Language Development from Theory to Practice

FOURTH EDITION

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Preface

Language development is an incredibly exciting field that connects to many areas of study, including allied health (such as speech-language pathology and audiology), the liberal arts (such as linguistics and psychology), and education (including early childhood, elementary, and special education). Because of this broad relevance, many undergraduate and graduate programs and preprofessional training programs require at least one course in language development. Instructors who teach these courses often note that introductory language development texts should:

- Clearly connect theories of language development to current educational and clinical practices
- Address individual differences in development, including cultural and linguistic diversity and atypical development (e.g., children with disabilities)
- Provide practical descriptions of tools used to measure language skills, including digital assessment methods
- Offer a genuinely multidisciplinary perspective that reflects the varied fields contributing to our understanding of language

Language Development from Theory to Practice was designed to meet and exceed these criteria. The text offers a comprehensive overview of the major topics in language development, including research methods, theoretical perspectives, developmental milestones from infancy through adolescence and beyond, language diversity, and language disorders. Our goal is to give students a strong foundation for advanced study in areas such as language disorders, psycholinguistics, bilingual and second language instruction, and developmental psychology. Rather than promoting a single theoretical perspective or framework, we introduce a range of theoretical orientations and viewpoints and explain how each has shaped research and practice in the relevant fields mentioned earlier.

New to This Edition

The Fourth Edition builds on the strengths of earlier versions while incorporating suggestions from instructors, students, and researchers. We have continued to prioritize features that support active learning in the text and/or in the ancillary online materials. The major updates to this edition include:

- Expanded focus on literacy development, including the Science of Reading, decoding, language comprehension, phonics, and the relationship between oral language and reading achievement

- Broader treatment of language diversity and multilingual development, with current perspectives on bilingualism and multilingualism, code-switching, translanguaging, English Learners, and second language acquisition
- Current approaches to childhood language disorders, including developmental language disorder (DLD), autism spectrum disorder, and other neurodevelopmental conditions, with updated terminology and research
- Reconceptualized treatment of nature and nurture in language development, integrating neuroscience and environmental influences on language learning, brain development, language processing, sensitive periods, and neuroplasticity
- The *Theory to Practice* boxes have been revised to focus on *"How Does This Content Relate to Classroom and Clinic Contexts?"* with practical recommendations for educators and clinicians
- Updated research and content throughout, complemented by additional data tables and visual elements
- All of the online materials have been updated to align with the new edition, and we have added several new resources including an LMS course module, case studies, and terminology flashcards

Additionally, several learning features previously in the text are now provided through the digital resources package. The end-of-chapter quizzes and the videos are available on the student section of the PluralPlus companion website, while the *Check Your Understanding* questions serve as formative knowledge checks within the new LMS course modules. This approach preserves these valuable learning resources while providing them in digital environments well suited to student review, self-assessment, and active learning.

Organization of the Text

Language Development from Theory to Practice is organized into 10 chapters. Chapter 1 defines language and explains how it relates to speech, hearing, and communication. It also introduces the domains of form, content, and use, and concludes with an overview of language differences and disorders. Chapter 2 explores the building blocks of language: phonological, morphological, syntactic, semantic, and pragmatic development. Chapter 3 describes the many reasons why people study language development, introduces major approaches to its study, and outlines key language-development theories. Chapter 4 explains how nature and nurture work together in language development, including how the brain processes and produces language. This chapter also examines sensitive periods in neuroanatomical and neurophysiological development and explains how caregiver interactions support early learning. Chapters 5 through 8 examine language development across four developmental periods: infancy (Chapter 5), toddlerhood (Chapter 6), the preschool years (Chapter 7), and the school-age years and beyond (Chapter 8). Each chapter discusses typical milestones; achievements in form, content, and use; intra- and interindividual differences in language development; and methods researchers and clinicians use to measure language development. Chapter 9 focuses on language diversity,

including the relationship between language and culture, how languages evolve and change, bilingualism and second language acquisition, and theories of second language acquisition and their implications for practice. Chapter 10 addresses language disorders in childhood. It defines the concept of a language disorder, outlines who identifies and treats these disorders, describes major types of language disorders, and summarizes effective intervention approaches.

Key Features of the Text

Each chapter bridges language-development theory and practice by providing students with a theoretical and scientific foundation to the study of language development. We emphasize the relevance of the material to students' current and future experiences in clinical, educational, and research settings.

Cultural and Linguistic Diversity

We highlight the many ways culture shapes language development, helping students understand and appreciate the diversity of children's communication experiences within and beyond the many types of communities in the United States.

