Instructor's Resource Manual and Test Bank

for

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The Development of Language

Eighth Edition

prepared by

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Contents

Preface

This manual and test bank is designed to accompany the eighth edition of *The Development of Language*. For each chapter, we have provided (1) a chapter outline; (2) a summary of the key concepts in the chapter; (3) suggested discussion topics and instructional activities. The separate test bank includes examination questions keyed to each chapter. For each chapter there are (4) multiple choice questions; (5) true-false questions; (6) short answer questions; and (7) suggested topics for essay questions. The test bank is followed by a separate answer key for the multiple choice and true-false questions.

The chapter outline and summary together provide a framework the instructor can use to build class lectures, or from which points of particular importance can be extracted. The sections on instructional activities and discussion topics include a variety of activities, some of which are appropriate for large lecture classes, whereas others are better suited to small classes or discussion groups. For most of the suggested activities, the level at which they are conducted can be adjusted by instructors to meet the needs of their students. Please note that many of the included activities are relevant to more than one chapter, and some (such as invitations to local professionals in language-related fields) may require advance planning.

At the end of each chapter in the textbook itself, there are suggestions for student projects. Many of the projects listed there may also be used as the subject of class activities or discussion. By the same token, many of the activities included in this manual can be modified to serve as the focus of student projects or term papers.

Creating instruments to assess student understanding is an onerous task for most instructors. In order to lighten that burden and to provide some standard measures, we have included a large number of multiple choice questions for each chapter, because, of all question types, they are surely the most time-consuming to construct. Instructors who rely primarily on multiple choice questions will find it easy to generate fair examinations from these samples. Others may prefer to use the questions as review material, to mix and match them with the true-false, short answer, and essay questions we also include, or, of course, to use essay questions exclusively.

Many thanks to the authors of the chapters in the textbook for their contributions to this manual and test bank, and our best wishes to all who teach. We welcome your comments!

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July, 2012

Chapter One
The Development of Language
An Overview and a Preview

CHAPTER OUTLINE

INTRODUCTION

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SUMMARY

KEY CONCEPTS TO EMPHASIZE

A. By the time they are 3 or 4 years old, children all over the world acquire the major components of their language. The development of language is a universal human achievement. The study of the ability of humans to learn language addresses some challenging theoretical and practical questions, such as how and why children develop complex grammar; whether children would learn to talk if no one spoke to them; whether language is a separate intellectual capacity; and whether other animals can learn language. Additional areas of study include individual differences in language acquisition, the development of reading, atypical language development, and changes in language skills throughout the life span. (Page 1)

B. Children make rapid progress in language acquisition. By the time they are of school age, they know the meaning and pronunciation of thousands of words, can vary their language to suit different situations, and are able to use complex grammatical forms. Language development does not cease, however, when a child reaches maturity, but continues to progress and change throughout the life cycle. (Pages 1-2)

C. Even before babies are born they are listening to the language spoken around them. Newborns prefer to hear the language they heard while *in utero*. During their first months, infants acquire the communicative skills that underlie language. They gaze into the eyes of their caregivers, are sensitive to the emotional tone of the voices around them, learn to listen to a conversational partner and to take conversational turns. If they want something, they discover ways of making their intentions known. Physiologically equipped to process incoming speech signals, babies can make fine distinctions among speech sounds that they hear, and, by about six months, have already begun to categorize the sounds of their own language. By 11 months, many babies understand 50 or more common words. At approximately the same age they take their first steps, many infants produce their first words. (Page 2)

D. Midway through their first year, babies begin to babble, playing with sound much as they play with their fingers and toes. By the beginning of their second year, babbling gives way to words. There has been considerable controversy over the relationship between babbling and talking, but most researchers now agree that babbling blends into early speech. (Page 2)

E. Once infants have begun to speak, the course of language development appears to have some universal characteristics. Toddlers' first utterances are typically one word long, simple in pronunciation and concrete in meaning. Some sounds are more difficult for a child to pronounce, so their **comprehension** of a word may differ from their **production** of it. Within a given language, children solve the phonological problems they encounter in varying ways. (Page 2-3)

F. A child's ability to relate words to their referents (**semantic development**) appears to progress within some restraints. Very young children's early vocabularies are more likely to contain words that refer to objects that move than to objects that are immobile. Their vocabularies reflect their daily lives and are unlikely to refer to abstract concepts or distant events. As they enter the school years, their words become increasingly complex and interconnected and they begin to gain **metalinguistic awareness**. This allows them to think about language, as well as to understand and define what "words" are. (Page 3)

G. Sometime during their second year, after they know about 50 words, children progress to the two-word stage in which words from the one-word stage are combined into **telegraphic utterances,** without articles, prepositions or inflections. These two-word utterances express the same kinds of thoughts and intentions in many different language communities. They ask for *more* of something, they say *no* to something, they notice that something has appeared or disappeared. Later in the two-word stage, children begin to express about a dozen more meanings, but they are not yet able to use language forms that indicate number, gender, or tense. What toddlers say is closely related to their level of cognitive and social development: They refer to things present in their immediate environment. Toddler language is in the here and now: there is no yesterday and no tomorrow. (Page 3)

H. As a child's utterances grow longer, grammatical forms start to appear. Children tend to learn language components within a particular language in essentially the same order. English speaking children, for instance, learn the prepositions *in* and *on* before the preposition *under*. After they learn regular plurals and pasts, they create some **overregularized** forms of their own, such as *gooses* and *eated*. Children's unique ability to acquire complex grammar remains at the heart of linguistic inquiry. (Page 3-4)

I. Language development also includes the ability to use language appropriately in different social contexts.
The system of rules governing language use to accomplish social ends is called **pragmatics.** Pragmatics governs such things as knowing how to make a conversation or ask a favor. To achieve **linguistic competence,** an individual must master phonology, morphology, syntax, and semantics. **Communicative competence** requires the speaker to be able to vary his or her language appropriately in a variety of situations. During the preschool years, children learn to make polite requests or clarifications of their own utterances. Later, they learn important variations in language that serve to mark their gender, regional origin, social class and occupation. (Page 4)

