This book considers issues of assessment and intervention for children with language impairments. It is written for undergraduate students who are just beginning to think about how to work with children who are language impaired. The assumption is that a student who uses this book will have already completed a course on normal language development.

I have developed the principles used in this book over a number of years of teaching undergraduate speech-language pathology and special education students. Many undergraduate books provide an overview of terminology and describe a broad range of assessment and intervention approaches. As a teacher, I discovered a problem with using such books. The books (and the way I was teaching—primarily with lectures) allowed students to stay in a passive learning mode. Students were able to successfully pass tests at the undergraduate level; but these “good students” were not prepared to begin the analytic thought and problem solving that I expected (and they needed) in graduate-level training. I decided the problem was not with the students but with the way I was teaching! My efforts to become a better teacher are reflected in the first overarching theme of this book.

I decided that rather than just expect students to memorize terms and answer short-answer questions (e.g., List three communication characteristics associated with autism spectrum disorder), I wanted to begin to train students to “think like a clinician.” I wanted to change my focus to an emphasis on the processes that highly skilled speech-language pathologists (SLPs) and educators use to make assessment and intervention decisions. I realized that I couldn’t give students all the facts they needed to know at the beginning level of training. However, I could provide multiple activities that would motivate students to think deeply, ask questions, and solve problems. I also realized that students need to “talk through” a particular problem or process. If I described a problem (and the solution), students nodded wisely and wrote down what I said. When I asked if anyone had any questions, no one raised a hand. But when I asked the students to explain to a small group or a peer what they had just learned, they could not verbalize the issue that had seemed so clear just a moment before.

I began a different kind of teaching. I started each day with a mini-lecture that I tried to keep under a half hour. Then I had students work in groups. I varied the activities. I found that this approach worked very well in face-to-face classes and also when I taught courses via distance learning. Rather than having the students only demonstrate knowledge with objective tests, I set up weekly activities during class time. I asked students in a distance learning class to complete the activities individually, with a partner, or in a small group (depending on the weekly project). I began to include activities such as these:

- I gave the students a decision tree and asked them to put a few descriptive words in each of the decision tree boxes, capturing the communication behaviors they might expect to see at each point in the decision-making process. Students explained the decision tree to a partner. I provide decision trees throughout this book.
- I gave the students simplified versions of assessment tools (trying to capture the essential elements of the decision-making process) and asked students to view videotapes
and begin to classify behaviors using the assessment tools. I realized that students’
administration might not be highly accurate! However, the emphasis was on having
students verbalize *why* they choose to classify behaviors in a particular way. I provide
simplified versions of assessment tools in this book.

- I realized that students needed to “put words into their own mouths.” I used activities
  in which students had to role-play an explanation to a teacher or parent. (A student
could write out a script if the course was taught via distance learning.) Information
that seemed easy to students during a lecture suddenly presented challenges when the
students were asked to teach someone else! I include many suggestions for role-playing
in the chapter activities.

- I began to iteratively come back to major points and have students explain to each
  other (or to the class as a whole, or write down and submit to me) how the fundamental
  principle applied to the current issue. So, instead of only teaching information on the
theories of language development at the beginning of the course, I wanted students to
retain old information and apply it to their new learning. For example, in a discussion
on intellectual disability, I said, “Working with the person next to you, write down how
social interaction theory, behaviorism, and systems theory might apply to our work
with an individual with an intellectual impairment.” As I walked around the classroom,
students asked many questions and actively engaged in solving “the problem.” I mirror
this technique in many of the “Focus” boxes and “Discussion and In-Class Activities”
assignments that occur in each chapter. I also iteratively present information on lan-
guage theory, form–content–use, and typical development throughout this book and
link theoretical information to assessment and intervention decision making.

- I developed a “numbered” system for talking about language subdomains. Previously,
  I had typically presented the concepts of form, content, and use in the parallel form
  (as it was taught to me). However, I was frustrated that during case example problem-
solving activities, students didn’t know where to start; they appeared to “randomly”
focus on a domain (e.g., syntax for a child who was at the beginning language learn-
ing stage). I wanted students to move sequentially through a thought process that first
considered an individual’s beginning pragmatic skills and then single words and word
combinations, then syntax, and so forth. I created subdomain numbering (introduced
in Chapter 2 of this book) to provide a scaffold for this problem-solving task. The
communication subdomains and information about four theories of language develop-
ment are now introduced in Chapter 2 in this second edition of the textbook.

- I began talking to students about *connections* when I introduced new topics. I linked
  new information to previous information and also discussed how the information might
apply more broadly across disorder types. I used the educational principle of helping
students move from the known to the unknown. I mirror this approach in this book by
including a section called *Connections* in many of the chapters. The *Connections* sec-
tions are linkages to previously learned concepts (e.g., applying the form–content–use
model to children with autism spectrum disorder) or include discussions of information
that can be applied broadly across disorder types (e.g., counseling families).

- Finally, and most importantly, I began to explicitly teach “meta” problem-solving
  skills. I tried to always explain why an SLP or educator might choose one approach
over another or clarify the underlying analytic process fundamental to the task. I gave
examples and then asked students to discuss possible solutions to the problem *and*
provide a rationale for their decision. I told students: “Right now it is not important
if you are wrong or right with your clinical decisions. I might make a different clinical
decision than you. But what I want from you right now is to give me a reason (based on language theory or researched evidence or family concerns) to support your decision. That is your task at this early stage in professional training.” With this approach, students started to take chances and hypothesize about a particular assessment or intervention strategy for a specific child. At the end of a discussion, I typically shared my thoughts and explained why I might make a different clinical decision than a student. But, before giving my opinion, I wanted students to begin to make decisions about intervention approaches that might work, based on their current knowledge. Throughout this book, I provide examples, case studies, and ideas for class discussion to stimulate this process. Chapter 4, which is about clinical decision making, grew out of my efforts to teach “meta” processes.

In sum, I began to be a better and more effective teacher for undergraduate students. This book is the result.

I am pleased that other instructors find that using these techniques helps students learn. After publication of the first edition, I was gratified to receive enthusiastic endorsement from instructors who had adopted the textbook for their courses on language disorders. Instructors wrote and shared that students “read this textbook closely” and that “the communication subdomain model is referred to throughout the academic semester.”

A second overarching theme of this book is current issues central to speech-language pathology and special education. This includes discussions of evidence-based practice (EBP), response to intervention RTI, classroom-based assessment and intervention, use of iPads and apps during treatment for communication disorders, and connection building between oral language and literacy learning.

To this end, I give specific attention to each issue in one section of the book but come back to each topic in other chapters. My intent is not to be redundant but to make it clear that certain topics affect broad aspects of service delivery and decision making. My emphasis on EBP is also represented in my decision to present only two or three intervention approaches for each of the disorder groups. Rather than present a full range of possible intervention approaches (without a detailed discussion), I wanted to discuss relevant research for select exemplary approaches and explain how they represented “levels of evidence” within EBP.

I used to wait until graduate-level training to expose students to primary research. I now believe, with the emphasis on EBP, that students need exposure to primary research at the beginning training level. I hope instructors will supplement my discussions of intervention by providing examples of primary intervention research. Students need to begin to evaluate the quality of primary research.

**NEW TO THIS EDITION**

- **EBP is introduced in a newly organized Chapter 1;** the concepts of EBP are then referenced in discussions of high-quality interventions throughout the book.
- **Elimination of a separate chapter on multicultural issues;** multicultural issues are now integrated throughout the textbook. The connections to multicultural issues are clinically relevant and practice oriented. Instructors can use this information to help students become more sensitive to nonmajority students and their families.
- **Updated information and research throughout the text** ensures that students are learning the most current information about language disorders.
Information and implications of DSM-5 is included throughout the text, specifically as it relates to children who are on the autism spectrum.

A revised approach to teaching students about language theories (Chapter 2) consolidates language theories into four basic theoretical approaches: social interactionist, behaviorist, cognitive constructivist, and emergentist. This streamlined presentation allows students to focus on the underlying theoretical principles impacting language intervention and assessment.

Two new appendices provide step-by-step tutorials to T-unit analysis and language analysis of children who demonstrate African American English.

The new appendices add to the clinically practical and instructor-friendly appendices from the First Edition (i.e., standardized scoring tutorial, form for language analysis of children with early developing language, example of a language assessment report).

The appendices allow instructors to easily incorporate practical hands-on activities into their distance-learning or face-to-face course on language disorders.

Chapter 7 provides a balanced description of challenges and opportunities for children with hearing loss who are learning to speak and listen as well as rationale for introduction of sign language for some children with hearing loss.

Research and interventions for children with hearing loss has been updated with the most current data.

Chapter 10 focuses on reading, writing, and spelling interventions for young emergent readers as well as for older school-age students.

A model of literacy intervention also is described for students with significant levels of language disability.

Chapter 11 on Augmentative Communication has been updated to include information on iPads and software “applications” (i.e., apps) and their use for students with complex communication needs.

I have enjoyed my years as a practicing SLP, and I am committed to teaching students to “think like a clinician.” My greatest hope is that this textbook helps that occur for the students who use it!

ACKNOWLEDGMENTS

Thank you to my husband, Dave (who helped prepare the permission requests for the second edition of this book); to my children, Megan Kaderavek Tsai and Brian Kaderavek; and to my granddaughter, Natalie, who keeps me optimistic about the future!

I’d also like to thank the reviewers of this edition: Valerie Boyer, Southern Illinois University; Deborah C. Cook, Springfield College; and Stephen D. Oller, Texas A&M University—Kingsville.
Welcome to this book about language disorders. The language disorders course in which you are now enrolled is probably your first course focusing on children with communication deficits. Up to this point, your training has concentrated on communication development in children who are developing typically. It is an exciting professional turning point when you begin to consider how to guide assessment and interventions for individuals with language disorders.

This book’s goal is to help you think like a practitioner. I focus on underlying theories and fundamental principles guiding clinical decision making. The ability to synthesize information, weigh scientific evidence, and see connections between basic principles will prepare you to work with children who have language impairments.
One book on language disorders cannot teach you everything you need to know to be a successful speech-language pathologist (SLP) or special educator. This book does not try to teach you everything! Instead, I have chosen to (a) emphasize basic principles and then (b) discuss selected assessment and intervention protocols as illustrative examples. I believe that at this early point in your professional training, it is better to provide more extensive information and examples for some exemplary assessment and intervention approaches (and clarify why they are exemplary) than to briefly describe many different approaches.

To help you become a decision maker, I include many examples, case studies, and opportunities for you to practice problem solving. By working through the examples, you will learn important analytic processes. In this chapter, I introduce four important cornerstones of the profession: (a) definitions for and background on language and language disorders; (b) a model of communication (i.e., the speech chain model); (c) the language domains of form, content, and use; and (d) a clinical decision-making model called evidence-based practice.

### Definitions and Background Information: Language Disorders

Understanding the difference between definitions is an important cornerstone of the field of communication disorders; specifically, there are differences between the terms language, speech, and communication. **Language** is a complex and dynamic system of conventional symbols used for thought and expression. Language can be expressed orally, through writing or pictured symbols, or manually (e.g., sign language).

Speech is not the same thing as language. Whereas language involves a symbol system, **speech** is the articulation and the rate (i.e., fluency) of speech sounds and the quality of an individual's voice. **Communication**, in contrast, includes symbolic and nonsymbolic information (i.e., facial expressions, body language, gestures, etc.). As an example, if I frown and cross my arms, although I am not using symbolic communication, I am communicating! A communication disorder may be evident in the process of hearing, language, speech, or in a combination of all three processes.

In U.S. schools, children with speech and language disorders (as a specific diagnostic category) make up 2.9% of the total school population. In addition, there are other subgroups of children who are not counted in this group who also have language disorders. Practitioners serve children who have hearing loss (0.2% of schoolchildren), multiple disabilities (0.3%), intellectual disabilities (0.9%), and learning disabilities (4.9%; NCES, 2012). Each of these subgroups demonstrates language impairments. Eighty-three percent of the SLPs who work in schools report that they regularly work with students with language disorders (American Speech-Language-Hearing Association [ASHA], 2012).