Research Foundations

Current initiatives in the educational, social science, and health communities emphasize the use of evidence-based practices. Such practices emphasize the importance of research results to making educational and clinical decisions. In keeping with this premise, we emphasize the research foundations of the study of language development and use the most current empirical findings to describe children's language achievements.

Multidisciplinary Focus

The study of language development is constantly evolving and being influenced by many diverse disciplines; this multidimensional and multidisciplinary foundation attracts many students to the study of language development. We introduce exciting innovations in theory and practice from many diverse areas of research.

Accessible, Student-Friendly Approach

We present the complexities of language development in an accessible, student-friendly manner without sacrificing the scientific and theoretical foundation students need. Concepts are introduced clearly and organized to help students build their understanding as they progress through each chapter, while examples and visual elements help make abstract and complex information more concrete. Pedagogical features are integrated throughout to highlight essential information, reinforce learning, and encourage students to engage actively with the material.

The text includes many pedagogical elements:

- **Learning Outcomes** begin each chapter and are aligned with key concepts and skills.
- **Important key terms are bolded and appear in an end-of-book glossary** to help students identify, learn, and review essential terminology.
- ***Theory to Practice* boxes** at the end of chapters offer recommendations for teachers and SLPs.
- **Chapter Summaries** reinforce major concepts and developmental principles.
- **Rich visual supports**, including colorful figures, tables, and photographs, contextualize abstract and complex information.

PluralPlus Online Ancillaries

The Fourth Edition is supported by a comprehensive collection of supplemental resources available through the **PluralPlus companion website**. These online resources extend learning for students beyond the book and provide instructors with flexible tools for course preparation and delivery.

For Instructors

- Customizable **lecture slides** provide chapter-by-chapter support for classroom instruction.
- An **Instructor's Resource Manual** with Learning Outcomes, Activities, Discussion Points, Case Studies, and a Test Bank with multiple-choice, true-false, and essay questions.
- A ready-to-import **LMS Course** with chapter-aligned modules tied to the Learning Outcomes. The modules present key concepts, *Check Your Understanding* assessments, and videos.

For Students

- **Quizzes** provide opportunities for self-assessment and review.
- **eFlashcards** reinforce the important terminology from the glossary.
- **Videos** illustrate and reinforce concepts presented in the text.

Instructions for accessing the online materials are provided on the inside front cover of the book. The companion website is located at:

https://www.pluralpublishing.com/publication/ldftp4e

About the Authors

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Laura Justice, PhD, is Distinguished Professor of Educational Psychology at The Ohio State University (OSU). A certified speech-language pathologist, Dr. Justice is an active researcher whose work focuses on language development and interventions in the birth-to-five population, with more than 200 peer-reviewed publications. Dr. Justice is passionate about the translation of research to inform practice and policy, and serves as the Executive Director of the Crane Center for Early Childhood Research and Policy at OSU.

CHAPTER 1

Language Development

An Introduction

Learning Outcomes

After completion of this chapter, the reader will be able to:

1. Define the term *language*.
2. Describe how language relates to speech, hearing, and communication.
3. Describe the major domains of language.
4. Identify several remarkable features of language.
5. Understand sources of variation in language development.

Hundreds of scientists worldwide study the remarkable phenomenon of children's language acquisition. Each year, these scholars publish the results of numerous studies on children's language development in scientific journals, pursuing answers to such questions as:

- Are some languages more challenging for children to acquire than others?
- Does screen time help or hinder children's early language development?
- Do children who show early delays in language development typically catch up with their peers?
- Do children learning a signed language develop language similarly to children learning a spoken language?
- Why do children with autism have such difficulties developing language skills?

These questions provide the student of language development a glimpse into many of the interesting topics language scientists focus on in their work around the world. These questions also suggest how important language research is to informing the everyday practices and activities of parents, teachers, psychologists, and other professionals invested in helping children achieve their fullest language development potential. That these questions and so many others have yet to be fully answered signifies that the study of language development is a constantly evolving and complex area of science in which practitioners have many more questions than answers.

In this chapter, we provide a general introduction to the study of language development and consider five major topics. In the first section, we answer the question "What is language?" and present a definition of language that we build on throughout this text. In the second section, we discuss differences among speech, hearing, and communication—three aspects of human development and behavior that are closely related but are nonetheless distinct capacities. In the third section, we address the major domains of language, a topic we introduce here and discuss more fully in Chapter 2. In the fourth section, we examine several remarkable features of language, and in the fifth section, we describe sources of variation in language development—two topics we explore more comprehensively in Chapters 9 and 10.

