



# CHAPTER

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## Language Laboratories



### language

A communication system in which words and their written symbols combine in various, regulated ways to produce an infinite number of messages.

### communicative competence

The ability to convey thoughts, feelings, and intentions in an organized, culturally patterned way that sustains and regulates human interactions.

### productive language

The production of speech.

### receptive language

Understanding the speech of others.

### phonology

The system of sounds that a particular language uses.

### phoneme

Any of the basic units of a language's phonetic system; phonemes are the smallest sound units that affect meaning.

One of the child's most remarkable developmental achievements is the mastery of language. Language is one of the most complex systems of rules a person ever learns, yet children in a wide range of different environments and cultures learn to understand and use their native languages in a relatively short period. Their ability to do this strongly suggests that human infants are prepared to respond to the language environment and to acquire language skills.

What is **language**? The aspect that most focus on when thinking about language, although admittedly only one small part of language (Turnbull & Carpendale, 1999, 2001), is that it is a system of communication, in which words and their written symbols combine in various, regulated ways to produce an infinite number of messages. Thus, language serves a wide range of purposes for the developing child. It helps him interact with others, communicate information, and express his feelings, wishes, and views. Children can use language to influence other people's behaviour, to explore and understand their environment by discussing it with others, and to escape from reality whenever they want through fantasy (Halliday, 1975). Language has social and pragmatic uses as well, such as getting people to do things, thanking people, expressing one's intentions, and so on. Language also helps children to organize their perceptions, direct their thinking, control their actions, sharpen their memories, and even to modify their emotions. And, above all, language helps them learn new things.

An important part of children's language learning is the development of **communicative competence**, that is, acquiring the ability to convey their thoughts, feelings, and intentions in an organized and culturally patterned way. This capacity for meaningful and understandable communication helps maintain and regulate human interactions (Haslett, 1997; Schaffer, 1974). In addition, communication is by definition a two-way process; we send messages to others and receive messages from them. Thus, language requires us to both produce and receive communication. Not surprisingly, these two aspects of language are often referred to as **productive language** and **receptive language**.

We start this chapter with an overview of the primary components of language; next, we explore the dominant theories of how language develops in the infant and young child. Then, we enter the world of words, sentences, grammar, and the rules for the use of language. How, and how well, do children communicate before they are able to use whole words? How does the child's understanding of the meaning of words develop? Do children acquire more complex sentence forms in a systematic fashion? How does the child learn grammar? How similar are grammars of different languages, including the language of the deaf? What skills are necessary to be an effective speaker or listener? After this exploration of how children gain new language skills, we ask how children begin to understand language as a system of rules for communication. Finally, we consider the tasks that confront children who learn two languages at once.

## THE COMPONENTS OF LANGUAGE: PHONOLOGY, SEMANTICS, GRAMMAR, AND PRAGMATICS

Children learn about the sounds, meanings, structures, and uses of language in specific contexts, and they learn all these things simultaneously. For purposes of analysis, however, scholars divide the study of language into four main areas: phonology, semantics, grammar, and pragmatics.

**Phonology**, the system of sounds that a particular language uses, includes not only the language's basic units of sound, or **phonemes**, but rules about how we put phonemes together to form words and rules about the proper intonation patterns for phrases and sentences. Phonemes are considered *basic* units of sound because they are the smallest sound units that affect meaning; changing a phoneme changes the meaning of a word. For example, by changing the initial phoneme in the word *bat*, we can make the very different word *cat*. By changing the middle phoneme, we can make yet another word, *bit*. A very important feature of phonologic rules is that they are *generative*, that is, they are applicable beyond the cases on which they are based. A native English speaker, for instance, knows that *kib*, though a nonsense word in English, is a possible sound pattern in the language's system, whereas *bnik* is not possible.

The study of word meanings and word combinations is called **semantics**. Comprehension of written as well as spoken language requires not only a knowledge of specific words and their definitions but an understanding of how we use words and how we combine them in phrases, clauses, and sentences. Thus, as children mature intellectually throughout their school years, their semantic knowledge continues to grow. Even adults continue to expand their vocabularies to encompass new knowledge. For example, a first-year psychology student must learn a whole new vocabulary of psychological terms.