J. How children acquire language skills has been a matter of debate among researchers. Learning theorists believe that parents shape their children's babbling into speech through reinforcement and teaching strategies. Linguistic theorists believe that language is an independent and **innate** faculty built into the human biobehavioral system. Between these two poles lie three interactionist perspectives. *Cognitive developmentalists* believe language is just one facet of human cognition: children learn to pair words with concepts they have already acquired. *Information theorists* see children as information processors and use computers to model the ways neural connections supporting language are strengthened through exposure to speech. *Social interactionists* emphasize the child's need to communicate, stressing the importance of

the role of **child directed speech (CDS)** in language acquisition. Gestural and usage based theorists are more concerned with the roots of language demonstrated by even very young children who learn to communicate first through gestures such as pointing. (Pages 4-5)

K. In addition to the many regularities in the course of language development, there are also many individual differences in rate and pattern of language acquisition since children adopt different individual strategies in language learning. Much of linguistic inquiry has been directed at finding commonalities across all children learning language, but individual differences must be accounted for by any comprehensive theory of language development. These differences may reflect variations in the child's temperament and style, and may also be related to the preferences of adults in a society. (Page 5)

L. Although language is an exceptionally robust human endowment, some conditions lead to atypical language development. In cases of deafness, the acquisition of oral language is difficult, but the ability to communicate is intact: Deaf children may learn a manual language such as **American Sign Language (ASL)** and be able to communicate in a complete and sophisticated way. Children with intellectual disabilities, including **Down syndrome,** or **autism spectrum disorders** may show slowed or atypical language development. Occasionally, children suffer from **specific language impairment** with no other obvious physical, sensory or emotional difficulties. Still other children may have particular problems producing speech due to motor or physical impairments, although their internal representation of language is intact. (Page 5)

M. By the time they get to kindergarten, children have amassed a vocabulary of about 8,000 words and almost all the grammatical forms of their language. They have also learned to use language in many different social situations, demonstrating an increase in communicative competence. During the school years, children interact increasingly with their peers and develop a form of peer speech that is quite different from speech to parents, and is also frequently both humorous and inventive. They frequently use jokes, riddles and language play, and may also pick up expressions from television and film. (Page 7)

N. New cognitive attainments allow children to think about language itself. Children in school become increasingly adept at producing connected speech, whether narrative, descriptive or explanatory, and learn to use **decontextualized language**. They also develop **metalinguistic awareness**, the ability to think about language itself. (Page 6)

O. Literacy is a milestone in language development calling upon new metalinguistic abilities as well as on the ability to use decontextualized language. Children from literate households already know a great deal about reading and writing before receiving formal instruction and are therefore at an advantage in school. Once children learn to read and write, these skills have profound effects on their spoken language. (Page 6)

P. Learning to read is not an easy task for all children and reading skills vary greatly in the population. People have been *speaking* since the earliest days of our prehistory, but *reading* has been a common requirement only in very modern times. Reading problems such as **dyslexia** pose serious theoretical and practical questions for psycholinguistic researchers. (Page 6)

Q. Language development continues into adulthood and is involved in psychological development: Developing a distinct personal linguistic style is a major part of developing an identity. Language development during the adult years varies greatly among individuals, depending on such things as level of education and social and occupational roles. (Page 6-7)

R. With advancing age, language may begin to change. Many older people have word-finding difficulties, and hearing loss and memory impairment can affect communication. However, narrative skill and vocabulary may continue to grow. In pre-literate societies, the official storytellers are often the older members of the community. Although most individuals remain linguistically vigorous in later years, those with **aphasias** and **dementias** may lose both comprehension and voluntary speech. (Page 7)

S. Human language has special properties that have led many researchers to conclude that it is **species specific** and **species uniform**. However, many animals, such as bees, sea mammals, and birds, have clearly defined communication systems. Bees returning to the hive perform a dance that tells other bees about nectar-filled flowers and gives directions on how to find them. A baby dolphin learns to produce a "signature whistle" by which it can be recognized. African elephants can communicate with each other seismically, using 25 distinct vocal calls and "rumbles" that are carried through the ground and picked up by elephants as much as a dozen miles away. Birds have distinct courting calls, calls

for flying away and calls for flying home. Calling loons may be communicating information about their size to potential rivals. These communication systems are not considered true languages: all are tied to a stimulus situation and a restricted set of messages. (Page 7-8)

T. True languages are characterized by *productivity, semanticity,* and *displacement*. No known non-human animal communication system meets all three of these criteria. Human language enables its users to comment on any aspect of their experience and to consider the past, the future and distant or imaginary things. (Page 8)

U. Attempts to teach language to talking birds has been extremely provocative. An African grey parrot named Alex, for instance, could recognize shapes, objects, and colors, and answer questions about them in English. He could also invent his own words, such as when he labeled cake "yummy bread." Young grey parrots can be trained to label common objects if they have human tutors who provide interactive lessons. Whether these birds actually have linguistic skills comparable to a young child, or are simply responding to complex learned cues is still an open question. (Page 8-9)

V. Studies of dogs have revealed that, while they cannot produce language, they do seem to be able to comprehend some language, and even have some language abilities that were previously assumed to be exclusively human. For instance, a border collie named Chaser learned the name for 1,022 objects during a three-year training period. When confronted with a novel name, she was able to infer that it belonged to an object she had never seen before. (Page 9)

W. Many researchers have wondered if primates are capable of learning human language. Chimpanzees, our closest relatives, are intelligent, social and communicative, and have been the subject of much study. Other projects have attempted to teach language to gorillas. These ape studies have provided useful and controversial data on the ability of non-humans to acquire human language forms. (Page 9)

X. Early attempts to teach chimpanzees to produce spoken language revealed that, although a chimpanzee may be able to understand a great deal of language, producing the speech sounds is far more difficult. The first chimpanzee language subjects, **Gua** and **Viki,** were brought up in human families and treated like human children, but neither made much language progress, although Viki did learn to produce a few recognizable words. Speech is an **overlaid function** that requires an extraordinary amount of physiological coordination and is probably not physically possible for a chimp. (Page 9-10)

Y. Attempts to teach language to chimpanzees (specifically **Washoe** and **Nim Chimpsky)** that employed American Sign Language were more successful. There are marked similarities between very young children's and chimpanzees' abilities to engage in symbolic communication, although it is not clear whether or not the chimps are capable of syntax and multiword utterances. Upon reviewing videotapes of these chimps interacting with their handlers, some researchers have gone so far as to say that they believe the chimps may have been responding to subtle cues from their trainers, rather than to the words themselves. (Page 10-11)

