 2008; Hughes, Turkstra, & Wulfeck, 2009; Joffe & Black, 2012; Lindsay & Dockrell, 2004; Pratt, Botting, & Conti-Ramsden, 2006). Among the parental concerns, which are more frequently expressed or different from those of other parents, are the following:

- Relatively negative expectations for the adolescents’ future and life as an adult
- Limited employment options and lack of independence
- Difficulties with social relationships and socialization
- Conduct problems
- Narrowed educational pursuits
- Limited community resources to support the adolescents in their adulthood
- The adolescents’ potential vulnerability to victimization and/or experiences having been bullied

As we see above and will see in our discussion below, these parental concerns may be justified.

**TABLE 5.2 |** Different Types of Credentials with Which Adolescents with Speech or Language Impairments and Specific Learning Disabilities Left School, Compared to Total Students in Special Education, in 2004–2005 School Year, Excluding Students Moved into General (Regular) Education

Types of Credential on Leaving High School	Types of Disability		
	Speech or Language Impairments	Specific Learning Disabilities	Total Students in Special Education
Left with a diploma	67%	61%	57%
Left with a certificate	12%	14%	17%
Left with no credential	21%	25%	26%

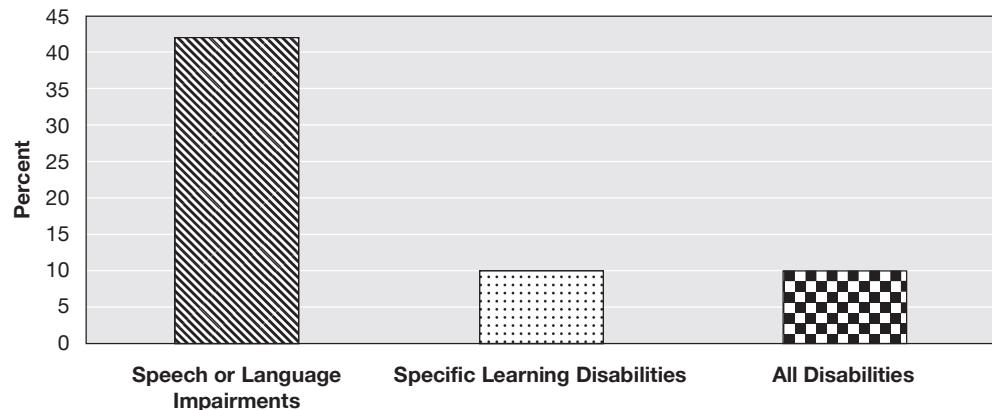
Source: U.S. Department of Education (2006).

### Personal and Societal Costs of Adolescent Language Impairment

While a language impairment in adolescence potentially limits opportunities for an individual's personal, vocational, and economic self-realization, the problem is not just the individual's. It is also society's problem. Undereducation and underemployment are common outcomes of a language impairment (Clegg et al., 2005; Johnson et al., 2010; Law et al., 2009; Whitehouse et al., 2009). As a result, potentially valuable human resources and contributions are wasted. In some instances, rather than contributing to society as a self-sufficient adult when the underlying potential to do so may have existed, an individual with residual language problems takes from society.

Adolescents with language impairment are at risk for leaving school before earning their full high school diploma (or equivalent), that is, dropping out (Clegg et al., 2005; Conti-Ramsden et al., 2009; Johnson et al., 2010). Table 5.2 shows data from the U.S. Department of Education (2006) indicating the percentage of adolescents with speech or language impairment in the 2004–2005 school year who left high school with a diploma or a certificate or either dropped out or otherwise left without receiving a formal credential. Because we know that a large number of adolescents labeled as having a specific learning disability have language impairment, data for this group of adolescents with a disability are also presented. As is evident, about one-third of the adolescents with speech or language impairment and a similar percent (36 percent) of those with specific learning disabilities either dropped out or otherwise left high school without receiving a formal credential or left with a certificate rather than a diploma. In Western societies, these individuals are likely to have difficulty finding long-term gainful employment, if any employment at all. Students who are at risk for dropping out or who have dropped out are more likely to be the individuals associated with juvenile delinquency, drug and alcohol abuse, and even youth suicide. Related issues involve states' efforts in the last several years to improve students' achievement scores on benchmarking tests and to reduce the number of students on the special education rolls and possible effects of Response-to-Intervention (RtI) activities that encourage assessment and trial interventions before initiating formal diagnostic testing and possible placement in special education.

A particular trend is states' moving some students from special education to general/regular education as students transition from elementary to secondary grades. This trend is notable for children who received speech or language services as elementary students. Figure 5.1 illustrates the percentage of students between 14 and 21 years of age who moved from special education to general education (regular education) in 2004–2005, the same academic year for which data on students leaving schools without diplomas were presented in Table 5.2. It is interesting to note that between 40 and 45 percent of students 14 to 21 years of age who had been classified as speech and/or language impaired for special education in previous grades were moved into regular/general education, while 10 percent of the same-age students classified as specific learning disabled in previous grades were moved into regular/general



**FIGURE 5.1 |** Percentage of Students between 14 and 21 Years of Age Moved from Special Education to General Education (Regular Education) according to 2004–2005 Data

Source: U.S. Department of Education (2006).

education. The percentage for the total number of students 14 to 21 years of age moved from special education to regular/general education was also 10 percent. The reasons for so many adolescents with speech and/or language impairments being reclassified from special education to regular/general education are worth investigation to determine if the teenagers legitimately no longer need special education support services or if other motivations led to their being moved into regular/general education. Even considering the 2004–2005 data, a substantial percentage of adolescents with speech and/or language impairments drop out of high school, that is, leave with no credential.

In adolescence, juvenile delinquency, youth suicide, and drug and alcohol abuse have been linked to deficits in basic skills, including speaking and listening abilities. A relationship between juvenile delinquency and adolescent language impairment is beginning to be documented in the literature, even though there has been some degree of awareness of a link between communication impairment and adult prison populations for several years. A comparison of the oft-cited characteristics of adolescents at risk for juvenile delinquency or those already in detention and the characteristics commonly associated with adolescents with language impairment shows considerable overlap and correspondence. For example, some of the characteristics that have been attributed to juvenile offenders or those at risk for juvenile delinquency include difficulties with interpersonal and social relationships, problems with emotional control, poor academic achievement including reading and writing difficulties, presence of learning disabilities, specific phonological deficits, and discrepancies between verbal IQ and nonverbal IQ scores, with nonverbal scores better than verbal scores (e.g., Archwamety & Katsiyannis, 2000; Bigelow, 2000; Foley, 2001; Kirk & Reid, 2001; Snowling, Adams, Bowyer-Crane, & Tobin, 2000). According to Svensson, Lundberg, and Jacobson (2001), over 50 percent of youths in juvenile detention centers have significant reading or written-language problems. Doren, Bullis, and Benz (1996) examined what factors of students with disabilities predict their arrest. Their results indicated the following:

- Students with specific learning disabilities were almost four times more likely to be arrested than other students with disabilities.
- Students with poor social and/or personal adjustment were 2.3 times more likely to be arrested than other students with disabilities.
- Students with disabilities who left school without graduating were almost six times more likely to be arrested than other students with disabilities.

This last factor can be considered together with the information we saw in Table 5.2 about the percentages of adolescents with speech-language impairments who leave high school

with no credential. The characteristics attributed to juvenile offenders are logically not independent of each other but rather are interrelated, for example, poor reading and academic achievement, verbal/nonverbal IQ discrepancies, and a diagnostic tag of learning disabled. Many of these characteristics sound remarkably like attributes of children and adolescents with language impairment, many of whom had not had previous language assessments.

A body of literature directly links juvenile delinquency and adolescent language impairment is growing. A report of the U.S. Department of Education (1999) indicated that 3 percent of the young people in detention centers had speech or language impairment and that another 45 percent had a specific learning disability, which is notable because of the high co-occurrence of language impairment and specific learning disability. Several groups of researchers have started reporting on various language abilities of male and female juvenile offenders or young adults with SLI who are involved with the legal system (Bryan et al., 2015; Davis, Sanger, & Morris-Friehe, 1991; Hopkins, Clegg, & Stackhouse, 2016; Rosta & McGregor, 2012; Sanger, 1999; Sanger, Creswell, Dworak, & Schultz, 2000; Sanger, Hux, & Belau, 1997; Sanger, Hux, & Ritzman, 1999; Sanger, Moore-Brown, Magnuson, & Svoboda, 2001; Snow & Powell, 2011; Snow, Powell, & Sanger, 2012). Their works have documented that the juvenile delinquent subjects in their studies can be characterized as follows:

- Have poorer results compared to nondelinquent adolescents or score in the language-impaired range on norm-referenced language tests
- Produce less complex language samples compared to nondelinquent adolescents
- Exhibit difficulties with sequencing ideas
- Do not comprehend meanings of words salient in legal contexts, such as *penalty* and *verify*, or the meaning of the Miranda rights statement
- Perceive themselves as having poor language and literacy skills that they believe negatively affect their self-esteem
- Show problems with pragmatic skills that include poor topic initiation and topic maintenance, inconsistent use of politeness techniques, and variable application of rules governing conversational interactions either because of deliberate intentions to violate the rules or because the language resource demands required during the flow of conversations exceed the adolescents' abilities to maintain appropriate use of rules
- Have difficulties relating cohesive narratives, which can interfere with their abilities to explain to law and judicial officials the scenarios in which they find themselves

Although there is evidence for an association between adolescent language impairment and juvenile delinquency, the evidence is not particularly well known, heeded, or utilized (Snow et al., 2012). The lack of awareness about the association of language and juvenile delinquency is demonstrated by findings, for example, that only a small proportion of incarcerated adolescents are likely to have received special education during their school years prior to their difficulties with the law and that, where services were provided, these tended to be for learning disabilities or behavioral disorders rather than language difficulties (Sanger et al., 2000, 2001). None of the juvenile delinquents in these two studies of Sanger and colleagues (2000, 2001) had received language services prior to incarceration, even though evaluation of their language skills while in juvenile detention indicated that a considerable number of them had language impairment.

Another potential personal and societal cost of adolescent language impairment that has also not been well documented or recognized is the possible relationship between language impairment in adolescence and youth suicide. Larson and McKinley (2003) reported that, of the individuals aged 10 to 14 years old involved with the Los Angeles Suicide Prevention Center, about half had learning disabilities. From our understanding of language and learning disabilities, we would justifiably suspect that most of these adolescents had language impairment. Given the socioemotional problems associated with language impairment in adolescence, a possible relationship between adolescent language impairment and youth suicide should not be particularly surprising.

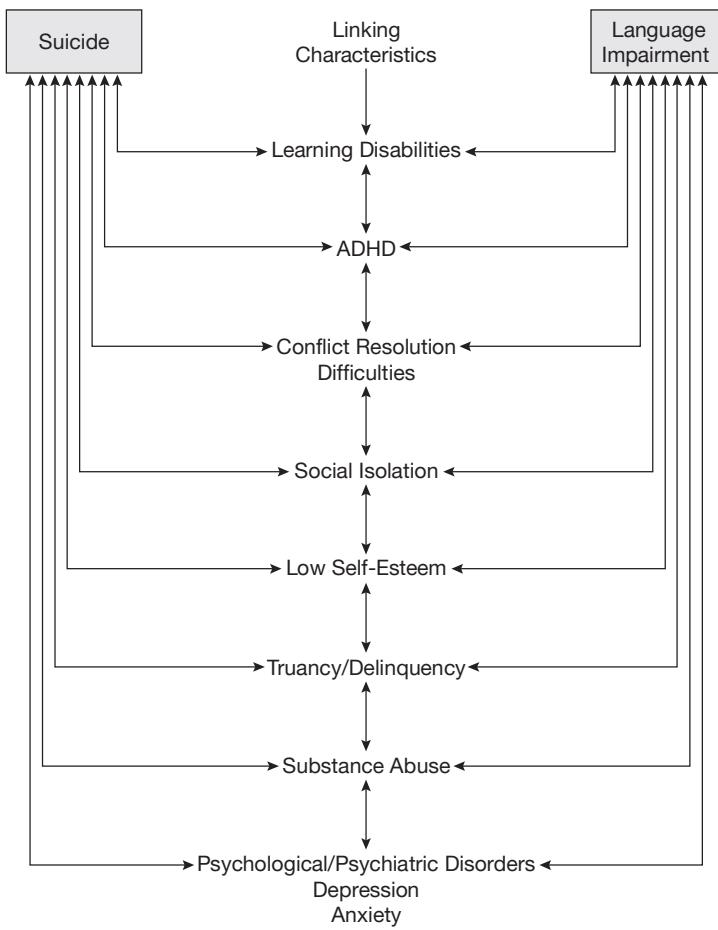
Although the risk factors for youth suicide are far from delineated, agreed on, and empirically validated, a number of factors have been suggested. Among these are the following:

- Psychosocial and socioemotional disorders, including affective disorders, and social skills problems, including low social competence disorders
- Depression
- Problem-solving difficulties, learning disabilities, and the correlates of learning disabilities such as impulse behaviors and, as we know, problematic social skills
- Substance use and abuse
- Unemployment issues

These factors, like the situation with juvenile delinquency, are ones frequently associated with adolescents with language impairment. There is also some evidence of a link between suicide and juvenile delinquency. In one study, 63 percent of youths who committed suicide had a record of involvement with juvenile justice (Gray et al., 2002). Social skills difficulties and peer relationship problems that we see in adolescents with language impairment might also be implicated in the results of a study conducted by Massa and Eggert (2001), a study that was not specifically about language impairment or language ability. These investigators examined the weekly activities of adolescents at risk for suicide compared to those of non-suicide-risk peers and found that the at-risk teenagers spent more of the weekday and weekend time in solitary activities. Results such as these suggest that social isolation from peers may be a factor in youth suicide. As a possible link between teenage suicide and language problems, Asher and Gazelle (1999) suggest that youths with language impairment are at risk for experiencing loneliness as one of the “negative emotional consequences of peer relationship problems” (p. 20). Previously, we also noted emerging evidence that as schoolchildren with language impairment progress through school, their self-esteem falls. Jerome and her co-researchers (Jerome et al., 2002) found that older students with language impairment “perceived themselves more negatively in scholastic competence, social acceptance, and behavioral conduct than did children with typical language development” (p. 700). This contrasts with younger school children with and without language impairment, who did not differ in how they perceived themselves in these areas. Previously we have noted self-esteem and/or self-concept concerns for adolescents with language impairment, for example, Wadman et al. (2008).

Figure 5.2 illustrates some of these possible links between youth suicide and adolescent language impairment. While links between adolescent language impairment and youth suicide are currently tenuous, unclear, and inexact, there seem to be sufficient cues from the literature to be suspicious that stronger links might be present but yet unexplored and unidentified. It would, however, seem worth the time and energy of professionals who work with teenagers with language impairment to be alert to signs of potential self-harm.

Links between substance (drug and alcohol) abuse and adolescent language impairment are, as with youth suicide, currently tenuous links, although there are reasons to suppose an association. In the study conducted by Gray et al. (2002), 65 percent of those youths who committed suicide had a history of substance abuse. In a follow-up study of individuals at 19 years of age who had been identified as language impaired at 5 years of age, Beitchman, Wilson, Douglas, Young, and Adlaf (2001) found that those with substance use disorders (SUD) compared to those without SUD were more apt to have been diagnosed with learning disabilities at 12 years of age, and this association was even stronger in cases in which the learning disability was still apparent at age 19 years. These researchers did not find a similarly strong relationship between age 5 years language impairment and age 19 years substance use problems. However, there was, not surprisingly, a strong association between children with language impairment at 5 years of age and identification of learning disabilities at age 12 and age 19 years, thus suggesting a trend but not a direct relationship. This trend prompted Beitchman, Adlaf, Douglas et al. (2001) to adopt a more individually focused approach using cluster analysis to look at the possible relationship between language impairment and substance abuse. When the comorbidity of SUD and psychiatric disorders, such as anxiety, depression, and antisocial and personality disorders, was examined in individuals at 19 years



**FIGURE 5.2 |** Possible Links between Youth Suicide and Adolescent Language Impairment  
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of age, these researchers found that a statistically significant percentage of those referred to as depressed drug abusers, as well as others referred to as having antisocial behaviors, had been identified as language impaired at 5 years of age. It may be that type of psychosocial outcome, substance abuse in adolescence and early adulthood, and language impairment recognized in early childhood are associated (Snow, 2000).

Adolescents and adults with histories of SLI have been shown to demonstrate more characteristics related to dependent-living situations and fewer independent-living characteristics (Clegg & Henderson, 1999; Clegg et al., 2005; Conti-Ramsden & Durkin, 2008; Johnson et al., 2010). Indices of dependent-living characteristics are the antitheses of those typically associated with independence, such as living outside parents' homes without parental or governmental support, holding and sustaining gainful employment without extended periods of unemployment and receipt of governmental benefits, general financial autonomy, and managing appointments and schedules without assistance. Early parenthood may also be associated with young adults with histories of SLI (Johnson et al., 2010), a factor that can, in turn, impact on types of employment and educational directions.

For most adolescents in Western societies, obtaining a driver's license signifies a passage from childhood to adulthood and a mark of increasing independent living. The language of driving instructions and both oral and written examinations for licenses contains many features that are known to be problematic for adolescents with SLI, for example, verbs, compound nouns, and abstract adjectives, such as *hazardous* (Pandolfe, Wittke, & Spaulding, 2016). It might not be surprising, therefore, that adolescents with SLI have been found to struggle with the language related to driver's licenses. They understand significantly less of

the vocabulary that appears in driving manuals (Pandolfe et al., 2016). Difficulties obtaining driver's licenses potentially restrict employment and post-secondary educational options for adolescents with language impairment, as well as potentially contributing to fewer independent living conditions and undermining self-esteem and self-concept further.

A substantial proportion of children and adolescents with SLI may be at risk for bullying and other forms of victimization (Conti-Ramsden & Botting, 2004; Lindsay, Dockrell, & Mackie, 2008; Redmond, 2011). In one study, the rate with which adolescents with SLI reported that they had been the victims of bullying was more than three times that of their peers without SLI, with 36 percent of adolescents with SLI having been bullied within a week of data collection for the study (Conti-Ramsden & Botting, 2004). A particularly disturbing research finding related to victimization is that young, female adults (25 years) with a history of SLI have greater reported incidences of sexual assault than their peers without SLI (Brownlie, Jabbar, Beitchman, Vida, & Atkinson, 2007).

In the past several decades, increases in technologies have led to dramatic changes in the nature of education, communication, and work. With regard to the nature of work, there are now fewer opportunities for unskilled workers, and these types of jobs have more limited opportunities for long-term employment and advancement. Yet, the information in Table 5.1 demonstrates that adolescents and adults with histories of SLI are likely to be employed in lower-paying, more unskilled jobs. The nature of work has increasingly required employees who can problem solve, read well at high literacy levels, follow instructions, integrate information, and generalize knowledge to new situations and who possess good interpersonal skills in order to work effectively as members of teams (Casner-Lotto & Barrington, 2006; Ehren & Murza, 2010). These employee assets are ones that are typically limitations of adolescents and adults with SLI.

A particularly important change has been the widespread accessibility to computers, smart phones, the Internet, e-mail, and messaging and texting for work, educational, and personal use. On the one hand, these technologies might benefit adolescents with SLI. For example, computer-assisted teaching and computer programs might help adolescents with language disorders to learn, access information (e.g., library resources and Internet searches), and manage production of a number of educational products (e.g., report, spreadsheets, graphics, and spell and grammar checks). Smart phone use might increase opportunities for these adolescents to establish and maintain relationships with peers that their oft-cited characteristics, such as shyness and social anxiety, lead them to find difficult. For example, use of texting and e-mail may remove several of the demands of simultaneous communicative interactions that are inherent in real-time communication.

However, there may be some downsides of these technologies for adolescents with SLI. Compared to normally developing peers, SLI adolescents have been found to use texting less frequently and to be less motivated to use texting for social purposes, such as making plans and engaging friends (Conti-Ramsden, Durkin, & Simkin, 2010; Durkin, Conti-Ramsden, & Walker, 2011). Use of cell phones for calls for both normally developing peers and the SLI adolescents has been shown to be similar, with both groups of teenagers using texting more than calling. Adolescents with SLI may be in a circular situation. The researchers (Conti-Ramsden et al., 2010) have suggested that, although use of smart phones was not particularly difficult for teenagers with SLI,

social difficulties limit the opportunities that young people with SLI have to interact with their peers, which results in less frequent exchanges of text messages. . . . Less frequent text messaging can therefore, in time, lessen the social experiences of adolescents with SLI by reducing their opportunities to develop social networks and to make arrangements to engage in social interaction with peers. (p. 206)

It is also possible that computer use by adolescents with SLI reflects unsystematic and inefficient strategies. Rather than decreasing demands for reading, literacy, and metacognitive skills, effective computer use and electronic communication modes have increased demands for reading, literacy, and problem solving. Efficient use of the computer and the Internet for communication and information acquisition requires skills such as increased reading speed and comprehension of printed material, metalinguistic and semantically based organizational abilities, and critical assessment of larger amounts of information than previously

experienced, all abilities with which adolescents with SLI can struggle. According to the research of Durkin, Conti-Ramsden, Walker, and Simkin (2009), issues with language and literacy ability helped explained why, compared to normally developing adolescents, teenagers with SLI used their home computers less for educational purposes and used some personal applications less, for example, using computer-based communication such as e-mail, MSN, and blogging; making online purchases; and downloading music. In contrast, the adolescents with SLI spent more time playing off-line computer games than their peers. In commenting about their uses of their home computers, the adolescents with SLI reported

they found information too technical, too text-bound, and difficult to comprehend. They mentioned difficulties with reading, writing and spelling; they found navigation through different applications problematic in addition to remembering information across different times of use. (p. 211)

However, consistent with Durkin and Conti-Ramsden's (2014) thinking, encouraging students' constructive computer use might have benefits for the adolescents that could assist them, for example, in promoting more positive peer interaction and supporting their educational pursuits. Nevertheless, adolescents with SLI may find that, for both their educational and personal purposes, using their home computers is generally harder than do their peers. This led Durkin and his colleagues (Durkin, Conti-Ramsden, et al., 2009) to conclude that "adolescents with SLI were likely to elect to engage less frequently as a function of perceived ease of use" (p. 211). In addition to perceived ease of use, the more limited uses of computers by adolescents with SLI may also relate to heightened anxiety related to using them Conti-Ramsden, Durkin, and Walker (2010). These researchers reported that "level of general anxiety, perceived ease of use and language ability had a direct association and were predictive of level of computer anxiety in adolescents with SLI" (p. 136).