**Grammar** describes the structure of a language and consists of two major parts: morphology and syntax. **Morphology** is the study of a language's smallest units of meaning, called **morphemes**—prefixes, suffixes, and root words—and of how those units are properly combined. Rules for altering root words to produce such things as plurals, past tenses, and inflections are part of a language's morphological system. **Syntax** specifies how words are combined into sentences. For example, each language has syntactic rules for expressing grammatical relations, such as negation, interrogation, possession, and juxtaposition of subject and object. The rules of syntax allow us to vary word order so that we are not limited to one way of saying what we mean. For example, we can say "Luis hit a high fly ball that Jake caught," or "Jake caught the high fly ball that Luis hit." Both sentences express the same basic idea but are appropriate in different contexts, depending on whether we want to focus on Luis or on Jake. Syntactic rules offer us great opportunity for linguistic creativity, but if we violate these rules, we will not make sense. Thus, we are free to form the syntactically correct sentence, "After class, I went to the library and listened to some music," but the syntactically incorrect sentence, "I listened to some music after class and I went to the library," is ambiguous and unclear.

The fourth component of language, **pragmatics**, consists of rules for the use of appropriate language in particular contexts (Bates, 1976; Shatz, 1983). Thus, pragmatics is concerned not only with speaking and writing but with social interaction, and it directly addresses the issue of effective communication. For example, a child learns to speak differently to her younger brother from the way she would speak to her parents, simplifying language for her brother just as her parents initially simplified their language for her. She also learns that she has a better chance of getting what she wants if she asks a schoolmate, "May I have one of your crayons?" rather than demand "Gimme a crayon!" And she learns that she must be more formal in writing than in casual speech but also that written language offers great creative opportunities. Researchers in pragmatics study these and other issues, such as how children learn to take turns in speaking, to remain silent while others speak, and to speak differently in such different settings as the classroom and the playground.

## THEORIES OF LANGUAGE DEVELOPMENT

Among those who study language development in children, as among those in many other subfields of child psychology, advocates of the influence of heredity on development vie with those who hold that learning accounts for the emergence and evolution of language. Most theorists today, however, maintain a more middle ground, recognizing the roles that both genetic and environmental factors play in language development. To gain a full understanding of this interactionist approach, which focuses particularly on the role of early caregivers in the child's acquisition of language, we first explore the environmental and then the nativist views.



### semantics

The study of word meanings and word combinations, as in phrases, clauses, and sentences.

### grammar

The structure of a language; made up of morphology and syntax.

### morphology

The study of a language's smallest units of meaning, or morphemes.

### morpheme

Any of a language's smallest units of meaning, such as a prefix, a suffix, or a root word.

### syntax

The subdivision of grammar that prescribes how words are to be combined into phrases, clauses, and sentences.

### pragmatics

A set of rules that specify appropriate language for particular social contexts.

### Language Researchers



Siblings are often good teachers for younger children, encouraging them to look at and manipulate interesting objects and giving names to shapes, colours, and noises that toys make.



## THE LEARNING THEORY VIEW

As we examine the learning perspective on language development, keep in mind that learning theorists vary widely in the degree to which they adhere to traditional learning principles. At one extreme is the behaviourist B. F. Skinner (1957), who argues that principles of operant conditioning wholly account for language development. At the other extreme are such theorists as Albert Bandura (1989), who recognizes the importance of cognitive functioning in his view of the learning process. (Recall our Chapter 1 discussion of the stages of observational learning.)

### How Learning Theories Account for Language Development

Traditional learning theorists invoke the principle of *reinforcement* to explain language development. On this view, the parents or other caregivers selectively reinforce each of the child's babbling sounds that is most like adult speech, that is, by giving attention to these sounds and showing approval when their baby utters them, they encourage her to repeat them. She then repeats the sounds, they approve again, and she vocalizes these particular sounds more often. Little by little, by giving their greatest approval to the infant's closest approximations to adult speech sounds, parents shape their child's verbal behaviour into what increasingly resembles adult speech.