Z. Research using pygmy or bonobo chimpanzees such as **Kanzi** has been promising, showing that these chimps do seem able to understand syntax and word order. Although Kanzi's accomplishments have gone beyond those of any of the earlier chimps, his linguistic abilities remain at the level of a 2- or 3-year-old child. The research community remains divided on whether these linguistic abilities are on the same continuum as our own or if they are qualitatively different. (Page 11)

AA. While language development requires social interaction, humans have evolved specialized capacities of speech as well as neural mechanisms that subserve language. Recent work in genetics has pointed to a specific gene (FOXP2) that is related to language that may have been the result of a mutation that occurred 120,000 years ago. So long as they are physiologically and psychologically intact and people speak to them, human children will acquire the language of those around them. There are strong arguments for the case that human language is biologically determined, owing its existence to specialized structures in the brain. Researchers are currently intrigued by the discovery of **mirror neurons** that may be an integral part of empathy and may also play a part in language development. (Page 12)

BB. Humans have specific areas in the cerebral cortex that are associated with language. Almost all right- handed, and about half the left-handed people in the world have their language areas **lateralized** in the left hemisphere. The right hemisphere still participates in some aspects of language processing. Techniques such as functional magnetic resonance imaging (fMRI) have made it possible to study the human brain in action. In the past, most information about

specialized areas of the brain came from people who had a specific brain injury such as a traumatic accident, stroke or aneurysm. (Page 12)

CC. Specific areas of the brain related to language function include **Broca's area, Wernicke's area** and the **arcuate fasciculus**. Damage to these areas in the adult can result in permanent **aphasia.** In young children, these specialized areas of the brain are either not so firmly specialized or the non-language hemisphere can take over in case of an injury. An infant or a child of 5 or 6 who suffers a left-brain injury is likely to recover complete language, whereas an adult with a similar injury may be language-impaired for life. (Page 12-14)

DD. The brains of newborns have many fewer synapses than adults. By the age of two, the number of synapses reaches adult levels, then increases rapidly to far surpass adult levels between the ages of four and ten. During the period of synaptic growth, there is also a pruning process as unused connections die off. This may help explain the neurological basis of sensitive or critical periods in development. (Page 14)

EE. Language development in humans is associated with other maturational events. Humans have a long list of adaptations that make language possible including the structure of their vocal cords, larynxes and mouths. Eric Lenneberg stated that the development of language is uniform across the species in its major characteristics, which suggests that it is species specific: 1) The onset of speech is regular; 2) speech is not suppressible; 3) language cannot be taught to other species; 4) languages everywhere have certain universals. (Page 14-15)

FF. In order to learn language, speakers must master a number of different tasks. A speaker who knows the syntactic rules of language is said to have *linguistic competence.* The expression of rules in everyday speech is *performance.* **Phonology** includes all the sounds in a particular language and rules for combining them. **Morphology** includes the rules by which words in a language are derived or inflected. A **morpheme** is the smallest unit of meaning in a language. A **free morpheme** can stand on its own. A **bound morpheme** must be attached to a free morpheme to have meaning and will appear as a prefix, suffix or infix. **Syntax** includes the rules by which words can be arranged into meaningful phrases and sentences. **Semantics** involves the ability to understand the meanings of words. **Pragmatics** refers to the use of language to express one's intentions and get things done in the world. Children must learn certain *conversational principles* to gain *communicative competence.* (Pages 15-18)

GG. Interest in the development of language has ancient roots, going back at least to the Greek historian Herodotus, a contemporary of Sophocles. However, systematic methods of studying the acquisition of language are relatively new. Late nineteenth and early twentieth century studies were primarily related to philosophical inquiries into human nature. Most studies took the form of diaries and were usually observations of the author's own children. Notable exceptions were studies of "wild children" and isolated children who had failed to learn language. Children's language was studied to arrive at norms, to describe gender and class differences and to search for the causes and cures of developmental difficulties. (Page 18-19)

HH. The field of **psycholinguistics** came into being in the 1950s when linguists and psychologists combined the techniques of their disciplines. In the 1960s, studies of grammar were most common. By the 1970s, interest broadened to include the study of language addressed to children. Beginning in the 1980s and 1990s, the study of psycholinguistics has included all the traditional topics, along with a growing twenty-first century interest in cross-cultural research and the relationship of language to social and psychological development. (Page 19-20)

II. Cross-cultural studies and studies of children in nontypical developments situations are vital to understanding the process of language acquisition. The effect of international adoptions, in which a child switches from one language community to another is of great interest to researchers. Other topics of interest include social class and gender differences in language, bilingualism, and atypical language learners. (Page 20-21)

JJ. Today's technological advances in equipment and the creation of computerized data banks have made data collection and analyses of child language easier and more efficient than in the past. Digital audio and video recorders have greatly simplified data collection and computers have made analysis easier. (Page 21)

KK. Studies of phonology or of prelinguistic infants require especially sensitive recording equipment and sophisticated computerized laboratory hardware. Imaging techniques have been used in studies of infants with various types of equipment, including machines that can measure electrical changes in the brain (**event related potentials – ERPs**) and those can measure magnetic changes (**magnetoencephalography – MEG**). (Page 21-22)

LL. Studies of language development can be *cross-sectional* or *longitudinal.* Cross sectional studies enable researchers to collect a great deal of data in a short time, and, because of the size of the sample, enable researchers to generalize their findings. Longitudinal studies, although expensive and time-consuming, can provide data about what happens to individuals in the course of language development. (Page 22)

Z. The design of language studies may be either *observational* or *experimental.* Observational studies involve a minimum of intrusion by the researcher. In an experimental study, there is typically an *experimental group* and a *control group*. The experimenter attempts to show that some kind of manipulation on his part produces a particular outcome on the part of the subjects. Language development researchers use a variety of *standard assessment techniques* such as *imitation, elicitation,* and *interviews*. (Page 22-24)