Westby and Atencio (2002) write,

In the 21st century, society has entered a new technological, information era. Where people once were valued for their ability to transform raw materials into products, now they are valued for the information they can possess and transmit. To be successful, individuals are expected to use technology to integrate more and more information from more and more diverse sources and communicate this information to more and more people. (p. 70)

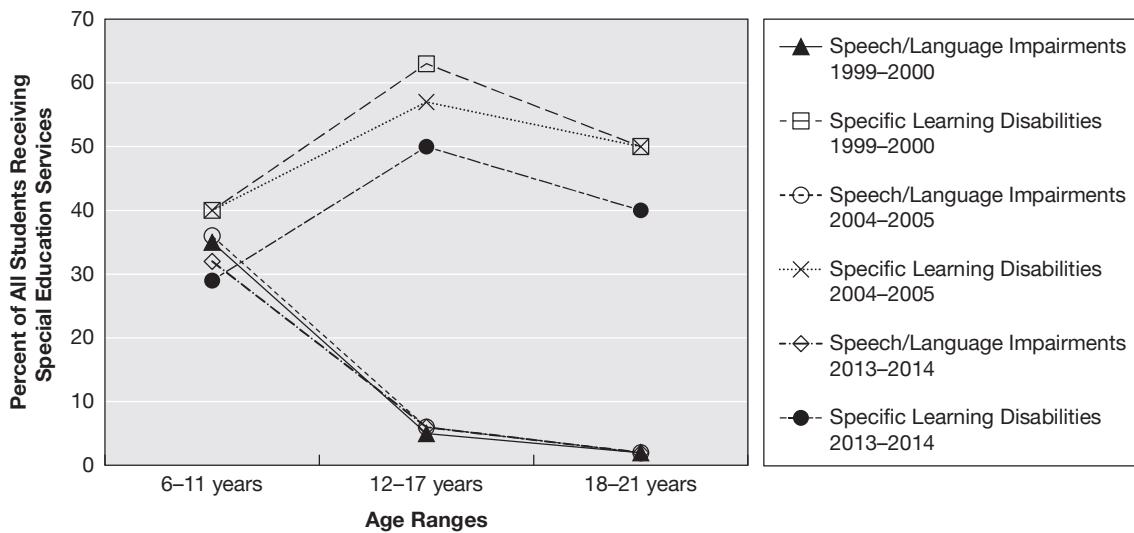
The adolescent with a language impairment is at greater risk than ever before for being able to keep pace in educational and in vocational pursuits in what are increasing electronic communications expectations for current school and work environments and for requirements for high literacy to obtain and achieve in employment in the modern workforce.

The personal, economic, and societal costs of adolescent language impairment are huge. Failing to recognize the issues and to address adequately the educational and social needs of adolescents with specific language impairment increases these costs.

### Reasons for Still Lagging Recognition and Continuing Underservice

Despite the mounting evidence that language impairments in young children persist in adolescents and that the associated personal and societal costs are staggering, adolescents with language impairment continue to be relatively underrecognized and definitely underserved professionally. Several reasons account for this. One is the emphasis that has been placed on preschoolers and elementary school children with language impairment. Early intervention to prevent or at least lessen academic and personal failures is the rationale behind this emphasis on young children. It is certainly a logical and worthwhile rationale, and it can work. However, it does not necessarily solve the problem; recall that we have characterized SLI (and even learning disabilities) as a lifelong disability that can have different manifestations at different ages and stages of life. Ongoing support is necessary. Children with SLI are not cured while they are preschoolers or in elementary school.

An example of one way in which the emphasis on young children detracts attention from adolescents with language impairment can be found in the numbers of speech-language pathologists (SLPs) who work in secondary schools compared to those working in elementary schools and preschools. At the end of 2015, of American Speech-Language-Hearing Association (ASHA) SLPs, 3.4 percent reported they worked in secondary schools, compared to 28.5 percent



**FIGURE 5.3 |** Students with Speech/Language Impairments and Specific Learning Disabilities as Percentage of All Students Receiving Special Education Services in Public Schools in the 1999–2000, 2004–2005, and 2013–2014 School Years

Source: U.S. Department of Education (2001, 2006, 2015).

in elementary and preschool settings (ASHA, 2016). These workplace data can be compared to 2009. According to ASHA (2009), 34 percent of ASHA SLPs in 2009 worked in elementary schools and preschools and 3.4 percent in secondary schools. As with 2016, this represents a large difference between the 3.4 percent working in secondary schools and the 34 percent in elementary and preschools. Data from the 2002 ASHA membership (ASHA, 2002) showed that approximately 30 percent of SLPs worked in elementary and preschool settings and 2.5 percent in secondary schools. These figures suggest little increase in the proportion of SLPs serving secondary schools over the past approximate 15-year period.

The low number of SLPs serving secondary schools is consistent with the proportion of students receiving speech or language services in elementary and secondary grades. Figure 5.3 shows the 1999–2000, 2004–2005, and 2013–2014 school-year data for percentages of all students in special education who received speech or language services or specific learning disabilities services in three age groups: 6 to 11 years, 12 to 17 years, and 18 to 21 years, ages that correspond to the elementary and secondary school grades and the immediate post-secondary years. What is apparent over the 15-year period is the conspicuous increase between the elementary-school-age group and the secondary-school-age group in the percentage of students with specific learning disabilities who receive special education services compared to the dramatic decrease for students with speech or language impairments. We know that: a) it is unlikely that so many children with language impairment would have been “cured” prior to entering secondary school, b) there is a close association between language impairment and learning disabilities, and c) from the data in Figure 5.1, with the movement of students receiving speech or language services from special education rolls to general/regular education counts, many of the children with language impairment in elementary school have likely been relabeled as having specific learning disabilities on entry into secondary school or dismissed from services all together.

An obvious issue with these trends for employment of SLPs and the data for numbers of adolescents being served in the secondary schools is the following:

- If language impairment is not being identified in adolescents, then the (spurious) conclusion is that there is no population needing the services of SLPs and, therefore, no need to employ them to serve secondary schools.

However, there is inherent circularity in this scenario:

- If only very few SLPs are serving the secondary schools, who is available in these schools to identify adolescents with language impairment or to advocate for their needs?

A related issue leading to underrecognition and underservice of adolescents with language impairment is that the historical lack of services at the secondary level can lead professionals serving language-impaired children who are progressing from elementary school to secondary grades to dismiss these children under the belief that further services may not be available or further change in language skills would be limited. Recall from Chapter 3 that Rice (2013), in reporting on the children in her research on the genetic bases of SLI, wrote that

Although they were receiving speech-language therapy at the outset of their participation in the study, ongoing monitoring of the services they were receiving . . . shows that the children were likely to be dropped from speech pathology services by age 7–9 years [emphasis added], although they were likely to receive services for reading or other academic limitations [emphasis added] after their speech-language pathology services were discontinued. . . . Thus, there was no common approach to speech-language therapy [emphasis added]. (p. 224)

From a professional and ethical perspective, the practice of dismissing students from services when the students need continuing support for their language issues as adolescents in order to access curricular content demands is unprofessional and probably unethical. There is a dramatic jump in curricular demands for language and literacy skills from elementary to secondary school, for example, the syntactic complexity of written texts (Scott, 2014; Scott & Balthazar, 2010), the abstract nature of vocabulary, the degree of inference involved in “reading between the lines,” the shifts in teachers’ language and the discipline-specific language (Fang, 2012). The practice of dismissing students with their weak language skills from intervention at the end of elementary school means that they are dismissed from services at the time they need these the most in order to survive middle and high school.

Criteria for dismissal from intervention and the tests and procedures used to determine adequacy of language functioning may result in further lack of recognition or underservice of language-impaired adolescents. Some tests may not be sensitive to the language behaviors that can cause problems for students entering secondary schools. Assessment needs to examine the high level, abstract, and figurative language abilities that are essential to drawing inferences, comprehending complex written and spoken expository discourse, and expressing integrated and cohesive information in speech and writing, that is, the language of academics in the secondary grades. An additional issue related to assessment tools is associated with notions of prevalence and, therefore, the number of adolescents who are language impaired. As we saw in Chapter 3, prevalence will be equal to what is determined to be the cutoff score for concluding that a language impairment is evident. That is, if  $-2\text{ SD}$  is the determined cutoff for determining the presence of language impairment, then automatically we know that the prevalence will be 2.5 to 3 percent (assuming a normal distribution). However, since SLI is not “cured,” we might suspect that the prevalence of SLI in adolescents would be similar to that in kindergarteners, about 7 percent, using the commonly accepted prevalence based on a  $-1.25\text{ SD}$  cutoff as did Tomblin et al. (1997). A further challenge is ensuring use of assessment procedures with adequate sensitivity and specificity to enable accurate identification.

The problems surrounding dismissal criteria and assessment procedures can be exacerbated by erroneous perceptions that only insignificant language development occurs beyond late childhood and that little more can be done after late childhood to help. These reasons may account, in part, for some of the data shown in Figure 5.1 about the percentage of students with speech or language impairments who were moved from special education to regular/general education.

A failure to realize the significant, negative effects that persisting language problems have on all aspects of life is a further reason adolescents with language impairment are underrecognized or neglected. Another is the failure to understand that adolescents’ academic, personal, or social difficulties may be related to language deficits, that is, the misattribution of children’s academic and/or behavioral problems to conditions other than language impairment. In some cases, the nature of the elementary educational structure may have provided sufficient support to students with less severe language impairment or who are introverted and do not act out so that academic struggles might not have surfaced or been noticed. Secondary curricular demands can trigger emergence of weaknesses in language abilities. These students are at risk of having their language problems neglected because of inadequate identification or misdiagnosis. If academic problems are exhibited, the student

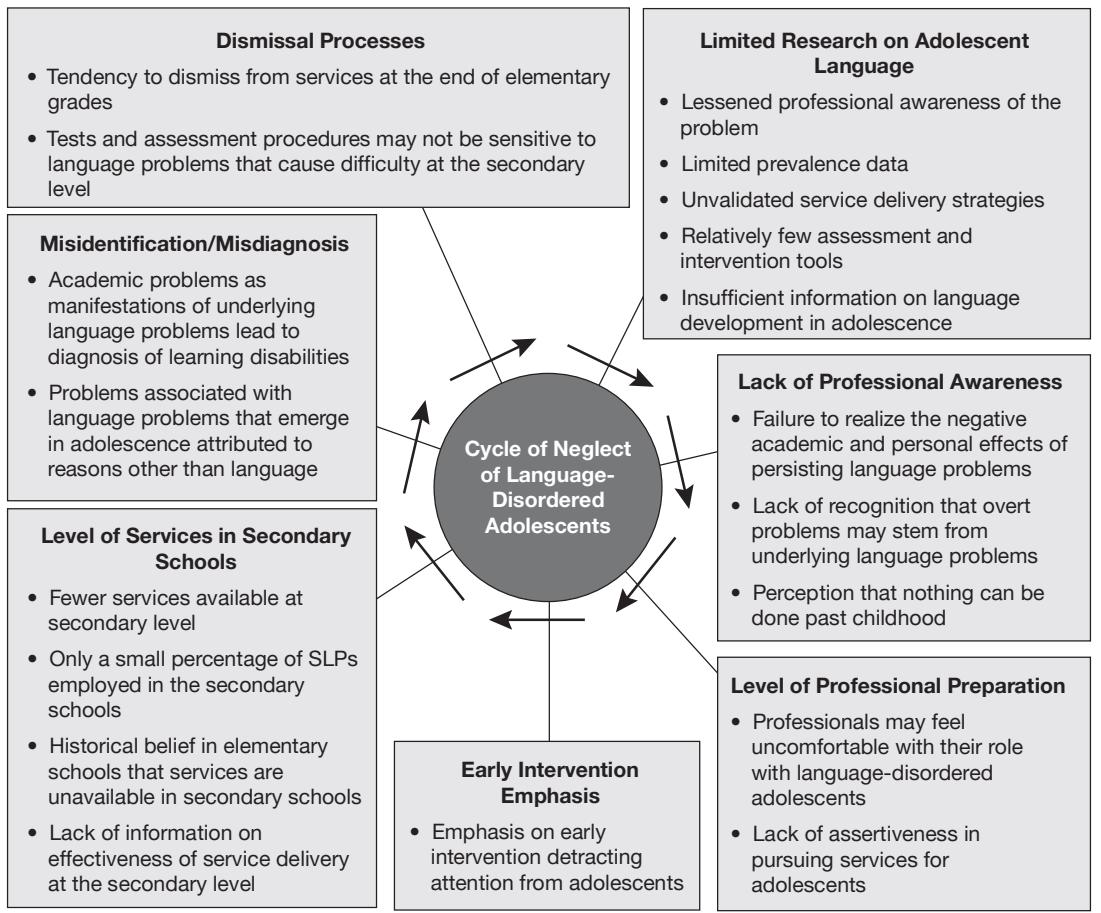
is frequently labeled or relabeled as having a specific learning disability, as we know, and services, if any, are then likely to be provided in learning disabilities programs, evidence of which we most likely see in the data in Figure 5.3.

In light of the discussion so far, it should not be surprising to learn that we have very limited direct data on the prevalence of language impairment in adolescents, and this unquestionably adds to their underrecognition. Again, we can see how limited data can create the perception that there are no individuals with the problems. In one of the few prevalence studies (McKinley & Larson, 1989), results indicated that 7 percent of 1,028 secondary students in a regular education program failed an adolescent language screening test. In thinking about these results, we need to recall the estimated prevalence of SLI (Tomblin et al., 1997), which has been estimated at about 7 percent. Of the students in remedial English classes for grades 9 to 12, 18 percent failed the screening test, a result that underscores the relationship between deficit oral language skills and poor academic achievement. This study also highlighted the greater percentage of adolescents with language impairment in special services focused on reading/writing/literacy skills, that is, the remedial English classes mentioned above. Ehren and Lenz (1989), too, found high numbers in special services in their study. These authors reported that

73% of a high-risk population of middle school students, including students in compensatory education and special education, evidenced some degree of language impairment. This same study found a prevalence of language impairment of 80 percent for the group with learning disabilities. (p. 193)

As further documentation of prevalence, 45 percent of the students enrolled in special education programs in a junior high school in Arizona failed a screening test of language, as did 53 percent of the seventh-grade students (approximately 12 to 13 years of age) who had been placed in developmental reading classes because of reading problems (Despain & Simon, 1987). In this report, a disturbing finding was that only about one-half of the students in the developmental reading classes had been referred for special education services, including language intervention services. Such findings reflect “the ‘happenstance’ nature of identification and composition of special education caseloads at the middle school level of education” (Despain & Simon, 1987, pp. 142–143). The findings of these older studies are consistent with more recent literature. Recall we previously made the point that language impairment is not regularly identified in students labeled with other conditions or problems (e.g., Hollo et al., 2014; Joffe & Black, 2012; Walsh et al., 2014), such as ADHD, juvenile delinquency, and behavioral/emotional disorders, among others. At present, knowledge regarding normal language development during adolescence is much less complete than it is for youngsters. There is also (1) limited knowledge about effective, efficient, and comprehensive assessment procedures for use with these teenagers; (2) an increasing number but still many fewer norm-referenced tests than for younger children; and (3) a paucity of information about evidence-based intervention strategies. In these circumstances, it is no wonder that many professionals might feel that they are not being adequately prepared to work with language-impaired adolescents, a feeling that can lead to a reluctance to pursue assertively the implementation of services in the secondary schools. This is dangerous because it can lead to invisibility of adolescents with language impairment and the professionals who can serve them. As Larson and McKinley (1995) point out, “Perpetuating a lack of visibility makes professionals vulnerable to being considered an expendable service” (p. 294).

Figure 5.4 summarizes various reasons language-impaired adolescents are an underrecognized and underserved population. These reasons are not mutually exclusive but instead are interrelated. This has the danger of leading to circularity in thinking and a cycle of neglect of adolescents with language impairment. Ehren and Lenz (1989) have used the phrase “self-perpetuating cycle” (p. 194) to describe the continuing problem of identifying and serving these adolescents. However, given the relatively recent increased attention to adolescents with SLI in the literature, some of the reasons presented in the figure might be expected to change in the upcoming years. For example, the box about limited research on adolescents with language impairment might be deleted or rewritten. However, until the research information has trickled down so that we see changes, such as adequate levels of services in schools for these adolescents and increased professional preparation, the boxes in the figure will, unfortunately, need to remain.



**FIGURE 5.4 |** The Cycle of Neglect of Adolescents with Language Impairment

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It is worth noting a final but disturbing thought before moving on to other topics related to adolescents and language impairment. This thought pulls together information from Figure 5.3 and Tables 5.2 and 5.3. The data on the percentage of adolescents with language impairment who leave high school without a diploma are based on the number of adolescents who are identified in the system while they are in high school. What the information in Figure 5.3 and the discussion in this section about the underrecognition of adolescents with language impairment tell us is that there are likely many more adolescents who have not been identified and are not included in our data, except perhaps as teenagers with specific learning disabilities, but even this is not all that encouraging. It is probable that we do not have data on a considerable proportion of adolescents with language impairment. “Child Find” concepts of the Individuals with Disabilities Education Act have yet to show up as “Adolescent Find” concepts as far as language impairment is concerned.

## CHARACTERISTICS OF ADOLESCENTS WITH LANGUAGE IMPAIRMENT

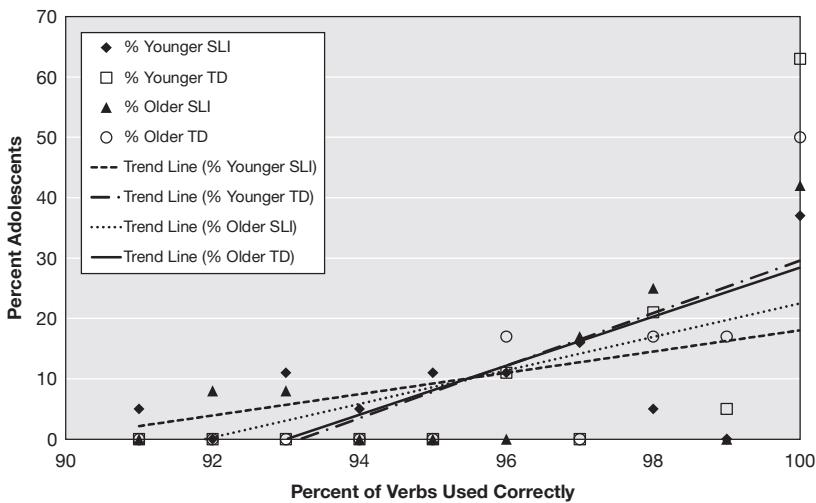
In Chapter 4, the language characteristics of learning-disabled school-age children were discussed. Adolescents with language impairment evince language deficits similar to those described in Chapter 4 and to younger school-aged children with language impairment. That is, language-impaired adolescents may have difficulties with words with abstract or multiple meanings or figurative language expressions, use less complex syntax, exhibit word-finding problems, have problems with morphologically complex words, and/or use nonspecific, non-content words, such as *thing* or *stuff*, or pronouns without clear referents. And, similar to what

we have seen from previous sections in this chapter as well as in previous chapters, language-impaired adolescents often experience difficulties in relationships with both their peers and adults, difficulties that have been attributed, in part, to problems in their communicative interactions. They may not adapt their communications appropriately for their listeners, or they may use inappropriate strategies, such as an aggressive or abrupt tone of voice, to deliver their messages. Their nonverbal behaviors, such as standing too close, can make their listeners uncomfortable, or these nonverbal behaviors may communicate unintentionally hostile or negative messages. Problems can exist with both expression and comprehension.

By adolescence teenagers with language problems talk in complete sentences that contain many correct syntactic and morphological features. However, some aspects of syntax and morphology may continue to be problematic for adolescents, even though errors may occur less frequently and the problems may be more subtle than in earlier years. For example, adolescents with language impairment use syntactic structures that reflect greater use of simpler, less complex forms with more errors, and the frequency with which language-impaired adolescents use the range of dependent/subordinate clause types or adverbial connectives may be less than expected of teenagers. Confirmation of these less accurate and less complex syntactic patterns (shorter utterances, less subordination, and different uses of different types of subordinate clauses) in the language of adolescents with SLI between 13 and 15 years old is evident in the findings from the research of several investigators (Nippold et al., 2008, 2009; Wetherell, Botting, & Conti-Ramsden, 2007).

The research findings regarding the persisting difficulties that preschool and school-aged children with language impairment have with verb morphology also prompt the question as to whether some problems with morphology, particularly verb form use, might continue to be evidenced by preadolescents and adolescents. Longitudinal data for children with SLI from 3 to 8 years of age (Rice, Wexler, & Hershberger, 1998) have shown that these children do not catch up with the path of increasing accuracy in marking verb tense that is demonstrated by their normally developing peers and do not reach at 8 years of age the almost 100 percent level of accuracy seen for their peers at 5 to 6 years of age. At 8 years of age, SLI children were still found to be achieving only about a 90 percent accuracy level. The difficulty is, however, that a 90 percent accuracy level might not be interpreted as an important reduction in the level of performance, an interpretation that could erroneously minimize the significance attached to this aspect of children's language performance. However, as Rice (2000) points out, morphological marking of tense in English is not optional, so that for children whose language is developing normally, "by a certain age, [use of correct] grammatical markers would show little variation" (p. 22).