A **language disorder** is impaired comprehension and/or use of spoken, written, and/or other symbol systems. A language disorder can represent a deficit in receptive language, expressive language, or a combined expressive–receptive deficit. **Receptive language** refers to an individual’s ability to understand and process language; **expressive language** refers to an individual’s ability to express and communicate meaning with language. Typically, an individual’s receptive language abilities are better than his or her expressive language abilities.
Sometimes a young child (2 to 3 years old) who exhibits a developmental lag in language is said to have a **language delay**, be a **late talker**, or have **late language emergence**. This terminology is used because experts state that a language disorder cannot be reliably diagnosed in young children in the absence of a primary disorder (e.g., intellectual disability, autism; Bishop, Price, Dale, & Plomin, 2003; Rescorla, 2009).

An individual with a language disorder is different from someone with a language difference. **Language difference** results from a variation of a symbol system used by a group of individuals that reflects and is determined by shared regional, social, or cultural/ethnic factors. It is essential that professionals distinguish between aspects of language production representing dialectal patterns (i.e., language difference) and true disorders in speech and language (ASHA, 2003b). For example, a teacher may say to her students, “I’ve got y’all’s assignments here.” This is a form of dialect associated with the southern United States; although it may be an unfamiliar expression to some U.S. speakers, it does not represent a language disorder. Information regarding language difference associated with dialect use is presented throughout this book.

As a final important point, I want to underscore that much of what you will learn about language disorders applies across disability categories. Rather than focusing on a child’s diagnostic category (e.g., autism, specific learning disability), skilled practitioners use a descriptive-developmental framework to guide intervention. A **descriptive-developmental approach** focuses on a student’s language development and function in a variety of natural contexts (Zipoli & Kennedy, 2005). A practitioner who uses a descriptive-developmental approach works to understand an individual’s communication strengths and limitations rather than focusing on his or her diagnostic label. This is a particularly important point, because I have organized the chapters in this book by disability category. There is, for example, a chapter on autism, a chapter on intellectual disability, and so forth. I organize chapters by disability categories because, in my teaching experience, I have found that beginning practitioners learn most easily with this organizational strategy. However, to counterbalance my organizational strategy, I continually clarify descriptive and developmental similarities between disability groups and highlight connections between intervention approaches across disability types. Read more about categorical versus descriptive approaches in Focus 1.1.

**The Speech Chain**

The **speech chain model** is a basic model of communication used to explain the processes of communication from the speaker’s production of words, through transmission of sound, to the listener’s perception of what has been said (Denes & Pinson, 2001). I present this model to point out how language fits into an individual’s communication system. The speech chain model is visually presented in Figure 1.1.

The first point I want to emphasize is that the speech chain model reminds us that language has both a receptive and expressive component. The speaker/listener role is visually represented in Figure 1.1 with the left-to-right nature of the diagram. A good communicator speaks and listens. Within a conversation, a person alternates between listening (using receptive language) and speaking (using expressive language). A competent communicator effortlessly comprehends the listener and produces meaningful language output. Remember that language output can be represented by spoken language, writing, or manual communication (i.e., sign language).
FOCUS 1.1 Learning More

The categorical model organizes language disorders on the basis of an individual’s syndromes of behavior; it is fundamentally a medical model. Its advantages are that it (a) is easily understandable, (b) often is necessary in qualifying a child for educational services, and (c) provides a basic explanation of how a particular child may be different from other children. The limitations of the categorical model are the following:

- There is not always a cause–effect relationship between an individual’s diagnosis and his or her language impairment. Does a hearing loss mean that a child will automatically have a language delay? (You will read more about this in Chapter 7)
- Children with different diagnostic labels may be quite similar. A child with a pragmatic disorder may be classified as having autism, intellectual disability, or specific language impairment.
- Children’s degree of impairment may vary dramatically within a diagnostic category. For example, a child with autism may be very mildly impaired; the diagnostic label may unfairly prejudice teachers or communication partners with regard to the child’s abilities.
- Knowing a child’s diagnostic classification may not be very helpful in planning an intervention program. SLPs, instead, use a decision-making process based on an individual’s communication strengths and limitations.

The second point about the speech chain is that the communication system requires a number of mechanisms to occur. Acoustic information must be transferred (Level 1 in Figure 1.1), motor activity must take place (Level 2), and the brain is activated at Level 3 to create meaningful symbolic (i.e., linguistic) information. All three levels of the system must be operating effectively for communication to occur. I elaborate on each of the three levels below.

Level 1 represents the acoustic level of communicative function: the external or environmental system. This level describes how physical energy is transferred between communication partners. In its simplistic form, Level 1 represents the molecular vibration forming sound waves and transferring physical energy from the speaker to the listener. It is very likely that you studied the external physical component of communication in a course called Speech Science or Physics of Sound.

Level 2 represents the internal physical/motor system required for communication. In the listener, the physical system consists of the hearing mechanism and the transfer of neural messages to the brain’s language center. In the speaker, Level 2 represents the speech system, including respiration, articulation, and phonation. The physical speech systems must be coordinated to produce intelligible speech. It is likely that you studied aspects of Level 2 motor communication in a course called Anatomy and Physiology. You will learn about disorders occurring in the speech system in coursework covering articulation disorders, motor-speech disorders, and voice disorders. You will learn more about Level 2 (i.e., physical) hearing problems in your audiology coursework.

Level 3 of the speech chain model represents the linguistic component of communication. Level 3, the linguistic component, is the focus of this book. The linguistic level is the ability of the listener to receive incoming Level 2 energy (i.e., neural signals) and turn the
physical energy into meaningful information via receptive language. The speaker creates meaningful linguistic information at Level 3.

The speech chain model emphasizes the complexity of the communication system and helps you integrate what you are learning in this course with other coursework. As you progress through your professional training program, continue to frame new knowledge within this basic model of communication functioning.

Let’s now move beyond the speech chain model and consider the three fundamental language domains of form, content, and use.

**Form, Content, and Use: The Cornerstones of Language**

To become an effective linguistic communicator, a speaker must master three language areas: the form of the message, the content of the message, and the message use, or function. Language form includes phonology, morphology, and syntax (i.e., the structure of language). Language content consists of semantics (i.e., meaning of language); language function consists of pragmatics (i.e., how language is used within social contexts). See Table 1.1 for formal definitions and examples of each of these terms.
Lois Bloom and Margaret Lahey (1978) developed the form–content–use language model and demonstrated how the three language areas intersect during communication (see Figure 1.2). The interlocking circles in the diagram are a reminder that (a) vocabulary (i.e., semantics) is used to produce (b) sentences involving the use of syntax structure and morphology, and that sentences are meaningless without (c) proficiency in language use. Lahey (1988) proposed that language disorders are caused when there is a disruption in language form, content, or use or a combination of disordered components. The interlocking circles (i.e., Venn diagram) representing form, content, and use remind us that the three domains are interdependent and that an effective communicator demonstrates

**Table 1.1 Language Definitions**

<table>
<thead>
<tr>
<th>Form</th>
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<tbody>
<tr>
<td><strong>Morphology</strong> is the system that governs the structure of words and the construction of word forms.</td>
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<tr>
<td>Example: At age 13 months a child says, “Two birdie!” and by 24 months says, “Two birdies!” The child has learned to add the s morpheme to indicate a plural form.</td>
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<table>
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<tr>
<th>Syntax</th>
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<tr>
<td>is the system governing the order and combination of words to form sentences and the relationships among the elements within a sentence.</td>
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<tr>
<td>Example: At age 24 months a child asks a question by saying, “Doggie outside?” With this utterance, the child omits the copula verb is needed for a question form; this is a typical error at 24 months. However, by 36 months the child says, “Is the dog outside?” In the second instance, the child demonstrates understanding of English word order by placing the copula verb is at the beginning of the sentence, demonstrating the use of interrogative reversal syntax form.</td>
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<table>
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<tr>
<th>Phonology</th>
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<tr>
<td>is the sound system of a language and the rules that govern the sound combinations.</td>
</tr>
<tr>
<td>To learn more about phonology and phonological disorders, go to the ASHA website: <a href="http://www.asha.org/public/speech/disorders/ChildSandL.htm">www.asha.org/public/speech/disorders/ChildSandL.htm</a>.</td>
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<th>Content</th>
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<tr>
<td><strong>Semantics</strong> is the system that governs the meanings of words and sentences.</td>
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<tr>
<td>Example: At age 11 months the child calls out, “da-da” whenever she sees a male. But by 15 months she only calls “da-da” or “daddy” for her father; she says “man” for unfamiliar men. In the first example, the child overgeneralizes the meaning of daddy, using it to refer to any male figure. This is a common early semantic pattern. As semantic knowledge develops, the child learns the meaning of the word daddy and uses this word only for her father.</td>
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<tr>
<th>Use</th>
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<tbody>
<tr>
<td><strong>Pragmatics</strong> is the system that combines the language components described above in functional and socially appropriate communication.</td>
</tr>
<tr>
<td>Example: A child tugs on his father’s pants and points to the TV. This is an example of a nonverbal request.</td>
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</tbody>
</table>

proficiency in all three domains. The form–content–use model is used widely in the communication disorders literature. You will learn about an elaborated version of the form–content–use chart, something I call the communication subdomains, in Chapter 2.

**Evidence-Based Practice: A Cornerstone of Clinical Practice**

Just as form, content, and use are the cornerstones of how language specialists think about language, there is another approach that has dramatically changed how practitioners think through clinical questions and make decisions about language intervention. This approach is called evidence-based practice (EBP). EBP refers to the process that practitioners use to evaluate whether a clinical practice, a strategy, a program, a curriculum, or an intervention is backed by rigorous evidence of effectiveness and whether a practice is appropriate for a particular individual.

**EBP: INTERNAL AND EXTERNAL EVIDENCE**

SLPs use both internal and external evidence in their EBP decision making. **Internal evidence** is provided by (a) an individual client’s perspective and beliefs and (b) an SLP’s clinical expertise. The contribution of internal evidence is part of ASHA’s definition of EBP: “An approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values, into the process of making clinical decisions” (ASHA, 2005, p. 1).
But internal evidence is not enough to guide EBP: As you can see from the first part of ASHA’s definition (i.e., “An approach in which current, high-quality research evidence . . .”), EBP also requires external evidence. External evidence consists of well-designed and controlled experimental studies that result in experimental data; by analyzing study results, a practitioner can determine whether a particular clinical practice is effective (Dollagen, 2007). Randomized controlled trials (RCTs) are considered the “gold standard” for evaluating the effectiveness of an intervention. RCTs are studies that randomly assign individuals to an intervention group or control group to measure intervention effects. The results of RCTs are used to guide clinical practice in medicine, education, and psychology, as well as in the field of speech-language pathology (Coalition for Evidence-Based Policy, 2003).

As an example of RCT, suppose you want to test whether a particular curriculum for English language learners (ELLs) is more or less effective than your school’s existing curriculum for ELLs. You randomly assign a large number of ELLs to either an intervention group that uses the new curriculum or to a control group that uses the existing curriculum. You measure the academic achievement of both groups over time. The difference in achievement between the two groups represents the effect of the new curriculum compared to the existing curriculum.

As you can imagine from this example, completing an RCT is time-consuming and expensive. Also, SLPs and special educators typically work with individuals who have low-incidence disorders. They therefore often cannot assign large numbers of students to one intervention or another. Consequently, in the EBP decision-making process, practitioners evaluate a range of experimental designs to determine whether a particular clinical practice meets the definition of high quality. We call this a tiered approach to evaluating external evidence the levels of evidence in EBP.

EBP: EVALUATING RESEARCH QUALITY

Because not all experiments consist of an RCT, an SLP evaluates the experimental studies that are available regarding a particular clinical practice and considers the study’s experimental level of evidence. The levels of evidence are on a continuum from the highest level (Level I) to the lowest level of clinical evidence (Level IV). As previously stated, the best research is produced by an RCT; Level I evidence resulting from randomized experimental research is considered the best research design. Level I evidence also includes meta-analyses. A meta-analysis is a specialized form of systematic review in which the results from several studies are summarized using a statistical technique resulting in a single weighted estimate of the results’ findings. Level II research reflects high-quality, but nonrandomized, experiments. Level III evidence reflects well-designed nonexperimental studies and case studies. A nonexperimental design is typically a description of clinical results implemented with a small group of students without the use of a comparison treatment. Level IV represents expert opinion. (See Table 1.2 for a summary of the levels of evidence.)