AA. One of the most significant events in language development research has been the creation of the Child Language Data Exchange System (**CHILDES**), launched at Carnegie Mellon University in 1984. The system is made up of 1) **CHAT:** transcription rules for transcribing spoken language; 2) **CLAN:** computer programs that run on the CHAT files to analyze such things as word frequency in a child's speech; and 3) a digital file data base in more than 25 languages containing data contributed from over 100 researchers worldwide.(Pages 24-25)

BB. CHILDES is web-based and free to researchers everywhere. (http://childes.psy.cmu.edu) CHILDES allows data sharing among researchers, increases the precision and standardization in coding, and automates coding procedures. In recent years, CHILDES has evolved in remarkable ways. The newest development is an interactive web resource linking transcripts with audio and video data. Examples of streaming video are now available online at the website. (Page 25)

DISCUSSION TOPICS AND INSTRUCTIONAL ACTIVITIES

1. During one of the first classes, you might want to show the film *Language Development,* produced by WGBH Boston and the American Psychological Association. This film is program #6 in the Discovering Psychology Series, which has recently been updated and is now on DVD. More information and teachers' resources are can be found at http://www.learner.org/resources/series138.html#program_descriptions. An older video that also features many researchers cited in this text is the Public Broadcasting Service NOVA program *Baby Talk* produced by WGBH, Boston.

2. Discuss the relative merits and disadvantages of different ways of studying the acquisition of language (cross sectional, longitudinal, observational, and experimental studies). Present a number of specific questions about language development and have students suggest what kind of design would be most appropriate (and feasible). What specific impact can new technology (e.g., a computerized data base) be expected to have on different methodologies?

3. To illustrate the complexity of languages, invite someone from the field of artificial intelligence or voice synthesis technology to talk to the class about the difficulties of programming computers to produce natural sounding speech. Discuss the size of the lexicon and number of rules necessary for a computer to successfully translate text from an elementary school textbook into spoken form. Which of the component skills must children learn in school? Which do children develop long before entering school?

4. Familiarize the class with journals devoted primarily to language-related research by asking several students to survey the contents of a number of such journals. Ask students to report to the class the types of research questions they found most often addressed during the past 2-3 years. Students might contrast these topics with those that most often appeared in the same journals ten years ago. Also have students note when each journal began publication. You might discuss how more specialized journals have emerged as the field of language research has grown and become more differentiated.

Chapter Two
Communication Development in Infancy

CHAPTER OUTLINE

KEY CONCEPTS TO EMPHASIZE

A. Most infants say their first real word at around one year of age. Long before they say their first words, however, infants in the **prelinguistic stage** begin to develop the ability to communicate through sounds. Even before birth, babies hear speech sounds and are born already accustomed to the sound of their mothers' voices, which they prefer to the sound of other voices. They even prefer the sound of the language they have been exposed to prenatally to the sound of a language they have never been exposed to. (Page 30)

B. Young infants can discriminate among most sounds that are heard in speech, even those sounds coming from languages to which they have never been exposed. This can be demonstrated using the **high amplitude sucking paradigm**. Although infants can distinguish a wide range of different speech sounds, even those that do not occur in their native language, by the time they are about 1 year old, they lose the ability to discriminate among many of the sounds that are not found in their native language. This suggests that, during the first year of life, their perception becomes attuned to the language around them. (Page 31)

C. One of the first steps in learning words is to recognize where each word starts and stops. The infant needs to learn to **segment** speech into individual words. This generally begins in the second half of the first year of life. Studies to test this have used the **Headturn-Preference Procedure**. Infants who are better at segmentation tasks have been shown to develop a larger vocabulary and have greater language skills later in life. (Page 32)

D. Infants are able to identify statistical patterns in language and use them to learn grammatical and lexical aspects of their native language. **Statistical learning** is a critical component of language development. A sensitivity to statistical patterns may be the first step in many aspects of early language development. (Page 33)

E. Although infants may seem completely dependent and helpless, they have many innate behaviors that draw adults to them, and are active interactional partners with their caregivers. Caregivers expect infants to make eye-contact with them. In fact, one of the first signs of atypicality exhibited by autistic children is eye aversion. (Page 34)

F. Long before they produce their first real words, babies discover that the cooing and babbling sounds they make draw caregivers to them and they learn to modify their vocalizations to sound more like speech. Adults who rated videotapes of babies preferred those who produced sounds that were more like speech. Even a 3-month old baby will make speech-like sounds if spoken to by a caregiver, and will learn to wait for the caregiver's response before taking a "conversational turn." By 8 months, even the approach of an adult will increase the quality of babbling sounds. (Page 34)

F. From the beginning, crying, cooing and babbling are communicative only in the sense that they serve as alerts to those who hear them. In the latter part of the first year of life, however, infants discover that they can make a signal and expect it to have a specific effect on the caregiver. This is the beginning of **intentional communication.** (Page 34)

G. Many parents view their infants' early vocalizations as communicative and meaningful, but most investigations have reported that the first signs of truly intentional communication emerge between eight and ten months of age. At this time, a baby makes eye contact with the partner while gesturing or vocalizing, some of her gestures or vocalizations may have become consistent and ritualized, and after a gesture or vocalization, she waits for a response. If she is not understood, she persists in attempting to communicate, sometimes modifying her behavior to make her meaning more clear. (Page 35)

H. The child moves gradually into intentional communication: for the average baby we expect the first signs of intentional communication to emerge between 8 and 10 months of age. Some babies as young as 6 months old might exhibit evidence of intentional communication. (Page 35)

I. Forms of early communicative behavior include both gestures and sounds. Most infants begin pointing at things between 6 and 10 months of age. Babies learn to respond appropriately to pointing between 9-12 months. Children who learn to communicate early by pointing are generally early in other aspects of language development as well: learning that gestures can serve as communicative symbols reflects an important stage in the child's mental development. (Page 36)

J. Most babies develop unique invented gestures before they learn their first words. Observing this, researchers taught a group of parents to use gestures while speaking to their infants starting at about 11 months of age. The babies began using these gestures slightly before words and had slightly better scores on tests of language development up to the age of 36 months. This started an industry of baby sign language. There is currently not enough research on the long term effects of baby signing to know whether or not it aids in the development of language. (Pages 36-37)