For older students and adolescents, there is now a group of studies that indicates that verb problems continue to be evidenced in children and teenagers with language impairment. In a set of related studies (e.g., Reed & Patchell, 2010; Reed, Patchell, & Conrad, 2006), four groups of adolescents were asked to relate narratives from looking at a wordless picture storybook. There were two groups of younger adolescents, each group with a mean age of 13;2 years with one group having SLI and the other comprised of typically developing (TD) adolescents matched on chronological age, gender, socioeconomic status, and nonverbal IQ to the SLI adolescents. There were also two other groups of older adolescents, each with a mean age of 15;9/15;10 years, with one group also having SLI and the other normal language, again paired on the same characteristics as for the younger group. Another study (Reed & Evernden, 2001) compared verb morphologically use in narratives, also during a wordless picture book task, of 12 normally achieving students aged 8 to 12 years, age-matched peers with reading difficulties co-occurring with various degrees of language difficulties. One pattern of verb form use that emerged from these studies for the adolescents with language impairment was more errors on verb forms during the narrative task, even though the frequency of errors overall was relatively small. Recall that Rice et al. (1998) reported that the mean percent correct rate for 8-year-old children with SLI was as high as 90 percent. Figure 5.5 shows the percent of the adolescents achieving a range of percent correct verb use in the Reed & Patchell (2010) and Reed, Patchell, and Conrad (2006) studies. As can be seen, the two groups of SLI adolescents had correct rates as low as 91 and 92 percent, a result reasonably similar to the 8-year-old children with SLI in the Rice et al. (1998) study. In contrast, the lowest accuracy rate for the two groups of TD adolescents was 96 percent. Figure 5.5 also shows the trend lines for percent



**FIGURE 5.5 |** Percentage of Verbs Used Correctly by Younger SLI and Typically Developing and Older SLI and Typically Developing Adolescents

Sources: Reed and Patchell (2010); Reed, Patchell, and Conrad (2006).

of verb used correctly by the younger and older SLI and TD groups. A similar result emerged in the Reed and Evernden (2001) study. As can be seen, the trend lines for the younger and older adolescents with SLI are noticeably flatter than those for both groups of the TD adolescents. The younger and older TD appeared to achieve similar accuracy rates, whereas for the SLI groups, the older language-impaired adolescents seemed to use verb forms marginally more accurately than the younger adolescents with SLI. For the younger and older TD students, 89 and 84 percent of them, respectively, performed at 98–100 percent accuracy. This contrasts with the 42 and 67 percent of younger and older SLI adolescents, respectively, who performed at the 98–100 percent accuracy rate. The language-impaired and TD groups also appeared to differ in their patterns of marking tense. As one example, the students with SLI tended to use more progressive verbs (*is running, were running* vs. *runs, ran*) than the TD students to mark tense. The unusual, greater use of progressive verb forms by SLI adolescents to convey tense (as opposed to regular and irregular past tense and third-person present) is intriguing. It might be a strategy that adolescents with SLI use to circumvent the complexities of regular and irregular verb tense marking. It might also be because the progressive grammatical morpheme is one of the earliest to be acquired by children.

Continuing verb morphological difficulties also emerged in a longitudinal study that followed up children in the earlier (Rice et al., 1998) study. Rice, Hoffman, and Wexler (2009) confirmed that verb morphological difficulties evinced in the language of young children with SLI continue to be seen when they are 15 years old in terms of their higher error rates in judgments of grammatical acceptability/unacceptability of statements in which forms of *be* and *do* verbs are or are not omitted. Sixteen-year-old teenagers with SLI have also been found to be less sensitive to omissions of verb tense and agreement inflections in statements than their normal peers (Leonard, Miller, & Finneran, 2009). The emerging evidence suggests that early verb morphological deficits associated with SLI do not resolve by adolescence, although the number of errors may not be high, and the patterns with which verb forms are used (e.g., higher progressive forms) and are detected may change with age. To the extent that verb morphology might be a clinical marker of SLI in young children, it might also be a clinical marker for SLI in adolescence.

And, there is now some evidence that these verb morphological difficulties continue into adulthood. Poll and his co-researchers (Poll, Betz, & Miller, 2010) found that tasks involving judgments of grammatical acceptability/unacceptability of statements containing verb morphological errors accurately classified young adults as having or not having SLI. Thus, it appears that verb morphological problems might continue to be effective as a clinical marker even beyond adolescence.

We might expect, however, that some language growth as a result of intervention, maturation, or both would occur between childhood and adolescence. Therefore, the language problems of adolescents may be less obvious and more difficult to identify than those of younger children. These factors can contribute to false negatives in identification (not identifying a problem when one actually exists) or even misdiagnosis.

The relative past neglect of language-impaired adolescents means that less is generally known about their specific communicative characteristics than about those of younger children with language impairment. Several authors have identified characteristics that adolescents with language problems frequently demonstrate in their conversational interactions and in their classrooms. Many of these difficulties are summarized in Table 5.3. As we can see, the problematic characteristics range across semantic, morphosyntactic, and pragmatic domains, with several of them involving metacognitive, metapragmatic, and metalinguistic skills. They also reflect high level comprehension, as well as expressive, difficulties. Larson and McKinley (1987) have suggested that problematic behaviors, such as those listed in Table 5.3, can provide starting points in determining “where a given adolescent matches or mismatches with educators’, parents’, or peers’ expectations” (p. 15).

**TABLE 5.3 |** Characteristics of Adolescents with Language Impairment in Conversational Interactions and Classrooms

Adolescents with Language Impairment . . .	
<b>Do not:</b>	<ul style="list-style-type: none"> <li>Show mastery of tense reference and subject/verb agreement</li> <li>Recall information presented in lessons</li> <li>Participate in lessons</li> <li>Appear to listen to the teacher during lessons</li> <li>Meet minimum standards for academic work</li> <li>Define words well or use them appropriately; recognize or understand meanings conveyed by bound morphemes in the form of prefixes and suffixes</li> <li>Paraphrase what is read or what others say</li> <li>Learn from other students’ questions</li> <li>Get along well with peers</li> <li>Participate in group discussions</li> <li>Complete assignments on time or complete them at all</li> <li>Organize work and materials</li> <li>Prepare for class</li> <li>Work independently</li> <li>Demonstrate knowledge on tests</li> <li>Understand when directions are being given or follow directions</li> <li>Use tactful deviousness</li> <li>Sustain topics of conversation</li> <li>Consider listener’s informational needs</li> <li>Recognize when a problem exists</li> <li>Develop hierarchy of ideas and thoughts for concepts</li> <li>Use a variety of complex sentences with an array of types of subordinate clauses in varying sentential positions</li> <li>Produce written connected text to communicate knowledge and meaning</li> <li>Make language categories and semantic relationships explicit</li> <li>Use language to talk about language during formal instruction</li> <li>Identify and/or understand main points; infer meaning from connected text</li> </ul>

(Continued)

**TABLE 5.3 |** *Continued*

Adolescents with Language Impairment . . .	
<b>Do:</b>	<p>Lack consistency in tense and number reference</p> <p>Need additional prompting to follow directions to complete tasks within their ability</p> <p>Demonstrate difficulties comprehending complex syntactic forms</p> <p>Demonstrate a negative attitude or approach to learning</p> <p>Use tactless statements</p> <p>Use concrete operations in their thinking</p> <p>Demonstrate difficulties obtaining and inferring meaning from what they hear and read</p> <p>Have a lack of awareness of communicative failure and inability to repair communicative breakdowns</p> <p>Ask irrelevant questions</p> <p>Provide irrelevant answers to questions</p> <p>Wander from conversational topics</p> <p>Use egocentric comments</p> <p>Violate the rules of conversational discourse (e.g., accessing conversations, taking turns, and closing conversations)</p> <p>Express or organize ideas illogically</p> <p>Converse in irrelevant ways with conversational partners</p> <p>Use syntactic forms that are incomplete and immature; use utterances that fail to communicate intended meaning</p> <p>Show word-finding problems; use high-frequency, low-meaning words too much</p> <p>Use messages that confuse listeners</p> <p>Have problems comprehending and using peer-appropriate slang/jargon</p> <p>Use excessive mazes and false starts</p> <p>Demonstrate poor listening skills</p> <p>Make illogical and impulsive judgments about information</p> <p>Show an abrasive communication style</p> <p>Misuse gestures/body movement and facial expressions; misuse rules related to appropriate physical distance between communicative partners</p> <p>Misunderstand cues related to gestures/body movements and facial expressions</p>

Sources: Ehren (1994); Larson and McKinley (2003); Lenz, Bulgren, and Kissam (1995); Schmidt, Deshler, Schumaker, and Alley (1989); Simon and Holway (1991).

## ASSESSMENT

A determination of match and mismatch is an essential component of assessment and intervention for language-impaired adolescents (Larson & McKinley, 1995). Each language-impaired adolescent presents a unique profile of communicative strengths and weaknesses. An objective of the assessment process is to identify each adolescent's unique profile. Summaries of problems that can characterize the communication of adolescents with language impairment, such as those in Table 5.3, can provide frameworks for assessing an adolescent's language functioning. In Chapter 4, Common Core State Standards (CCSS) for students across the range of elementary and secondary grades were introduced, with attention drawn to the number of standards that address language and literacy skills (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010). The standards relevant for the secondary grades can also serve as guidelines as to skills that need to be assessed in adolescents who may have language impairment (Whitmire, Rivers, Mele-McCarthy, & Staskowski, 2014).

Expectations are that adolescents can use all aspects of language to function effectively in their social, academic, and vocational contexts. These expectations imply, therefore, that

in assessment, an adolescent's communicative performance in each of these contexts needs to be examined. If an adolescent is struggling in any or all of these contexts, then a language impairment should be suspected, and the adolescent should be more closely assessed. Because we know that language impairment is often unidentified in students with other diagnostic labels, such as ADHD, dyslexia or reading disabilities, emotional/behavioral disabilities, or specific learning disabilities, any students with these diagnoses need to have their language assessed. If language impairment is present but not being addressed, attempts with other interventions may not be as effective as they could be.

The assessment of adolescents can be divided into two parts, each serving a different function. The first part involves identifying adolescents who exhibit problematic language behaviors and who may have language impairment. The second part is a more in-depth exploration of the adolescent's language functioning to either confirm or reject the initial identification and, if the identification is confirmed, to determine the adolescent's level of functioning in a variety of areas to identify areas to be targeted in intervention and the appropriate placement for intervention and to select the appropriate service delivery format. In the following sections, we discuss aspects of both parts of the assessment process. A few norm-referenced tests are available to assist in the process. However, observations of adolescents' performances in a variety of contexts and nonstandardized assessment methods must also be included as routine parts of the assessment process.

### Identification

Teacher referrals and language screening are two common methods of identifying language-impaired adolescents. These are not mutually exclusive methods. Both may—and probably should—be used.

**Teacher Referrals.** Referrals from general/regular education teachers, special educators, remedial teachers, and other specialists are ways of identifying adolescents with possible language problems. One critical factor in the success of this method is the degree to which these secondary school professionals understand and recognize the nature of language impairment in adolescents and know the potential sources of professional help for the adolescents. For this reason, information dissemination to these professionals is important in providing services for language-impaired adolescents (Larson & McKinley, 2003).

Information dissemination includes sharing with classroom teachers and support personnel (e.g., counselors, special educators, social workers, and principals) information about the characteristics of adolescents with language impairment, the ways in which language impairment can be manifested academically and socially, and the intervention services available. Imparting this information helps to ensure that those professionals who have daily contact with adolescents or who interact with them in a variety of situations make appropriate referrals for assessment (Ehren, 2009b; Ehren & Whitmire, 2009; Larson & McKinley, 1995). In-service presentations (Ehren & Whitmire, 2009; Reed & Miles, 1989) are one way to increase school professionals' knowledge of adolescents with language impairment and the assistance that can be provided for these teenagers and to promote referrals. Another method is to contribute to school newsletters or newsletters of educators' professional groups. McKinley and Larson (1989) used this last approach to disseminate information to secondary school principals. Another strategy is to take advantage of schools' increasing use of educators' self-developed portfolios as part of their annual evaluations. Activities that involve informing school colleagues about adolescent language and literacy can be embedded in these portfolios as performance objectives. Opportunities to inform supervisors occur as they review the portfolios and engage with the educators in discussions of the activities and the reasons for them.

Asking informed educators to complete observational/behavioral ratings scales on their students is one way to obtain referrals. Several rating scales of language and language-related skills are available for use with adolescents. Such ratings not only aid in identifying adolescents with possible language problems but also direct assessment to areas of communication most highly suspect in an adolescent and indicate those aspects of an adolescent's language functioning that most concern others.

**Screening.** Language screening tests are used to indicate in broad terms whether an individual's language skills are adequate or whether there is a discrepancy from normal expectations that is sufficient to warrant further assessment. Professionals disagree about the benefits of mass screenings of all students in secondary schools or if an alternative screening approach, such as screening all students in specified grades in secondary schools, such as all students in grades 7 and 10, is effective. Some suggest that a more effective approach is selective screening of students who meet certain criteria, such as students in learning disabilities programs, those who received speech-language services in earlier grades, students receiving tutoring or remedial reading services, or adolescents at risk for dropping out of school.

Only a few norm-referenced language screening tests for adolescents are commercially available. Each of these is designed to be administered individually to adolescents. The tests examine a variety of aspects of communicative functioning, and the estimated time to administer these ranges from about 2 to 15 minutes. Another approach to administering screening tests is to utilize group screening tests that can be administered to, perhaps, whole classrooms of students. Simon (1987) developed a group screening procedure, the Classroom Communication Screening Procedure for Early Adolescents, to be used primarily with students in grades 5 through 9. The procedure can be administered in the students' classrooms or in other group settings and takes about 50 minutes to complete. It is a paper-and-pencil task, although the writing is limited mostly to circling answers or writing single words so that it can be used with students who have difficulty with written language.

There are, however, several concerns with many language screening tests, and for that matter, with many diagnostic language tests for adolescents. Adolescents with language impairment generally talk in sentences, particularly in conversational contexts, and can often perform adequately on decontextualized language tasks, such as pointing to pictures that represent the meaning of words. The language struggles of adolescents may only surface in relatively demanding language tasks and when challenged with abstract, higher-level language tasks, (i.e., those required in the academic climate of secondary schools). Higher-level, abstract language tasks include those requiring comprehending complex sentences with multiple embedding of relative subordinate clauses, drawing inferences from expository discourse, or deciphering the meanings of morphologically complex words. Unless these types of tasks are major parts of screening procedures, we run the risk of missing students at risk for language impairment.

It is possible that a language sampling approach can avoid the downsides of most screening tests. For adolescents, an expository sample would tap higher-level language skills more relevant for academic performance than a narrative sample. Asking an adolescent to provide, for example, an explanation of how he or she might persuade a teacher to lift an afterschool detention is one example of a possible task. Because this is being employed as a screening task, a rating scale for characteristics of interest, e.g., use of relative clauses, literate and specific vocabulary words, appropriate nonverbal communicative behaviors, could be used to make judgments of adequacy or concern and, if concern, a follow-up, more complete assessment could be implemented. The list of characteristics could be compiled from those shown in Table 5.3. Students could also be asked to define a few printed morphologically complex words drawn from their relevant textbooks or worksheets. Other authentic, educationally relevant, but brief, tasks could be utilized, again with criterion-based rating scales to facilitate decision making about adequacy or concern needing follow-up. Such approaches can be used strategically with teacher opinions or ratings and information about students' academic and social performances in order to identify adolescents at risk for language problems.

### Language Assessment

**Norm-Referenced Tests.** Some of the more complete language tests that are appropriate for individuals 11 years of age or older are listed in Table 5.4. Tests that examine areas of functioning closely related to language, such as phonological processing in the Comprehensive Test of Phonological Processing-2 (Wagner, Torgesen, Rashotte, & Pearson, 2013) or problem-solving abilities in the Test of Problem Solving—2 Adolescent (Bowers, Huisingsh, & LoGiudice, 2007), are also included for reference. Most of the tests in the table are

**TABLE 5.4 |** A List of Some Adolescent\* Language and Language-Related Tests

Test Name	Author(s)	Year
Clinical Evaluation of Language Fundamentals—5**B & H	Wiig, Semel, and Secord	2013
Clinical Evaluation of Language Fundamentals—5 Metalinguistics	Wiig and Secord	2014
Comprehensive Assessment of Spoken Language—2**B	Carrow-Woolfolk	2017
Comprehensive Receptive and Expressive Vocabulary Test—3	Wallace and Hammill	2013
Comprehensive Test of Phonological Processing—2	Wagner, Torgesen, Rashotte, and Pearson	2013
Detroit Tests of Learning Aptitude—4**H	Hammill	1998
Expressive One-Word Picture Vocabulary Test—4**B & H	Martin and Brownell	2011
Expressive Vocabulary Test—2**B	Williams	2007
Fullerton Language Test for Adolescents—2**H	Thorum	1986
Illinois Test of Psycholinguistic Abilities—3	Hammill, Mather, and Roberts	2001
Lindamood Auditory Conceptualization Test—3	Lindamood and Lindamood	2004
Oral and Written Language Scales—II**B	Carrow-Woolfolk	2011
Peabody Picture Vocabulary Test—4**B & H	Dunn and Dunn	2007
Receptive One-Word Picture Vocabulary Test—4**B	Martin and Brownell	2010
SCAN—3:A Tests for Auditory Processing Disorders in Adolescents and Adults	Keith	2009a
SCAN—3:C Tests for Auditory Processing Disorders for Children	Keith	2009b
Social Language Development Test Adolescent	Bowers, Huisinagh, and LoGiudice	2010
Test of Adolescent and Adult Language—4	Hammill, Brown, Larsen, and Wiederholt	2007
Test of Adolescent/Adult Word Finding—2	German	2016
Test of Auditory Processing Skills—3	Martin and Brownell	2005
Test of Integrated Language and Literacy Skills	Nelson, Plante, Helm-Estabrook, and Hotz	2016
Test of Language Competence—Expanded Edition**H	Wiig and Secord	1989
Test of Language Development (Intermediate)—4th Edition	Hammill and Newcomer	2008
Test of Narrative Language	Gillam and Pearson	2004
Test of Pragmatic Language—2	Phelps-Terasaki and Phelps-Gunn	2007
Test of Problem Solving—2: Adolescent**H	Bowers, Huisinagh, and LoGiudice	2007
Test of Word Finding—3	German	2015
Test of Word Knowledge**H	Wiig and Secord	1992
The Expressive Language Test	Bowers, Huisinagh, LoGiudice, and Orman	2010
The Listening Comprehension Test: Adolescents	Bowers, Huisinagh, and LoGiudice	2009
The Word Test—2 Adolescent**H	Bowers, Huisinagh, LoGiudice, and Orman	2005
Woodcock-Muñoz Language Survey—III	Woodcock, Muñoz-Sandoval, Ruef, Alvarado, Schrank, McGrew, Wendling, and Dailey	2017

\* Designed for individuals 11 years of age or older.

\*\* Listed as among the 10 most frequently used as identified in Betz et al. (2013) (\*\*B), or Huang et al. (1997) (\*\*H), or both (\*\*B & H) studies, although possibly earlier versions than those listed here.

norm referenced. Some examine skills in a variety of language areas such as syntax and semantics or listening comprehension, for example, the Oral and Written Language Scales-II (Carrow-Woolfolk, 2011), the Test of Adolescent and Adult Language-4 (Hammill, Brown, Larsen, & Wiederholt, 2007), and the Test of Integrated Language and Literacy Skills (Nelson, Plante, Helm-Estabrook, & Hotz, 2016). Others focus on one area of language such as vocabulary or pragmatics, for example, the Expressive One-Word Picture Vocabulary Test-4 (Martin & Brownell, 2011) and the Test of Pragmatic Language-2 (Phelps-Terasaki & Phelps-Gunn, 2007).

Several surveys have investigated what tests are used more frequently and what criteria of tests affect their selection for use in language assessments. For example, Betz, Eickhoff, and Sullivan (2013) asked SLPs how frequently they used 55 language and language-related tests for their assessments involving children between 5 and 9 years of age who were suspected of having SLI and compared their choices to several psychometric features of tests, such as reliability and sensitivity. In an earlier study, Huang, Hopkins, and Nippold (1997) surveyed Oregon SLPs about the language tests they used most frequently for individuals in the age range 13 to 19 years. The 10 used most often in each study are identified in Table 5.4 by double asterisks and a letter indicating the first letter of the first author's surname. In a number of cases the nominated tests in the studies were earlier versions of the ones listed in the table. Some differences in which tests were identified as being used more frequently could be expected based on the age range the SLPs were asked to consider, as well what tests were available at the time of the studies.

Norm-referenced tests allow those working with adolescents with suspected language problems to provide numbers that convey some notion about the presence and severity of an adolescent's language impairment and how an individual's language performance compares to that of TD peers. These numbers may be required by school administrators in order to qualify students for services. This is one reason that prompted Apel (1999b) to write that he is "not sure at the present time there is a way to 'beat the numbers game'" (p. 101), even though the norms and validity for a number of the tests have been questioned. However, for adolescent language assessment, it is possible that some norm-referenced tests can identify problems with some aspects of language that standardized, but generally unnormed approaches, including language sampling, might not. For example, Nippold, Mansfield, Billow, and Tomblin (2009) used both a language sampling task involving an expository discourse task about peer conflicts and two subtests (Concepts and Directions and Recalling Sentences) of the norm-referenced test Clinical Evaluation of Language Fundamentals—3 (Semel, Wiig, & Secord, 1995) to investigate the syntax abilities of adolescents with SLI. Although the language sampling task was effective in distinguishing between normally developing 15-year-olds and their same-age peers with SLI for utterance length, clause density (a measure indicating use of subordinate/dependent clauses), and noun clause use, the task was insensitive to differences for adverbial and relative clauses (Nippold et al., 2009). By comparison, the combined performance on the two subtests of the norm-referenced test clearly distinguished between the two groups of adolescents, suggesting that some norm-referenced testing may reveal language deficits that language sampling could miss. Consequently, Nippold et al. (2009) suggested that norm-referenced testing and language sampling using expository discourse tasks can complement each other. Despite the several weaknesses associated with norm-referenced tests, their use has an important place, albeit not the only place, in language assessment of adolescents.

Sensitivity (accurate identification of children with the impairment) and specificity (accurate identification of children without the impairment) of tests are major issues in deciding what to use in assessment, and these two measures of diagnostic accuracy are not always available for norm-referenced tests as professionals try to select the best tests to use. In addition, as we know, tests that are available are not always sufficiently sensitive in order to identify adolescents who struggle as a result of poor language skills. Unless skills that we know are problematic for adolescents with SLI—such as metalinguistics, abstract vocabulary, inferencing, figurative language, complex syntax with different forms of subordination, verb tense morphology, nonword repetition, and morphologically complex words—are included as part of assessment, we need to be cautious about our conclusions about the presence or

absence of language impairment. A particular caution is warranted with regard to results of tests such as the Peabody Picture Vocabulary Test. It is not uncommon for adolescents with SLI to score within normal limits on this receptive, single-word vocabulary test because it tends not to be very sensitive to the semantic comprehension problems of these adolescents, which are those that create significant struggles for them in dealing with secondary school curriculum. Consequently, decisions about an adolescent's language status should not be made on the basis of such tests. In contrast, these same adolescents may score well below the cutoff for normal performance on language comprehension tests that require them to interpret figurative language expressions, make inferences, or interpret statements with ambiguities. Table 5.5 shows some examples of such higher-level language comprehension tests items that tend to be more sensitive in identifying language impairment in adolescents than more concrete, decontextualized, single-word vocabulary comprehension tests.