Other learning theorists (Bandura, 1989; Bullock, 1983) propose that the child learns primarily through *imitation* or observational learning. According to this view, the child picks up words, phrases, and sentences directly by imitating what he hears. Then, through reinforcement and *generalization*, or applying what he has learned to new situations, the child learns when it is appropriate or inappropriate to use particular words and phrases.

### Limitations of Learning Theory Accounts

Although learning theory accounts of language acquisition have a contribution to make in the ongoing discussion of how language evolves, they have not fared well as representatives of a sole explanation. First, critics have pointed out that the number of necessary specific connections—that is, linkages between a baby's vocalization and a parent's reinforcing response—to even begin to explain language is so enormous that a child could not acquire all of them in even a lifetime, not to mention a few short years. Second, naturalistic studies of parent-child interaction fail to support the learning theory account. For example, mothers are just as likely to reward their children for statements that are truthful but grammatically incorrect as they are to reinforce the children for grammatically correct utterances (Brown & Hanlon, 1970). After all, parents respond as frequently to a child's meaning as to her grammar because they are concerned to teach her acceptable behaviour as well as correct language. It is difficult to see, then, how adult reinforcement alone might account for the child's learning of grammar (Brown, 1973; Pinker, 1994).

A third argument against learning theory is that it is impossible to predict the vast majority of language utterances from specific utterances by other people. For example, utterances that are closely tied to environmental cues, such as "Hello," "Watch out!" or "You're welcome," are relatively rare. For most sets of circumstances, language affords an enormous degree of creative latitude that, according to nativists, is not accounted for by learning theories. Fourth, learning theory accounts have not explained the regular sequence in which language develops. Children in the North American culture and other cultures seem to learn the same types of grammatical rules and in the same order. For example, they learn active constructions before passive constructions. They learn to say, "Taisha and Neville prepared the posters for the class presentation" before they learn to say, "The posters for the class presentation were prepared by Taisha and Neville." Inasmuch as the passive voice is weaker and less direct, it seems a pity that children ever learn it! Finally, behavioural theories basically portray the child as playing a less active role in language development than the nativist views we discuss next, which argue that the child plays an active and creative role in discovering and applying general rules of language.

Apparently, traditional learning principles are not any more critical to the learning of sign language by the deaf child than they are to the hearing child's acquisition of language rules (Goldin-Meadow & Morford, 1985; Petitto, 1993). Nevertheless, learning principles may play a very important and useful role in modifying language usage and in overcoming

language deficits in some people (Whitehurst, Fischel, Caulfield, DeBaryshe, & Valdez-Menchaca, 1989). Some programs based on learning principles, which are available to parents, have been shown to be effective in helping children who are delayed in their language development, compared with their peers (Zelazo, Kearsley, & Ungerer, 1984). Lovaas (1987; Lovaas & Smith, 1988) has demonstrated the usefulness of imitation and reinforcement principles in at least partially overcoming speech problems among autistic children. Owing to neurological deficits, however, autistic children still may not reach normal levels of communicative competence.

## THE NATIVIST VIEW

Linguist Noam Chomsky (1968), for years the most influential advocate of the nativist position, proposed that children are born with an innate mental structure that guides their acquisition of language and, in particular, grammar. Chomsky termed this structure a **language acquisition device (LAD)**. Although not all the specifics of Chomsky's theory of language development have been supported, his influence on the study of language has been revolutionary. His leadership position in the nativist camp has now been taken up by Steven Pinker (1989, 1994), who has continued to build on Chomsky's work. Pinker's book *The Language Instinct* (1994) has become a bestseller, suggesting that the field of language holds great interest for laypeople as well as for scholars.

### Claims of the Nativist Approach

Nativists assert that certain *universal features* common to all languages are innate. For example, sentences in all languages contain a subject, verb, and object. Nativist theory also claims that children use a set of innate *language hypotheses* to derive rules from the language *data* that they hear. Nativists believe that the normal human child is biologically predisposed to learn any human language with ease. Finally, in contrast to learning perspectives, the nativist approach views language as an abstract system of rules that cannot be acquired by traditional learning principles.