K. The vocalizations used by children shortly before they speak their first conventional words form a link between prelinguistic communication and speech. Vocalizations that contain consistent sound patterns and are used in consistent situations but are unique to the child rather than based on the adult language are called **protowords.** Protowords are often tied to particular gestures. (Page 37)

L. Researchers use several different methods to assess a child's communicative level, such as **low-structured observation** in which a caregiver plays with the child in a natural way while a trained observer scores the child's behavior. In **structured observation,** the researcher manipulates the situation to increase the likelihood of observing interesting behavior. A **communicative temptation task**, such as presenting the child with an attractive toy enclosed in a plastic container he cannot open, might be used to entice a child to produce a request. (Page 37)

M. The **MacArthur Communicative Development Inventories** provide scales to assist in the clinical evaluation of communicative intent. Typically, a child's mother is asked to report on words comprehended or said. A similar test, the **Language Development Survey**, has proven to be a reliable screening tool for identifying children with expressive language delay. Another assessment device, the **Communication and Symbolic Behavior Scales,** was used on a study of almost 2,000 infants, including those with various risk factors. A continuing goal of these studies is to find reliable early clues that would predict whether a child is having difficulty acquiring language. (Page 38)

N. Although infants have the **biological capacity** for language learning, they will not learn to speak without social interaction. One of the most important goals of research into the social context of communicative development is to find out what kinds of experiences are sufficient to allow language development, and how variations in experience affect it. (Pages 38-39)

O. Speech addressed to babies, known as **baby talk, child directed speech (CDS)** or **infant-directed speech (IDS)** and **motherese** is geared to communicate with infants and makes use of specialized words, as well as distinctive intonation patterns, usually high-pitched sounds, and exaggerated stress. The primary difference between speech directed to babies and that directed to adults is that the **prosodic features** are more important than the words. A number of studies have shown that infants as young as two days old prefer baby-talk patterns to the patterns of adult-adult speech. (Page 39)

P. Variations in the prosodic features in speech to babies are common across many languages and may indicate that these characteristics are especially effective in gaining the infant's attention. However, cross-cultural research has indicated that although special intonation patterns are a universal feature of baby talk, these patterns are not uniform. For instance, higher pitch and exaggerated intonation are not characteristic of baby-talk in rural African American families in North Carolina, Kaluli families in New Guinea, or Quiche-Mayan Indian communities in Guatemala. (Page 39)

Q. Because the baby talk register holds the infant's attention, it may increase his affective development by cementing the bond with his caregiver. Children can learn language even if they are not in loving interactions, but adult-infant attachment may aid optimal development. Infants appear to learn best from "happy talk."(Page 40)

R. Some researchers suggest that the exaggerated prosodic features of baby talk may help infants become aware of the general intent of the message before they discover that the message consists of meaningful words. Because labels for objects tend to be pronounced more distinctly in baby talk, this may help the child to segment larger units of speech. Depressed mothers, whose language displays less pitch variability, have babies who show poorer associative learning of words than babies of normal mothers. (Page 40)

S. Caregivers in our culture talk to infants in a way that encourages them to participate. They tend to behave as though infants are able to carry out conversations with them, and encourage infants to take their conversational turn, even if this "turn" is no more than a burp. When babies are very young, mothers tend to accept almost any behavior as communicative, but as children grow older, mothers tend to demand higher quality vocalizations. (Page 40-41)

T. The adult's interpretation of the infant's vocalizations may help the child get the idea that communication is possible. Children can learn to talk with a wide variety of linguistic experiences; however, certain experiences may affect the rate of language learning. Children in American families whose caregivers speak to them more frequently learn language skills more rapidly than children whose caregivers are less interactive. Since lower socio-economic class mothers tend to talk less than do middle class mothers, one important question is whether this less verbally-interactive style ultimately puts their children at a communicative disadvantage. (Page 41-42)

U. At about 6 months, infants begin to show great interest in their surroundings. At this point, caregivers in our society usually change their strategy of interacting, encouraging their interest in objects. At about 9 months, an important change occurs in the children's **social cognition**: they begin to understand that other people are intentional beings with their own thoughts and goals. (Page 42-43)

V. Children whose caregivers encourage joint attention to objects and supply labels for them, increase their vocabularies faster than children whose caregivers who do not. Joint attention is based on a positive and affectionate relationship between the infant and the caregiver, and words are most likely to be learned if the caregiver focuses on what the child is interested in. Gimmicks like flashcards or vocabulary drills are highly suspect and might even be counterproductive. (Page 43)

W. When the caregiver follows the child's interest and bases the next utterance on what the child focuses on, this is a **verbally sensitive** or **responsive interactional style**. This style contrasts to a style that is **verbally intrusive** or **controlling interactional style**, which constantly redirects the child's focus. Verbally sensitive styles predict better language skills. There are some cultural differences in the way that caregivers tend to deal with labeling objects and subjects of joint attention. (Page 43)

X. Studies in the United States have shown that joint attention to objects accompanied by labeling by the caregiver provides an opportunity for the infant to learn the names of things. For most children, the first evidence of word understanding occurs at 8-10 months. By 11 months, typical children respond to about 50 words including many names for common objects. (Page 43-44)

Y. Some early infant communication can grow out of structured situations and game playing such as "pat-a-cake" and "peekaboo." Other **formats** that encourage language learning are such situations as being fed, being dressed and being put down for a nap. Things that are typically said in these circumstances can help infants recognize the correspondence between words and meanings. (Page 44)

Z. Another highly structured situation is picture-book reading. Book reading brings parents and children together and provides an opportunity for language growth. Reading a book over and over helps the child learn from the routine. (Page 52)

AA. A complete explanation of the emergence of intentional communication will have to consider 1) the biological basis for language; 2) the social and cognitive development of the child; and 3) the types of experience the child has with caregivers. It is likely that there is an inborn predisposition to symbolic communication in the human infant and particular experiences interact with this predisposition to help bring about language development. (Page 52)

DISCUSSION TOPICS AND INSTRUCTIONAL ACTIVITIES

1. Invite an infant and his or her mom to class. Have the mother play with and talk to her child. Let students observe characteristics of the mother's speech and of the baby's own vocalizations. Note particularly what the mother will accept as a conversational "turn" on the infant's part.