In comparison to the many language tests designed for use with younger children, there are fewer for adolescents. If we eliminate any of these tests because of questionable validity and sensitivity/specificity, our choices of what to use narrow even more. These are among several of the reasons that standardized, unnormed language assessments and informal observations are used and can be used so effectively with adolescents. Other reasons are that many norm-referenced tests examine only limited aspects of language behavior and usually provide for probing only small samples of any particular language skill. These alone do not yield sufficient information about patterns of language behaviors to allow us to develop

**TABLE 5.5 | Examples of Higher-Level Language Comprehension Test Items**

Type of Higher-level Comprehension Test Items	Examples
Ambiguous Expressions	What are two meanings of: <ul style="list-style-type: none"> <li>■ “Visiting relatives can be tiresome”</li> <li>■ “The pipe is cool”</li> </ul>
Figurative Expressions	What are the meanings of the following: <ul style="list-style-type: none"> <li>■ “A rolling stone gathers no moss”</li> <li>■ “A penny saved is a penny earned”</li> </ul>
Idioms	What are the meanings of the following: <ul style="list-style-type: none"> <li>■ “It’s raining cats and dogs”</li> <li>■ “A house divided against itself cannot stand”</li> </ul>
Metaphors/Similes	What are the meanings of the following: <ul style="list-style-type: none"> <li>■ “It’s as light as a feather”</li> <li>■ “The wind was an arrow that pierced the heart”</li> </ul>
Inferences	Tell me who I am? <ul style="list-style-type: none"> <li>■ “I had finally gotten used to being weightless. I really enjoyed floating by the moray eels hidden in their crevices. The circling sharks, on the other hand, made me uncomfortable.”</li> </ul> Tell me what has happened? <ul style="list-style-type: none"> <li>■ “He was so dejected. He just continued to stare at the examination paper in his hands.”</li> <li>■ “The attorney was ecstatic. The new evidence the detectives uncovered was a game changer.”</li> </ul>

specific intervention objectives. Techniques other than norm-referenced tests are necessary when assessing the language skills of adolescents.

**Unnormed Standardized Methods.** In 1993, Damico advanced an argument about language assessment that continues to apply. He stated that assessment “activities used must be more *authentic*, more *functional*, and more *descriptive* than the assessment procedures previously employed with this population” (p. 29). Authentic assessment means looking at and gathering information about how an adolescent uses or cannot use his or her language in contexts that are “real” for the adolescent (e.g., in understanding what teachers say in classroom lessons, in peer interactions, in interpreting spoken and written disciplinary discourse, in trying to apply for part-time jobs, in studying for tests, or in understanding and/or explaining a movie or book). This approach to assessment is often referred to as ecological assessment (McCormick, 2003) and it attempts to assess what is important for functioning in the real world. A number of strategies are available to assist in undertaking more authentic assessment of adolescents. These include analyzing samples of an adolescent’s language, creating contrived situations to elicit examples of specific language behaviors of interest, examining portfolios of the student’s work, and assessing the educational system in which the student is expected to function.

**Analysis of Spontaneous Language.** It is impractical to attempt to analyze an adolescent’s entire language behavior in any one day. However, it is important to sample language in several situations. A particularly important approach is to sample in several academic disciplines. We have seen elsewhere in this text that academic disciplines differ in how both spoken and written language is used. Therefore, one or more representative samples of spontaneous language are obtained for analysis. Specific factors related to obtaining language samples are discussed in Chapter 13. There the focus is more on the younger child than on the adolescent with a suspected language impairment. However, the principles of obtaining a sample in varying communicative situations and of audio or video recording the sample apply in all instances. Here we discuss approaches that are appropriate specifically for adolescents. For adolescents, samples of their language in dealing with increasingly complex genres are important for the assessment process, thus samples of conversation, narrative, and expository discourse are necessary. Because language characteristics vary with different academic disciplines (Ehren, Murza, & Malani, 2012; Fang, 2012; Fang & Schleppegrell, 2010; Schleppegrell, 2001), samples collected from adolescents as they deal with several different disciplines have the potential to be particularly revealing about an adolescent’s language ability in ways that are directly tied to educational functioning.

With regard to conversational language samples, several analysis approaches are available. One example is Larson and McKinley’s (1995) Adolescent Conversational Analysis. This analysis method provides for examination of both the listener and the speaker roles of an adolescent during conversational interactions. Listener abilities that are analyzed are understanding the speaker’s vocabulary and syntax, following the speaker’s main ideas, listening in a nonjudgmental way, and signaling lack of understanding. Speaker abilities are divided into four aspects: language features, paralanguage features, communication functions, and verbal and nonverbal communicational rules. Within each of these broad aspects, specific features of communicative functioning are noted and analyzed. Each of the communicative behaviors is judged as appropriate or inappropriate each time it occurs during a language sample. The tallies or frequency counts of both appropriate and inappropriate behaviors are transferred to a profile form that summarizes an adolescent’s strengths and weaknesses. This profile can lead to the development of specific intervention objectives and can form part of the basis of a valid and defensible intervention plan.

As Nippold (2014b) writes, “During conversations, adolescents with typical and impaired language development produce utterances that are shorter and less complex than those they produce during other genres. . . .” (p. 41). In multiple studies (Nippold, Hesketh, Duthie, & Mansfield, 2005; Nippold, Mansfield, & Billow, 2007; Nippold, Mansfield, Billow, & Tomblin, 2008; Wetherell, Botting, & Conti-Ramsden, 2007), the language—and in particular the syntax—that adolescents with SLI used was less complex in language sampling

contexts that used conversation than those that used either a narrative or an expository task, with an advantage for more complex syntax occurring in an expository task that involved adolescents talking about peer conflict resolution as opposed to one that asked adolescents to explain a game or sport. Another limitation of using only a conversational language sample with adolescents to identify language impairment and areas of language problems is that, in situations that do not require the use of particular forms, these students can avoid using aspects of language that are not well established in their repertoires or those that continue to create problems for them (Reed & Patchell, 2010; Wetherell et al., 2007). A guiding principle for examining the language of an adolescent is that we need to look for what is *not* present in the adolescent's language or what the adolescent *does not do* with language as much as looking at what an adolescent does do or use. Because a conversation task might not push or challenge an adolescent to use aspects of language that are difficult for the adolescent, we need to include in our assessment practices tasks that induce attempts at using language targets of interest so that we can find out what the adolescent is capable or not capable of. Certain types of narrative and expository discourse tasks seem to accomplish this.

As we saw in Chapter 3, a narrative task can often put sufficient demands on language ability to push or stress an individual's language performance. Problems with narrative production are also implicated in children whose early language problems persist into the adolescent years (Stothard et al., 1998). There are several types of narrative tasks, each having its advantages and disadvantages and each stressing an adolescent's language performance in different ways. In the Wetherell et al. (2007) study and those of Reed and colleagues (Reed, Conrad, & Patchell, 2006; Reed & Evernden, 2001; Reed & Patchell, 2004, 2010; Reed, Patchell, et al., 2006) that looked at verb tense, a storytelling task from a wordless picture book was used. This type of narrative task reduces demands on a student for creative story generation and the influences of variables involving degrees of previous knowledge with particular stories but does not provide an auditory model of the story so that the language used is the language of the adolescent, not that recalled from an examiner's story. Telling a story also tends to encourage the use of past-tense verbs, which means that it may trigger the appearance of verb use patterns not evident in other types of discourse, particularly those that might lead to use of present-tense verbs. A further advantage of including a language sample obtained from a narrative task is that it can provide general information about an adolescent's ability to use narrative and story structure, a particularly important genre in the adolescent years.

Nippold (2014b) has suggested that narrative elicitation approaches other than a wordless picture book be considered. Different narrative tasks may lead to different features and complexity of language elicited in the samples, an effect that has the possibility of skewing results obtained from analyses of the samples. Wetherell and colleagues (2007) compared the performance of adolescents with SLI in two narrative genre tasks, one the classic wordless picture story and the other a conversational narrative. Their findings revealed that the adolescents demonstrated more errors and difficulties in the wordless picture task, including more verb morphological errors, than with the conversational narrative elicitation task. Two other studies (Huber, Reed, Patchell, & Conrad, 2011; Taliaferro, Reed, & Patchell, 2015) compared the verb morphological patterns of younger and older adolescents with SLI and TD on two narrative elicitation methods—one, again, the classic wordless picture book task and the other a story generated from looking at a single picture. Similar to the findings of Wetherell et al. (2007), these two studies also found that the two elicitation methods yielded different patterns of verb morphology. The adolescents with SLI showed more problems, including less use of past tense verbs, with the wordless picture book elicitation approach than the single-picture elicitation method. One of Nippold's (2014b) suggested alternatives for narrative elicitation with adolescents is to use fables, which are first read to the adolescents while looking at single pictures illustrating the fables and which the adolescents then retell, with the assistance of the illustrations. Although Nippold proposes that fables can be "an effective way of eliciting complex syntax in the narrative speaking of young adolescents" (p. 50), she acknowledges that additional research is needed to validate use of fables for narrative elicitation. Such studies need to determine how the language characteristics that emerge with fable telling compare to those elicited by other methods. These comparative studies are

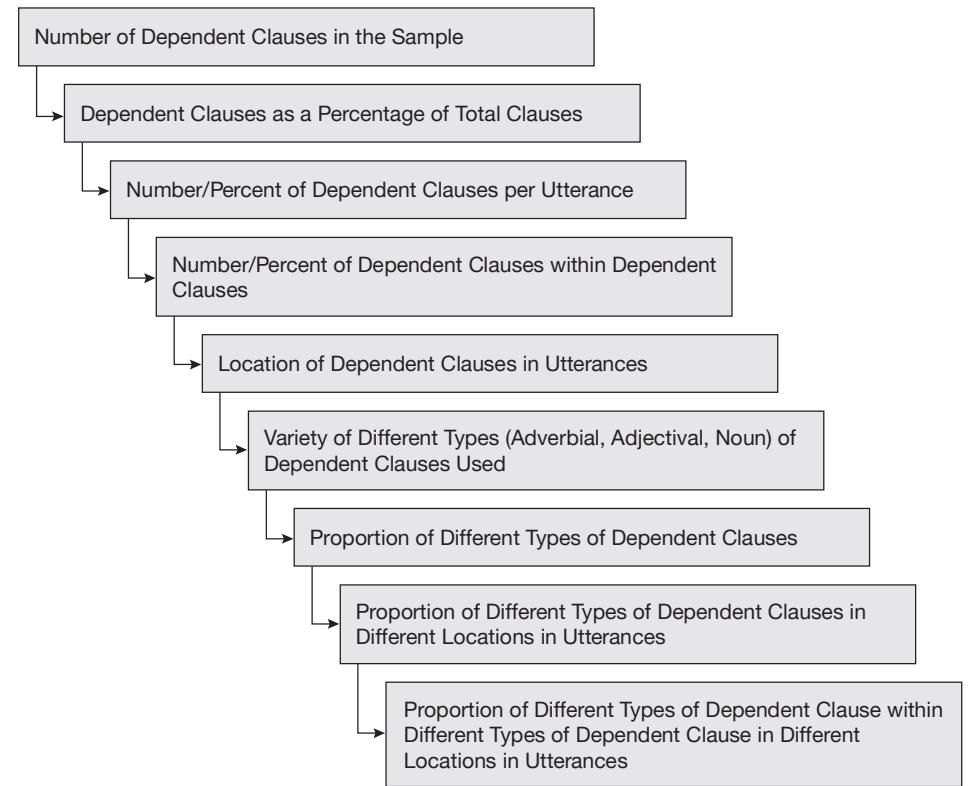
essential in order to inform professionals in their choices about the approaches best able to identify adolescents of all ages with language impairment and indicate patterns of language able to provide directions for intervention.

Because expository discourse is such a core element of secondary-school curricula and adolescents' academic performance, it needs to be an essential element of language sampling. One problem that is exacerbated in sampling expository discourse is the amount of prior knowledge an adolescent has about the topic or task used to elicit the sample. Prior knowledge affects the complexity of language elicited by the task (Kamhi, 2009; Nippold, 2010a; Snyder & Caccamise, 2010). Therefore, in order to know that the obtained sample represents an adolescent's language skills and not topic knowledge, it is important that before selecting a particular topic, an adolescent's level of knowledge about it needs to be determined. As an alternative, Nippold (Nippold et al., 2005; Nippold et al., 2007; Nippold et al., 2009) has used several tasks that circumvent specific-content issues. She has asked adolescents to explain how to play a favorite sport or game and how to resolve a peer conflict. Both tasks elicited more complex language than a conversation task. Again, professionals need to be alert to the expository discourse tasks they choose to obtain language samples. Given the increasing interest in expository discourse problems associated with adolescents with SLI and recognition of the negative impact on their curriculum content learning, we are likely to see future research helping to provide clearer guidelines for selecting language sampling tasks to improve assessment accuracy.

Although Larson and McKinley (1995) suggested that the elements of analysis for the aspect of language features include an adolescent's use of a variety of syntactic forms, they were not specific in identifying what "variety of syntactic forms" (p. 286) should be examined as part of their conversational analysis. Several studies have measured a number of syntactic (and morphological) features such as number of utterances, length of utterances, verb morphological errors, and other morphological errors. However, given the expectations for use of complex sentences in secondary curriculum and the information about subordinate/dependent-clause development and conjunction usage in adolescence that is available (Loban, 1976; Nippold et al., 2005; Nippold et al., 2007; Reed, Griffith, & Rasmussen, 1998; Wetherell et al., 2007), an in-depth analysis of an adolescent's use of dependent/subordinate clauses is important. One such measure is known as *clausal density*, determined by dividing the number of utterances in the sample (or more usual for adolescent language samples, C-units or T-units, per Chapter 2) by the number of clauses (sum of independent and dependent/subordinate clauses). This measure provides relatively general data about adolescents' clausal use, but it does not reveal what types of dependent/subordinate clauses (i.e., adverbial, nominative, adjectival/relative) in what proportions and where the clauses are used. A finer-grained analysis of clausal usage has the potential to reveal the presence of language problems that are subtler but insidiously undermine adolescents' success with secondary curriculum content. Figure 5.6 illustrates a guide for proceeding systematically through increasingly finer-grained analyses of an adolescent's dependent/subordinate usage in a language sample. In light of findings about SLI adolescents' continuing difficulties with verb morphology (e.g., Leonard et al., 2009; Reed, Patchell, et al., 2006; Rice et al., 2009), another potentially important area to examine is an adolescent's verb form usage and detection of correct/incorrect forms, including the degree to which an adolescent evidences mastery of correct verb form use (especially past-tense verb forms) and the forms by which the adolescent marks tense.

In Chapter 13, several approaches to analysis methods for language samples are introduced. Some are more appropriate than others for adolescents and the types of samples relevant for this age group. One of the more widely used computerized language sample analysis systems (Systematic Analysis of Language Transcripts—SALT) (Miller, Andriacchi, & Nockerts, 2015) provides options for analyzing samples collected via conversation or through narrative, and more recently via procedural and persuasive expository genres. Databases that permit comparisons of an individual adolescent's analysis to TD adolescents of similar ages are provided for young adolescents whose samples were collected in conversation or narrative contexts and for young and older adolescents for procedural expository and persuasive samples.

*Contrived Situations.* The concepts of and push for the use of authentic forms of assessment can put professionals in a bind when assessing the language abilities of adolescents.



**FIGURE 5.6 |** Increasingly Finer-Grained Analyses of Dependent/Subordinate Clause Usage in Adolescents' Language Samples

As Nippold (1995) has indicated, “Tasks that are sensitive to later language development sometimes involve the use of language in limited or contrived contexts” (p. 320). To examine an adolescent’s language performance in contrived situations seems, on the surface, to be contrary to the principles of authentic assessment. However, it may be necessary to use contrived contexts to elicit information about language abilities that are undermining a student’s ability to function in authentic situations. Consequently, it might be useful to avoid considering these two approaches as mutually exclusive. Instead, using contrived situations can be helpful when additional probing of particular skills or eliciting the use of infrequently occurring language structures (e.g., adverbial connectives) is necessary or when an adolescent’s ability with language needs to be stressed. Contrived situations are also helpful in assessing the degree to which an adolescent is able to learn new language behaviors and the amount of instructional effort needed from professionals to facilitate the learning, that is, dynamic assessment. Using contrived situations can also provide information about language behaviors that were not evidenced in other sample conditions and that reveal important information about an adolescent’s language skills. These situations might be particularly helpful for assessing language abilities involving aspects of figurative and literate language (e.g., proverbs, word definition skills, slang, and idioms) and adverbial connectives.

Contrived situations may also be particularly helpful for examining adolescents’ language comprehension abilities when norm-referenced testing for receptive language does not provide sufficient information for identification of language impairment or intervention planning. Comprehension ability is increasingly being recognized as an aspect of language performance that is often overlooked in terms of its impact on performance and outcomes from earlier language difficulties. For example, the evidence is mounting that children and adolescents who have receptive language impairment, with or without expressive language impairment, fare more poorly on measures of social adjustment and level of language abilities in adolescence. Careful assessment of an adolescent’s comprehension abilities is important, and many norm-referenced receptive language tests, unfortunately, focus

too much on concrete, single-word vocabulary and not enough on comprehension of connected text and, in particular, the ability to infer meaning from connected text.

*Portfolios.* In using portfolios as part of the assessment process, an adolescent and others who interact regularly with the adolescent (e.g., teachers and school counselors) add examples of the adolescent's work to a file. The file is intended to represent a collection of the adolescent's abilities in a variety of communication contexts and to reflect the adolescent's responses to different academic and communicative demands. A portfolio analysis of an adolescent's work from a number of different subjects and different types of communication tasks in these subjects can also provide leads as to what language the adolescent is expected to use to perform adequately. The use of portfolios as a method of assessment is seen as a particularly ecologically valid approach.

A variety of approaches to analyze portfolios of adolescents is available. Wiig (1995) has described one such approach to systematically conducting a portfolio analysis. Her approach uses a  $4 \times 4$  matrix that can be applied in a "structured, multidimensional assessment profile for focused holistic evaluation of portfolio samples across subject areas within a curriculum" (p. 23). She referred to a profile resulting from such an assessment as an "S-MAP" (p. 23). Dimensions to be included in the assessment matrix vary by what are important dimensions for a particular communication task or context. Each dimension is then assessed on a rating scale of 1 (Good) to 4 (Unacceptable). For example, for a narrative sample, Wiig (1995) suggests that each of four dimensions (1. Organizational Structure; 2. Recall and Elaboration; 3. Coherence, Cohesion, and Conventions; 4. Evaluation, Monitoring, and Revision) be evaluated and assigned one of four ratings (1. Good; 2. Acceptable; 3. Marginal; 4. Unacceptable). Wiig (1995) provided descriptors to guide ratings within each dimension. For example, a description of "A recognizable narrative structure is followed; there is a clear beginning, middle sequence, and ending" for Organizational Structure is rated as "Good," whereas a description for Evaluation, Monitoring, and Revision of "There are many revisions or no revisions when appropriate; when there are revisions, they are abrupt and without transitions, become tangential and verbose" is rated as "Marginal" (p. 25). A matrix such as this has the potential to bring to the analysis of adolescents' portfolios a more structured and standardized approach than might otherwise occur.

Examples of students' written work can also be analyzed in ways similar to analyses used for spoken language samples. If the portfolios do not contain sufficient written samples to provide adequate work to obtain a representative picture of the students' written language abilities, contrived approaches that ask students to produce a piece of written discourse can be used. Both narrative and expository genres can be sampled. Nippold (2014b) has provided protocols for eliciting written samples of both genre types. Analyses can parallel those used for spoken language samples and include metrics derived for overall productivity, for example the number of sentences (i.e., T-units), and for syntactic complexity, for example, mean length of sentences and clausal density, as well as finer-grained analyses of dependent/subordinate clause use. Attention to the mechanics of writing, for example punctuation, paragraphing, and spelling patterns, can also be analyzed. Misspellings can often reveal information about an adolescent's phonological processing, in addition to what spelling rules might be known. The written samples can additionally be subjected to grammatical error analyses (Scott & Windsor, 2000) and use of low frequency words (*examined, surveyed*) versus high frequency general words (*looked at*).

*Assessing the Educational System.* Success or failure in school significantly affects all aspects of life in adolescence as well as adult life. When an adolescent suspected of having a language impairment has particular difficulty with certain subject areas, a look at the spoken and written language features of the specific discipline compared to the adolescent's language strengths and weaknesses may shed light on the reasons for the adolescent's difficulties. Larson and McKinley (2003) believe that additional analysis can include other elements of the student's educational environment, such as the student's motivation and attitude toward specific subjects and the instructional approaches used in the subjects in which the student is struggling. These authors suggest that such an assessment can help identify the source(s) of the problems.

To facilitate an educational analysis, Larson and McKinley (1995) developed the Curriculum Analysis Form. The form is divided into three parts, all of which are completed for each course an adolescent is finding especially difficult. The first section analyzes the textbook used in the course, and the second focuses on the course's organization and the student's comprehension of classroom lectures/instructions and examinations. The last section of the form asks the adolescent to answer *yes* or *no* to a list of questions designed to probe the adolescent's attitude toward the course. When the analysis is completed, it helps clarify what strategies can be employed to assist the adolescent in dealing with educational language levels.

Lunday (1996) also developed a checklist to guide assessment of what communication skills are expected for postsecondary classroom and vocational success. This form consists of six aspects of language (Vocabulary, Use, Function, Organization, Form, and Pragmatics), each of which is evaluated by answering a number of questions about expectations, for example, expected to participate in classroom discussions, expected to interpret and use non-verbal cues, and required to understand figurative expressions. The teacher's expectation for each question is ascertained (i.e., yes it's an expectation, no it's not, or not applicable). For each question, the student's success in meeting each expectation is also evaluated as being positive, negative, or somewhere in the middle (+/-). The results provide a profile of what communication skills are important for the student from a teacher's perspective and the student's degree of ability to meet those expectations. This approach is quite consistent with the match/mismatch approach to assessment advocated by Larson and McKinley (1995), and the information obtained from such an analysis helps in determining intervention objectives.