If language ability is an inherited species-specific characteristic, all languages of the species must display universal features, that is, they must share certain basic characteristics. In fact, by examining such features as the sounds used in speaking, the way words are organized in sentences, and how meaning is determined in various languages, investigators have concluded that a set of common principles does underlie all human languages (Slobin, 1985, 1992). For instance, speakers of all languages create a vast number of spoken words by combining a relatively small set of particular sounds. Each of the world's languages uses only a limited sample of all the possible vocal sounds human beings can make. Moreover, words are always combined into structured sequences that the English language calls sentences. Finally, all languages have grammars, and nativists claim that these grammars share certain formal properties as well (e.g., the subject-predicate relationship).

In support of their position, nativists make several observations about language acquisition (Maratsos, 1989; Meisel, 1995; Pinker, 1994). Consider, for example, that in many different cultures, normal children acquire language relatively quickly and learn it well. Nativists point out that because children receive such fragmented and incomplete environmental input, this input alone cannot possibly account for the amazing feat of language acquisition. Those about them can give children only a limited number of examples of the tremendous range of complex structures of which language is capable; children have to go beyond these examples and figure out the patterns—a task at which they are very successful. Nativists, therefore, argue that the child must be preset to acquire language. As Box 8-1 suggests, some of the most striking evidence for the possibility of an innate predisposition for language comes from the study of children who speak a **creole language**.

#### language acquisition device (LAD)

Chomsky's proposed mental structure in the human nervous system that incorporates an innate concept of language.



Noam Chomsky

Steven Pinker

#### creole language

A language spoken by children of first-generation, pidgin-language speakers; a language that, in contrast to pidgin, is highly developed and rule governed.



## Box 8-1

## PERSPECTIVES ON DIVERSITY

### ARE CREOLE LANGUAGES EVIDENCE OF A UNIVERSAL FIRST GRAMMAR?

The most striking evidence that children may possess an innate program or template for grammar comes from the work of Derek Bickerton (1983, 1988, 1990), who has studied creole languages around the globe. The creole language often arises in a context in which people who speak different languages are thrown together in a single culture. These languages, according to Bickerton, are developed by the children of first-generation immigrants, who often speak a kind of *pidgin* language, and “exhibit the complexity, nuance, and expressive power universally found in the more established languages of the world.” (1983, p. 116) In Hawaii, the southeast coast of North America, New Orleans, the Caribbean, the Guyanas, Africa, islands in the Indian Ocean, Indonesia, and the Philippines, where peoples from countries of Asia, Africa, Europe, and the Americas came together to form strikingly polyglot societies, all the children in each culture, regardless of their parents’ native languages, used a single creole language with a single structure and linguistic system. Moreover, the languages have lived on in succeeding generations and in similar form. How could the children of these different racial and ethnic groups have evolved languages that resemble each other if they did not possess some sort of inner template of a universal grammar?

In these multicultural societies, many of which were made up of immigrants imported to labour on colonial plantations, communication began with workers’ development of a pidgin language, a simplified linguistic system created out of two languages that suddenly come into contact with each other. Pidgin adopts the vocabulary of the dominant language, but, as Table 8-1 shows, it lacks grammatical complexity. Its sen-

tences are often no more than strings of nouns, verbs, and adjectives. For this reason and because pidgin is highly individualistic, varying from speaker to speaker, its usefulness is limited. This limitation is probably what leads the children of pidgin speakers to develop the more complex type of communication represented by creole languages.

The language that children in polyglot societies develop is much richer in grammatical structure than pidgin (Bickerton, 1983). And interestingly, creole languages that develop in different places throughout the world are very similar in their structure, no matter what the contributing languages! Even more remarkably, the speech of first-generation creole-speaking children does not differ from that of later generations of speakers, which suggests that the acquisition of this new language happens very rapidly. Together, the uniformity of language across speakers and geographic locales and the speed of language acquisition argue against any simple explanation that children who learn creole are borrowing cafeteria style from one contact language or another.

What are the implications of these observations for theories of language acquisition? According to Bickerton (1983),

*The evidence from creole languages suggests that first-language acquisition is mediated by an innate device . . . the device provides the child with a single and fairly specific grammatical model. It was only in pidgin-speaking communities, where there was no grammatical model that could compete with the child’s innate grammar, that the innate grammatical model was not eventually suppressed. The innate grammar was then clothed in whatever vocabulary was locally available and gave rise to the creole languages heard today. (p. 121)*

#### critical period

A specific period in children’s development when they are sensitive to a particular environmental stimulus that does not have the same effect on them when encountered before or after this period.