EBP: FACTORS CONTRIBUTING TO RESEARCH QUALITY

Now that you know about the levels of evidence, let’s consider how practitioners evaluate a study’s research quality. Let’s start with Level I. Remember that Level I research reflects the most rigorous investigation standard because studies assigned to Level I (a) compare performance of two or more groups of students (i.e., control group design) and (b) randomly assign students to one group or the other.
Comparison of the effects of different treatments is the “heart and soul” of Level I research; in the best-case scenario, two different interventions (also called treatments) are compared. The ELL curriculum study described above is an example of two comparison treatments.

Sometimes, however, instead of comparing the effects of two different treatments, researchers compare students in a treatment condition with students who receive no treatment (i.e., treatment vs. no-treatment design). In the no-treatment group, students continue with their regular school or home activities but do not receive any special intervention. Although comparison between treatment and no-treatment groups is an acceptable Level I design, it is not as strong as comparison of two different treatments. Consider that in the treatment vs. no-treatment design, students in the treatment group may improve because they receive regular, positive interaction with an attentive adult; student gains may not be directly attributable to specific characteristics of the intervention. Comparison of two different treatments solves this problem.

Subject randomization also is an important component of Level I research. In a randomized research design, a group of students consent to participate in a study. After the researchers obtain consent, they randomly assign the students to the treatment group or the comparison group. Randomization adds certainty to the interpretation of results. If randomization is not used, there is a possibility of bias. For example, imagine that I say, “I would like you to participate in a study on the effects of exercise. You can choose to be in a group in which you will exercise four times a week, or you can choose to be in a group that exercises two times a week.” In this situation, it is likely that individuals with specific character traits (perhaps highly motivated individuals) will choose to be in the group that gets more frequent exercise; less motivated individuals may choose the two-times-per-week group. Study results would then potentially represent variations in motivation levels rather than compare exercise effects. Random assignment increases the validity of experimental results.

Other factors contribute to the evaluation of research quality. An overall goal of high-quality research is to (a) limit any extraneous factors that could potentially contaminate the results, (b) determine that participants in the group are similar except for treatment exposure, (c) document results with highly reliable and valid measures of performance,

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**Table 1.2  Levels of Evidence for Scientific Studies**

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<th>Level</th>
<th>Criteria</th>
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| Level I | Evidence from one well-conducted randomized clinical trial.  
Systematic review or meta-analysis of high-quality randomized controlled trials. |
| Level II | Similar findings demonstrated from nonrandomized experiments (with good experimental design) from several different researchers. |
| Level III | Well-designed nonexperimental studies (i.e., correlational and case studies). |
| Level IV | Expert committee report, consensus conference, clinical experience of respected authorities. |

and (d) provide statistically significant and meaningful data (Gillam & Gillam, 2008). These factors are described in more detail below.

One goal of high-quality research is to document that reported effects are not contaminated by unintended variables. One factor that causes contamination is research bias. Research bias occurs when an examiner unconsciously inflates a student's abilities because he or she knows the student participated in an intervention and “should” improve. Potential for research bias is reduced when blinding is used. **Blinding** means that the individual who assesses the students is not the same individual who provides the intervention or directs the study. Without blinding, there is potential for contamination of outcome data.

Contamination also occurs when the individual providing the treatment fails to implement the treatment as planned. To counter this possibility, high-quality studies include measures of treatment fidelity. **Fidelity** refers to the degree to which an intervention is carried out as described. One way to document intervention fidelity is to videotape intervention sessions and count or code the interventionist’s behaviors.

A second factor impacting research quality is documentation of group similarity prior to the intervention. As I have already pointed out, randomization makes it more likely that the groups do not differ. However, in communication disorders research, investigators must also demonstrate prior to the study that subjects in treatment and comparison groups are relatively the same. Without this assurance, it can be argued that the participants’ ability level or environmental circumstances influenced the results. For example, consider that I am completing a study, and I find that my comparison-group students are significantly more impaired than my treatment-group students. My results are affected because I cannot be certain treatment-group improvement is due to my intervention. Because the treatment group was (on average) less impaired, improvement may represent natural development and may not represent change due to the intervention. To minimize this factor, prior to implementing an intervention, researchers document participants’ age, communication ability, socioeconomic status, classroom environment, intellectual ability, ethnicity, etc. Documentation and analysis clarify group equivalency prior to the treatment implementation.

A third factor in research design relates to assessment. Good research studies use highly reliable and valid measures to document change in students’ behaviors. You will learn how to judge the reliability and validity of assessment measure in Chapter 4.

The final factor to be considered when evaluating a research design is the need for study results to be statistically significant as well as clinically meaningful (Schuele & Justice, 2006). To determine significance, the (most basic) process is to compare mean performance between treatment and comparison groups. Significance tests reflect the probability that the reported outcome being due to chance, or random fluctuation, is adequately small. When interpreting intervention research, statistical significance demonstrates that the intervention made a *real* difference in student performance.

Although statistical significance is important, by itself it is not sufficient. It is possible for a study to produce statistical significance, but the degree of change may not be clinically meaningful. To overcome the limited interpretability of statistical significance, high-quality research studies report effect sizes. **Effect-size estimates** are numerical values designed to characterize results in functional and meaningful ways. Effect-size data indicate the magnitude of an effect in addition to estimates of probability (Schuele & Justice, 2006). Typically, effect-size estimates are interpreted with two processes. The first process
uses a commonly accepted benchmark to differentiate small, medium, and large effect sizes (Cohen’s $d$: .2 = small effect, .5 = medium effect, and .8 = large effect; Cohen, 1988). In a second process, the researcher compares his or her effect size to effect sizes achieved in similar studies.

Now that you understand the factors used to determine a research design’s quality, consider the steps I followed when evaluating one study (Figure 1.3). As you can see, I evaluated an RCT that compared the language gains between three groups of students with language impairment following an intervention. Students were randomly assigned to receive either a specialized computer intervention (i.e., Fast ForWord) or two alternative group assignments (a generic computer program and a no-treatment group). With your classmates, consider each factor in the left-hand column and identify the study characteristics that align with each factor (in the right-hand column). Hopefully, by examining one RCT in detail, you will gain an appreciation of how the EBP process works. At the end of the chapter, I provide several suggestions of additional RCTs that could be analyzed in a similar fashion.

**Figure 1.3 Factors to Consider When Evaluating Evidence from a Randomized Control Study**

1. Did the study clearly describe the intervention (e.g., how the treatment group [TG] differed from the control group [CG] intervention)?
   - No differences between groups prior to intervention

2. Was there random assignment? Were any systematic differences between TG and CG described?
   - Random assignment

3. Did the study use valid measures? Did they consider long-term outcomes of participants?
   - Valid & reliable measures; long-term outcomes were evaluated

4. If the study found intervention to be effective, did the researchers report the size of effect?
   - This study did not support the efficacy of FFW as an intervention for children with severe mixed receptive-expressive language impairment

Seventy-seven children between the ages of 6 and 10 years with severe mixed receptive-expressive specific language impairment participated in a randomized controlled trial (RCT) of Fast ForWord (FFW).

Standardized measures of receptive and expressive language were used to assess performance at baseline and to measure outcome from treatment at 9 weeks and 6 months.

Children were allocated to 1 of 3 groups. Group A ($n = 23$) received the FFW intervention as a home-based therapy for 6 weeks. Group B ($n = 27$) received commercially available computer-based activities designed to promote language as a control for computer games exposure. Group C ($n = 27$) received no additional study intervention. Each group made significant gains in language scores, but there was no additional effect for either computer intervention.

What is Fast ForWord?
FFW is a computer-based intervention using acoustically enhanced speech stimuli. The stimuli are modified to exaggerate their time and intensity properties as part of an adaptive training process. It has been proposed that FFW improves language functioning and reading.
Although in this example I evaluated a Level I study, remember that Level II, III, and IV studies also can be of very high quality even though they are not randomized comparison-group studies (Fey, 2006; Justice & Fey, 2004). High quality at Levels II to IV is documented with similar factors as described for Level I studies: careful description of subject characteristics, the use of valid and reliable measures to document change, minimization of contamination of results, and reporting of outcome data to document significant and meaningful results.

**EBP: Evaluating the Quantity of Data and Using Data to Make Clinical Decisions**

When professionals use EBP decision making to guide intervention selection, they also consider the quantity of supporting evidence (ASHA, 2005; Justice, 2006). Interventions with a body of documentation have more evidence supporting their use. Many commonly used speech-language pathology interventions have not yet been evaluated by RCT studies. In such cases, a professional examines the body of evidence across all levels, including nonrandomized research studies, case studies, and expert opinion.

Interventionists develop skills to assess research results and judge the accumulated body of research on a proposed intervention. Professionals use searches to access peer-reviewed research, such as the one available with Google Scholar (http://scholar.google.com). In contrast to regular Google access (which typically does not represent peer-reviewed research), Google Scholar allows a professional to access peer-reviewed research (Nail-Chi et al., 2006).

In addition to searching for research studies on Google Scholar, today’s SLPs have many additional resources to help locate high-quality research studies. For example, in 2005, ASHA began to compile research on intervention effectiveness. This database is called the Compendium of EBP Guidelines and Systematic Reviews, and if you are a NSSHLA member, you can access the site at www.asha.org/members/ebp/compendium/. As a classroom activity, go to this site and look at the systematic reviews under the category “Language disorders.” As you can see, there are many different reviews; as you progress through the chapters in this book, go back and search for topics that are covered (e.g., hearing loss, autism, specific language impairment, literacy and reading).

After looking at the possible reviews, begin to consider how evaluating the research will help you select the appropriate intervention approach for students with communication disorders. To help in this process, whenever possible I include a description of the level of evidence for each intervention approach I present in this book. By threading this information throughout the book, my intent is to help you become more comfortable with EBP concepts.

**EBP: Final Thoughts**

EBP is very important to the field of speech-language pathology and education. However, it may take some practice and thought before you feel comfortable evaluating the quality of clinical and educational research. Remember that practitioners across many professions use EBP to help guide their clinical decisions. Using EBP helps them answer the question; “Is there clear evidence that the approach I am recommending will be effective?” Understanding the principles of EBP will set you on the path to becoming a successful professional.
Summary

- A language disorder is impaired comprehension or use of spoken, written, or other symbol systems. An individual with a language disorder is different from someone with a language difference. Language difference is a variation of a symbol system used by a group of individuals that reflects and is determined by shared regional, social, or cultural/ethnic factors. Sometimes a young child (2 to 3 years old) who exhibits a developmental lag in language is referred to as having late language emergence; experts use this terminology because language impairment cannot be reliably diagnosed in young children in the absence of a primary disorder.

- Receptive and expressive language occurs at the linguistic level of the speech chain. Other communication processes that are within the motor/physical and the acoustic levels contribute to the communication system.

- Language consists of three overall domains: form (syntax, morphology, phonology), content (semantics), and use (pragmatics). The three domains are interdependent, and an effective communicator demonstrates proficiency in all three domains.

- Evidence-based practice (EBP) refers to the process that practitioners use to evaluate whether a clinical practice, strategy, program, curriculum, or intervention is backed by rigorous evidence of effectiveness and whether a practice is appropriate for a particular individual. Research studies are evaluated according to four levels of evidence. Level I refers to randomized comparison-group studies; this is considered the “gold standard” of research evidence. Level II represents research from nonrandomized experiments but with good experimental design from several different researchers. Level III represents research from correlational studies or case studies, and Level IV refers to expert opinion.

Discussion and In-Class Activities

1. In groups, give examples of communication behaviors in children’s morphology, pragmatics, semantics, and syntax that will be demonstrated as the child matures.

2. Explain the speech chain model to an individual who is not in your class. Draw a simple diagram to illustrate your explanation. Role-play this explanation in class.

3. Go to the video library at the Colorado Department of Education: www.cde.state.co.us/resultsmatter/RMVideoSeries.htm. Watch several of the child-interaction videos and discuss the behaviors or language that illustrate the domains form, content, and use. How do these domains overlap in the communication that you see?

4. Using the process outlined in Figure 1.3, evaluate the following research studies:


Discuss in class whether you feel these studies would qualify as Level I or Level II in the levels-of-evidence hierarchy.