The approach employed by Lunday (1996) to assessing classroom communication expectations recognized the importance of the perspectives of the teachers in influencing what communication skills adolescents need for success. What teachers perceive to be more and less important adolescent communication skills with them can set standards for adolescents' performances and influence their students' academic and personal success. To find out what high school teachers think are important communication skills for adolescents, Reed and Spicer (2003) asked grade 10 teachers to rank the importance of 14 communication skills. The skills represented a range of what would be considered primarily skills used for managing discourse (e.g., topic maintenance, conversational clarification, and repair) and those related primarily to empathy and interpersonal relationships and considered to be addressee focused (e.g., taking a listener's perspective, comprehending vocal tone). Two metalinguistic/figurative language skills (verbal humor comprehension and appropriate slang usage) were also included among the 14 communication skills. Table 5.6 shows the teachers'

**TABLE 5.6 |** High School Teachers' Ranking of the Importance of Communication Skills for Adolescents' Interactions with Their Teachers, in Order from Most to Least Important

1. Relating narratives
2. Presenting differing points of view or thoughts logically
3. Employing conversational clarification and repair strategies
4. Taking a conversational partner's perspective
5. Turn taking appropriately
6. Using appropriate vocal tone
7. Establishing and maintaining appropriate eye contact
8. Selecting conversational topics
9. Comprehending nonverbal communication
10. Comprehending vocal tone
11. Conveying messages tactfully
12. Maintaining topics
13. Comprehending verbal humor
14. Using appropriate adolescent slang

*Source:* Reed and Spicer (2003).

ranking of the 14 communication skills from most to least important. The skills ranked as relatively high in importance were ones generally associated with discourse management strategies, while the least important skills were the two metalinguistic/figurative language skills. To identify potential areas of mismatch and, therefore, potential intervention objectives, students' degrees of ability with each of these communication skills can be compared to the relative importance attached to them by their teachers, not unlike the approach used with Lunday's (1996) checklist.

## INTERVENTION

In 2008, Cirrin and Gillam published results of their systematic review of language interventions for school-age children. The authors reported that "no studies were located that focused on students in middle grades or high school" (p. S110) and of the 21 studies that met criteria for review, only two considered any intervention approaches for students age 12 years or older. This reflects in another way the underrecognition of adolescents with language impairment, but it also means that there is more limited evidence to guide intervention for adolescents with language impairment than that available for language intervention for younger children (Nippold, 2011). On a more positive note, since 2008 there is an increasing amount of literature that addresses language-impaired adolescents, which suggests that more intervention research will include adolescents. Currently, however, there are several principles that can guide intervention.

There is a general consensus among professionals working with adolescents with language impairment that these adolescents must participate in planning their own intervention, which contrasts with much of the intervention with language-impaired youngsters, who are often naive about the purposes and objectives of intervention. As early as 1985, Larson and McKinley wrote that there can be "no 'hidden agenda' when providing services for adolescents" (p. 72). The principle of no hidden agenda means the following:

- Purposes of assessments are explained and results are shared with the adolescent.
- Responsibility for identifying, establishing, and prioritizing intervention plans and objectives is a task shared among the adolescent and relevant professionals (e.g., SLPs, classroom teachers, and special educators).
- The reasons why particular skills are included in assessments and/or targeted in intervention are explained to and discussed with the adolescent.

Among the several reasons for adopting this approach are the following:

- Adolescents who recognize and accept that they have problems with communication and believe that intervention can help often begin to identify their own communicative behaviors that they wish to improve and that are important to them.
- Involvement in determining their own objectives leads the adolescents to accept responsibility for their problems, to take ownership of the problems, and to realize that they have the major role in modifying their language skills.
- Taking responsibility for their own problems and ways in which to address them means that adolescents are more likely to be motivated to improve.
- It begins to address what is a major objective of intervention with adolescents—improving their "meta" skills, that is, metalinguistics, metacognition, and metapragmatics.

### Principles in Determining Intervention Objectives

***Emphasize Strategies, Regularities, and the Metas.*** Objectives need to emphasize direct instruction that shows adolescents how to learn language (Kamhi, 2014) and how to manage language demands of learning. Adolescents need to be taught strategies, rules, and techniques that will improve their communicative performances and their abilities to use their language to learn and function socially and vocationally. These are the skills and strategies that can generalize to daily language use. The emphasis is, therefore, on using and improving metalinguistic,

metacognitive, and metapragmatic abilities. Sometimes the term *executive functioning* or *self-regulation* is used to describe the focus or processes related to this strategies approach, but as Singer and Bashir (1999) point out, “both are considered ‘meta’ constructs” (p. 265).

Several different specific strategies approaches are described in the literature, among them the Self-Regulated Strategy Development Model (Graham & Harris, 1999), the Strategic Process Model for Strategy Development (Wiig, 1990), the Strategic Instruction Model® (SIM®) of the University of Kansas Center for Research in Learning (e.g., Deshler & Schumaker, 1988; Deshler et al., 2001), and Integrative Strategy Instruction (Ellis, 1993). What all of these have in common, according to Bray (1995), is that “students learn how to identify patterns in the information to be processed, select a plan of strategies to learn the information, implement the strategic plan, and later evaluate and monitor its effectiveness” (p. 67). This approach contrasts with intervention objectives focusing on tutoring in academic content areas. Intervention, then, includes teaching specific strategies and discussions about which of the strategies can be employed under what situations, including specific examples of other possible situations. Adolescents’ conscious attempts to acquire strategies and to generate more examples of where else to apply the strategies can enhance, in very practical ways, the students’ metalinguistic and metacognitive skills and facilitate generalization or bridging. Additionally, this approach stresses the pragmatic aspects of language and makes language functional for the adolescents, another guiding principle of intervention for adolescents with language impairment.

***Don’t Miss the Missing Language Skills Needed to Underpin Strategies.*** A strategy does not work if an adolescent does not have the necessary underpinning language skills. However, with adolescents the approach is not to retreat to developmental sequences, an approach often seen with younger children. First, there are no “developmental sequences,” like sequential acquisition of 14 grammatical morphemes, to rely on when working with adolescents. Second, we can expect that an adolescent’s language skills represent a patchy pattern, in part as a result of idiosyncratic exposures to prior interventions and as a result of academic and social successes and failures.

Intervention for any specific language skills must be determined by identifying those needed for a particular strategy for an individual to implement a strategy and those absent from the adolescent’s repertoire, again the match/mismatch concept. For example, several of the strategies approaches noted previously include the strategy of teaching adolescents how to systematically implement steps to tackle paraphrasing. Thus, the adolescent is required to learn what those steps are and then to practice executing those steps, for example, knowing that the main idea of a passage needs to be identified as one of the steps. However, the process of paraphrasing and the steps within the process require multiple underpinning language skills, in this case, one of which would be access to sufficient vocabulary related directly to the topic/content of the material to be paraphrased. If an adolescent does not have a range of words to engage in paraphrasing about particular topics, an intervention objective might be to target *relevant* vocabulary. This approach to targeting vocabulary differs from an approach that involves a random selection of words and synonyms from, for example, some grade-level list of words pulled from a resource book. The first approach integrates an intervention objective directly with educationally relevant needs. It might be, however, that the adolescent has not yet learned the prefixes and suffixes relevant for the content, another underpinning skill that could be a focus of intervention. Again, however, any work on prefixes and suffixes is related to *relevant* disciplinary content rather than a random selection of prefixes and suffixes. It is also possible that the adolescent does not know the skills of how to begin deciphering morphologically complex words generally. In all cases, intervention for any of these skills would make it explicit for the adolescent as to how they relate to the paraphrasing strategy and to how they apply in other situations.

***Authentic Intervention—but “Practice Makes Perfect.”*** Just as assessment processes with adolescents need to be authentic, so does intervention. Singer and Bashir (1999) advise to avoid decontextualized interventions. Goals of intervention are not isolated from the day-to-day demands for communication and learning that students encounter. (pp. 271–272)

The examples above illustrate the principle of objectives having a basis in the adolescents' educational contexts.

Authentic objectives promote positive human interactions, facilitate academic success, and allow people to operate on a day-to-day basis without recurring failures. Using information about what communication skills are more and less important to adolescents and their various communication partners in different situations, such as those shown in Table 5.7 as well as Table 5.6, can be helpful in selecting intervention objectives. We see that when TD adolescents were ranking communication skills according to perceived importance in positive interactions with peers, skills more closely related to empathy and concern for communication partner tend to be ranked as more important. Figurative language skills (slang usage, verbal humor) tended to be ranked as less important. Skills related to managing discourse mostly fell into the medium important range. However, as can also be concluded from the rankings in Table 5.7, SLPs might not want to rely solely on what they believe would be important skills for adolescents because, as results of one of the studies shown in that table indicate, their opinions might differ substantially from those of adolescents, especially when adolescent peer interactions are being considered (Reed, Bradfield, & McAllister, 1998). There is also some evidence that adolescents with language impairment may perceive the relative importance of different communication skills for positive interactions with their peers differently from the relative importance perceived by TD adolescents (Reed & Brammall, 2006, 2008). For example, language-impaired adolescents have been found to rank humor comprehension and logical communication higher in importance than their TD peers and vocal tone comprehension and tact as lower in importance. When intervention centers on practical and relevant language abilities, adolescents are likely to recognize their importance and, therefore, be motivated to acquire them. This is especially true if the purposes of the objectives are explained and if real-life examples of effective and ineffective communication are provided and used as part of intervention.

It is unfortunate that for many adolescents with language impairment, their history of intervention will have been inconsistent, possibly with gaps in services, and objectives and directions of intervention may have suffered from a lack of coherence. This means that skills or strategies that might have been targets of intervention previously may not have been adequately learned in order to be stable or retained. Furthermore, these adolescents are typically inefficient learners who need additional time, repeated efforts, and more exposures than other students to learn and/or use a new skill or strategy. In contrast to their need for increased consistency and enhanced learning opportunities, their intervention has more than likely been inconsistent, with inadequate opportunities and repetitions of learning trials. This situation creates a wide gap between the learning opportunities that adolescents need to have provided for them to learn and achieve and what is often provided for them.

What is not known for adolescents is how much "practice makes perfect" or how much "more" is necessary. This translates as not knowing what the "dose" for intervention needs to be in order to be effective (Scott, 2014). And, we are not precise in what we should measure to determine effectiveness. It might be that our definitions of "effective" need to mirror the principle of "authentic objectives." That is, if an adolescent with language impairment is able to function independently or with minimal supports from general/regular educators in important learning and social environments, intervention has been effective. This approach is a departure from the idea of measuring number of correct responses for narrow intervention objectives. The former idea of "effectiveness" correlates more closely with learning, whereas the latter notion of "effectiveness" correlates more closely with performance. Drawing on the ideas of Bjork (2004), Kamhi (2014) wrote that "*Performance* is the short-term context-specific occurrence of some behavior, whereas *learning* is the long-term context-independent occurrence of the particular behavior" (p. 93).

To achieve effectiveness, Simon (1998) advised that focused practice and overlearning of strategies and their implementation are essential and that "drill is not necessarily bad" (p. 263). She added, however, that focused practice and drill need to be meaningful and to take place in context. That is, work on intervention objectives needs to be authentic, there needs to be a sufficient amount of it, and it needs to be consistent. Kamhi (2014), based on Fey (1988), comments that, in light of how much language exposure occurs for TD children to learn particular

**TABLE 5.7 |** Rankings of the Importance of 14 Communication Skills for Adolescents in Different Communicative Contexts, in Order from Most to Least Important

<i>Whose Rankings:<sup>1</sup> TD Adolescents Context: In peers' communication for positive peer relationships</i>	<i>Whose Rankings:<sup>2</sup> TD Adolescents Context: In adolescent's own communication with peers for positive peer relationships</i>	<i>Whose Rankings:<sup>2</sup> TD Adolescents Context: In adolescent's own communication with teachers</i>	<i>Whose Rankings:<sup>3</sup> Speech-Language Pathologists Context: In adolescents' communication for positive peer relationships</i>
Taking a conversational partner's perspective	Comprehending nonverbal communication	Turn taking appropriately	Initiating topics of conversation appropriately*
Comprehending vocal tone	Taking a conversational partner's perspective	Taking a conversational partner's perspective	Selecting conversational topics
Conveying messages tactfully	Comprehending vocal tone	Presenting differing points of view or thoughts logically	Employing conversational clarification and repair strategies
Turn taking appropriately	Using appropriate vocal tone	Employing conversational clarification and repair strategies	Presenting differing points of view or thoughts logically
Using appropriate vocal tone	Selecting conversational topics	Using appropriate vocal tone	Turn taking appropriately
Establishing and maintaining appropriate eye contact	Conveying messages tactfully	Conveying messages tactfully	Comprehending verbal humor
Comprehending nonverbal communication	Presenting differing points of view or thoughts logically	Comprehending vocal tone	Comprehending nonverbal communication
Employing conversational clarification and repair strategies	Turn taking appropriately	Relating narratives	Using appropriate adolescent slang
Selecting conversational topics	Employing conversational clarification and repair strategies	Establishing and maintaining appropriate eye contact	Relating narratives
Presenting differing points of view or thoughts logically	Establishing and maintaining appropriate eye contact	Selecting conversational topics	Establishing and maintaining appropriate eye contact
Relating narratives	Relating narratives	Comprehending nonverbal communication	Taking a conversational partner's perspective
Comprehending verbal humor	Comprehending verbal humor	Maintaining topics	Conveying messages tactfully
Maintaining topics	Maintaining topics	Comprehending verbal humor	Comprehending vocal tone
Using appropriate adolescent slang	Using appropriate adolescent slang	Using appropriate adolescent slang	Using appropriate vocal tone

Sources: <sup>1</sup>Henry, Reed, and McAllister (1995); <sup>2</sup>Reed, McLeod, and McAllister (1999); <sup>3</sup>Reed, Bradfield, et al. (1998).

\*In this study, the item for topic initiation replaced the topic maintenance item in the other studies.

elements of language, providing only limited intervention time assumes that “the language learning abilities in children with language impairments are somehow better than those of typically developing children” (p. 93). We know the opposite is true about the language learning facility of language-impaired adolescents. They are not efficient language learners.

Previously in this chapter we presented data about students being dismissed from language intervention at the end of elementary school. Scott (2014) raised the question of when older children and adolescents should be dismissed from intervention. One answer may relate to the idea of “authentic” effectiveness, per above—that is, the question of how well an adolescent with a language impairment is able to function in the academic and social context of secondary school. A second answer might lie in notions of Response to Intervention (RtI) frameworks. Within these frameworks, an adolescent with language impairment could move seamlessly back and forth from special education/SLP Tier 3 intervention to supports in Tier 2 or 1 at different times within the different secondary grades, depending on language demands of the curriculum and social challenges and their match with the adolescent’s skills. With this approach, there is no need to ask the question of when adolescents with language impairment should be “dismissed” from intervention. The more appropriate questions are to what degree is an adolescent still needing language-learning supports to succeed and what are the best settings with the best professionals to provide those.

**Different Intervention Emphases for Adolescents at Different Stages.** The period of adolescence spans 7 or more years. If thought of in terms of the changes that occur in a young child from infancy to 7 years of age, it should not be a surprising idea that the developmental stage known as adolescence needs to be considered as consisting of substages, much in the same way that the 0- to 7-year period is thought of as several stages (infants, toddlers, preschoolers, and primary school age). When planning intervention, therefore, the adolescent’s stage must be considered, and the strategies, activities, and objectives need to correspond to his or her social-cognitive level (Larson & McKinley, 2003).

In the early years of adolescence, teenagers with language impairment have several years of school ahead of them, so there is still opportunity to improve academic performance. Relationships with peers are beginning to take on greater importance, and there is greater expectation for appropriate interactions with a larger variety of people. For these reasons, intervention objectives with teenagers in the early years of adolescence that focus on language to improve both social and academic performance would likely be appropriate (Larson & McKinley, 2003). In contrast, teenagers in late adolescence, such as those between 16 and 18 years of age, are likely to have concerns about post-high school, i.e., vocational options, further education and training, and employment. Peer relations are more important than in the early adolescent years, and interactions with workmates take on increased importance. For these adolescents, objectives that emphasize improving language for vocational as well as social/workplace situations may be more important, whereas intervention objectives with a large focus on language to improve academic performance may carry less importance, depending on the individual adolescents. For adolescents in the years between the early and later stages of adolescence (i.e., between about 13 and 15 years), peer relationships have considerable importance, and there is still some time to take advantage of academic input. However, vocational concerns may also emerge. For these reasons, there is considerable rationale for intervention objectives with these adolescents in the middle period of development to emphasize social, vocational, and academic language skills (Larson & McKinley, 2003).

**Choosing Objectives for Success.** One maxim that we know well about human learning is that nothing succeeds like success; we know that success in learning leads to more success. This is a particularly important principle to consider in selecting intervention objectives for language-impaired adolescents, especially in the early stages of intervention. An adolescent with a language impairment likely has a history of academic and personal failure and may believe that he or she is not capable of learning when language is involved. It is not unusual for language-impaired adolescents to resist or avoid such learning situations, especially if they are removed from mainstream settings for their intervention. Therefore, as Bray (1995) writes, “it is important for a student to see results soon after learning and trying a strategy in order to ‘buy into’ the program” (p. 69). When adolescents see that they “can do it” and

that it makes a difference in real ways for them, they are more apt to try to do more and to improve. Motivation problems are commonly ascribed to adolescents with language impairment. Choosing objectives that promote quick success, particularly in the early stages of intervention, can help overcome some of the problems related to motivation.

### Factors in Implementing Intervention Objectives

**Direct Teaching.** Intervention requires direct teaching of skills and specific strategies to adolescents (Ehren, 2002) so that they actually learn these and the analysis abilities needed to apply and evaluate them, to learn to recognize when the skills and strategies should be used and which should be tried, and to learn to self-initiate applying these. Other adolescents have learned a great deal of language, a great deal about how to learn, and a great deal about how to use their language to learn, often without having been taught any of this directly; language-impaired adolescents have not, and there is little reason to believe that by the time these individuals reach adolescence, they will learn these skills without being taught directly. As an example, we know that adolescents with language impairment are likely limited in the types of complex sentences that they use, recognize in written text, and comprehend. For these reasons, expanding these adolescents' repertoire with complex sentences, and in particular those with relative clauses (adjectival clauses), is an often recommended intervention objective (Kamhi, 2014; Nippold, 2014a; Scott, 2014) that can underpin several strategies (e.g., paraphrasing, inferencing, sentence writing) and can be taught directly in intervention. Direct teaching can include, for example: a) the metalinguistic activity of discussion about what a relative clause is (syntactically and semantically) and how it functions in particular types of sentences (complex) (i.e., disambiguates a noun, describes a noun), b) an activity involving a search for relative clauses in individual sentences and subsequently in short paragraphs, c) an accompanying activity that involves discussion of what the clause "says" about the noun, and d) an activity involving combining two 1-clause sentences (simple sentences) into a 2-clause sentence with one of the clauses a relative clause. And, because an individual underpinning objective is related to strategies that it supports, activities are subsequently absorbed into the strategies and used in executing these, for example, paraphrasing the ideas in two sentences by using one complex sentence with a relative clause.

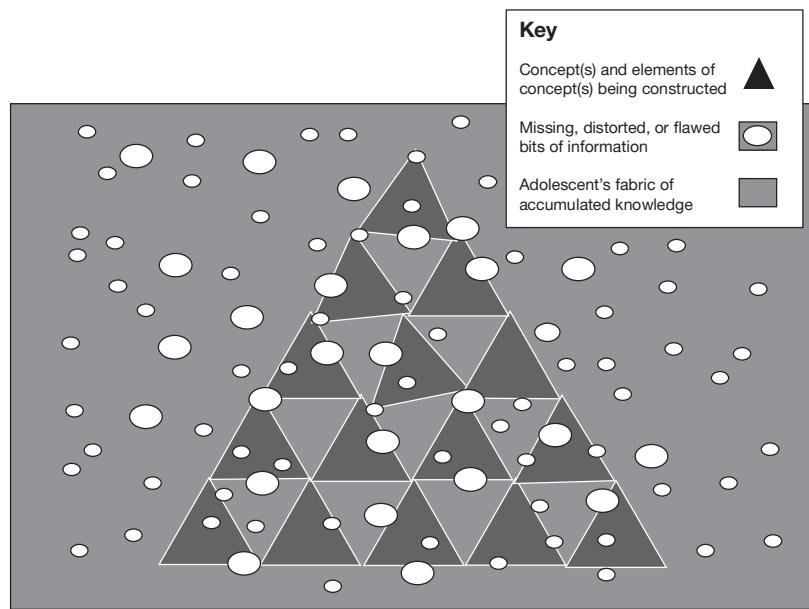
**Consideration of Characteristics of Adolescents with Language Impairment.** Implementing intervention objectives and, in particular, direct teaching that focuses on a strategies approach can be a bit trickier than it might seem. The things that these adolescents need to learn to do require them to use the very abilities and skills that are typically weak for them and are actually considered to be characteristics of these teenagers. This is probably why the adolescents did not acquire the strategies and skills in the first place. Table 5.8 highlights what might be incompatibilities and clashes between the requirements of learning and using language-related strategies and a number of the characteristics commonly seen in adolescents with language problems.