2. Bring tape recordings of a newborn crying and of a five or six-month old crying. For the older infant, try to include different types of cries (discomfort, request, etc.). Have students try to interpret the cries relying on audiotape alone. Point out how the older child's cries are more differentiated and more easily interpreted.

3. Bring in tape recordings or videotapes of individuals speaking languages other than English, for instance, cable television broadcasts of the news in a variety of languages. Have the class listen to these and discuss what kind of help they would need in order to segment the speech, identify its phonemes, and make sense of it.

4. If there are speakers of languages other than English in the class, ask them to provide examples of baby talk words. List these words, and have the class analyze them, both in terms of their phonology and the kinds of meanings they express.

5. Bring a tape recording of an adult talking to a child and the same adult in conversation with another adult. Have students try to identify features that distinguish the two conversations.

Chapter Three
Phonological Development
Learning Sounds & Sound Patterns

CHAPTER OUTLINE

ENGLISH SPEECH SOUNDS AND SOUND PATTERNS
- Phonetics: The Production and Description of Speech Sounds
- Descriptive Features: Classifying Sounds by How They Are Produced
- The Major Sound Classes: Vowels and Consonants
- The Shape of the Vocal Tract: Position of Articulation
- Variability in Production: Phonetic Detail
- Contrast: The Phoneme
- Phonotactics: Constraints on Possible Words
- Suprasegmental Aspects of Speech: Stress and Intonation Contour

PRODUCTION: THE PRELINGUISTIC PERIOD
- Sounds of Babbling
- The Relationship between Babbling and Speech

LEARNING TO MAKE WORDS
- The Beginning of Phonological Development: Protowords
- Words and Sounds: Vocabulary and Phonology Interact
- A Cognitive Approach to the Acquisition of Phonology

LEARNING TO PRONOUNCE
- How Real Children Pronounce Words

PHONOLOGICAL DEVELOPMENT: NORMS AND MEASURES
- Phonetic Inventories of Young Children
- Accuracy of Production
- Ages and Stages of Acquisition
- Atypical Development

THE ACQUISITION OF ENGLISH MORPHOPHONOLOGY

PARENTS' ROLE IN PHONOLOGICAL DEVELOPMENT

LANGUAGE VARIATION IN THE UNITED STATES: LANGUAGES, DIALECTS, AND SPEECH STYLES
- Spanish in the United States
- Regional and Ethnic Dialectal Differences in English
- Pronunciation in Conversational Speech

KEY CONCEPTS TO EMPHASIZE

A. Children's early pronunciation of words often sounds different from adult pronunciation. These early pronunciations tend to vary in predictable ways as the child makes the transition from babble to speech. Learning to say and pronounce words requires a tremendous amount of skill. (Page 52)

B. An important step in any discussion of phonetics is to arrive at a standard set of symbols to represent the whole array of possible speech sounds. Linguists and speech-language scientists say spoken words are composed of *speech sounds, phones,* or *segments* rather than letters. The International Phonetic Alphabet (**IPA**) is used to transcribe the sounds of spoken words. (Page 52)

C. **Descriptive features** are used to describe and classify speech sounds in terms of their *source* in the vocal tract and the *shape* of the vocal tract during sound production. If speech sounds are partly or entirely produced through **vocal fold** vibration, they are considered **voiced** sounds. Kissing and clucking mouth noises are another type of speech sound. Some other sounds rely on turbulence (air stream friction). The sounds produced are changed or modulated by the positions and actions of the lips, jaw and tongue. **Articulatory phonetics** is the study of how the vocal tract gives sounds their distinct identities. (Pages 53-54)

D. Sounds can be divided into two major classes. **Vowels** are made with the vocal tract relatively unobstructed so that vocal fold vibration, modified by varying positions of the articulators, is the only source of sound. **Consonants** are made with a more constricted vocal tract and are classified based on three aspects of production: *place of articulation, manner of articulation* and **voicing**. Consonants whose sound source is air stream friction are called **fricatives**, which may be voiced,

unvoiced or with friction in the **glottis** (the English letter "h" for example.) Consonants made with the tightest vocal tract are the **stops. Affricatives** begin like a stop and end like a fricative. Oral stops, fricatives and affricatives are referred to as **obstruents.** (Pages 54-55)

E. Glides are made with some vocal tract constriction and are often called **semivowels**. The **liquids** ("l" and "r") are made with more constriction than the glides and, like glides, have phonetic characteristics between vowels and consonants: for instance, they may be used as a complete syllable, such as the "l" sound in the English word "beagle." (Pages 55-56)

F. Speech sounds are also classified by their **place of articulation**: the point at which the upper and lower articulators meet each other to produce the sound. The sounds [p], [b], and [m] are **labial** or **bilabial.** The sounds [f] and [v] are **labiodental**. The "th" sounds in *thigh* and *thy* are **interdental.** The sounds [t], [d], [n], [s], [z] and [l] are **alveolar**. The "sh" sound in *shoe* is **palatal.** The sounds [k], [g] and [ŋ] are **velar.** The sound [h] is **glottal.** (Page 56)

G. The contrasting sounds of a language are called its **phonemes.** Words that are differentiated by the pronunciation of one pair of sounds, such as *thy* and *thigh* are called a **minimal pair.** If a minimal pair exists such that changing from one sound to the other changes the meaning of the word, the two sounds are said to **contrast**. (Page 57)

H. Every language has different rules for permissible combinations of sounds to form words, as well as where in a word it is permissible to use certain sounds. These are called **phonotactic constraints.** English words, for instance, can end with the consonant clusters *lp* and *rt* as in *help* and *hurt,* but we couldn't have a new word like *lpeh* because English phonotactic rules do not permit initial consonant clusters of this type. In learning a new language, mastering a new consonant cluster or word position for a familiar sound may require a great deal of work. Learning phonotactic arrangements is a central part of the child's acquisition of phonology. (Page 57) CC. **Suprasegmental** aspects of speech include matters of pitch, loudness and timing. **Stress** is particularly important for correct pronunciation in many languages. In English, words of more than one syllable typically have a syllable that receives *primary stress*. Stressed syllables generally are louder, longer and higher in pitch than unstressed syllables. The pattern of pitch changes in a phrase or sentence is called its **intonation contour.** (Pages 57-58)