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**Chapter 1 Case Study**

Consider each of the descriptions of a child with a language delay or disorder. Discuss in class whether you think the child has a disorder of form, content, or use. Sometimes more than one domain is impacted. Remember that the goal in this first case assignment is for you to begin talking and discussing the concepts of form, content, and use. I provide many more details about the domains in Chapter 2.

- Olivia is 29 months old. She plays with toys in age-appropriate ways, points at objects she wants, and interacts socially with her brother and parents. She has three words she uses to communicate: *mama, kitty,* and *Bob* (her brother).
- Gina is 10 years old. She has difficulty reading and makes many grammatical errors in her writing. Her sentences are short and unelaborated. She is well liked by her peers and is a very good soccer player.
- Colton is 8 and has difficulty making eye contact. Although he can talk, he rarely initiates communication with others. When he does communicate, he wants to talk about his passion—trains—to the exclusion of other topics.
The first two chapters of this book introduce you to important fundamental concepts. I build on these foundational concepts in future chapters that focus on language disorders. In Chapter 1, you learned important terminology associated with language disorders and read about the foundational clinical principle evidence-based practice. This chapter continues to build on that information by (a) introducing four major theories of language development and (b) discussing how children move through the language domains of form, content, and use with the communication subdomains model.

Chapter Overview Questions

1. What are the primary differences between the nature and nurture perspectives of language development?
2. What are the four different theories of language development as described in this chapter?
3. How does each theory influence intervention approaches?
4. What are the five different communication subdomains?
5. What is the most important communication characteristic associated with each subdomain?
6. How do practitioners use information regarding the subdomains to guide clinical interventions?
I hope you are not groaning inwardly at the mention of language theories! This book focuses on explaining how language theories are important principles used to identify children’s language challenges and to develop intervention programs. I will be referring back to language theory throughout this book when I discuss intervention options for children with communication impairments.

It is important to recognize that no single theory can explain the complex process of communication, but each theory makes a contribution toward understanding how language develops and how intervention helps children who struggle to communicate. To help you understand the contributions of language theory, I first provide an overview of the debate between the nature and nurture theories of language development. Then I present more detailed information on four theories of language development: behaviorism, constructivist theory (i.e., Piagetian cognitive theory), social interactionist theory, and emergentist theory. You will learn about other important language theories later in your clinical training, but the four theories presented in this chapter are foundational. I will refer to these theories in later chapters when I present information on specific clinical interventions.

**Language Development: Nature versus Nurture**

Perhaps the most fundamental issue in language development focuses on the question “How and why does a child develop language?” Many theorists have debated this question, and the popularity of various theories has changed over time. It is important for a language practitioner to understand the underlying issues regarding these debates, because strong intervention approaches are linked to language theory. When a skilled practitioner chooses an intervention approach, she must understand its theoretical base.

A historical debate centers on whether language is an innate ability of humans or a function of an individual’s environment. This debate is often referred to as nature versus nurture. Theories favoring the contribution of nature to language development began with Plato in classical Greece and evolved into a viewpoint supported by Noam Chomsky in the 1950s. A summary of the nature-supported position is that certain fundamental language skills are innate, and language capacity is present from birth. Theorists who favor the role of nature are sometimes referred to as nativists or (historically) as rationalists.

On the opposite side of the theoretical debate are those who favor the environment as the critical factor in language development. Theorists who support this position are sometimes referred to as empiricists. In an extreme interpretation of the empiricist viewpoint, a newborn is a “blank slate” on which the environment shapes language development. The empiricist viewpoint has shaped many language theories, including the behavioral theories of B. F. Skinner (1957), and it has played an important role in the Piagetian perspective (1926/1952). I will be discussing behaviorism and Piaget’s cognitive constructivist approach in the sections below.

It is important to remember that there is no simple answer to the question of how children learn language so quickly and so uniformly across many different cultures. However, for now, remember that the theories presented in this chapter—behaviorist, constructivist, social interactionist, and emergentist—represent different viewpoints along the nature-versus-nurture continuum.
Behaviorism is a theory that suggests that learning occurs when an environmental stimulus triggers a response or behavior. As mentioned previously, this theory is strongly influenced by the empiricist viewpoint. Behavioral principles suggest that when we reward or punish behaviors, we can either increase the frequency of positive behaviors or decrease or alter negative behaviors. B. F. Skinner (1957) is the individual most closely associated with behaviorism.

Skinner proposed that language, like other behavior, is produced because caregivers selectively reinforce words. For example, the parent says the word “cracker,” and the child responds by saying “ka-ka.” The parent says, “Yes, this is a cracker!” and gives the child a cracker. The parent’s positive response and the cracker both provide reinforcement. The word ka-ka gradually is shaped to match the adult production of the word. Shaping occurs when an individual is expected to produce closer approximations to the behavioral target prior to reinforcement. In this example, the parent eventually expects the child to say “cracker” before providing the desired item.

A number of important concepts used in speech-language pathology and special education are based on behaviorist theory:

- **Reinforcement**: Reinforcing a child’s behavior makes it more likely that the behavior will occur in the future. **Positive reinforcement** is a stimulus using pleasant rewards that increases the frequency of a particular behavior. In contrast, **negative reinforcement** is unpleasant to the child. An example of negative reinforcement is an adult frowning, nagging, or making disapproving comments to a child and continuing to do so until the unwanted behavior ends. The child stops the unwanted behavior (presumably producing a more desirable behavior) to avoid the negative stimuli. Reinforcement can be social (“high-fives,” smiles, encouragement, or praise), activities (participating in a pizza party following successful completion of therapy activities), or material (allowing the child to have favorite foods or earn points for toys).

- **Extinction**: Extinction is based on the behavioral principle that when a child’s response is not reinforced, the ignored behavior will decrease or disappear. An example of extinction is ignoring a child’s negative behavior.

- **Antecedent**: An antecedent event is a stimulus that precedes a behavior. The child’s behavior (with reinforcement) can be linked to the antecedent event. For example, a child sees a cookie (the antecedent event) and says, “Want cookie!”

- **Punishment**: Punishment is a negative response that a child views as undesirable. It follows a behavior that the adult wishes to eliminate. Punishment makes it less likely that the negative behavior will occur; an example of punishment is placing a child in a “time-out chair” following the child’s misbehavior.

- **Chaining**: **Behavioral chaining** occurs when an activity requires a number of linked steps; a complex behavioral sequence is broken down into smaller units so the child can be trained to complete a multistep task. For example, if a child is being trained to wash his hands, he is first taught to turn on the water, then to use soap and engage in hand washing, then to turn off the water, and then to dry his hands. Individual components are rewarded in successive steps.

**Clinical Implications of Behaviorist Theory.** Behaviorism has influenced educational practice in many ways. First, drill-and-practice activities within intervention sessions are based on behaviorist theory (Fey, 1986). The goal in drill-and-practice sessions is to
stimulate many child behaviors that can be shaped and rewarded by the interventionist. Drill-and-practice also tends to focus on discrete, isolated aspects of language, with the idea that small skills are sequentially linked in a step-by-step approach to form more complex communication behaviors. The step-by-step principle underlies many intervention programs for children with more significant levels of disability (e.g., intellectual disabilities, autism; Pelios, MacDuff, & Axelrod, 2003).

Second, behaviorist theory principles underlie the practitioner’s focus on observable and measurable behaviors. Behaviorism demands that a child’s responses be documented and that change in language performance be demonstrated by ongoing progress monitoring. A skilled practitioner documents a child’s performance and progress toward achieving long-term goals.

All language theories have limitations and strengths in explaining language learning. The limitation of behaviorist theory is that it is not a comprehensive theory; it does not explain how an individual produces complex and novel behaviors. For example, children produce utterances they have not heard, without reinforcement. Behaviorism does not explain this phenomenon. However, behaviorist theory helps explain how children learn discrete behaviors. As a result, the application of behaviorist principles is useful in certain intervention programs.

CONSTRUCTIVIST THEORY
Cognitive constructivist theory is based on the numerous writings of Jean Piaget (e.g., Piaget, 1952). Piaget examined children’s logical reasoning abilities (i.e., problem solving) and proposed a sequence of progressively sophisticated cognitive skills, from primitive thinking (at the beginning of the sensorimotor stage) to advanced cognitive ability (in the formal operations stage). Piaget was influenced by empiricist theory because—while he believed that the cognitive processes underlying language (e.g., the mental processes that allow one to recognize, recall, create, and evaluate) are innate—like the other empiricists, he believed language itself is not innate. However, Piaget differed from other empiricists in that he proposed that children actively contribute to the language-learning process. He emphasized that children use the symbolic properties of language to represent conceptual knowledge about the world and that specific cognitive achievements are required for linguistic development. He believed that linkages exist between children’s motor ability, play behavior, and language development. Characteristics of Piaget’s four stages of cognitive development are summarized in Table 2.1. Figure 2.1 illustrates a child at play who is developing her problem-solving skills at the sensorimotor stage of development.

The parallel development of motor, play, and language milestones is summarized in Table 2.2. There is a very practical need for language interventionists to understand cognitive constructivist theory: Practitioners use Piagetian principles to evaluate cognitive skills needed for language development and often observe children’s play behavior with a Piagetian perspective. A detailed description of a play-focused observational protocol is provided in Chapter 6. The following important concepts are based on Piaget’s cognitive theory:

- **Schema:** A schema is a concept, mental category, or cognitive structure; children form many different schemata as they interact with their environments. (*Schemata* is the plural form of *schema.*)
- **Assimilation:** A child evidences assimilation when he takes in new information and incorporates it into his existing schemata. When a child sees an unfamiliar animal, such as a camel, and says “*borsa,*” he is evidencing assimilation.
## Table 2.1  Piaget’s Cognitive Stages

<table>
<thead>
<tr>
<th>Age</th>
<th>Stage</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to 2 years</td>
<td>Sensorimotor</td>
<td>Begins with reflexive and motor learning. Progresses rapidly, learning object permanence, means–end, etc.</td>
</tr>
<tr>
<td>2 to 7 years</td>
<td>Preoperational</td>
<td>Most rapid stage of language learning. Child learns to solve physical problems.</td>
</tr>
<tr>
<td>7 to 11 years</td>
<td>Concrete operations</td>
<td>Child learns to categorize and organize information; begins to be a logical thinker.</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>Formal operations</td>
<td>Learns to be an abstract thinker, tests mental hypotheses.</td>
</tr>
</tbody>
</table>

## Figure 2.1  An Infant’s Exploration of Her Physical Environment Facilitates Cognitive Development
Table 2.2  Linkages between Piaget’s Sensorimotor Substages and Motor/ Cognitive, Play, and Communication Behaviors

<table>
<thead>
<tr>
<th>Substage (age)</th>
<th>Motor/cognitive</th>
<th>Interactions and imitation</th>
<th>Play</th>
<th>Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Reflexive</td>
<td></td>
<td>Interactions are caregiver initiated</td>
<td></td>
<td>Cries, laughs, coos</td>
</tr>
<tr>
<td>(Birth–1 month)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II Primary circular</td>
<td></td>
<td>Child repeats own behaviors</td>
<td>Grasping, looking at object</td>
<td>Babbles (child actively interacts)</td>
</tr>
<tr>
<td>(1–4 months)</td>
<td></td>
<td>Imitates behaviors that he or she has produced before</td>
<td>Begins to interact with people with gestures and vocalizations</td>
<td>Beginnings of semantic understanding (6–8 months)</td>
</tr>
<tr>
<td>III Secondary circular</td>
<td></td>
<td>Behaves as if he or she is cause of all actions (early causality)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4–8 months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV Causality</td>
<td></td>
<td>Looks for object if sees it being hidden (object permanence)</td>
<td>Imitates behaviors not produced before</td>
<td>Links gestures and vocalization</td>
</tr>
<tr>
<td>(8–12 months)</td>
<td></td>
<td>Knows other people can cause activities (more developed causality)</td>
<td></td>
<td>Expansion of semantic function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evidence of planning of intentional behaviors (means–end)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V Tertiary circular</td>
<td></td>
<td></td>
<td>Figures out how to make toys work (cause and effect)</td>
<td>First meaningful words</td>
</tr>
<tr>
<td>(12–18 months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI Representational</td>
<td></td>
<td></td>
<td>Imitates actions that are stored mentally</td>
<td>Multiple-word utterances</td>
</tr>
<tr>
<td>thought</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(18–24 months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Language Theory and the Communication Subdomains

- **Accommodation:** A child evidences accommodation when he adjusts his schemata on the basis of new information. In the preceding example, the child eventually accommodates new information and uses the word “camel.”
- **Equilibrium:** Piaget believed that children attempt to find a balance between assimilating new information into old schemata and developing new schemata through accommodation. This balance is called equilibrium.
- **Disequilibrium:** As a child recognizes that two schemata are contradictory, disequilibrium occurs. Reorganization to higher levels of thinking is motivated by this disequilibrium. Disequilibrium is evidenced in the preceding example when the child recognizes that the word “horse” fails to capture the camel’s unique characteristics.
- **Symbolic play:** Symbolic play is evidenced when a child uses one object to represent another. For example, a child might tie a towel around his neck and say the towel is a cape and that he is Superman.
- **Object permanence:** A child evidences object permanence during the sensorimotor stage of development when he realizes that an object exists even when he cannot see it. Very young children cannot understand that objects continue to exist even when they can’t be seen or felt. For example, prior to achieving object permanence, a child will quickly lose interest in (and not search for) a hidden toy.
- **Object constancy:** Object constancy is another concept of the sensorimotor stage; a child learns that he is viewing the same object, regardless of distance, light, or different viewing angle.
- **Means–end:** Means–end behavior is evidenced when a child demonstrates intentionality; it occurs when the child identifies a problem and makes a plan to solve the problem. An example of means–end behavior is a child pushing a button or pulling a string to make a toy move. A child calling out “Mama!” and waiting for his mother to appear also demonstrates means–end behavior.