These adolescents have a long history—possibly as long as they are old—of “not quite having got it,” “it” being whatever was in the environment to be learned at any point in time. These adolescents are also victims of the “Matthew effect” Stanovich (1986), explained as real-life examples of the second part of the proverb, “The rich get richer and the poor get poorer.” Because adolescents with language impairment most likely started school with poor language skills when good language skills are required for becoming readers, they might not have learned to read fluently and well. And because reading is the greatest single source for further language acquisition and world knowledge, their poor reading skills mean that the gap between students with language problems and those able to take advantage of reading and formal education widens greatly through the early school years into adolescence. Because of the missed bits of information and the mislearning that have fed into these adolescents’ concept formation and knowledge base for years, Simon (1998) suggests that “over time, a great deal of *misinformation can be acquired*” and that students’ world knowledge can seem “quite weird” (p. 258). The misconceptions that adolescents with language impairment acquire mean that they attempt to build new knowledge on top of flawed, distorted, and/or incomplete information. Wiig (1995) likens this to trying to build a house on a hole instead

**TABLE 5.8 |** Discrepancies between Characteristics of Adolescents with Language Impairment and Requirements of Strategies Taught in Intervention

Some Characteristics of Adolescents with Language Impairment	Requirements Involved in Learning and Employing Language-Based Learning Strategies
An adolescent with a language impairment likely has weak metalinguistic and metacognitive skills.	A strategies approach requires an adolescent to analyze and think about communicative situations and language demands of a learning task, that is, metalinguistic and metacognitive skills.
Many adolescents with language impairment are quite poor and inefficient information processors.	In essence, what this does is ask the adolescent to use what are weak metalinguistic and metacognitive skills, rather than use what might be stronger skills, to learn new strategies and apply them in new situations that, in themselves, are “meta” skills.
Inefficient information processing abilities probably mean that an adolescent’s problem-solving and task-analysis activities are slow.	Using metalinguistic and metacognitive tasks can require that a considerable amount of information be stored in short-term or working memory long enough to be processed and mentally manipulated.
The educational system and interpersonal interactions expect quick responses; a language-impaired teenager may have learned over his or her many school years that adults and peers dislike incorrect responses less than delayed or no responses.	A strategies approach requires that the adolescent take time to figure out an appropriate approach to a problem and arrive at a correct answer.
The adolescent might have figured out that if he or she guesses but is wrong, an adult will probably explain and fill in the missing parts or move on to something or somebody else so that the language-impaired adolescent is “let off the hook.”	Guessing is the exact opposite of what is necessary for the considered, analytical approach involved in using strategies.
To the adolescent, it may be better to respond quickly and be wrong than cause a delay or create a silence while trying to figure out a correct response.	
There is the possibility of a long history of a language-impaired adolescent having been provided with inadvertent positive reinforcement for quick, ill-considered responses.	
Adolescents with language impairment may have habituated a “guessing strategy.”	
Response impulsivity is characteristic of many adolescents with language impairment.	
Adolescents with language impairment are often concrete thinkers and concrete problem solvers.	A strategies approach involves both situational analysis and performance evaluation, which are generally considered to be quite hypothetical and formal thought processes.
Many adolescents with language impairment are passive and dependent learners; “learned helplessness” is a term sometimes associated with adolescents with language impairment.	Learning and using strategies requires that students initiate the process of analyzing a task, select one or more strategies from their repertoire, and then apply these and do so independently without needing to be prompted by another person.
Adolescents with language impairment often fail to self-activate or self-initiate the application of strategies even when they have learned the strategies and where to use them.	

of a solid foundation. A somewhat different analogy is illustrated in Figure 5.7. In this illustration, an adolescent’s world knowledge is conceived of as a piece of fabric into which pellets from a shotgun have been fired and which have left randomly sized and randomly located holes in information. Concepts and knowledge that underpin the formation of new, larger, and more complex concepts are flawed, distorted, and undermined in unpredictable ways by the holes in knowledge. In working with adolescents with language impairment, professionals cannot assume that the concepts these teenagers have formed are similar to those of their normally achieving peers.



**FIGURE 5.7 |** A Schematic Illustration of Adolescents' Constructions of Concepts on an Incomplete Fabric of Accumulated Knowledge Flawed over Time by Missing Bits of Information as a Result of Early and Ongoing Language Impairment

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***Intervention Approaches to Accommodate Adolescents' Language and Learning Characteristics.*** Although implementing intervention objectives for adolescents with language impairment might be tricky, a number of techniques and approaches can be helpful in getting around the barriers to learning raised by the language and learning characteristics exhibited by these adolescents. Among these are the following:

- Teach, expect, and reward an adolescent's self-activation and self-initiation in applying strategies and skills; stress independent learning; and identify self-activation and self-initiation as intervention objectives in their own right. This particular approach attempts to replace dependent, passive learning behaviors with those characteristic of active and independent learners and those more in line with learner expectations in the high school years.
- Ensure overlearning and stabilization, plan for and build in redundancy, and incorporate repetition in many different situations; follow up; return regularly and frequently to previously targeted objectives to review performance and ensure the skills have been maintained; and build in regular monitoring and checking of skills previously targeted that are no longer active intervention objectives. All of this is especially important in light of what has probably been an inconsistent intervention history for an adolescent and the evidence that skills and strategies often break down during periods of stress, typically when they are most needed, even when these appeared to have previously been learned quite well.
- Because speed of response is the antithesis of what is trying to be achieved by a strategies approach for these adolescents, replace habituated guessing and response impulsivity with a strategy that allows them to delay responding and provides for processing time. Increasing wait time before making responses has been found to improve the quality of the responses of school-age children with language-learning disabilities to higher-level cognitive questions involving synthesis of information and to increase their verbal fluency (i.e., reduce maze behavior) in relating the information. These findings are consistent with information from educational research involving both school-age and university students (Kaplan & Kies, 1994; Tobin, 1986, 1987). However, many of those

with whom adolescents interact in the educational system and in peer relationships are likely to expect them to keep up in conversational turn exchanges and with responses in interactions. It is important, therefore, to help these individuals to employ an appropriate wait time and for the adolescents to adopt pragmatically appropriate ways to delay responding, such as making a statement that indicates an intentional delay (“Let me think about that,” “Mmmm”). For school-age children with SLI, Evans, Viele, and Kass (1997) found that the use of verbal pauses (e.g., “ah,” “um”) at the beginning of the children’s turns during conversational interchanges predicted their use of longer utterances. Such responses mark a turn, signal awareness of the previous utterance, indicate a need for a response, and fill the space while providing time to comprehend what was to be taken in and formulate a response. Such responses need to be well rehearsed and habituated, however, if they are to be of help to adolescents.

Although many adolescents with language impairment demonstrate a pattern of ill-considered, quick responses, there are some who do not respond at all or who exhibit long, silent pauses in their utterances, leaving silences to fill the spaces where others expect responses or disrupting the flow of conversation. If the reason for the silences is that an adolescent is using these “to buy” processing time, these occurrences of unacknowledged silences, often misinterpreted by others as sullenness or obstinacy, can also be addressed by replacing the behavior with a more pragmatically appropriate delaying tactic involving a rehearsed statement or filler.

- Employ concrete, hands-on activities to work on abstract “meta” tasks. Recall that adolescents with language impairment are often at a concrete stage of cognition for learning. The idea is to use activities consistent with concrete cognitive levels—for example, sorting cards or objects, creating models, or using paper and pencil or a computer to map concepts—to facilitate development, use, and learning of various higher-level cognitive “meta”-level tasks associated with a strategies approach. For example, Scott (2014), in describing how she approaches teaching relative clauses to language-impaired school children and adolescents, uses “active manipulation” (p. 149) to combine clauses into complex sentences by cutting and pasting, via a computer, a center-embedded relative clause into an independent clause.
- Reduce information processing demands (e.g., how much information needs to be stored at a time in working memory and how much mental manipulation is involved in a task) by keeping needed information in the immediate environment. This can be accomplished by using intransient and stable stimuli (usually visual or graphic), such as lists, charts, or computer monitors, to supplement or counter transient auditory stimuli. With this technique, an adolescent can retrieve and consult bits of information in “permanent” (i.e., intransient) form that are needed to solve abstract or metatasks or needed to implement a particular problem-solving strategy. Often, the activities that address reducing information processing demands are consistent with concrete operations activities, as above.

**Activities with an Authentic Focus That Integrate Aspects of Language.** As we saw above, suggested techniques do not preclude the use of authentically based activities. In fact, the techniques can be ways to facilitate language-based strategies and to integrate work on several aspects of language. As an example, a science-based activity might center around a very real-life, functional ability and, therefore, quite authentic objective, such as understanding a TV weather broadcast. A small-group setting might be used to address several functional aims: (1) to understand meanings of words and roots and affixes, such as *precipitation*, *barometer*, and *prevailing*, as in *prevailing winds*; (2) to recognize cause–effect relationships based on the next day’s forecast; (3) to identify specific differences between formal register as used in a TV broadcast and informal register inappropriate for such a communicative situation; (4) to select words, phrases, and sentences appropriate for use in a formal communicative context, such as giving a weather broadcast; (5) to prepare the script for a teleprompter; and (6) to adopt a formal communicative style to execute giving a weather report on TV. We see that these objectives encompass semantic, syntactic, morphological, and pragmatic aspects of language at both the receptive and the expressive level, yet they center on a possible

curriculum-relevant activity while promoting metalinguistic and metacognitive skills across spoken and written discourse.

### Service Delivery

In Chapter 4, several different models of service delivery were discussed. What we know about intervention for adolescents with language impairment is that traditional service delivery models, such as the pullout model, are not effective if used as the sole intervention approach. As early as 1983, Boyce and Larson (1983) discussed service delivery issues for adolescents and provided four reasons for the ineffectiveness of traditional models:

1. When secondary students are removed from their classrooms for short periods of time twice a week, the usual daily schedules are disrupted.
2. Secondary students who need to walk in and out of classrooms during class periods are viewed as different from their peers during a developmental period when conformity to the peer norm is important to them.
3. Intervention can be viewed as punitive because, in addition to the first two reasons, the adolescents “receive no credit for work that may be very difficult for them” (p. 23).
4. Establishing and maintaining relationships with service providers are difficult when these professionals are removed from the usual routine of the schools. Additionally, the traditional one-to-one intervention fails to promote communicative interactions and provide opportunities to practice new language skills in varied communicative contexts.

In light of the evidence that language intervention needs to have sufficient intensity and frequency with educational relevancy, service delivery models other than the traditional pullout model need to be implemented, with the pullout model reserved for only a few situations and often for only short periods of time (Ehren, 2009b; Nippold, 2012).

It is also likely that, by themselves, indirect models in which others deliver intervention are typically not sufficient to address the academic and social needs of many of these students. However, it is important to integrate the principles of this service delivery approach into more encompassing models of providing intervention for these adolescents. That is, close collaboration and consultation among all professionals who interact with an adolescent are essential for a unified and integrated intervention program. This not only is good practice but also is consistent with the legislation that guides and funds service delivery, particularly as principles of Response to Intervention (RtI), discussed in Chapter 4, that infuse both the regular/general education and special education systems, blur, appropriately, the boundaries between the two.

Although RtI models have been implemented in many elementary schools, these models have been slower to be embraced at the secondary level (Ehren, 2009b; Ehren & Whitmire, 2009). There are several reasons for the lag in RtI implementation in middle and high schools, among them the focus on students' learning content versus learning skills, general/regular secondary teachers often having less training in working with students with disabilities, the complications of secondary-school schedules, less recognition of factors affecting the learning of adolescents with language impairment, and less awareness of students with language impairment. Nevertheless, the RtI framework has potential to overcome some of the disadvantages of more traditional models of service delivery for adolescents with language impairment (Ehren, 2009b; Ehren & Whitmire, 2009). It can capitalize on consultative and consultation models and lead to language intervention support to occur more frequently within classroom settings, thus fitting more closely with educationally relevant and authentic principles. One model is for classroom teachers and specialists with expertise in language (e.g., SLP, learning disabilities teacher) to team in the students' classrooms. This model has the potential to provide curriculum-based instruction with a “lens” (Ehren, 2009a) that focuses on the language demands of curricular materials and the language of instruction. A language specialist can assist in bringing the language into focus and facilitate the adolescents to adopt language strategies that let them gain access to content in the curriculum. Helping language-impaired adolescents access curricular content is essential to

their academic success, but such content access will have typically been limited previously because of their language challenges and their related issues with literacy (Ehren, 2009a).

Another service delivery model for providing direct language intervention for language-impaired adolescents is to deliver intervention in classrooms with an SLP or other language specialist as the teacher. (Larson & McKinley, 2003; Nippold, 2011; Work, Cline, Ehren, Keiser, & Wujek, 1993). In this model, existing blocks of time in the school's daily schedule are frequently utilized for intervention. Students may be seen for an entire time period on a regularly scheduled basis, sometimes as frequently as 5 days a week. As with other classes, the students are generally seen in groups, although these groups are much smaller than the usual academic class. Small-group sessions facilitate interaction and communication practice. To describe such an intervention format, supportive titles, rather than punitive ones, are recommended, such as those of Larson and McKinley (1995), that is, "Individualized Language Skills" or "Oral Communication Strategies" (p. 162). The Language Intervention Program for Secondary Students (Comkowycz, Ehren, & Hayes, 1987), implemented in Polk County Schools in Florida, selected the name Exceptional Student Education—Language Arts because the class "is taught under the rubric of a state-designed curriculum framework" (p. 204). A program in the Palo Alto Unified School District in California chose the name Language/Study Skills Class (Buttrill, Niizawa, Biemer, Takahashi, & Hearn, 1989). With this intervention format, students' efforts are recognized, intervention is not viewed as penalizing or stigmatizing, and strategies and underpinning language skills can be learned and practiced in interactive situations. The model resolves the problems of traditional service delivery formats. Furthermore, because the format fits into the daily academic schedule, intervention becomes an integrated, accepted part of the school routine.

## SUMMARY

In this chapter we have seen that

- Even though we are learning more about adolescent language impairment, gaps remain in our knowledge, and this group of individuals with language impairment continues to be underrecognized and underserviced professionally.
- Gaps in our knowledge make assessment of language-impaired adolescents an especially challenging process; nevertheless, assessment must include norm-referenced procedures in combination with language sampling, observation, and other standardized, unnormed procedures.
- Fewer norm-referenced language tests have been developed for adolescents than for youngsters, and the validity, including sensitivity and specificity, of several of these adolescent tests is questionable.
- Intervention for language-impaired adolescents needs to
  - Involve the adolescents in helping to set their own intervention objectives.
  - Emphasize strategies and underpinning language skills for the strategies and improve metalinguistic, metapragmatic, and metacognitive skills.
  - Focus on functional communication skills, emphasize authentic objectives in authentic contexts, and help them acquire strategies and metaskills so that they can effectively access the content of the curriculum in their classes.
- Consider an adolescent's developmental stage and use a variety of intervention techniques to work around the barriers to learning that an adolescent with a language impairment can exhibit.
- Shift away from primarily using traditional service delivery models in order to accommodate the needs of these adolescents.

If only one point is to emerge from the information in this chapter, it is that language impairment negatively impacts adolescents' academic and personal successes in middle and senior high schools and limits their social, vocational, and educational opportunities as adults. Continuing to underrecognize or underserve these language-impaired adolescents would be a sad professional commentary.

# 6

# Language and Children with Intellectual Disabilities

Stacey L. Pavelko

## LEARNING OBJECTIVES

After reading this chapter, you should be able to:

- Provide an overview of intellectual disabilities
- Discuss the delay-disorder controversy associated with intellectual disabilities
- Discuss language characteristics and associated implications for intervention
- Discuss implications for intervention
- Summarize issues related to language and children with intellectual disabilities

This chapter will discuss the diverse characteristics of children with intellectual disabilities (ID). A wide range of physical conditions and behaviors exist among these children. Some children may show mild intellectual deficits and few other problems; they look like their peers, attend school, and interact well with typically developing (TD) children. They do not have seizures or other neurophysiological disorders and speak intelligibly and effectively. Other children may have more significant intellectual deficits and present a totally different picture; they have physical disabilities and attend a special school or special classroom with other severely disabled children and communicate poorly. Some children may occasionally scream and scratch themselves, others may wear a helmet to protect their head in case of falling during a seizure, and some may not communicate with speech. When reading the research on children with ID, it is important to ask several questions: What kinds of children were studied? How old were they? What did they look like? How severe was their intellectual impairment? How severe were their physical, social, and educational problems? By challenging the information in this way, readers will come to appreciate children with ID as a complex, heterogeneous group rather than falling into the trap of thinking about them as a homogeneous group of children.

## AN OVERVIEW OF INTELLECTUAL DISABILITIES

### Definition

Historically, the commonly used term for *intellectual disability* was *mental retardation*. The American Association on Intellectual and Developmental Disabilities (AAIDD), formerly called the American Association on Mental Retardation (AAMR), is among the more prominent professional organizations that support individuals with intellectual and developmental disabilities. It uses the term *intellectual disability* (AAIDD, 2010), which has evolved to be the more preferred term for most professionals. Schalock and colleagues (2007) provide an in-depth discussion about the shift to the term *intellectual disability*, a discussion which is beyond the scope of this chapter. What is important to understand in reading this chapter is that the term *intellectual disability* refers to the group of individuals who were previously referred to as mentally retarded in terms of number, kind, level, type, duration of disability, and the need these individuals have to access services and supports (AAIDD, 2010; Schalock et al., 2007). For the most part, in this chapter the terms *intellectual disability (ID)* and the organization name, AAIDD, will be used, unless it would be inappropriate to do so, as in a quotation, proper name, or reference citation.

An influential definition of ID is that of the AAIDD (2010):

Intellectual disability is characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18.

A diagnosis of ID requires that three criteria be met. The first criterion is a significant limitation in intellectual functioning. Intelligence refers to general mental ability and includes reasoning, planning, solving problems, thinking abstractly, comprehending complex ideas, learning quickly, and learning from experience (AAIDD, 2010). An individual's level of "intellectual functioning" is typically determined from the results of a norm-referenced test of intelligence and the AAIDD quantifies a "significant limitation" as an IQ score that is approximately two standard deviations (SDs) below the mean. However, the AAIDD cautions that professional judgment be used when interpreting the score and the test's standard error of measurement, reliability, validity, and strengths and limitations. Although each state sets its own guidelines for identifying children with ID, most states use a cutoff IQ score of 70–75, which usually equates to 2 SDs below the mean (Polloway, Smith, Patton, Lubin, & Antoine, 2009). Given the AAIDD recommended 2 SDs cutoff, approximately 2–3 percent of children will have limitations due to significant ID based on a normal distribution. From this perspective, the determination of the presence of ID can be thought of as a statistical determination as opposed to a functional one.

There is, however, another group of children to consider. These children have IQs that fall in the range of 1 to 2 SDs below the mean, or usually IQ scores of 70 to 85. This is approximately 13.5 percent of the population. The children do not fall into either the traditional ID range (70 or below) or the normal IQ range (85 or above). However, we know that they struggle both socially and academically but are often not eligible for special services in school because of the IQ cutoff of 70 to 75. When the focus of discussion about these children is language, the term *nonspecific language impairment*, has begun to be used, as we saw in Chapter 3. In Chapter 3 there is also a more complete discussion about mental age/IQ and language age comparisons in determining language performance and statistical approaches to identifying language impairment based on normal variation and normal distribution.

Several tests are used to measure intelligence, depending on the age and verbal ability of the child:

- The *Stanford-Binet Intelligence Scale—Fifth Edition* (Roid, 2003) has a long history and is still used with children of all ages.
- The *Wechsler Intelligence Scale for Children—Fifth Edition* (Wechsler, 2014) is another test used commonly with children of school age.

- As detection and intervention efforts focus increasingly on infants and younger children, the *Bayley Scales of Infant and Toddler Development—Third Edition* (Bayley, 2006) has gained popularity.
- For nonspeaking individuals, tests that do not require verbal responses are needed, such as the *Leiter International Performance Scale—Third Edition* (Roid, Miller, Pomplun, & Koch, 2013).

There are other IQ tests with specific uses and advantages. What all IQ tests have in common, however, is that they yield a mental age (MA), an estimate of an individual's level of cognitive functioning. An IQ score is derived by dividing the MA by the individual's chronological age (CA) and multiplying by 100, that is,  $\text{IQ} = \text{MA}/\text{CA} \times 100$ .

Although the IQ scale is a continuous set of numbers, it is the practice of professionals in the field to describe levels of impairment for purposes of education and intervention plans and research. Until 1992, the AAIDD supported the use of descriptive labels based on IQ intervals. These labels paralleled an older set of terms that had traditionally been used in educational placement. Since 1992, there has been a shift toward describing individuals in terms of the intensity of supports they need in order to learn and function across environments. In 2010, the AAIDD proposed a multidimensional classification system, which represents a significant departure from the previous classification systems. Table 6.1 provides the older terms and new classification system. Unfortunately, states vary considerably with respect to the use of classification systems. One 2009 survey of state agencies reported that 45.1 percent of states did not use a classification system and 21.6 percent of states used a system that was consistent with the older 1983 AAMR system (Polloway et al., 2009).

The second criterion that must be met for a diagnosis of ID is a significant limitation in adaptive behavior. The AAIDD (2010) defines *adaptive behavior* as “the collection of conceptual, social, and practical skills that have been learned and are performed by people in their everyday lives” (p. 43). Adaptive skills fall into three categories (i.e., conceptual, social, practical) and include such behaviors as appropriate language, managing money, following rules, eating, dressing, and acquiring office skills. Examiners often employ norm-referenced tests, such as the *Vineland II: Vineland Adaptive Behavior Scales, Second Edition* (Sparrow, Cicchetti, & Balla, 2005) and the *Adaptive Behavior Assessment System—Third Edition* (Harrison & Oakland, 2015), that are normed on the general population to determine if an individual performs more than 2 SDs below the mean in at least one of the three categories of skills. The third criterion that must be met for a diagnosis of ID is that the limitations in intellectual functioning and adaptive behavior appear before 18 years of age, that is, during the developmental period.

**TABLE 6.1 | Levels of Impairment of Individuals with Intellectual Disabilities**

	AAMR/AAIDD Classification	Traditional Label	IQ Range	Percentage of Persons with ID
Previous labels	Mild	Educable	50–55 to 70	89
	Moderate	Trainable	35–40 to 50–55	7
	Severe	Custodial	20–25 to 35–40	3
	Profound	Life support	Below 20–25	1
Revised labels	Intermittent	Short-term supports, such as during an acute medical crisis		
	Limited	Supports needed regularly but briefly, such as employee assistance to remediate a job-related skill deficit		
	Extensive	Ongoing and regular assistance, such as long-term home living support		
	Pervasive	Potentially life-sustaining support, such as attendant care, skilled medical care, or help with taking medications		

In the literature on exceptional children, several other terms are used that have meanings similar to ID. *Developmental disability* is one such term. This label is used in federal law to describe mental or physical disabilities (or both) that appear before age 22 that are likely to continue indefinitely in self-care, language, learning, mobility, self-direction, capacity for independent living, and economic self-sufficiency. There is great, though not total, overlap between the categories of ID and developmental disability. The differences occur at the upper end of the impaired range (e.g., an IQ of 65), where an individual may receive a diagnosis of ID but *not* developmental disability (Grossman, 1983). There are, however, circumstances when the IQ of a child has not or cannot be determined. In these circumstances, it is common for the child to be identified by etiological category (e.g., fragile X syndrome) or labeled as *developmentally disabled* (Taylor & Kaufmann, 1991). *Autism spectrum disorder (ASD)* is another term that has substantial overlap with ID. A majority of children with ASD have IQ scores within the impaired range. Both researchers and practitioners, however, have tended to treat children with ASD as a distinct group. Therefore, a separate chapter in this text is devoted to this group of children.