Another source of support for the nativist view is evidence that human beings learn language far more easily and quickly during a certain **critical period** of biological development. A critical period is a time during which a child is sensitive to a particular environmental stimulus that does not have the same effect on him when he encounters it before or after this period. The critical period for language stretches from infancy to puberty. Before puberty, a child may achieve the fluency of a native speaker in any language (or even in two or more languages simultaneously) without special training, but after puberty, it is extremely difficult to learn a first language. Dramatic examples come from several famous case studies. In the winter of 1800, a 12-year-old boy who had lived in the woods near Aveyron, France, was discovered. The boy had no language, and in spite of efforts by Jean Itard at the National Institute for Deaf-Mutes in Paris, the boy was able to learn only a few words. No one knows why. Perhaps the boy was impaired at birth, or perhaps language can only be acquired before puberty (Lane, 1976). In another, modern case, 13-year-old “Genie” was discovered to have been kept locked in a room by her mentally ill father from the time she was 18 months of age (Curtiss, 1977, 1989; Rymer, 1993). Although Genie was more successful in learning to communicate than the wild boy in France, she never acquired normal language. These cases strongly suggest that there is a critical period for language acquisition (Hoff-Ginsberg, 1997). Young children whose speech is disrupted by brain injury often recover their language capacity rapidly and completely, but if the

Further support for this argument comes from evidence that the common errors that English-speaking toddlers make are perfectly acceptable creole expressions. For example, between ages 3½ and four years, children often use double negatives. In “Nobody don’t like me,” both subject and verb are negative. Although some languages allow the double negative in verb forms (e.g., one may say in French, “*Je ne vais jamais au cinema*,” which translates literally as “I no go never to the movies”), creoles are the only languages that allow this doubling up of negatives in both subjects and verbs: “Nothing not have value” is perfectly acceptable in creole tongues. Similarly, when a feature of the local language matches the structure of creole, children avoid making errors that would seem quite natural—further evidence that the structure of creole may, in fact, be an innate language template. Determining whether we can

accept the structure of creole language as the basis of first-language acquisition will require much more research. If it turns out to be true, a biological basis of language would seem to be more than just a possibility.

The case is certainly not closed. Some recent critics such as Tomasello (1995), have argued that adult influences may still play a role in the emergence of creole English. Only by observing the language development of first-generation and creole children can we be certain that children are building a language based solely on an internal template and without the assistance of adult models and adult feedback. The interactionist position (see pages 000-000), which suggests that both biological factors and environmental influences provide the best account of language acquisition, may offer a viable alternative explanation for the Hawaiian creole findings.

**Table 8-1****Some Utterances in Hawaiian Pidgin English**

Pidgin:	Ifu laik meiki, mo beta make time, mani no kaen hapai.
Direct translation:	If like make, more better die time, money no can carry.
Meaning:	“If you want to build (a temple), you should do it just before you die—you can’t take it with you!”
Pidgin:	Aena tu macha churen, samawl churen, haus mani pei.
Direct translation:	And too much children, small children, house money pay.
Meaning:	“And I had many children, small children, and I had to pay the rent.”

**Source:** From Bickerton, 1990.

brain damage occurs after puberty, the prognosis for the recovery of language is poorer; there is considerable variation, however, even among adults (Goodglass, 1993; Lenneberg, 1967).