Practice your clinical problem-solving skills by considering the information in Focus 2.1. What Piagetian concepts are the children demonstrating in each example?

**Clinical Implications of Cognitive Theory.** Practitioners observe children’s play behaviors to gauge children’s general cognitive ability and level of representational thought. I provide an example of this decision-making process in Figure 2.2. Representational
Figure 2.2 Observing Children’s Play to Understand Levels of Representational Thought

1. Does child evidence sociodramatic play with multiple play sequences?
   - YES → Child is demonstrating a high level of symbolic play; approximate developmental level 24–36 months
   - NO

2. Does child pretend with objects, directly using his/her own body? (e.g., pretends to sleep, eats from an empty spoon)
   - YES → Child is demonstrating an early level of symbolic play; approximate developmental level 18–24 months
   - NO

3. Does child show comprehension of the function of an object but without pretending? (Note: child seems “serious” rather than playful; items are used for real purposes)
   - YES → Child is evidencing that he/she is presymbolic; approximate developmental level < 18 months of age

Clinical Skill Development:
How does the practitioner use observed play behavior to gauge a child’s level of representational thought?

thought is the child’s ability to represent one object with another. An example of high-level symbolic play (the first step in Figure 2.2) is a child pretending to cook dinner, setting the table, placing dolls and stuffed animals around the table, and pretending to serve dinner. Practitioners look for evidence of representational thought to gauge a child’s readiness for symbolic language.

The limitation of cognitive constructivist theory is the proposal that children (a) move through discrete and qualitatively different stages of development and (b) work through the stages sequentially. A child at the sensorimotor stage is thought to solve
problems by using qualitatively different strategies than a child at a later stage of development. However, children do not always follow this linear and step-by-step developmental progression. Sometimes children solve surprisingly difficult problems (i.e., problems seemingly beyond their cognitive stage) within certain contexts and with the right support. On the other hand, the strength of cognitive constructivist theory is that it helps practitioners understand how children use physical exploration to increase their problem-solving abilities.

**SOCIAL INTERACTIONIST THEORY**

Social interactionists view language as a means of making social connections and communicating ideas (Nelson, 2010). Social interactionists favor the role of nurture in the nature–nurture debate. An early advocate for this position was Lev Vygotsky (1934). Vygosky was a Russian psychologist; his work was translated into English and began to influence modern language theory in the 1970s.

Vygotsky viewed a child’s interactions with adults and more able peers as being key to their overall development. Like Piaget, Vygotsky believed that children construct their own knowledge. However, whereas Piaget believed that cognitive development occurs primarily through children’s interaction with physical objects, Vygotsky believed that cognitive development is socially mediated—that is, that a child’s interactions with others influences cognitive understandings (Bodrova & Leong, 2007).

Vygotsky proposed that initially a child and a more capable partner (an adult or older child) solve problems together, but eventually the child internalizes the process and is able to carry out the function independently. There has been an explosion of research exploring Vygotskian principles in recent years (Winsler, 2003).

Vygotsky also asserted that language plays a critical role in shaping learning and thought. For example, he proposed that **private speech** plays a role in cognitive development. Private speech occurs when children speak aloud as they are engaged in play. Vygotsky’s view was that private speech is a step that allows children to internalize important concepts. One of the most important Vygotskian principles is the notion of the **zone of proximal development (ZPD)**. The ZPD is the competence that a child demonstrates with minimal assistance. The ZPD is the area between the zone of competence (what a child can do independently) and the zone of incompetence (what a child is unable to do, even with assistance; Baroody, Lai, & Mix, 2006). Vygotsky proposed that teaching children within the ZPD (at the point where children can just perform a task with some assistance) is the key to maximizing child learning. Using the ZPD principle has prompted practitioners to introduce tasks to young children even when the tasks are difficult (Kaderavek & Justice, 2004). For example, preschool children are engaged in early literacy activities with adult support. You will learn more about this concept in Chapter 10.

Social interactionists believe that parents play a critical role in children’s language development. Parents provide support for their child’s learning by introducing names for objects and actions in meaningful contexts, by responding to a child’s utterances, and by finding ways to show or tell children when there are linguistic confusions. For example, if a child says, “You drinking juice,” the adult typically says, “Mommy is drinking coffee; this coffee is hot!” When parents expand their child’s utterances, they are providing subtle feedback about the child’s language. Vygotsky’s social interactionist theory was made prominent in the Western world by Jerome Bruner (1983), who emphasized the role
of adult–child interaction in children’s language learning. Additional important concepts in social interactionist theory include:

- **Infant-directed talk:** Infant-directed talk (also called motherese; Baldwin & Meyer, 2007) describes the characteristics of child-directed communication that enhance an infant’s ability to learn language. Characteristics of infant-directed talk include the use of content words (i.e., nouns, verbs) in isolation, placement of content words at the end of sentences (“A doggie, see the doggie?”), increased pitch on content words, and talking about objects and events in the “here and now.” It has been theorized that these facilitating characteristics help infants extract the important information and make linkages between speech and objects or events.

- **Coordinating attention:** Adults follow an infant’s focus of attention and match their communication to the child’s eye gaze. Also, in Western cultures, adults try to direct infants’ attention to specific objects by pointing or showing (Baldwin & Meyer, 2007).

- **Scaffolding:** Scaffolding refers to adult support that allows a child to engage in a challenging activity. Scaffolding techniques can include simplifying a task, providing directions and clarifying a task, reducing a child’s frustration, modeling a correct response, and motivating and soliciting a child’s task engagement. When used effectively, scaffolding is faded from levels of high support to minimal levels of guidance.

- **Mediation:** The term mediation is related to scaffolding. In scaffolding, the focus is on the adult’s manipulation of the task to increase the learner’s success. In mediation, the goal is to provide the learner with insights in order to teach the learner “how to learn.” During a mediated learning task, the student is encouraged to accept responsibility so that he or she can function more independently. When mediating a task, the practitioner might say, “Tell me the steps you are going to follow to finish this project.” The practitioner’s goal is to increase the student’s awareness of the steps required for task completion.

- **Parent–child communication routines:** Adults structure infant play routines in systematic patterns sometimes called scripts. Scripts involve predictable patterns of action that facilitate infant participation. The interaction familiarity allows the child to anticipate his or her role in the interaction, building pragmatic communication skills (Baldwin & Meyer, 2007; Bruner, 1981). Examples include “How big is baby? SO big!” (the child is encouraged to lift his or her arms overhead); “Peek-a-boo!” (the child anticipates the “boo!” by laughing and eventually initiates hiding); repeated book-reading routines (parent repeats familiar vocabulary or prompts actions); and waving while saying “bye-bye.”

**Clinical Implications of Social Interactionist Theory.** Speech-language pathologists (SLPs) and special educators frame many of their assessments and interventions based on social interactionist theory. Social interactionist theory encourages practitioners to incorporate children’s caregivers into intervention programs and to work with children in their homes and classrooms to build social interactions. I describe strategies to enhance child–caregiver language interactions in Chapter 6.

The limitation of social interaction theory is that, taken on its own, it does not explain everything about language development. For example, in some cultures caregivers do not use infant-directed speech, yet children still develop language. Again, we are reminded that one language theory, by itself, is not sufficient to explain the complex behavior of language development.
EMERGENTIST THEORY

While the theories discussed so far have been discussed for decades (and even centuries), there is a relative newcomer to language theory: emergentist theory. Proponents of emergentist theory believe that debates on whether language ability is based on nature or nurture are overly simplistic and reflect a time when researchers lacked access to sophisticated computer modeling programs and brain imaging procedures (e.g., functional magnetic resonance imaging [fMRI]). Enhanced technology allows language researchers to explore language development in ways not possible in the past (MacWhinney, 1998, 2010). Learn more about how emergentist research uses current technology in Focus 2.2.

In the emergentist position, language learning is an interconnected system that involves more than a person’s genetic makeup, his or her environment, or the neural connections that develop as a child is exposed to a language. It is a complex, open system in which a child’s biology adapts to his or her environment. Importantly, emergentist theory underscores the need for children to be actively engaged in their environments (Evans, 2008). In order for a system to adapt and change, the child must be an active user and processor of language input.

Emergentist theory guides many current research programs focusing on children’s language acquisition. One research approach uses computer simulations to model how the brain develops neural linkages that support language learning. It is hypothesized, for example, that children learn to extract specific language features because they detect consistent patterns (i.e., cues). For example, it has been estimated that a human hears more than 15 acoustic sounds in every speech syllable (Anderson, 2000). However, very quickly a toddler learns that some acoustic differences are important and others are not. Think about the subtle but important distinction between “spot” and “stop” (especially if the toddler is running toward the street!). At an early age, the child’s recognition of an acoustic pattern increases survival (an evolutionary rationale for the cognitive skills needed to develop a language system). Linguistic cues are also provided by a child’s understanding of a situation (i.e., pragmatic cues) or can be provided by word order or meaning. Using acoustic, pragmatic, semantic, or syntax cues to detect language patterns is biologically efficient because it reduces the child’s cognitive load and has the previously described evolutionary function. Computer simulations are used to understand how cue recognition streamlines language comprehension and use.

FOCUS 2.2  Research

Emergentist research is data driven. The computer simulations critical to emergentist research require transcribed child language; a source of these language samples is the Child Language Data Exchange System (CHILDES). CHILDES was established in 1984 to serve as a repository for language data. Its earliest transcripts date from the 1960s, and CHILDES now has language samples (transcripts, audio, and video) in more than 20 languages. During the early 1990s, CHILDES researchers developed software programs capable of analyzing language transcripts. To date, more than 3,000 published studies cite the CHILDES database or transcription software as a source of their data or data analysis. You can learn more about the CHILDES repository at http://childes.psy.cmu.edu/intro/.
Clinical Implications of Emergentist Theory. An emergentist perspective can be used to guide language assessment and intervention. A practitioner who uses an emergentist perspective is likely to attend to the inconsistencies in a child’s language and carefully note emerging features. Intervention with this theoretical base would engage the child with targeted features to foster systemwide change. The emergentist approach is consistent with two intervention approaches discussed in later chapters: language recasting and focused stimulation (Poll, 2011).

The Five Communication Subdomains

Experts have developed and debated the theories discussed above; these theories are critical to our understanding of the field. This section of the chapter is not about language theory—rather, it discusses the five communication subdomains, a model of language development that I have created to help students understand how children move through the language domains form, content, and use. In my teaching, I find that many beginning clinicians struggle to understand where to start with a child who has communication impairments. An experienced SLP can assess a child and fairly quickly determine whether the child needs to work primarily on social language (i.e., pragmatics) or word combinations (i.e., semantics), or whether the communication impairment involves the child’s use of grammar and sentence complexity (i.e., syntax). To help students learn clinical decision-making skills, I train them to consider sequentially each of the subdomains when analyzing a child’s communication behaviors. So, after you review the information in Focus 2.3, let me introduce you to the communication subdomains.