*Learning disability* is a category of impairment that is defined in federal law. Children with ID are specifically excluded from this category. In practice, though, there is a relationship between learning disability and ID. In just the 7 years following the enactment of Public Law 94-142, a 19 percent decrease was reported in the number of children receiving special education services who were identified as intellectually disabled. In actuality, however, this decrease may have reflected a shift in labeling practices, with many of the individuals with mild intellectual disabilities being reclassified as learning disabled (Frankenberger & Harper, 1988; MacMillan & Siperstein, 2001). It is also possible that some children with IQs in the 70 to 85 range may be classified as learning disabled.

### Causes and Types of Intellectual Disabilities

In the preceding discussion, test performance was used to distinguish different levels of ID. Differentiation by level of performance is important to educators and administrators because it serves to place children with ID into programs and allocate funds to those programs. Other differences related to characteristics of different children with ID are frequently more important, however, to others who are interested in uncovering the causes of ID.

Research findings from many sources suggest that there are two broad categories of ID: *biological origin*, which includes a demonstrated biological cause of the disability, and *cultural-familial origin*, which includes those individuals for whom social, behavioral, or educational risk factors predominate (AAIDD, 2010). Although this two-group distinction is useful as a shorthand way to categorize the causes of ID, the distinction is often blurred in real life. Individuals with social, behavioral, or educational risk factors may also have biomedical risk factors and vice versa. For example, a child who is born with Down syndrome (*biological origin*) may come from an impoverished environment and have *cultural-familial* risk factors such as maternal malnutrition, lack of prenatal care, and impaired child-caregiver interactions. Conversely, a child with primarily *cultural-familial* risk factors such as parental drug use and parental abandonment may also have a *biological* factor such as a single-gene disorder.

Several types of chromosomal or other genetic abnormality produce congenital syndromes associated with ID. With the completion of the Human Genome Project in 2003, a 13-year venture coordinated by the U.S. Department of Energy and the National Institutes of Health, more attention in the professional literature has been paid to the identification and diagnosis of syndromes. Although there are over 500 syndromes that can cause ID, Down syndrome (DS), fragile X syndrome (FXS), and fetal alcohol spectrum disorder are the more common syndromes (Centers for Disease Control and Prevention [CDC], 2015). DS is the most widely known genetic cause of ID (CDC, 2015) and affects approximately 1 in 700 live births. DS is most commonly caused by an extra 21st chromosome (*trisomy 21*). FXS is the most commonly known cause of inherited ID. FXS is an X-linked genetic disorder caused by a defect of the fragile X mental retardation 1 (FMR1) gene. The prevalence of FXS is reported in two ways: full mutation and permutation. The prevalence of full mutation in the general population is approximately 1 in 4,000 males and 1 in 6,000 females (Hagerman, 2006).

The prevalence of permutation in the general population is approximately 1 in 151 females and 1 in 458 males (Seltzer et al., 2012). Individuals with full mutation typically exhibit ID; in contrast, individuals with FXS permutation generally exhibit normal intelligence, but are reported to have learning disabilities, emotional difficulties, neurological deficits, and endocrine problems that further increase the chance of the FMR1 mutation in the general population (Hagerman, 2008). Males are typically more severely affected because they have only one X chromosome (Hagerman, 2008). In addition, approximately 20–50 percent of males with FXS also meet full criteria for a diagnosis of autism (using the DSM-IV diagnostic criteria) and 75 percent meet the criteria for ASD (Clifford et al., 2007; Hall, Burns, Lightbody, & Reiss, 2008; Kaufmann et al., 2004). Most of the research conducted with individuals having FXS has been with males.

Rarer genetic disorders that affect intellectual functioning are Williams syndrome (WS), Angelman syndrome (AS), and Prader-Willi syndrome. WS is caused by missing genetic material on chromosome 7, affecting approximately 1 in 10,000 to 1 in 15,000 live births (Shprintzen, 2000). This deleted genetic material includes the elastin gene (ELN), which is essential for maintaining the elasticity of fibers and connective tissue (Shprintzen, 2000). AS is a nonprogressive neurological disorder affecting approximately 1 in 10,000 to 1 in 25,000 live births that results from a deletion of genetic material from the mother's 15th chromosome (Richard & Hoge, 1999; Shprintzen, 2000). Should there be a deletion from the 15th chromosome from the father, Prader-Willi syndrome results, with occurrences ranging from 1 in 8,000 to 1 in 25,000 live births (Kleppe, Katayama, Shipley, & Foushee, 1990; Richard & Hoge, 1999; Shprintzen, 1997, 2000). Table 6.2 summarizes information pertaining to appearance, physical features, and health problems of children with some of these ID syndromes.

**TABLE 6.2 |** Comparison of Appearance, Physical Features, and Health Problems Associated with Children with Intellectual Disabilities Syndromes

Intellectual Disability Syndrome	Appearance/Facial Characteristics	Physical Features	Health
<b>Angelman Syndrome</b>	Microcephaly Large, wide, smiling mouth ( <i>macrostomia</i> ) with irregular spaced teeth Deep-set eyes Mandibular protrusion Hypopigmentation resulting in fair complexions A wide base and stiff-legged gait <i>Sources:</i> Richard and Hoge (1999); Shprintzen (1997, 2000)	Low tone ( <i>hypotonia</i> ) Hand flapping Tremors and jerky movements of the extremities Ataxia Visual problems (e.g., nystagmus, optic atrophy, strabismus, squinting, and poor acuity) <i>Sources:</i> Richard and Hoge (1999); Shprintzen (2000)	Epilepsy/seizure disorders in 80% of children Possible early failure to thrive Persistent feeding difficulties <i>Sources:</i> Richard and Hoge (1999); Shprintzen (2000)
<b>Down Syndrome</b>	Small head circumference Upward-slanting, oval-shaped eyes with prominent epicanthal folds Midface hypoplasia A small chin and a small nose with flattened bridge Small oral cavity with a short, high, narrow palate; possible bifid uvula or cleft	Generalized hypotonia results in gross motor delays (e.g., poor quality of movement; deficits in postural control, stability, strength, and coordination; and delayed acquisition of motor milestones, hyperreflexive)	Cardiac problems: Congenital heart defects or disease in 40% to 60% (e.g., structural malformations, pulmonary artery hypertension, and pulmonary vascular obstructive disease) Hematology concerns: Increased prevalence of leukemia or low platelet counts

(Continued)

**TABLE 6.2 | Continued**

Intellectual Disability Syndrome	Appearance/Facial Characteristics	Physical Features	Health
	<p>As child develops, lips become prominent, thickened, and excessively moist</p> <p>Underdeveloped, protrusive jaw</p> <p>Malocclusion</p> <p>Small, short low-set ears; structure of external, middle, and/or inner ear may be abnormal</p> <p>Sources: Chamberlain and Strode (1999); Richard and Hoge (1999); Shprintzen (1997, 2000)</p>	<p>Low tone also results in oral-motor/feeding problems (e.g., poorly integrated suck-swallow-breathing patterns, tongue protrusion, open-mouth posture, and decreased sensory awareness and responsiveness to food placed in mouth)</p> <p>Sources: Chamberlain and Strode (1999); Richard and Hoge (1999); Shprintzen (1997, 2000)</p> <p>Visual problems: 40% have poor bilateral vision or amblyopia ("lazy eye"), 20% to 50% have strabismus, and 10% to 20% have nystagmus; congenital cataracts are common</p>	<p>Sources: Chamberlain and Strode (1999); Patterson and Lott (2008)</p> <p>Endocrine disorders: Increased likelihood of diabetes and/or thyroid problems that may lead to obesity or decreased intellectual functioning</p> <p>Sources: Chamberlain and Strode (1999); Patterson and Lott (2008)</p> <p>Gastrointestinal defects or blockages that may lead to nutritional problems (e.g., duodenal atresia and Hirschprung disease)</p> <p>Source: Patterson and Lott (2008)</p> <p>Immunodeficiencies: Low T-cell counts or T-cells that do not function adequately, contributing to increased incidence of upper respiratory infections (i.e., ear, nose, and throat infections), leukemia, and cardiac problems</p> <p>Source: Chamberlain and Strode (1999)</p> <p>Sleep disturbances: Sleep disorders possibly due to airway obstruction (<i>apnea</i>)</p> <p>30% to 60% of children have chronic obstructive hypoventilation</p> <p>Difficulty regulating sleep-wake cycles due to decreased serotonin levels</p> <p>Sources: Chamberlain and Strode (1999); Patterson and Lott (2008); Shott et al. (2006); Stores (1993)</p> <p>Orthopedic problems: Atlantoaxial instability—increased mobility between the first and second cervical vertebrae that increases the risk of spinal cord injury; dislocation of cervical spine, hips, knees; and foot problems</p>

**TABLE 6.2 | Continued**

Intellectual Disability Syndrome	Appearance/Facial Characteristics	Physical Features	Health
<b>Fetal Alcohol Syndrome</b>	<p>Smooth philtrum Thin vermillion border Small palpebral fissures</p> <p><i>Source:</i> Bertrand et al. (2004)</p>	<p>Below the 10th percentile in height and/or weight, either pre- or postnatal Small or diminished overall head circumference CNS abnormalities: structural, neurological or functional, or a combination</p> <p><i>Source:</i> Bertrand et al. (2004)</p>	<p>Dementia: Unusually higher incidence Alzheimer disease type in middle age</p> <p><i>Source:</i> Patterson and Lott (2008)</p>
<b>Fragile X Syndrome</b>	<p>Macrocephaly Prominent forehead and jaw Elongated narrow face with drooping eyelids and long ears Flattened nasal bridge High, narrow palatal arch Flat feet and small hands</p> <p><i>Sources:</i> Hagerman (2002); Richard and Hoge (1999)</p>	<p>Hypotonia Short stature Hyperextendible finger joints Macroorchidism (large genitals) Visual problems (e.g., 8% to 30% have strabismus, nystagmus, and/or farsightedness)</p> <p><i>Sources:</i> Richard and Hoge (1999); Shprintzen (1997, 2000)</p>	<p>Hernia Dislocated joints Mitral valve prolapse Gastroesophageal reflux in infancy Oral-motor feeding problems Seizures</p> <p><i>Sources:</i> Hagerman (2002); Richard and Hoge (1999); Sterling and Warren (2008)</p>
<b>Prader-Willi Syndrome</b>	<p>Almond-shaped eyes slanting upward Narrow forehead Narrow palatal arch Micrognathia Underdeveloped chin Small hands and feet</p> <p><i>Sources:</i> Richard and Hoge (1999); Shprintzen (1997, 2000)</p>	<p>Hypotonia and associated motor delays Short stature Hypogonadism Visual problems (e.g., strabismus and myopia)</p> <p><i>Sources:</i> Burack (1990); Zigler and Balla (1982); Zigler and Hodapp (1986, 1991)</p>	<p>Obesity develops between ages 2 and 5 years Insatiable appetite resulting in 95% obesity</p> <p><i>Sources:</i> Richard and Hoge (1999)</p> <p>Maladaptive behavior Sleep disturbances Self-destructive behaviors High tolerance for pain</p> <p><i>Source:</i> Shprintzen (2000)</p>

Prenatal events, such as physical injury or substance abuse, can cause injury to the fetus and lead to an ID. Fetal alcohol spectrum disorder (FASD), previously referred to as fetal alcohol syndrome (FAS), is one such condition. FASD is an umbrella term that is used to describe a range of effects caused by maternal drinking during pregnancy. It is estimated to occur in 50 per 1,000 live births (May et al., 2009) and is a leading cause of a preventable disability that can include ID (Abel & Sokol, 1987). Approximately 70–75 percent of

individuals with FASD have a normal IQ, yet still demonstrate significant deficits in functional ability (O’Malley, 2007a).

The term *FASD* is not intended to be used as a clinical diagnosis. Rather, under the umbrella term, *FASD*, there are three different conditions, differentiated by the types of symptoms. Fetal alcohol syndrome (FAS) represents the severe end of FASD. A diagnosis of FAS requires three components. First, three facial anomalies must be present—a smooth ridge between the nose and upper lip, a thin upper lip, and a short distance between the inner and outer corners of the eyes. Second, impaired growth, which is defined as height or weight below the 10th percentile, either pre- or postnatally, must be documented. Third, central nervous system problems must be documented.

These can manifest as structural, neurologic, or functional (Bertrand et al., 2004). Table 6.2 includes descriptions of FAS. According to the National Organization on Fetal Alcohol Syndrome (NOFAS), individuals diagnosed with alcohol-related neurodevelopmental disorder (ARND), a second condition under the umbrella FASD, do not have the FAS facial anomalies, but may have ID and problems with learning and behavior (NOFAS, 2014). Finally, individuals with the third type of FASD, alcohol-related birth defects (ARBD), have physical defects that include heart, skeletal, kidney, ear, and/or eye malformations (NOFAS, 2014).

## THE DELAY–DIFFERENCE CONTROVERSY

A fundamental issue in ID research over the years has been the *delay–difference controversy*, that is, whether the cognitive and linguistic processes of individuals with and without ID are the same. No one disputes that the *achievements* of children with ID are lower. The debate focuses on the *explanation* for that lower achievement and whether it requires us to invoke the idea of specific qualitative differences in how these children develop. To investigate the delay–difference controversy, researchers have applied the scientific method of making and testing predictions. These predictions have included the technique of matching participants with and without ID according to their CA, MA, or language age (LA) and examining their performances on a variety of tasks.

Supporters of the difference position point to three findings, any or all of which may be areas of qualitative difference in individuals with ID:

1. They suffer from a deficit in verbal mediation ability due to the inactivity of the verbal system and its dissociation from the motor system (Dulaney & Ellis, 1997).
2. They are inherently more rigid in their behavior (Dulaney & Ellis, 1997).
3. They have inadequate short-term memory (also called *working memory*) function that is necessary to perform certain cognitive tasks (Jarrold, Cowan, Hewes, & Riby, 2004; Miolo, Chapman, & Sindberg, 2005).

The notion of rigidity is hard to pin down, but it is most often illustrated by studies that show a deficit in abstract thinking. Children with DS, for example, have been found to classify objects by their common perceptual attributes (size, shape, and color) rather than by abstract categories (fruit, clothing, and furniture). They seem to have difficulty in hierarchical thinking, that is, recognizing that entities can be thought about at several levels. For example, the family pet has a proper name, *Rudy*; has a basic-level name, *dog*; has a subordinate name, *dachshund*; and has several superordinate names: *mammal*, *quadruped*, and *animal*. It may be hard for these children to accept that all of these names provide accurate descriptions of the same dog but at different levels of thinking.

Deficits in working memory have been offered as an explanation for a range of problems commonly seen in children with ID. It is generally believed that these children rarely employ strategies in situations that require active problem solving but can be taught to do so. However, the strategies taught for one task do not usually transfer spontaneously to other tasks. Most studies of problem solving, as well as most clinical descriptions, indicate that the performance of children with ID varies widely from one situation to the next. It has been suggested that this is due to limitations in functional working memory, which, in turn, may

be the result of slowness in information processing, difficulty with simultaneous processing, and/or limitations in working memory storage capacity (Grieco, Pulsifer, Seligsohn, Skotko, & Schwartz, 2015). Research on long-term memory has reported deficits in memory consolidation and problems at the levels of encoding and retrieval, which are adversely affected by attentional deficits (Grieco et al., 2015).

In response to this evidence of differences, the delay position draws attention to the distinction between cognition and achievement. Some of the performance differences observed in familial ID may be simply due to lack of experience that results in deficits of knowledge. Other performance differences may be attributed to motivational differences in individuals with ID. Research has found persons with ID to be responsive to social reinforcement but at the same time wary of strange adults. They may be less likely to rely on their own cognitive resources and instead tend to problem solve imitatively. They may have an expectancy of failure based on experience and, therefore, be more motivated to avoid failure than to achieve success. They respond better to tangible reinforcement but often exhibit *learned helplessness*, that is, not doing things even though they know how (Bybee & Zigler, 1999). Although ID is viewed primarily as a cognitive disorder, it may have associated with it the noncognitive characteristic of *passivity*, that is, not initiating the use of certain strategies known to be available to them. It has been noted that individuals with DS, who often possess reasonably good social skills, will often use those skills in order to sidestep difficult learning situations.

There is currently no clear answer regarding the *delay-difference argument*. Proponents on both sides of the argument have offered evidence to account for the qualitative and quantitative differences found in individuals with ID. Because a multitude of factors can account for these differences, it may well be the case that a combination of both delays and differences explain the cognitive and linguistic processes of individuals with ID.

## LANGUAGE CHARACTERISTICS AND ASSOCIATED IMPLICATIONS FOR INTERVENTION

All children with ID can be expected to exhibit some type of communication and/or linguistic deficit. The AAIDD specifies that one component of the adaptive behavior deficits seen in all ID is a communication disability. Consequently, professionals can expect that children with ID may need some form of language or communication intervention. This raises the age-old question of whether cognitive deficits cause the language impairment or whether both the cognitive and the language deficits result from some other deficit, generally thought to involve central nervous system functioning, and acknowledge the reciprocal and interactive effects of language and cognition. This question is difficult to answer because research investigating the complex interrelationship between language and cognition has resulted in inconsistent findings. What is important to note, however, is that in the case of ID, language impairment is in some way related to the ID. If cognition alone were the answer for determining language abilities, then the language characteristics of children with different ID syndromes would likely be very similar. However, the opposite seems to be true. Recent research suggests differing language profiles associated with various causes of ID. Language and other communication abilities may not be equally affected in children with different syndromes. The language profiles associated with Angelman syndrome, Down syndrome, fetal alcohol spectrum disorder, fragile X syndrome, Prader-Willi syndrome, and Williams syndrome, as well as specific considerations for both assessment and intervention, are discussed in the following sections.

### Angelman Syndrome

**Language Profile.** Most children with Angelman syndrome (AS) do not acquire speech and language skills sufficient to use speech as a primary means of communication, and others may only speak a few words (Alvares & Downing, 1998; Williams, Peters, & Calculator, 2009). Although some researchers have reported children with AS demonstrate stronger abilities in

comprehension when compared to production (Alvares & Downing, 1998; Jolleff & Ryan, 1993), other researchers have not found a difference (Andersen, Rasmussen, & Strømme, 2001). When children with AS do acquire some oral language, they may use it to request desired objects or to reject undesired objects, but rarely use language to label, describe, or imitate (Didden, Korzilius, Duker, & Curfs, 2004).

Children with AS may present with some clinical features such as hand-flapping, stereotypic and/or repetitive behaviors, and sensory preoccupations that overlap with some features of ASD. As a result some children with AS have been mistakenly identified as having ASD rather than AS (Williams, 2005). Several researchers have, however, reported that a percentage of children with AS do legitimately meet diagnostic criteria for ASD (Bonati et al., 2007; Moss et al., 2013).

Approximately 20–80 percent of infants with AS demonstrate feeding problems, typically stemming from sucking or swallowing disorders (Williams et al., 2009). Bottle-feeding may be easier than breastfeeding because infants often have difficulty initiating sucking and sustaining breast-feeding. Related to their sucking or swallowing problems, drooling is often a persistent problem and frequently requires the use of bibs (Williams et al., 2009). Approximately 30–50 percent of older infants evidence persistent tongue protrusion, which usually remains throughout childhood and may persist into adulthood.

**Assessment Considerations.** Because some children with AS have been mistakenly identified with ASD, an initial assessment of speech and language will need to provide a differential diagnosis of AS versus ASD. Because many children with AS do not develop speech and language skills sufficient to rely on speech as a primary means of communication, many children may need an augmentative and alternative (AAC) evaluation, which is discussed in Chapter 12. Finally, when evaluating infants and young children, an evaluation of feeding and swallowing behaviors may be warranted.

**Intervention Considerations.** Various forms of AAC systems should be considered to provide effective means of communication (Williams et al., 2009). Sign language or enhanced natural gestures may be particularly well suited for many children with AS, given the research that supports a preference for use of gestures (Calculator, 2002). AAC as an intervention approach is discussed in Chapter 12. In addition, for children with a co-morbid diagnosis of ASD, applied behavioral analysis therapy may be helpful (Williams et al., 2009). This and other intervention considerations for children with ASD are discussed in Chapter 7.

## Down Syndrome

**Language Profile.** Children with Down syndrome (DS) typically have stronger receptive language skills than expressive language skills, with relative strengths in pragmatic skills, receptive vocabulary, and narrative skills, particularly for events, themes, and story elements (Dykens, Hodapp, & Evans, 2006; Finestack, Palmer, & Abbeduto, 2012; Miller, 1995; Roberts, Chapman, Martin, & Moskowitz, 2008). When telling stories from wordless picture books or videos, children with DS have been found to include salient events, themes, and story elements commensurate with their cognitive levels and language comprehension (Boudreau & Chapman, 2000; Miles & Chapman, 2002). Children with DS also often demonstrate a relative strength in gesture use and imitation, and these skills could be used to facilitate the use of words (Abbeduto, Warren, & Conners, 2007). In contrast, many individuals with DS demonstrate delays beyond expectations for their mental ages in phonological working memory, phonological processing, expressive vocabulary, microstructural narrative elements, and syntax, specifically with regard to production of complex syntax, grammatical morphemes, and negation (Finestack & Abbeduto, 2010; Finestack et al., 2012; Finestack, Sterling, & Abbeduto, 2013; Roberts et al., 2008). Specific areas of pragmatic skills that pose particular difficulties for children with DS have also been described. These include particular weaknesses in the ability to construct utterances that effectively convey intents and difficulty introducing topics and maintaining them (Abbeduto et al., 2006; Kumin, 2008b).

With regard to literacy, many children with DS are often able to read better than might be expected when comparing their reading skills to their other language and cognitive abilities. Children with DS typically develop emergent literacy skills and word recognition skills that are commensurate with their nonverbal development and demonstrate a relative strength in sight word reading. Decoding, phonological awareness, and writing may, however, be particularly challenging for the children.

Speech intelligibility is a particular concern for children with DS that continues into adulthood. Difficulty producing intelligible speech is likely the result of a combination of factors, including disturbances in voice, articulation, resonance, fluency, and prosody (Kent & Vorperian, 2013). Although the craniofacial anatomy of individuals with DS is characterized by an average-sized tongue with a compact mid- and lower-face bone structure and a high, often shelf-like, palate, anatomic anomalies cannot account for all aspects of the speech disorder. Studies of articulation and phonology demonstrate both delayed ("developmental") and disordered ("nondevelopmental") inconsistent error patterns (Kent & Vorperian, 2013). Many individuals with DS are also likely to demonstrate fluency disorders (Kent & Vorperian, 2013). Finally, approximately 6–10 percent of children with DS have diagnoses of ASD; these children with dual-diagnoses demonstrate distinctive patterns of unusual stereotypic behaviors, anxiety, and social withdrawal (Carter, Capone, Gray, Cox, & Kaufmann, 2007).