What Is Language?

Language Defined

You probably have an intuitive sense of what **language** is because it is a human behavior you have acquired to a sophisticated level and use routinely for various purposes. In fact, you are using your language abilities right now as you read this chapter. However, if you take a moment to define language more explicitly, you may find the task challenging. Give it a shot, using the box below:

My Definition of Language:

If you found that difficult, you are not alone. In fact, if you were to ask 10 classmates for a definition of language, each would likely respond differently. The same outcome would probably occur if you questioned 10 language researchers!

Some aspects of language that might have appeared in your definition are: Language is a basic and essential human behavior that typically develops early in life. Language involves words and sentences and both expression (language production) and comprehension (language understanding). Language is a process of the brain that helps people communicate their thoughts to other individuals. Language is related to speech, hearing, and communication. Even more specifically:

> **Language** is a dynamic rule-governed system of symbols that is used in various modes for thought and communication (American Psychological Association, 2018; American Speech-Language-Hearing Association, 1982).

Next, we explain more clearly the key features of language described in this definition.

Language Is a System of Symbols

The first feature of language warranting discussion is that it is a code, consisting of a system of symbols called **morphemes**. Morphemes are the smallest units of language that carry meaning; we combine them to create words. Some words consist of a single morpheme (e.g., "school"), but many words comprise two or more morphemes, such as "schools" (two morphemes—"school" + "-s," with the second morpheme "-s" marking plural tense) and "preschools" (three morphemes—"pre" + "school" + "-s"). These symbols can exist in spoken, written, or signed (manual) format, a point we'll return to shortly.

In its use of symbols, language is a type of *code*. A code refers to the translation of one type of information into another type of information, which involves the use of symbols. A symbol is a sign or object that stands for something else (such as when you hold your thumb up in the air to signify that everything is OK!). For humans to develop the capacity to use language thousands of years ago, perhaps the most important prerequisite was the human ability to use symbols. In language, we build words by combining morphemes to express many different aspects of the world to others. For instance, as English speakers, we can represent an internal feeling of happiness by using the single word "happy." When we use the word "happy" in a conversation with other people to describe our feelings, we use the word itself as a symbol to represent our feeling of happiness. Although we can share feelings and ideas through other means—such as gestures, facial expressions, and posture—words are highly specific and provide a uniquely powerful tool for communicating.

An important characteristic of the language code is that the relationship between a word and its **referent** (the aspect of the world to which the word refers) is *arbitrary*. For example, although English speakers recognize that "happy" refers to a specific feeling, any other word (e.g., "sprit," "nopic," or "grendy") would do. Likewise, one way English speakers can denote plurality is to attach the morpheme "-s" to words, as in "pens" or "dogs." Because the relationship between the plural morpheme "-s" and its plural marking is arbitrary, English speakers could denote plurality in various other ways. In contrast, the code we use to organize words into sentences is not arbitrary; rather, we must follow specific rules for organizing thoughts into words and sentences, as we discuss next.

Language Is Rule-Governed

The second feature of language is that it follows rules. The rule-governed feature of language allows members of a given language community, such as Mandarin speakers, to communicate in that language. Individuals within a given language community accept the rules that govern their shared language. For instance, speakers of English agree to use the word "dog" (and related words and synonyms, such as "pup," "puppy," and "canine") to refer to those companion creatures, rather than other potential words, such as "boop" or "ming." Speakers of Spanish use a different word to refer to their companion friends ("perro"), as do users of American Sign Language. Adhering to specific rules allows all members of a language community to use language with one another as a tool for expression. A *language community* is a group of people who share a common language. In fact, somewhere in the history of the human species, a single language probably emerged within a social community of about 100 hominids (Cartwright, 2023). Some experts argue that language emerged within this community as a type of grooming behavior, providing an efficient way to share socially useful information (Christiansen & Kirby, 2003). Accordingly, the numerous languages of the world emerged from this single community of language users.