To understand the five communication subdomains, consider Figure 2.3. This figure presents form, content, and use in parallel boxes aligned in relation to four age groups: infant, toddler, preschool, and school-age children. Form, content, and use are represented by the left-to-right columns in Figure 2.3. The age groups are shown from top to bottom. Form, content, and use are subdivided into five communication subdomains: early pragmatics, vocabulary, early word combinations, morphosyntax, and discourse. Practice your clinical decision-making skills regarding form, content, and use by reading and thinking about the information in Focus 2.4.

FOCUS 2.3 Clinical Skill Building

As you learned in Chapter 1, form, content, and use are typically presented in a Venn diagram as three linked circles. The linked circles remind us that the three domains interact with each other and that no single domain functions in isolation. Keep this important relationship in mind as you read about the communication subdomains. I present the subdomains in linear fashion—to help students understand how the domains develop—but it is important not to lose sight of the critical relationships between the domains. It is the relationship between form, content, and use that allows an individual to be an effective communicator.
**Figure 2.3** Diagram Demonstrating Form, Content, and Use and the Five Communication Subdomains

<table>
<thead>
<tr>
<th>Infant</th>
<th>Toddler</th>
<th>Preschool</th>
<th>School-Age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMUNICATION SUBDOMAIN 1:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Pragmatics:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye contact, nonverbal and verbal turn taking, joint visual attention</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Later Pragmatics:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request, demand, question, respond, state</td>
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<td></td>
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<tr>
<td>Early Discourse:</td>
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<td></td>
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<tr>
<td>Initiate and maintain topics, repair communication, etc.</td>
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<tbody>
<tr>
<td><strong>COMMUNICATION SUBDOMAIN 2:</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Early Vocabulary Learning:</td>
<td></td>
<td></td>
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<tr>
<td>Agents, actions, modifiers, etc.</td>
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<tbody>
<tr>
<td><strong>COMMUNICATION SUBDOMAIN 3:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Word Combinations:</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>agent + action, object + agent, agent + object, action + object, action + location, entity + location, attribute + entity, etc.</td>
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<tbody>
<tr>
<td><strong>COMMUNICATION SUBDOMAIN 4:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later Vocabulary Learning:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prefixes and suffixes, root words, figurative language, relationships between words, vocabulary for academic use</td>
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</thead>
<tbody>
<tr>
<td><strong>COMMUNICATION SUBDOMAIN 5:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later Discourse:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Use language to interact and maintain status with peers; use politeness forms, sarcasm, humor; produce narratives; etc.</td>
<td></td>
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</tr>
</tbody>
</table>

*Phonology also is an important component of the form domain, although it is not a focus of this text.

**FOCUS 2.4 Clinical Skill Building**

Consider the following case examples and decide whether the deficits reflect form, content, or use. Remember that sometimes a deficit impacts more than one domain.

- A fourth-grade student is having difficulty comprehending his reading, especially in science and geography. He is very social and gets along well with his peers.
- A sixth-grade student who has been diagnosed with a learning disability does not appear to understand when other students are using sarcasm; he takes their statements literally. This situation is causing problems at school.
- A 2-year-old has 50+ words, but almost all of the words are nouns. He is not making 2-word combinations.
- An eighth-grade student is getting poor grades in writing composition. His teacher says his writing is “immature” and that he does not write with enough complexity.

*Phonology also is an important component of the form domain, although it is not a focus of this text.*
The five subdomains are presented in the following pages in this order: (1) early pragmatics, (2) vocabulary, (3) early word combinations, (4) morphosyntax, and (5) discourse. This order parallels the thinking process of a skilled practitioner. When a skilled practitioner observes an individual’s communication, he or she mentally “checks off” specific language abilities that are (or are not) observed. The process is not hit or miss; on the contrary, the important communication behaviors are identified, deliberately observed, and sequentially documented. As mentioned earlier, to train students to use this process, I ask them to consider each subdomain one step at a time. During a child language observation, I ask each student to answer the following questions:

- Do you see the early pragmatic skills associated with Subdomain 1?
- Do you see the beginning use of vocabulary in the young speaker associated with Subdomain 2?
- Do you see the word combinations expected in Subdomain 3?
- Is the student developing the advanced vocabulary expected at later stages of Subdomain 2?
- Do you see the morphosyntax features associated with Subdomain 4?
- Do you see the sophisticated discourse skills typically seen with Subdomain 5?

When the student answers each question, he or she focuses attention on the sequential process of communication development. Through this step-by-step process, students’ critical-thinking skills become more deliberate and focused. I hope this overview is helpful as you read about each of the communication subdomains. As you read about each of the communication subdomains, merge this model with all your prior knowledge of language development.

It is also important that you connect the subdomains with your understanding of Brown’s stages of language development. Roger Brown (1973) traced children’s syntax acquisition by considering their mean length of utterance (MLU; i.e., average sentence length) and documenting the morphemes occurring at varying levels of MLU. Brown’s Stage I is demonstrated in children between 12 and 26 months of age; it describes children prior to their use of morphemes. In contrast, Brown’s Stages II–V+ describe children with MLUs of 2–4+ words per utterance. Brown’s Stages II–V+ occur in children developing typically between the ages of 27 and 46 months (2 to 4 years of age).

At Brown’s Stages II–V+, children demonstrate an increasing use of morphological forms. I will be describing children’s morphosyntax development in the section on Communication Subdomain 4. More background on Roger Brown and his stages of language acquisition are provided in Focus 2.5. An overview of Brown’s stages of syntax development and his morphological features associated with each stage is provided in Table 2.3.

Following the discussion of each communication subdomain, I cover briefly the implications of the subdomain skills in relation to assessment and intervention. I will refer back to the five communication subdomains in upcoming chapters.

**Subdomain 1: Early Pragmatic Skills**

Communication Subdomain 1 begins at birth and is observed in children’s prelinguistic communication. Figure 2.4 is a visual graphic for Communication Subdomain 1. At the earliest stages, children make sounds, movements, and gestures, and they give visual attention without communication intention. However, communication partners attribute meaning to these actions, with the result that children developing typically eventually
FOCUS 2.5  Learning More

In 1962, Roger Brown and his associates at Harvard began a long-term study of syntax and morphological development. They followed the language development of three children they called Adam, Eve, and Sarah. Researchers observed and transcribed the children’s speech every week for a period of 1 year (for Eve) to 5 years (Adam and Sarah). Observations lasted from 30 minutes to over 2 hours. Brown partitioned the children’s increasingly longer utterances into five stages, according to the children’s MLU.

Brown noted that during Stage II, the children’s utterances typically became longer than two words and other linguistic forms (morphemes) emerged. Brown analyzed intensively 14 of the morphemes; he suggested that morphemes emerge in a specific sequence in most children: (1) the present progressive ing inflection on verbs; (2 & 3) the locative prepositions in and on (these develop at the same time); (4) the plural s inflection on nouns; (5) past irregular verbal inflections such as did, went, and came (Brown looked at a large set of irregular past tense verbs); (6) the possessive ’s inflection on nouns; (7) the uncontractible copula be (In sentences such as “Here I am” and “There it is,” the copula cannot be contracted.); (8) the definite and indefinite articles a and the; (9) the past regular ed inflection on verbs; (10) the third-person present tense regular verb inflection s ( “He talks”); (11) the third-person present tense irregular verb inflections does, doesn’t, and has; (12) the uncontractible auxiliary be (The past tense form cannot be contracted; we must say “He was going.”); (13) the contractible copula (“It’s red”); and (14) the contractible auxiliary be (“He’s going”).


Table 2.3  Brown’s Stages of Language Development

<table>
<thead>
<tr>
<th>Age/Brown’s stage</th>
<th>Morphemes</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–24 months/Stage I MLU 1.0–2.0</td>
<td>Semantic combinations: two-word utterances</td>
<td>See Communication Subdomain 3 (Morphological development has not yet emerged.)</td>
</tr>
<tr>
<td>24–30 months/Stage II MLU 2.0–2.5</td>
<td>ing verbs Prepositions (in, on) Plural s</td>
<td>“Boy running.” “On box.” “See two kitties.”</td>
</tr>
<tr>
<td>30–36 months/Stage III MLU 2.5–3.0</td>
<td>Irregular past tense verbs Possessive ’s</td>
<td>“I went home.” “That Daddy’s car!” “He is.” “The toy broke.” “Grandpa cooked dinner.” “She likes it.”</td>
</tr>
<tr>
<td>36–42 months/Stage IV MLU 3.0–3.75</td>
<td>Irregular past tense Articles (a, the) Regular past tense Regular 3rd-person verbs</td>
<td>“The dog has a bone.” “Is be going?” “Kitty’s eating.” “He’s little.”</td>
</tr>
<tr>
<td>42–60 months/Stage V–V+ MLU 3.75–4+</td>
<td>Irregular 3rd-person verbs Uncontractible auxiliary Contractible auxiliary Contractible copula</td>
<td></td>
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</tbody>
</table>
produce these same behaviors with communication intent. Children are thought to have communication intent when they exhibit a collection of behaviors including (a) producing gestures, vocalization, and/or eye contact to direct the attention or actions of a communication partner; (b) exhibiting joint visual attention; (c) waiting after a communication attempt (i.e., expecting the partner to respond); or (d) persisting in a communication attempt that is not understood. The frequency and rate of early intentional communication behaviors are associated with more advanced language during the child's later years (Calandrella & Wilcox, 2000).

**JOINT VISUAL ATTENTION**

Joint visual attention (JVA) is a particularly important early communication skill. The child demonstrates the ability to respond to JVA when he follows the visual direction of an adult’s gaze (i.e., looks where the adult is looking). The child initiates JVA when he points or shows an object with the intention of drawing his partner's attention to the object or event. JVA is one of the first interactive communication acts. Children reliably produce JVA between 10 and 12 months of age. It is important to remember that there will be cultural variation with respect to children's use of eye gaze, along with differences
in other aspects of early pragmatic function resulting from cultural communication patterns (Ochs & Schieffelin, 2001).

DEVELOPMENT OF EARLY PRAGMATIC FUNCTIONS

Between 8 and 15 months, children begin to demonstrate a range of pragmatic functions. These functions include requesting objects or activities, refusing, and commenting. Between 16 and 23 months, new pragmatic functions are added, including requesting information, answering questions, and acknowledging a response (Chapman, 2000). It is important to remember that children’s pragmatic functions can be demonstrated using varying communication means. For example, a child can demonstrate a request by pointing, gesturing, using a word and a gesture, or producing one- or two-word utterances (“Want cookie”). In all cases, the child is producing a request, although the way he or she is requesting varies from nonlinguistic to linguistic.

EARLY DISCOURSE SKILLS WITHIN COMMUNICATION SUBDOMAIN 1

As children become more adept communicators, they begin to actively participate in communication exchanges demonstrating the skills associated with discourse. Discourse is the connected and contingent flow of communication between two or more individuals. At the beginning stages of Communication Subdomain 1, a child’s conversational turns will be nonverbal (e.g., pointing, gesturing). Discourse skills include the following conversational rules that are required to complete a successful communication (Hegde & Maul, 2006):

- Initiating a conversation rather than always depending on the communication partner to initiate a new topic
- Taking turns during a conversational exchange rather than monopolizing the conversation
- Maintaining the ongoing topic of conversation rather than making overly abrupt topic changes
- Using language or nonverbal indicators to indicate when a conversational topic is being switched
- Indicating when the conversation is not understood and/or sensing when the communication partner does not comprehend the conversation (i.e., conversational repair)
- Using language appropriate for the context and situation (i.e., code switching)

The ability to use and request conversational repair is an important discourse skill. Conversational repair strategies are verbal behaviors exhibited by a speaker or listener during a communication breakdown. A listener uses conversational repair to indicate that he or she has not understood the speaker’s message. A repair can be as simple as “What?” or indicated by a more formal request, such as “I don’t understand what you just said.” A speaker uses conversational repair when he or she realizes there has been a communication breakdown. Preschoolers use an early level of communication repair when they repeat their message verbatim. More sophisticated conversational repairs are evidenced when the speaker restates or elaborates the utterance.