Because of possible structural malformations of the ear and other oral-facial structural characteristics that affect Eustachian tube function, hearing level is a concern. Approximately one-third to three-fourths of individuals with DS experience hearing loss (Roizen & Patterson, 2003).

**Assessment Considerations.** Because hearing loss is prevalent in children with DS and can impact language learning, hearing status needs to be closely monitored (Roberts et al., 2008). Assessment of phonological working memory using nonword repetition or memory-span tasks (American Speech-Language-Hearing Association, 2001) may provide insights into language abilities and avenues for intervention. Language and narrative samples should be obtained both with and without picture support because research has indicated significant differences in performance based on the level of visual support (Roberts et al., 2008). A thorough evaluation of writing skills will be necessary to determine whether difficulties stem from working memory deficits and/or delays in motor skills. Finally, an assessment of fluency should also be considered.

**Intervention Considerations.** Children with DS typically have difficulties in phonological working memory so learning might be facilitated by tasks that are broken down into different steps. They can also benefit from repeated opportunities to hear words and sentences and repeated, brief instructions (Gathercole & Alloway, 2006; Gathercole, Alloway, Willis, & Adams, 2006). In addition, picture-based storybooks may be particularly helpful (Chapman, 2003). Intervention should target use of grammatical morphemes, acquisition and use of complex vocabulary, and production of intelligible speech using developmentally sequenced goals (Roberts et al., 2008). Because of oral-motor problems that can affect speech production and intelligibility, children with DS demonstrate a relative weakness in producing intelligible speech sounds. Thus, interventions should include a focus on vocal development and producing intelligible speech (Brady, Bredin-Oja, & Warren, 2008) without necessarily aiming for speech that is free of speech sound errors. Importantly, research has demonstrated that individuals with DS continue language and literacy learning well into adolescence; thus, continued access to language and literacy support provided by a team of educators is likely beneficial for the children (Roberts et al., 2008). Because children with DS typically demonstrate a relative strength in sight word reading, intervention might be able to capitalize on this relative skill in order to use reading activities to develop improved spoken language and verbal short-term memory skills during the preschool years. In fact, some authors advocate introducing reading to these children as soon as they have comprehension vocabularies of 50–100 words (Buckley & Johnson-Glenberg, 2008). However, to address the children's potential relative difficulties in decoding printed words and phonological awareness, interventions might also include goals that promote

phonological awareness, understanding and using letter-sound rules, and decoding skills (Buckley & Johnson-Glenberg, 2008).

### Fetal Alcohol Spectrum Disorder

**Language Profile.** Most researchers have reported that children with fetal alcohol spectrum disorder (FASD) score lower on measures of language functioning when compared to control groups (Aragón et al., 2008; Janzen, Nanson, & Block, 1995; McGee, Bjorkquist, Riley, & Mattson, 2009). The children often have significant difficulties with syntactic elements of language (Carney & Chermak, 1991; Wyper & Rasmussen, 2011), but may have strengths in receptive language skills (McGee et al., 2009). Nevertheless, a consistent finding that has emerged from the research is that children with FASD typically demonstrate particular problems in using language in sophisticated social contexts (Coggins, Timler, & Olswang, 2007a; Quattlebaum & O'Connor, 2013), for example:

- understanding abstract language
- accessing peer groups
- negotiating compromises
- resolving conflicts
- maintaining friendships

Children with FASD also have difficulty with narrative language, specifically, coherence of and cohesion in narratives, with cohesive reference in nominal phrases posing a particular challenge (Coggins, Timler, & Olswang, 2007b; Thorne, Coggins, Olson, & Astley, 2007). In addition, difficulty with mental state verbs, e.g., *consider, believe*, which may be related to inadequate theory of mind, has been documented (Timler, Olswang, & Coggins, 2005a). Stevens and colleagues (2015) have suggested that deficits in both social perspective taking and empathy may underlie the children's difficulties with peer relationships. With regard to academic achievement, Adnams and colleagues (2007) have reported that children with FASD have lower scores on tests of phonological awareness, word reading, and spelling compared to their same-aged peers, and difficulties in mathematics have been well documented.

A high percentage of individuals with FASD (approximately 49–94 percent) also present with attention deficits (Mattson, Crocker, & Nguyen, 2011; Peadon & Elliott, 2010) with the proportion of individuals diagnosed with both FAS and attention deficit/hyperactivity disorder (ADHD) increasing with increasing levels of alcohol exposure. The presence of ADHD appears to be independent of IQ and likely persists into adolescence and adulthood (Bhatara, Loudenberg, & Ellis, 2006; Fryer, McGee, Matt, Riley, & Mattson, 2007; Peadon & Elliott, 2010). Because of their brain damage, infants with FASD often display a variety of behaviors such as a delayed suck reflex, poor feeding, and poor habituation to parents' natural anxiety about parenting (O'Malley, 2007b). Because of craniofacial anomalies, children with FASD are likely to demonstrate conductive hearing loss, often secondary to recurrent otitis media. Although data are limited, sensorineural hearing loss may occur with the same frequency as seen in children with DS or those with submucous cleft palate (Cone-Wesson, 2005).

**Assessment Considerations.** Because individuals with FASD commonly present with attentional deficits, a differential diagnosis of FASD versus ADHD is particularly important (Mattson et al., 2011). With respect to language, Thorne and colleagues (Thorne & Coggins, 2008; Thorne et al., 2007) suggest a way to evaluate one aspect of the narratives of children with FASD. Their method, the rate of nominal reference errors (rNRE), calculates errors of introduction (improper obligatory referencing of what is known versus what is new) and referential errors in tying information together. Because of craniofacial anomalies, hearing status needs to be carefully assessed and monitored, and feeding and swallowing evaluations may be warranted.

**Intervention Considerations.** Because children with FASD can have particular difficulties entering peer groups, resolving conflicts, maintaining friendships and negotiating

compromises (Coggins et al., 2007a), intervention that includes a focus on social processing and social communication behaviors, especially those that involve mental state verbs, is often beneficial for these children. Although research regarding specific social skills interventions for children with FASD is limited, the Children's Friendship Training (CFT) procedure has some evidence to support its effectiveness (Keil, Paley, Frankel, & O'Connor, 2010; O'Connor et al., 2006). Interventions should also focus on other areas of language that are problematic for children with FASD, such as comprehension and production of complex syntax, general language competence, and production of narratives, with special emphasis on nominal cohesion (Thorne & Coggins, 2008; Timler, Olswang, & Coggins, 2005b). Although the data regarding literacy interventions for this group of children are limited, some research suggests that interventions focused on early literacy skills, such as phonological awareness, as well as narrative comprehension and retell, are effective. These skills may be appropriate intervention targets for both preschool and young school-aged children (Adnams et al., 2007).

Because infants with FASD often have issues with feeding and swallowing, therapy should focus on addressing issues of attachment that can co-occur with feeding problems. Techniques such as swaddling, feeding strategies, and sensory integration techniques have been used and suggested as being helpful (O'Malley, 2007b).

### Fragile X Syndrome

**Language Profile.** Girls with fragile X syndrome (FXS) usually have less language delay than boys, although there is considerable variability in severity. Some research also suggests that initiating and sustaining conversations are particularly difficult for girls with FXS (Lesniak-Karpia, Mazzocco, & Ross, 2003; Roberts et al., 2008). In contrast, boys with FXS typically demonstrate moderate to severe delays in receptive and expressive language, with greater delays noted in expressive language (Abbeduto, Brady, & Kover, 2007; Roberts, Mirrett, & Burchinal, 2001). Receptive and expressive vocabulary seems to be a relative strength for boys with FXS (Finestack et al., 2013; Roberts et al., 2008). Another relative strength may include narrative abilities, specifically those involved in providing initial settings and character details (Finestack et al., 2012). In contrast, researchers generally agree that conversational discourse skills are particularly impaired; perseveration also seems a particular challenge. This observation has led some to propose that perseveration may be a defining characteristic of FXS (Roberts et al., 2008). Additionally, pragmatic functions such as greetings, turn taking, making conversational repairs, and making requests seem especially difficult for the children. Some aspects of syntax, including production of complex clauses, complex noun phrases, and verb phrases are also particularly impaired (Finestack & Abbeduto, 2010; Price et al., 2008). With regard to literacy, children with FXS typically demonstrate difficulty with decoding and phonological awareness but strength in sight-word reading (Buckley & Johnson-Glenberg, 2008).

Speech intelligibility in conversation is a specific concern for males with FXS. Several co-morbid speech disorders, including developmental phonological errors (i.e., consonant substitutions, omissions, and distortions), voice problems, childhood apraxia of speech, and fluency disorders have all been reported in the literature (Van Borsel, Dor, & Rondal, 2008). In addition, frequent otitis media is common during the first year of life and may contribute to speech and language delays.

Many children with FASD also have a co-morbid diagnosis of ASD. Approximately 75 percent of males with FASD meet the DSM-IV criteria for ASD (Clifford et al., 2007; Hall et al., 2008; Kaufmann et al., 2004).

**Assessment Considerations.** The difficulty with speech intelligibility that some children with FXS present with indicates that a thorough speech evaluation, in addition to a language assessment, is a necessary element of the assessment process. For children who do not develop functional speech, AAC systems could be considered. Because many children with FXS also meet the diagnostic criteria for ASD, initial evaluations of speech and language need to carefully assess for the presence of ASD (Clifford et al., 2007; Hall et al., 2008;

Kaufmann et al., 2004). In addition, language production and comprehension in the areas of vocabulary, syntax, pragmatics, and narrative production need to be considered during assessment (Finestack et al., 2013; Martin, Losh, Estigarribia, Sideris, & Roberts, 2013). Of particular importance is documentation of the presence/absence of perseveration, especially during conversational contexts. Finally, because research has indicated a high occurrence of otitis media with associated conductive hearing loss, it is important that hearing status be carefully monitored on a regular basis.

***Intervention Considerations.*** Children with a co-morbidity of ASD will likely have more difficulty with social and conversational language uses and may benefit from intervention strategies used for children with ASD (Roberts et al., 2008). Behavioral characteristics such as the inability to direct and sustain attention, social anxiety, and gaze aversion may interfere with conversation. Intervention should also target increasing expressive syntax, reducing perseveration during discourse tasks, and producing more complex narrative elements such as character or plot development (Finestack et al., 2012; Martin et al., 2013; Roberts et al., 2008). Narrative interventions have been shown to elicit longer utterances for children with FXS and can be used as a context for vocabulary and syntactic targets. Initial literacy interventions can use strengths in sight-word reading to build other skills; however, intensive interventions in phonological awareness are often necessary (Buckley & Johnson-Glenberg, 2008). Specific interventions to improve speech intelligibility in conversation for children with FXS have not been researched; however, Scharfenaker and colleagues (2002) suggest that reducing rate, normalizing the rhythm of speech, and improving oral-motor functioning may increase the children's speech intelligibility.

### Prader-Willi Syndrome

***Language Profile.*** Research delineating the specific language profiles of children with Prader-Willi syndrome is limited (Dimitropoulos, Ferranti, & Lemler, 2013). What is known is that many individuals with Prader-Willi syndrome demonstrate expressive language abilities that are more impaired than receptive abilities. Particular difficulties in morphosyntactic, narrative, and conversation skills, such as maintaining a topic, turn taking, and maintaining appropriate proximity to a conversational partner, have been found (Dimitropoulos et al., 2013; Lewis, Freebairn, Heeger, & Cassidy, 2002; Van Borsel, Defloor, & Curfs, 2007). Many children with Prader-Willi syndrome demonstrate oral motor impairments that significantly impact articulation and, therefore, their ability to effectively use speech to express what language they have (Lewis et al., 2002). Vowel errors and difficulty producing multisyllabic words have been shown to be particularly troublesome for these children (Lewis et al., 2002). In contrast to areas of weakness, several researchers have noted relative strengths in the areas of vocabulary and pragmatic development (Van Borsel et al., 2007).

***Assessment Considerations.*** Because many individuals with Prader-Willi syndrome exhibit articulation difficulties, assessment needs to document the children's speech patterns, including phoneme production in multisyllabic words and vowel errors. Assessment of language needs to focus on evaluation of morphosyntactic abilities, conversational skills, and narrative abilities, including story retell, story grammar components, and story content.

***Intervention Considerations.*** Children with Prader-Willi syndrome likely require both language intervention and intervention to address articulation errors. Research suggests that intervention approaches that follow a typical developmental course seem to be appropriate (Lewis et al., 2002).

### Williams Syndrome

***Language Profile.*** Individuals with Williams syndrome (WS) generally show strengths in the areas of phonological short-term memory, speech production, and concrete receptive

vocabulary. Their difficulties with morphology and syntax are commensurate with their cognitive abilities (Brock, 2007), but they tend to have particular areas of weakness with comprehension and production of relational/conceptual vocabulary and with certain pragmatic skills, specifically, turn taking, maintaining topics, and understanding the conversational requirements of their conversational partners (Brock, 2007; Mervis, 2009). They may also tend to perseverate on personal topics (Hoffmann, Martens, Fox, Rabidoux, & Andridge, 2013). Research on the production of narratives has documented difficulty with maintaining a theme, using cognitive inferences, and employing conjunctive ties (Brock, 2007). Infants with WS often have feeding disorders due to low muscle tone, strong gag reflexes, and/or poor sucking/swallowing. Approximately 50 percent of individuals with WS experience chronic otitis media, and hyperacusis (excessive sensitivity to sound) is frequently observed in individuals with WS. Progressive sensorineural hearing loss, with mild-to-moderate high-frequency sensorineural hearing loss in adults, has also been documented (Marler, Elfenbein, Ryals, Urban, & Netzloff, 2005).

**Assessment Considerations.** An accurate assessment of pragmatic language is essential and needs to include an examination of discourse-level skills such as turn taking and topic maintenance. Documentation of the presence/absence of perseveration on personal topics is also necessary (Hoffmann et al., 2013). Because infants with WS can have oral motor problems, an evaluation of feeding and swallowing is an important part of the assessment process, and hearing status needs to be assessed regularly.

**Intervention Considerations.** Research indicates that early pragmatic delays lead to pragmatic difficulties later in life (John, Dobson, Thomas, & Mervis, 2012). Thus, intervention for pragmatic language needs to start as early as possible. Intervention for children from early intervention through early school age should, however, focus on all aspects of language and literacy. As children move into adolescence, intervention needs to include a focus on conceptual/relational language (Mervis & John, 2010). Reading instruction using a phonics-based approach appears to be an effective method for these children (Mervis & John, 2010). As intervention progresses, hearing needs to be monitored frequently because of the potential for conductive and sensorineural losses to appear.

## IMPLICATIONS FOR INTERVENTION

Each child with ID presents a unique pattern of communicative strengths and weaknesses that must be identified as a result of a thorough individual assessment. There is, therefore, no single intervention prescription for children with ID. There is, however, a set of general principles and considerations that apply to all intervention efforts. As an overarching principle, intervention should comprise a comprehensive assessment and a flexible and functional intervention plan, emphasizing the child's strengths to address specific communicative-linguistic needs that are derived from case history, previous evaluations, parent feedback, and teacher input (Kumin, 2008a). The words "flexible" and "functional" are particularly central to intervention for these children. Goals and objectives of intervention need to have at their core the functional application of language, literacy, and communication. And, the goals and objectives must be sufficiently flexible to meet the individual child's functional needs, and these must be modified frequently to match the child's changing needs.

In this chapter we will discuss intervention that focuses on enhancing oral and written language. There are, however, children with ID who have significant difficulties using speech for communication. For these children, AAC approaches might be viable options. There are also other children with ID whose language development can be promoted by employing some forms of AAC. AAC as an intervention approach is discussed in Chapter 12. Chapter 14 in this text discusses language intervention principles and strategies that apply to most children with language disorders, regardless of the etiology of the disorder. Therefore, the section below on intervention implications will focus more specifically on intervention related to children with ID. It will augment the information in the previous section that

introduced assessment and intervention considerations related to specific syndromes, based on the unique profiles of these children with ID. The information here is organized around four questions:

1. What is unique about children with ID that can influence intervention?
2. What are the foci and purposes of intervention for children with ID?
3. What materials are appropriate for children with ID?
4. What goals are appropriate for addressing intelligibility?

### What Is Unique about Children with ID?

General language intervention approaches used with various children who have language impairments tend to be adapted to the needs of children with ID. However, four overarching considerations are particularly relevant when providing interventions for children with ID. These are: a) a need for repetition, b) intervention occurring in naturalistic environments, c) a need to plan for generalization, and d) addressing learned helplessness and poor decision making of children with ID.

As discussed in Chapter 1, the task of the language learner is to find rules and regularities from language input and experiences in order to abstract linguistic commonalities. Chapter 14 discusses that children with language impairments require multiple exposures to benefit from language interventions. When applied to children with ID, language and literacy learning opportunities and interventions need to be even more intensive and ongoing and to occur even more frequently because children with ID need many more exemplars to make these abstractions. For example, Allor and colleagues (2014) provided small-group, daily reading instruction for 40–50 minutes to children with IQs ranging from 40–80. Using their results, they estimated how long it would take a child with ID to reach an end-of-first-grade reading level. Children with IQs between 70 and 80 were predicted to require 1.5 school years; children with IQs ranging from 56–69 were predicted to require approximately 3 academic years to make the same gains. And, children with even lower IQs, 40–55, were predicted to need 3.5 years to attain the skills TD children achieve midway through first grade. As another example, Yoder and colleagues (2014) reported that daily, as compared to weekly, communication and language therapy resulted in superior spoken vocabulary outcomes after 9 months of therapy for children with DS. These results indicate that intensive, long-term intervention is necessary for children with ID to make meaningful gains in their language and literacy skills. Furthermore, children with more significant cognitive impairments require even more intense, long-term interventions.

Children with ID benefit from language and literacy interventions that use naturalistic settings and concrete examples. For example, a number of studies has documented positive effects of language and literacy interventions for children with ID when the intervention uses daily/classroom activities to enhance language-learning opportunities (Hansen, Wadsworth, Roberts, & Poole, 2014; Roberts, Kaiser, Wolfe, Bryant, & Spidalieri, 2014; Schreibman et al., 2015). One intervention method that has been shown effective for children with ID is milieu teaching (Kaiser & Roberts, 2013), which is discussed in further detail in Chapter 14. This method encourages communication partners to follow the child's lead, prompt, and model specific language skills within the context of daily routines and activities and has been used successfully to increase both language and literacy skills (Hansen et al., 2014; Kaiser & Roberts, 2013). Many children with ID, however, have significant difficulty understanding and using abstract language. Therefore, although intervention might start by focusing on enhancing concrete language that surrounds daily activities, it needs to move toward explicitly incorporating abstract language as a child acquires more language skills.

A third particular consideration is generalization. Because children with ID tend to be concrete-bound learners, many have difficulty generalizing skills targeted in direct teaching settings to environments outside the settings in which the skills were learned. Generalization is more likely to occur when language skills are targeted in a variety of settings, such as a child's home, classroom, and community. An important consideration of any intervention

program is to plan explicitly for generalization by engaging caretakers, teachers, and others important in the child's home and/or classroom in providing multiple opportunities in multiple settings to practice multiple exemplars of the intention targets.

Considerable research has investigated the effectiveness of both parent and/or teacher-implemented language/literacy interventions and has reported positive, significant effects on children's language development (Rakap & Rakap, 2014; Roberts & Kaiser, 2011). Across these interventions, parents and/or teachers are given coaching and mentoring in providing language/literacy interventions in the home or classroom. Results have indicated that children make more gains when interventions were provided by both a parent and an SLP than by an SLP alone (Kaiser & Roberts, 2013). Such practices are consistent with ASHA recommendations (American Speech-Language-Hearing Association, 2005). The results of these studies also have important implications for the service delivery models used with children with ID.

Because children with ID have difficulty generalizing skills taught in one environment to other environments, the nature of service delivery models used with the children must be carefully considered. Although no one service delivery model has been proven superior over another, research suggests that classroom-based services are an effective way to provide language intervention (Cirrin et al., 2010). Furthermore, learning theory suggests skills generalize better when learned in the situations where the skills are to be applied. This means that interventions that remove children from the environments in which they need to use their communication skills are likely not the most effective for promoting increased language/literacy skills. Instead, inclusive models where children receive intervention services in their general classrooms or resource rooms may be more appropriate (Zurawski, 2014). Positive effects of language and/or literacy interventions for children with ID when the interventions are provided in classrooms have been empirically documented (Hansen et al., 2014; van der Schuit, Segers, Van Balkom, Stoep, & Verhoeven, 2010).

An unfortunate reality is that children with ID experience frequent failures. As a result, these children might adopt an approach to responding to requests or making decisions that is referred to as *learned helplessness*. They may also be reticent to initiate interactions. These characteristics reflect those of a passive communicator. Children may not do things or participate in interactions even though they know how (Bybee & Zigler, 1999). According to Jenkinson (1999), learned helplessness and poor decision making are related, and children with ID tend to make poor decisions. When making decisions, they may tend to rely on a limited number of solutions and apply those solutions to new situations inflexibly. Another issue related to decision making presents when children with ID approach multi-step processes. The limited success they tend to experience at each stage appears to result from failing to have a complete comprehension of decision situations, generating few alternative solutions, failing to anticipate the possible negative consequences of a course of action, and not selecting an appropriate course of action (Khemka & Hickson, 2006).

These failures can contribute not just to reinforcement of learned helplessness but to negative self-images, increasing resistance to trying, and a higher likelihood of being motivated by extrinsic factors, such as ease, comfort, avoidance of stress, security, health, external rewards, and avoidance of failure (Tassé & Havercamp, 2006). Therefore, in order to facilitate successful inclusion of adolescents and adults with ID in community and work environments, intervention must explicitly address decision-making skills (Khemka & Hickson, 2006), promote appropriate assertiveness and considered responses to requests, and avoid unintentionally reinforcing learned helplessness.

Although these considerations have been discussed separately, they are interconnected and interact. For children with ID to make the most gains from intervention, professionals delivering interventions need to provide appropriately intensive interventions that include multiple exemplars, provide interventions across all settings where the children need to use the targeted skills and strategies, and actively engage parents, teachers, and other caregivers in the intervention process. Finally, interventions also need to teach explicitly children with ID when and how to activate the skills and strategies taught in intervention and scaffold learning so that children become more independent and self-reliant.