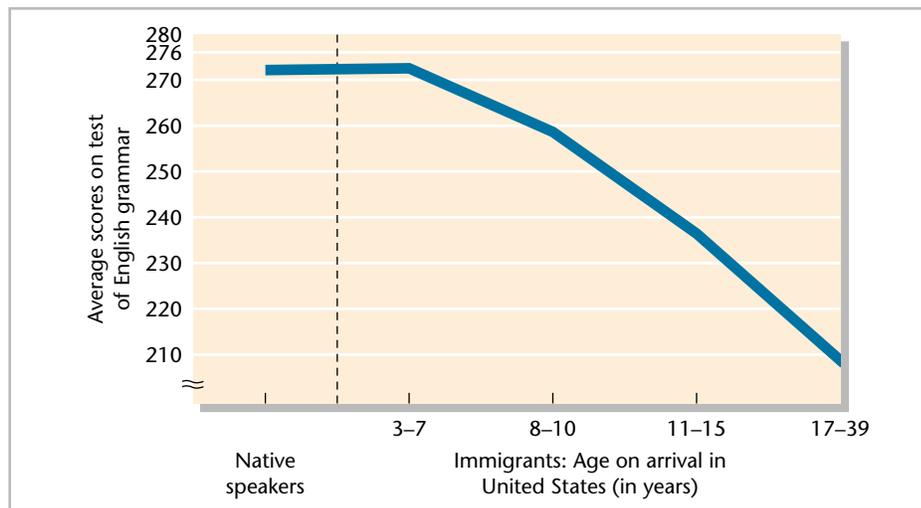
Lenneberg (1967) proposed that children not only can achieve fluency in a second language but do so more readily than adults, but the evidence here is mixed. In keeping with the critical period hypothesis, a recent study of second language learning clearly supports the view that there is a sensitive period for learning grammar. Johnson and Newport (1989, 1991) asked native Korean and Chinese speakers between the ages of three and 39 years to judge the accuracy of the grammar in a variety of English sentences. Participants in the study who had their first exposure to English before reaching puberty had a clear advantage (Figure 8-1). Deaf people show a similar advantage in learning sign language. Newport (1991) found that those who were exposed early to American Sign Language (ASL) became more competent sign language users as adults. Similarly, in Nicaragua, Senghas (1995) found that deaf children who learned sign language at the age of four or five acquired a structurally richer language than children who began to learn sign language at older ages. And similarly, Mayberry and Eichen (1991) have found that even among adults who had been using sign language for at least 20 years, learning sign language in childhood conferred a variety of advantages in sign language use. There may also be a critical period for learning the correct accent for a particular language; Krashen (1975) found that accents are hard to modify after puberty, a finding that is consistent with the Lenneberg position.

FIGURE 8-1

It helps to learn a new language early in life.

On a test of English grammar, native speakers of Chinese and Korean who had immigrated to the United States before they were seven years old scored as well as native speakers of English. The older the immigrants were when they arrived in the United States, the less well they did on the test.

(Source: Newport, 1990; redrawn from Johnson & Newport, 1989)



Children often come to sound like native speakers of a language, whereas adults, unless they take up residence in the country of the language, more often do not (Krashen, 1975).

Others, however, have argued against this critical period hypothesis. In an early study of English speaking families who moved to the Netherlands, after one year, adolescents and adults had learned more Dutch, and learned it faster, than children between three and 11 years (Snow and Hoefnagel-Hoel, 1978). And in response to some of the more recent evidence, Ellen Bialystok of York University and Kenji Hakuta of Stanford University have pointed out that aspects of Johnson and Newport's own data are not consistent with the critical period hypothesis. These authors argue that according to the critical period hypothesis, there should be a rapid decline in learning at the end of the critical period, which would be consistent with a learning mechanism being "turned off" at a particular age (Birdsong, 1999), and not a gradual decline with increasing age after the end of the critical period (Hakuta, *in press*). According to a re-analysis of Johnson and Newport's (1989) data by Bialystok and Hakuta (1994, 1999), however, English proficiency showed its sharpest decline in language skills with increasing age. As opposed to a critical period for language learning, these authors propose that the advantage typically shown by children in secondary language learning could be due to the fact that children have a more nurturing environment, better educational opportunities, receive simplified input, and so on. Accordingly, these authors argue that it is hard to find true support for the idea of a critical period per se in second language learning.

Ellen Bialystok



### Limitations of Nativist Accounts of Language Development

The nativist view of language development has its limitations as well. First, few theorists agree about the exact nature of the types of grammatical rules that children learn. In fact, several theorists have offered alternative explanations of the early grammar acquisition process that differ from Chomsky's original formulation (Maratsos, 1989, 1998; Slobin, 1985). Moreover, the Chomsky account of grammar itself has been widely discredited as a viable account of how language develops (Pinker, 1994). Second, language learning is a gradual process and is not completed as early as nativist accounts would predict. As we will see later in the chapter, specific aspects of grammar continue to develop in the elementary school years and even beyond.