The term code switching refers to an individual’s ability to alternate between formal and informal language in conversations. It also refers to an individual’s ability to vary between dialectal language patterns and General American English. See Focus 2.6 to learn more about dialects.
Chapter Two

A child demonstrates conversational code switching when he or she uses one questioning style with a peer (“Wanna go?”) and switches to a formal questioning style when communicating to a teacher (“May I please go to my locker right now?”). Early discourse skills begin in preschool and continue to advance through the school-age years (see Subdomain 5).

FOCUS 2.6 Multicultural Issues

Dialects are variations of a particular language and are spoken by a large group of people who may share ethnic, regional, or national similarities. A dialect, like a language, has distinct syntactic, semantic, and phonetic features. There are at least 24 regional dialects within the United States. African American English (AAE) is one of the most frequently used nonmajority dialects in the United States. Dialects are often mislabeled as regional accents; however, accents reflect regional differences in phonology (e.g., pronunciation of vowels) and semantics (e.g., use of different words to describe the same object, such as “sack” versus “bag”). When one dialect is seen as “superior and proper,” the result is linguistic chauvinism. Linguistic chauvinism often results in speakers of a particular dialect being scorned. It may ultimately result in a student being afraid to express himself. Children often bear the brunt of linguistic chauvinism and may suffer psychological distress and educational barriers.

As an example of the negative effects caused by linguistic chauvinism, imagine a Jamaican American preschooler trying to communicate to his teacher using the dialect he was taught at home. Initially, the child may be surprised to understand that his teacher does not understand him, and he may be hurt if he is told, “That is not the right way to speak.” Instead of reprimanding the child, a teacher should repeat the child’s comment in General American English (i.e., “Standard English”). Next, the teacher should briefly explain that it is okay to talk differently at home than at school.

The teacher’s explanation about “home language” versus “school language” serves two purposes. First, the explanation facilitates the child’s meta-awareness of his speech pattern; it introduces the child to the concept of code switching by explaining that one language or dialect is appropriate at home and another is appropriate at school. Second, the teacher’s explanation honors the child’s home language and acknowledges that the child has the right to speak with varying dialectal patterns.

A child demonstrates conversational code switching when he or she uses one questioning style with a peer (“Wanna go?”) and switches to a formal questioning style when communicating to a teacher (“May I please go to my locker right now?”). Early discourse skills begin in preschool and continue to advance through the school-age years (see Subdomain 5).

CLINICAL IMPLICATIONS FOR COMMUNICATION SUBDOMAIN 1

The beginning pragmatic skills in Communication Subdomain 1 (i.e., joint visual attention, turn taking) underlie all later communication; children developing typically have pragmatic intent before they produce words (Chapman, 2000). This means that, as a skilled practitioner, you may focus on building pragmatic skills in older children with atypical communication. For example, if you are working with an older student with intellectual disability who lacks joint attention, turn taking, and imitation, you would facilitate these basic pragmatic skills in your intervention program. Pragmatic interventions also include helping individuals with social communication deficits join in peer play or group interactions (Timler, Olswang, & Coggins, 2005).
A focus on underlying pragmatic abilities is generally the first aspect of communication that is “checked off” during the observational process. If an SLP or a special educator identifies a weakness in an individual’s ability to enter interactions, become a part of interactions, and stay in interactions, Communication Subdomain 1 becomes the focus of intervention (Fujiki & Brinton, 2009).

**Subdomain 2: Vocabulary Development**

The early stage of Communication Subdomain 2 (vocabulary development) overlaps with early pragmatic development. In fact, it is important to remember that all the stages in the form, content, and use domains co-occur and influence each other.

Vocabulary development begins toward the end of the first year of life and continues to develop throughout one’s life. Vocabulary development “takes off” during the early preschool years and then experiences another surge during the school years, when children develop advanced vocabulary associated with content areas (i.e., content words associated with social studies, science) and written language (see Chapters 6 and 10). Figure 2.5 is a visual presentation of Communication Subdomain 2.

**Figure 2.5 Communication Subdomain 2**
A child's first words are typically produced between 10 and 16 months. First words usually describe:

- Appearance/disappearance/recurrence ("more," "all gone," "hi," "bye-bye")
- Names of people, pets, and interesting objects ("Mama," "Dada," "kitty," "light")
- Affection attitudes ("hug," "no") (Chapman, 2000)

Fillmore (1968) proposed that children's semantic use of words precedes syntax and is guided by universal concepts. He named his theory *case grammar*.

Children's vocabulary development progresses quickly: By the time they are 2 years old, children typically produce 200 to 500 words and understand many more words than they produce (Fernald et al., 2001). By 30 months, children's vocabulary consists of approximately 54% common nouns, 7% verbs, and 5% adjectives. Other categories include function words (*the, a, and, mine*) and sound effects (Caselli, Casadio, & Bates, 2001). Semantic deficits are characteristic of many language disorders, including developmental delay, autism spectrum disorder, hearing impairment, and specific language impairment. During the school years, students with language-learning disabilities continue to demonstrate semantic problems. For example, students with language impairments have difficulty comprehending stories in both spoken or written form, have difficulty with figurative (i.e., nonliteral) language, and demonstrate problems with extended discourse (McGregor, 2009).

**CLINICAL IMPLICATIONS FOR COMMUNICATION SUBDOMAIN 2**

Practitioners continually evaluate whether vocabulary levels can support a child's communication and promote academic achievement. At early stages in vocabulary development, practitioners consider whether children's word usage reflects a variety of semantic categories. Many children with language impairments do not develop enough action words; this deficiency negatively impacts the formation of sentence production. An interventionist may train caregivers to facilitate a variety of semantic forms.

Children's vocabulary use often varies in relation to their environmental experiences. Consider, for example, that first-graders from families of high socioeconomic levels know twice as many words as children from poor families (Hart & Risley, 1995). An interventionist takes this into account and works with some families to train them in book-reading strategies and implement other vocabulary-enhancing approaches (see Chapter 5).

Vocabulary continues to be a focus for school-age students. The average 17-year-old knows more than 60,000 words (Bloom, 2001); imagine the challenges for a student with language impairment who struggles to learn new vocabulary! Experts propose a number of best practices to help students become successful word learners (National Reading Panel, 2000; Nelson & Van Meter, 2006). Successful vocabulary interventions should (a) integrate new word meaning with familiar words; (b) provide repeated, meaningful, and contextual opportunities to learn new words; (c) provide explicit (i.e., teacher-directed, didactic) and implicit (i.e., naturalistic, exploratory) learning opportunities; (d) aim for fluent and automatic understanding and use of new words; and (e) teach students to be more independent word learners.

A concept associated with word learning is called syntactic bootstrapping. **Syntactic bootstrapping** occurs when a child is able to glean the meaning of a novel word from the surrounding function words. I provide more details and research regarding syntactic bootstrapping in Focus 2.7.
FOCUS 2.7 Research

Syntactic bootstrapping occurs when a child is able to glean the meaning of a novel word from the surrounding function words. For example, if I say, “He saw a bleeper,” you are likely to guess that the word bleeper is a noun because it follows the article a. Research has confirmed children’s use of syntactic bootstrapping at a very young age. For example, Mintz and Gleitman (2002) showed that 36-month-old children identify a word as an adjective from its position in a sentence. In their experiment, a puppet described an object using a nonsense adjective. For example, “Look at this stoof horsie! This horsie is very stoof.” After presenting the training items, an experimenter showed the children two test objects side by side and asked, “Look at these two things. Can you give the puppet the stoof one? Can you show the puppet which of these two things is stoof?” The results indicated that preschoolers identified objects with shared descriptive characteristics (i.e., the same color or size), showing that preschoolers use syntax to make deductions about word characteristics. Syntactic bootstrapping helps children learn the meaning of new words.

Figure 2.6 Communication Subdomain 3

Subdomain 3: Multiple-Word Combinations

Once an individual produces approximately 50 individual words, word combinations begin to emerge. Figure 2.6 visually demonstrates the word combination stage, Communication Subdomain 3. Early word use is not categorized by syntax terms such as noun or verb. Consequently, Communication Subdomain 3 (early word combinations)
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and Communication Subdomain 4 (morphosyntax) are qualitatively different. I elaborate on what I mean by “qualitatively different” in the next two paragraphs.

Remember that Brown’s stages of language acquisition are framed around syntax and morphological acquisition. Therefore, Communication Subdomain 1 (early pragmatics), Communication Subdomain 2 (early vocabulary learning), and Communication Subdomain 3 (beginning word combinations) all occur before a child demonstrates the use of syntax and morphology. I demonstrate this visually in Figure 2.7.

This concept can be confusing for a beginning practitioner. It is important to clear up any confusion, however, because (unfortunately) some interventionists focus on syntax and morphology too soon. So—at the risk of repeating myself—the foundational skills demonstrated within Communication Subdomain 1 (i.e., joint visual attention, turn taking, imitation, early pragmatic skills), the one-word productions uttered at the early stages of Communication Subdomain 2, and the semantic word combinations produced within Communication Subdomain 3 precede an individual’s readiness for Communication Subdomain 4 (morphosyntax). In the first three subdomains, children are not using syntax and morphology. However, the communication skills characteristic of the first three subdomains are always noted; delayed or nonexistent skills within the first three subdomains are targeted for intervention.

So, to return to the issue of “qualitative difference,” Communication Subdomain 3 is qualitatively different from Communication Subdomain 4 because, at this early word combination level, children are not governed by adult syntax rules and do not use morphological forms. Instead, in Communication Subdomain 3 children create combinations of words by naming objects or people of interest, stating the actions objects or people perform, describing the object’s or person’s characteristics, and describing who owns or

**Figure 2.7** Relationship between Communication Subdomain 3 and Brown’s Beginning Use of Morphemes

- Toddler
- Preschool
- School-Age

Form (Syntax and Morphology)

Brown’s Stage I: (Same as Communication Subdomain 3)

**COMMUNICATION SUBDOMAIN 4:** Morphosyntax (Brown’s Stages II–V+)

Morphemes begin to emerge: *ing* (present progressive verb), *s* (plural), ‘s (possessive), prepositions *in* and *on*, etc.
Language Theory and the Communication Subdomains

possesses an object. Practitioners use semantic terms to describe these productions: agent (the “doer” of the action), object (the receiver of the action), action, location, possession, and object attribution.

Children’s early word combinations must be judged within the contexts in which they occur. For example, a child might say “Doggie house” and mean “The dog is in his doghouse” or “That is the dog’s house” or “I want the dog to come in my house.” Table 2.4 provides examples of early word combinations and demonstrates how the word combinations are described using semantic terminology.

**Table 2.4 Examples of Two-Word Combinations**

<table>
<thead>
<tr>
<th>Semantic combinations</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent + action</td>
<td>“car go,” “kitty bye-bye”</td>
</tr>
<tr>
<td>Action + object</td>
<td>“kiss dolly,” “need juice”</td>
</tr>
<tr>
<td>Agent + object</td>
<td>“kitty ball”</td>
</tr>
<tr>
<td>Action + location</td>
<td>“put in”</td>
</tr>
<tr>
<td>Entity + location</td>
<td>“Sam outside”</td>
</tr>
<tr>
<td>Possessor + possession</td>
<td>“my doll”</td>
</tr>
<tr>
<td>Demonstrative + entity</td>
<td>“that doggie”</td>
</tr>
<tr>
<td>Attribute + entity</td>
<td>“wet sock”</td>
</tr>
</tbody>
</table>

**CLINICAL IMPLICATIONS FOR COMMUNICATION SUBDOMAIN 3**

Once a child is able to demonstrate Communication Subdomain 1 (early pragmatic skill) and has more than 50 single words (developed during early-stage Communication Subdomain 2), practitioners target early word combinations (Communication Subdomain 3). Interventionists engage children in early play activities (e.g., playing with building blocks or trucks, sociodramatic play with dolls) to facilitate multiple-word combinations. A child’s caregivers also are trained to facilitate these semantic combinations.

For older individuals with significant communication impairments, practitioners also may target Communication Subdomain 3. Communication may either be verbal or incorporate an augmentative and alternative communication (AAC) approach. You will learn more about AAC in Chapter 11.