I. During their first year, infants produce both **reflexive** (cries, coughs, grunts, burps) and **nonreflexive** vocalizations (cooing, jargon babbling). All infants seem to pass through the same stages of vocal development, progressing from reflexive vocalizations to cooing and laughter, vocal play, and canonical babbling and jargon babbling before advancing to early speech. (Pages 58-59)

J. The infant's hearing of her own vocalizations takes on increased importance during the babbling stage. Some vocalizations appear to be made for their own sake. **Sound play** may contain recurring favorite sound sequences, or even early words. A child's jargon vocalizations may be delivered with eye contact, gesture and the intonation and prosody of fluent sentences. The child seems to have grasped the social nature of conversation, and often conveys interactional meaning. At other times the jargon utterances appear to be imitating the outward form of adult utterances without any intended meaning (Page 59)

K. In the first six months, most sounds babies make are vowel sounds, with most consonants produced in the back of the mouth. With the onset of canonical babbling, there is a shift towards front consonants, especially [m], [b] and [d]. Between six and twelve months, the sound repertoire expands considerably in a way that is similar across all languages. Toward the end of the first year, babbling begins to sound increasingly like the language that a child is hearing in terms of the sounds used and not used and in the use of particular pitch contours and timing (Page 59)

L. Sound classes that are frequent in late babbling are nearly identical to those that appear in the first adult-based words. Sound classes that are absent in babbling, such as fricatives, affricatives and liquids, are precisely the sound classes that are mastered late in the production of real words. The sounds of late babbling may serve as the building blocks for the production of words. (Page 59)

M. Recent research has shown that babble has a limited range of sounds that are gradually brought under control and that most early speech sounds develop directly out of babble. Some children continue to mix babble with early speech, and early meaningful words tend to be linked to the sound patterns of babble, presumably because the child has developed **vocal motor schemes** to handle a particular set of sounds. The quality and complexity of canonical babbling

correlates positively with later language development in both typically developing children and children with hearing impairment. (Page 60)

N. **Protowords** invented by children to signify a particular object or action are an important bridge to language because they show that the child has developed voluntary control over his vocalizations and that he has acquired the concept that sounds have meanings. However, protowords are often phonetically less stable or semantically more context-bound than are true words. As children begin to acquire a vocabulary, their early words often resemble their babbles--words like *mama* and *dada*. Even in their earliest words some children appear to choose words that have favorite sounds. This is called **lexical selection.** Their failure to pronounce words in adult-like fashion in most cases is not because they cannot hear the differences in adult sounds. (Pages 60-61)

O. Some theories predict that language development will follow a course of steady improvement towards the adult model. However, there are cases of **regression** in phonology when the child finds new ways of producing an utterance and temporarily loses correct aspects of their older way of saying something. Another type of regression refers to the apparent loss of the ability to say a particular sound in new words, coupled with the retention of the ability to say them in old words. (Page 62)

P. **Cognitive** or *problem-solving theories* of phonological development posit that the child is an intelligent creature, actively trying to solve the problem of how to talk like those around her while constrained by her **physiological substrate for language**. She may adopt different general strategies such as **selection** of favorite sounds, **avoidance** of difficult ones and systematic replacement or rearrangement of sounds in a target word. Within a child's personal strategy for doing this, there are some characteristic components: 1) trial-and-error articulations, 2) generalization, and 3) overgeneralization. (Page 62)

Q. Cognitive theorists claim that everything the child does phonologically is the result of problem solving. The raw materials of phonology are biologically given, putting some constraints on the acquisition of phonology. For instance, it is generally easier to learn to make stops than to make fricatives. Although children have many similarities in their phonological systems, they also have many individual differences. The exact order of acquisition of phonemes varies across children and the ages of acquisition vary even more. (Page 62)

R. Hearing one's own sound production is an important element in learning phonology: children who are prelingually deaf may never learn to produce much intelligent speech, although fully effective manual sign language can be learned rapidly because children can see their hands and compare their manual signs to the signs of others. Children need *internal feedback* to assess their own performance, in language as in any other fine motor skill, and will practice words and sounds consciously or unconsciously and modify them as necessary. . (Page 63)

S. Children learning to pronounce have been shown to follow a regular and systematic approach to saying words correctly. In describing early speech, we can write **rules** that relate early words to adult targets, describe the child's limitations or **constraints,** and describe the child's preferred forms in terms of **templates**. For most children's early speech, there is a core of words that show a clear pattern. Most children get words partially right before they get them entirely right. *Feature changes* are common errors and often occur in regular patterns: replacing voiced with unvoiced stops, for instance. (Pages 63-65)

T. Children learn to say sound sequences, not simply sounds. Most young speakers have difficulty with **consonant clusters** and may leave out one consonant, or substitute a different sound for the one that causes them trouble as they are trying to be **faithful** to the adult phonology. Regular patterns of correspondence between adult words and a child's pronunciation may be written down as *child phonology rules.*(Pages 65)

U. In early language development, word pronunciations are often affected by the *length of the word* and its *stress pattern*: unstressed syllables in initial or medial positions are often omitted. Another common pattern is the use of **dummy syllables.** Children may also alter sounds within words to make them sound more similar. This is called **assimilation**. (Pages 66-67)

V. Many children have regular ways of replacing sounds in adult words that can be described with child phonology rules. These rules, once acquired, may take on a life of their own. In such cases, the child has strengthened the connections between the sound of the word the way she hears it and her own incorrect pronunciation of it to the point where she

can't substitute the correct sound for the incorrect one. Early words often include a few that are unexpectedly accurate or inaccurate considering the child's other pronunciations. These are called **phonological idioms.** (Page 68)

W. A child may have an abstracted pattern for sets of words known as **canonical forms.** The output of a child with up to about 100 words can generally be described as several sets of canonical forms based on the child's **templates** plus a handful of other relatively isolated words. A child's canonical forms represent the same kind of sound sequences she has learned to produce and her rules are representations of regular ways she adjusts adult words to fit her patterns. Not all children arrive at regular rules and there is a great amount of variation in phonological development across children. (Pages 68-69)

X. Children adopt different strategies in learning to pronounce: some are relatively conservative, only using words they can render with reasonable accuracy, even if they recognize the words themselves. Other children avoid sounds they have difficulty producing. Some children adopt one word at a time, while others use a more global approach, approximating whole phrases. Other children might combine approaches, embedding one or two clear words in an otherwise unintelligible stream. Children learning languages other than English may have different strategies and patterns in acquisition. (Page 70)

Y. Although children vary in development of phonology, there are common features of acquisition that present a general picture of acquisition. Data from large groups of children provide norms that can be used by speech-language pathologists who need to identify children whose phonological development is atypical. **Phonetic Inventories** and **Percent of Consonants Correct** are two common assessment methods**. (**Pages 70-73).