In Chapter 2, we discuss in more detail the rules used in language, but here we briefly discuss one of these rules to further detail the rule-governed nature of the language system: the marking of past tense. Consider an instance in which you want to communicate something that happened in the past, prior to today. There are words you can use to mark *tense*, or the expression of time, such as "yesterday," but we also apply rule-based *inflections* to verbs to signify that they happened in the past. In English, we do this with the past tense "-ed" inflection. We use this inflection to mark verbs as past tense, as in "called," "walked," or "chatted." (In English, many verbs are considered irregular, in which we mark tense differently, as in "hit," "told," and "rang." These are considered irregular because they don't follow the rule!). A fascinating aspect of language (which we shall discuss shortly) is that once one knows these rules, they can apply them generatively to previously unknown words and even made-up words. For instance, young children will mark past tense by applying the "-ed" inflection to words they have only just learned and to irregular verbs as they are still sorting out when and when not to use this inflection, as in: "I told-ed Grandma about the new dog!"

Language Is Dynamic

The third feature of language is that it is dynamic. This means that language is in a state of activity and change, both within an individual who is acquiring language and within a community itself. Let's consider the case of the individual. As we discuss throughout this book, the acquisition of language begins at birth, or even before birth, in utero, and is in a near-constant state of change across the lifespan. Even as adults, our language skills are dynamic. As one example, we might seek to learn a second (or even third!) language. As another example, as we age, some aspects of our language skills may decline. We might have increasing difficulty finding the names for things (Studer et al., 2024), which is a normal part of aging.

The language a community uses is also very dynamic, constantly changing. When the first edition of this book was published, in 2008, there was no such word as "selfie," which is now a

commonplace term. In any language, words come and go. Can you think of other words that have recently become commonplace among your language community?

Language Can Be Used in Various Modes

A fourth feature of language is that it can be used in various modes. Language can be spoken and heard (spoken language), it can be written and read (written language), and it can be used manually (sign language). In fact, a sentence expressed in spoken language can also be expressed in written language and in sign language.

Language Is a Tool for Human Communication

The fifth feature of language, and possibly its most important, is that it is a tool for human communication.

Communication is the process of sharing information, such as thoughts, feelings, and ideas, among two or more persons. Although other species are able to communicate, such as dogs, primates, birds, dolphins, and ants, the innate and specialized capacity of humans to use language as a tool to communicate is what makes the human species unique. For instance, although some primates may communicate alarms to one another using calls, these alarm calls seem to be general and do not symbolically represent a given predator (e.g., eagle) (Christiansen & Kirby, 2003). Experts argue that language itself is what definitively distinguishes humans from other species (Wang & Minett, 2005), specifically its use as a tool for highly complex communication among the human species.

Language as a Module of Human Cognition

Beyond its role in supporting human communication, language is a cognitive tool that helps humans to develop a picture of the world around us. This picture of the world includes not only symbolic representations of linguistic concepts (e.g., "big," "fly," "crazy") that are organized in a vast brain-based network, but also the formal syntactic or grammatical rules that organize these concepts into orderly, surface-level representations.

Language probably emerged in the human species to provide an efficient and effective means for communication within a community. In other words, language emerged as a cultural and social evolution, rather than a biological evolution: Our need and interest to communicate with others gave rise to the complexity of language over time (Christiansen & Kirby, 2003). Some experts suggest that language emerged in the human species because of increases in the size of human communities (e.g., from about 50 members in a group to more than 100 members), and therefore increases in the complexity of social dynamics (Dunbar, 2017). With time, the neural circuitry of the human brain responded to the adaptive advantage of using language not only as a social tool but also as an inner representational tool, emerging as a specialized part of the human mind (Christiansen & Kirby, 2003).

The human brain uses language as a representational tool to store information and to carry out many cognitive processes such as reasoning, hypothesizing, memorizing, planning, and problem solving. These processes are sometimes called higher-level language skills to

differentiate them from more basic-level language abilities. When applied to mathematical and scientific tasks, these higher-level abilities may be called mathematical reasoning and scientific reasoning; however, it is important to acknowledge the role of language in mathematical and scientific reasoning tasks. For instance, suppose you are asked to complete the following mathematical reasoning task:

> The average cost of high-quality earbuds in the United States in 2025 is about $100. Assuming the price of consumer goods will increase about 3% per year, how much, on average, would a new pair of earbuds cost in 2030?

You would have difficulty generating an answer without using language as a tool. Although some persons may contend that they think in images and not in words, certain thoughts—such as "It's difficult to understand how justice was applied in this case"—are impossible to view as images and require language to be invoked as a representational tool.

As we consider the definition of language, particularly its relation to cognition, we need to explore the concept of *modularity*. We introduce this concept here and discuss it more thoroughly in Chapter 3. Modularity is a cognitive science theory about how the human mind is organized within the structures of the brain (De Almeida & Gleitman, 2017). Questions about modularity concern whether the human brain contains a set of highly specific modules—regions of the brain developed to process specific types of information—or whether the human brain is itself a generalized module in which all parts work together to process information. A module is a specialized problem-solving device in the brain that responds to information of a restricted type.