**Subdomain 4: Morphosyntax Development**

Communication Subdomain 4 coincides with Brown’s stages of language acquisition II–V+. At this point children’s utterances begin to demonstrate characteristics of syntax and morphological development (i.e., language form). The emergence of syntax and morphemes occurs between 24 and 36 months for children developing typically. Examples of early-developing morphological structures include the present progressive *ing* verb form and the initial occurrence of the plural *s*. (Review Table 2.3 for the list of Brown’s morphemes.)
By the time children are age 5, their sentences evidence complex syntax, including the use of embedded phrases and clauses. Figure 2.8 is a visual presentation of Communication Subdomain 4.

I use the term morphosyntax to avoid wordiness throughout this book and because the lines between syntax and morphology are blurred. For example, when a speaker asks the question “Are you going to the party?” she uses several morphemes (e.g., the auxiliary verb are and the ing verb). However, the speaker also uses syntax rules to sequence the morphemes into an interrogative reversal sentence. The term morphosyntax captures this combination of features. However, you should also keep in mind that the three components of language form (morphology, syntax, and phonology) have distinct properties that can independently challenge children who have language impairments. In Chapter 6, I describe particular morphological challenges of children with specific language impairments.

Morphology by definition involves the smallest unit of linguistic meaning. Some morphemes are considered to be free morphemes. Free morphemes can stand alone, as in the example of unmarked verbs (walk, drive, go) and unmarked object names (boy, tree, street). A bound morpheme carries meaning but must occur with a free morpheme. Bound morphemes include the plural s (boys), possessive ’s (girl’s), verb tenses (walked), and so forth.

An interesting feature of bound morphemes is their morphophonologic features. Morphophonology refers to the phonological variations occurring with morpheme use. For example, when creating a plural form, speakers sometimes use an es and sometimes an
s, depending on the final phoneme in the word. To illustrate, speakers produce the plural of *bus* with *es* (*buses*) but produce the plural of the word *hat* with *s* (*hats*). In another version of plural form, speakers produce the plural of a word with a final /f/ (*leaf*) with *ves* (*leaves*).

Morphophonologic variation also is demonstrated by different pronunciations of the past tense *ed* morpheme. Speakers produce a voiceless /t/ when the root verb ends with a voiceless phoneme (*pushed, walked, bounced*) but use a voiced /d/ when the root verb ends with a voiced phoneme (*played, carried, showed*).

**CLINICAL IMPLICATIONS FOR COMMUNICATION SUBDOMAIN 4**

Once an individual (a) demonstrates the ability to use foundational pragmatic functions (Communication Subdomain 1) and (b) produces multiword combinations using a variety of semantic categories (Communication Subdomain 3), practitioners typically evaluate a speaker’s use of morphosyntax using the framework developed by Brown (1973). In Chapter 3, I describe the process used to complete a language analysis using Brown’s stages.

An individual’s syntax competency continues to increase in sophistication during the school years. Consequently, practitioners focus on syntax skills in their interventions with school-age students who demonstrate weaknesses in this area. Often syntax deficits are demonstrated in students’ ability to read difficult texts and write at the level required for school success. During the school-age years, syntax analysis and intervention often focus on the speaker’s use of sentences with conjunctions (*and, but, then, or, because, after, unless*) and sentences with embedded clauses. I describe assessment and intervention of complex syntax production in Chapters 3, 6, and 10.

**Subdomain 5: Advanced Pragmatic and Discourse Development**

Although Communication Subdomain 5 is listed last in my ordering system, remember that all the aspects of form, content, and use have been developing side by side since the child began to communicate. In children developing typically, the discourse skills associated with Communication Subdomain 5 have evolved seamlessly from the early pragmatic/discourse skills associated with Communication Subdomain 1. Further, the older child’s discourse skills require the vocabulary and syntax competency associated with the other subdomains. Remember that discourse is defined as the connected and contingent flow of language between two or more individuals. Vocabulary, morphologic, and syntax skills are required to have a connected and contingent flow of information! A visual diagram of Communication Subdomain 5 is shown in Figure 2.9.

Between ages 3 and 7, children’s developing pragmatic/discourse skills include the ability to use language to reason and to reflect on past experiences, predict events, express empathy, maintain status and interactions with peers, use and understand sarcasm and politeness forms, and code switch in order to adapt communication to the situation and listener (Chapman, 2000).

During the school years, students continue to increase the sophistication of discourse competencies. A successful learner develops communicative behaviors required for school success. High-level pragmatic/discourse skills are needed to (a) gain access to social activities, (b) participate effectively in group learning activities (e.g., science experiments), (c) respond to others’ comments by validating their opinions, (d) sustain cooperative group
(e) negotiate differences of opinion, (f) offer contradicting opinions with socially acceptable strategies, and (g) respond appropriately to teacher or peer feedback (Fujiki & Brinton, 2009).

Teacher–student communication is a form of discourse called classroom discourse. Classroom discourse generally is characterized by the teacher’s initiation of a question, the teacher’s evaluation of the student’s verbal contribution, and the teacher’s control of the conversational topic (Moore, 2012). Also, classroom discourse currently is viewed as the mechanism that facilitates students’ high-level thinking skills (e.g., problem solving in mathematics, science, social studies; Nilsson, 2008).

Students also have to learn to modify discourse styles for different situations. Some forms of discourse are called narratives. An oral narrative is a verbal retelling of past experiences or a telling of “what happened” (Ukrainetz, 2006). An individual’s ability to produce narratives is associated with school success (Green, 2009). A different form of narrative is called an expository narrative. This is an informational genre; teachers ask for expository narratives when they ask students to describe a scientific experiment or summarize a historical event (“Describe the events leading up to and causing the Civil War”). Each discourse and narrative genre places unique demands on the language learner. I provide more information on narrative development and discourse interventions in Chapters 5 and 10.

**CLINICAL IMPLICATIONS FOR COMMUNICATION SUBDOMAIN 5**

Skilled practitioners track children’s abilities to use vocabulary, produce sentences, and use advanced language within sophisticated discourse genres demonstrated in Communication Subdomain 5. SLPs and special educators recognize that very specific discourse demands
are placed on students entering school; the challenges are even greater for children with language disorders (Peets, 2009). To obtain a complete picture of a student’s discourse abilities, a practitioner must observe the student in the classroom, with peers, during production of narratives, and in response to a variety of stimuli and situational prompts (e.g., story retelling, expository narratives, group interactions).

The accurate assessment of discourse demands careful language analysis skills; I discuss discourse analysis in Chapter 3. Interventions focusing on peer interactions and the sophisticated language abilities needed for reading and writing are discussed in Chapters 6 and 10.

Summary

- Nature versus nurture is a historical debate over whether language is an innate ability of humans or a function of an individual’s environment.
- Behaviorist theory suggests that learning occurs when an environmental stimulus triggers a response or behavior.
- Cognitive constructivist theory is based on the writings of Jean Piaget, who proposed that children demonstrate a sequence of progressively more sophisticated cognitive abilities.
- Social interactionist theory is based on the principle that communication interactions play a central role in children’s acquisition of language; this theory is often connected to the writings of Vygotsky.
- Emergentist theory views language learning as an interconnected system that is more than one’s genetic makeup, or environment, or the neural connections that develop as a child is exposed to a language; it is a complex, open system in which a child’s biology adapts to his or her environment.
- Practitioners use behaviorist theory when they use reward systems to train behaviors.
- Practitioners observe children’s play behaviors to informally gauge children’s general cognitive ability and level of representational thought; this is an example of how cognitive theory has influenced clinical practice.
- Social interactionist theory has influenced many current therapies; practitioners use this theoretical approach to focus on enhancing interactions between communication partners.
- Emergentist theory guides much of the current research on language acquisition; the research often uses computer simulations to understand language development.
- Communication Subdomain 1 encompasses early pragmatic skills, including joint visual attention, imitation, and turn taking.
- Vocabulary (Communication Subdomain 2) progresses from the early one-word level and continues to develop through adulthood.
- Once children have more than 50 words, they typically begin to produce 2-word combinations during the development of Communication Subdomain 3.
- Syntax and morphological development, often described in terms of Brown’s stages of language development, are evidenced during Communication Subdomain 4.
- Children’s discourse skills continue to develop in Communication Subdomain 5.
- Early pragmatic functioning (Communication Subdomain 1) is fundamental to all communication and may be the focus of intervention for individuals with severe social communication deficits.
Practitioners may target teaching children a variety of semantic meanings at the one-word level and facilitate advanced vocabulary learning for children with vocabulary deficits (Communication Subdomain 2).

Practitioners use language facilitation techniques and/or train caregivers to develop children's use of multiple-word utterances. Some children with severe disabilities may use augmentative and alternative forms of communication to communicate at this level (Communication Subdomain 3).

If children are having difficulty with morphosyntax in Communication Subdomain 4, practitioners use language analysis to determine appropriate linguistic targets.

Practitioners facilitate social use of communication to enhance a child's social and academic achievement; this is the focus of Communication Subdomain 5.

**Discussion and In-Class Activities**

1. In groups, brainstorm three activities that you could implement with five different individuals. Each group should focus on an individual with a primary deficit in one of the five subdomains. Share the activities in class. Compare and contrast how the activities differ based on the communication priorities of each communication subdomain.

2. Following the discussion above, identify a theoretical approach supporting one activity from each communication subdomain.

3. Find a number of catalogs that contain intervention materials and assessments. In small groups, locate materials listed in the catalogs that you believe are based on the following theoretical approaches: behaviorism, social interactionism, and cognitive constructivism (i.e., sensorimotor emphasis). List or underline the words in the item description that support your conclusion. Share what you find with the rest of the class.

4. View video recordings of individuals with communication impairments. If you had to pick only one communication subdomain to target in intervention, which one would it be? Explain your answer.

5. Watch this YouTube clip on African American English (AAE): www.youtube.com/watch?v=Zqohw8nR6qE. One of the speakers discusses how and when he decides to code switch. Does everyone code switch to some degree? Give examples.

6. Listen to American dialects posted on the Internet at http://dare.wisc.edu (select Sample, Audio Samples, and then click one of the samples listed). Have students break into groups and have each group choose an area of the country. The group should then summarize that area’s dialect in terms of vocabulary (i.e., word choice), prosody, and phonology. The group should determine what stereotypes are sometimes associated with the dialect it studies.
Chapter 2 Case Study

Sachi is a 4-year-old female attending a preschool program; it is an inclusion program (i.e., some children are developing typically, and others have developmental delays). Although Sachi has not been formally diagnosed, she demonstrates behaviors on the autism spectrum. She is not linguistic, does not interact socially with others, and does not initiate early pragmatic functions. She spends most of her time wandering around the classroom, carrying a small battery-powered fan that she and turns off and on. As the assessor, you have identified goals in Communication Subdomain 1 as the most important communication targets. You have been working with Sachi in the classroom, incorporating her peers in turn-taking games such as “marble raceway” (i.e., the children take turns dropping the marble into the spiral racetrack). Sachi is starting to respond to her name and make eye contact when it is her time to take a turn.

Sachi’s parents are Japanese American. They speak some English, but to communicate effectively, you must speak slowly and use simple vocabulary. Sachi’s parents have scheduled a conference with you; they are concerned because you are not teaching Sachi “to talk.” To explain your intervention goals, you begin by showing video-recorded interactions of young children (toddler age). You turn off the volume so that Sachi’s parents will focus on the nonverbal signs of communication. You ask Sachi’s parents to identify instances of nonverbal communication. With your help, they identify gestures, pointing, eye gaze, smiling, joint attention, and waiting behaviors. You emphasize the importance of these behaviors as a foundation for later communication.

Finally, you show a video recording of Sachi in her supported classroom interactions. You and Sachi’s parents identify instances where Sachi is beginning to demonstrate early pragmatic communication. Together, you and Sachi’s parents begin to identify some activities they can do at home to facilitate Sachi’s early pragmatic skills.

Questions for Discussion

1. View videotapes of young children; watch while the volume is turned off. Locate instances of behaviors reflecting Communication Subdomain 1.
2. Role-play the interaction with Sachi’s parents with other students in your class. Practice explaining your communication goals in simple terms. Draw a simple diagram to help Sachi’s parents understand the need to begin with nonverbal pragmatic communication behaviors.