Z. By three years of age, most children are able to pronounce most sounds in their language, although they still make many errors. Consonants such as liquids and fricatives are likely to be in error even at four or five, as are consonant clusters, especially in word-initial position. Correct pronunciation of all sounds is usually achieved by eight years of age. (Page 73)

AA. By age seven or eight, most children can correctly pronounce all the English phonemes, however, they do not sound like adults. They tend to speak more slowly and with greater variability in pronunciation and timing. They also may adopt speech styles used in their particular group. Children whose language is not intelligible by school age are considered to exhibit delayed development. (Page 73)

BB. The smallest unit of meaning in a language is a **morpheme.** Morphemes include inflectional endings that may have many different phonological forms depending upon the words they are attached to. These forms are known as **allomorphs** and the way the choice is determined among different allomorphs is known as **morphophonology.** As the child's vocabulary grows she must also learn the stress patterns typical of more complex morphology, such as the pronunciation of related words like *photograph* and *photography.* (Page 74)

CC. Overt correction by adults plays little role in the acquisition of language, at least with respect to phonology and syntax. Parents do seem to improve the precision of *their own* articulation above normal conversational levels to help their children learn to speak. However, children's phonological errors seem to be fairly resistant to overt correction. (Page 75)

DD. About 80% of American children are monolingual, but this is not the case in the rest of the world, where an estimated two thirds of children are raised at least bilingual. Spanish is the second most common language spoken in the United States and is spoken by about 50 million people. In most cases children raised in Hispanic-origin homes learn Spanish as a first language, but researchers have only recently begun to study the acquisition of Spanish. (Page 75).

EE. There are many complicating issues to studying the acquisition of Spanish, including which dialect the children are learning, whether they are being raised bilingual, and whether they have been exposed to one language at home and another at school. Studies of acquisition have concentrated on either the acquisition of Spanish by monolingual children or by children acquiring English and Spanish either simultaneously or sequentially. (Page 76)

FF. North American Spanish phonology varies with the dialect spoken and differs from English in a variety of ways—for instance English has the voiceless palatal fricative heard in *shoe* and Spanish has the voiceless velar fricative heard in *Quixote.* They have different nasals, different "r" sounds, and different rules for consonant clusters. (Page 77)

GG. English has more phonemes than Spanish, which appears to have less complex phonology. However, Spanish words are in general longer than English words and monolingual children acquiring Spanish appear to do so at the same general rate as monolingual children acquiring English. The sounds that are acquired late differ by language, though both groups of children acquire the particular "r" sounds of their language late. (page 77)

HH. Support for the idea that children acquiring both English and Spanish bilingually will be slowed in their phonological development is mixed. Overall, studies suggest that learning two languages is not more difficult than learning a single language, though some aspects of acquisition may take a bit longer. (Page 78)

II. There is also much social and regional variation in pronunciation across English speakers, topics studied by **sociolinguists**. Children acquire the regional and stylistic variants that they hear, which has some clinical and research implications: we cannot tell whether a child's form that differs from our own is correct or incorrect until we compare it with how the child's parents say the word. Speech-language pathologists need to know which pronunciations are normal for the language varieties that their clients are learning. For instance, the vowels used in words like *pin* and *pen* or *cot* and *caught* vary regionally. The ethnic variety of English known as African American English differs in a number of respects from Standard American English, where for instance AAE typically reduces final consonant clusters found in SAE and deletes SAE final consonants. (Page 78-79)

JJ. Pronunciation of words in conversational speech may also differ greatly from the way words are pronounced when read from a list. Common casual speech rules include simplification of word-final consonant clusters, omission of vowels in unstressed syllables and partial devoicing of phrase-final voiced stops and fricatives. Although young children are often given the opportunity to hear nouns in isolation, most other words they hear occur in less formally pronounced phrases. (Pages 79-80)

DISCUSSION TOPICS AND INSTRUCTIONAL ACTIVITIES

1. Have students discuss regional variants of word pairs such as *marry/merry, err/air, pen/pin, dart/dot*, and others they may think of.

2. Have students suggest possible and impossible English names for a new brand of cereal. If there are speakers of other languages in your class, ask whether those same names would be possible in their language. Also ask them to give examples of other sequences not found in English that would be possible in their language.

3. Give students examples of words with only one and with more than one morpheme to illustrate the difference between word and morpheme.

4. Bring a list of the lexical items used by a child between the ages of 20 and 24 months. Have the class analyze it for evidence of cluster simplification, assimilation, canonical forms, etc.

Chapter Four
Semantic Development
Learning the Meanings of Words

CHAPTER OUTLINE

KEY CONCEPTS TO EMPHASIZE

A. Infants understand in a general way some of what is said to them long before they understand any individual words. The process of learning to relate words to their referents and understanding words in an adult-like fashion is called semantic development. During the course of semantic development, children's strategies for learning word meanings change as the internal representation of language grows and becomes reorganized. (Page 89)

B. A word is an arbitrary sign that signifies a referent. The relationship between a word and its referent is usually symbolic, although certain onomatopoeic words (such as the word *thud*) have a more obvious and meaningful connection to what they signify. Words like *bow wow* that are onomatopoeic often make up a large part of a child's early vocabulary and it is probably easier for children to learn these words. (Page 90)

C. Some research has shown that young children believe that the word and its referent are intrinsically related. Ancient philosophers such as Plato also argued that there is a natural relation between things and words. This kind of belief gives rise to folk etymologies. (Page 90-91)

D. One possible way to define the meaning of a word is to say that it is a mental image. Although it might seem logical that the sound of the word might evoke a mental picture of the referent, not all people can imagine vivid pictures, and some abstract words such as *happy* or *jealousy* have no pictureable referents. Furthermore, the mental images of different speakers tend to be idiosyncratic. (Page 91)