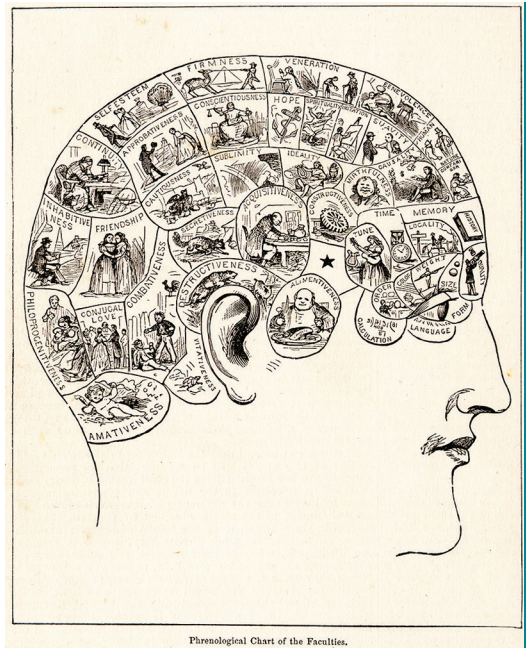
When we use the term *module* in discussions about the brain, we typically are describing brain functions or structures that have very specialized roles. For instance, a given structure in the brain may only process one very specific type of information, such as depth perception within the visual system. Some cognitive theorists contend that the brain consists of very large domain-general modules, which carry out very general tasks such as memory and reasoning, as well as domain-specific (specialized) modules that execute very specific types of tasks.

With respect to language, some language theorists argue that the human brain contains a large number of *language-specific modules*, tightly clustered and highly interconnected, each of which processes specific types of linguistic information (Curtiss, 2013). Such theorists contend that during human evolution, the neural circuitry of the brain became highly specialized in several regions to handle the task of developing and using language (Barrett, 2012). Researchers have long known that specific regions of the brain are associated with specific language abilities. For instance, people who sustain damage to certain areas of the left frontal lobe, as can occur during a stroke, often exhibit difficulty with basic grammar. These people may omit grammatical markers and speak with a "telegraphic" quality (e.g., "Tommy go store now"). This linkage between the site of brain damage and grammatical problems suggests that this region of the brain governs aspects of grammar. The results of brain-imaging studies of the workings of undamaged brains also indicate that various regions of the brain correspond to highly specific aspects of language (Fedorenko et al., 2024), a concept we elaborate on in Chapter 4.

Studies of children with developmental language disorder, a group we discuss more thoroughly in Chapter 10, also provide some support for the notion of language modularity. Typically developing in all areas except for language, children with developmental language disorder, or DLD, exhibit problems in very precise aspects of grammar, such as marking verb tense. Verb tense marking includes, for instance, inflecting verbs with "-ed" to create the past tense, as in "Juan brushed his teeth." At ages 4 and 5 years, children with DLD have significant problems with past-tense marking (Calder, Claessen et al., 2022), even when other aspects of language development are proceeding normally. Across any number of languages, including English, German, and Swedish, this is a prominent marker of children with DLD (Leonard & Schroeder, 2024). That verb structures are so clearly impaired in children with DLD suggests that perhaps there is a particular module of the brain that processes verb structures and that this is the site of disturbance in cases of DLD (Abbott & Love, 2023).

The concept of language modularity is not without its critics. Some scientists argue that language is processed by a general neural network that operates throughout the brain, and that the hypothesized language modules are connectivity hubs (Aliko et al., 2023). The basic argument here is that language functions are not contained exclusively in specialized regions of the brain; rather, language functions occur throughout the entire brain. Although this discussion of language being modular (or not) may feel overly academic, what does seem clear is that language functions specific to a given module (or area of the brain) *can be subsumed* by another area of the brain when injury occurs. For instance, some language functions can be taken up by the right hemisphere following stroke damage to regions of the left hemisphere that are specialized for language functions (Xing et al., 2016). We discuss the notion of brain plasticity in Chapter 4.

Franz Gall, an 18th-century German scholar, popularized the idea that the human brain contained a number of "organs." Each organ contained different aspects of one's personality, such as hope and destructiveness. What kind of evidence did Gall have to argue for these organs?



Phrenological Chart of the Faculties.