Third, this perspective makes it very difficult to account for the many languages human beings speak throughout the world. Despite the nativist claim that languages possess universal features, how are we to envision features that produce such different grammatical structures, including many varying forms of syntax? And how can it be that a universal feature of using a set of sounds to express meaning leads to the enormous variety of sound combinations that we find in the world's languages? Fourth, this view tells us little about the role of pragmatics and communication. Inasmuch as all peoples form societies of one kind or another, why is there not some universal language feature that governs the way language is used in social interaction? The nativist view gives the social context of language

little recognition, and we now know that social influences play a much larger role in language development than earlier scholars had thought.

It seems likely that human beings are biologically prepared *in some way* for learning language. However, it seems quite unlikely that biological principles alone can account for all aspects of language development.

### THE INTERACTIONIST VIEW

Most modern theorists of the development of language take the interactionist view, recognizing that language is learned in the context of spoken language but assuming as well that humans are in some way biologically prepared for learning to speak. Interactionists are concerned with the interplay between biological and environmental factors in the acquisition of language. Complementary to the role of socializing agents, such as parents, in the child's acquisition of language is the child's own very active role in his development of normal speech. "Children are instrumental in the language development process. Not only do they formulate, test, and evaluate hypotheses concerning the rules of their languages, but they also actively compile linguistic information to use in the formulation of hypotheses." (Tagatz, 1976, p. 90; see also Gallaway & Richards, 1994; Morgan, 1990) In the interactionist view, normal language develops as a result of a delicate balance between parent and child understanding; when parents speak to children in a way that recognizes how much the children already know and understand, they increase enormously their children's chances of comprehending a novel message (Bloom, 1998; Ninio & Snow, 1996; Swensen, 1983). In addition, social interaction with parents, and sometimes even peers, can act as an effective intervention for children with language disorders (Gallagher, 1996; Schenider & Watkins, 1996). You will recall from Chapter 1 that Vygotsky proposed this sort of help from older and more experienced people as necessary to children's learning. We will explore Vygotsky's concepts in greater depth in Chapter 9 (see also Fischer & Bullock, 1984; Rogoff, 1990, 1998; Vygotsky, 1934).

### Facilitating Children's Language Development

An advocate of the social interaction view, Jerome Bruner has proposed that the environment provides the language-learning child with a **language acquisition support system**, or **LASS** (Bruner, 1983; Snow, 1989). In contrast to nativists like Chomsky, whose concept of the LAD he parodies, Bruner emphasizes the parents' or primary caregivers' role as facilitators of language acquisition. What does Bruner suggest the LASS consists of? During children's earliest years, parents support their development of language and their comprehension with several strategies. For example, parents often introduce objects to a child to provide a basis for their mutual play and speak about objects and events that are present and easily visible to the child. They monitor their child's apparent goals or intentions closely, and in general, they try to modulate, correct, or elaborate their child's behaviour, rather than specifically redirect it. "And they construct an internal model of their child's current preferences, skills, and world knowledge, which they continuously update and check." (Fischer & Bullock, 1984, pp. 75-76) Although parents do not usually conceive of these tactics as deliberate teaching techniques but see them rather as natural efforts to carry on conversation with their children, they are very specifically facilitating their children's learning. Again, we see how this interactionist view is consistent with Vygotsky's theory.

We turn now to a series of techniques that adults use to facilitate language acquisition in young children. These techniques include playing nonverbal games, using simplified speech, and elaborating on and rewording children's own utterances to help them sharpen their communicative skills.

**PLAYING NONVERBAL GAMES.** Parents make some of their first efforts to "converse" with their children in early nonlinguistic games, such as peek-a-boo or pat-a-cake. Children learn some structural features of spoken language, such as turn taking, from these games. And because these kinds of games involve regular, repetitive, and, thus, predictable behaviours, they may also lay a foundation for the systematic rules of language. At first, young babies are not capable of either initiating or responding in "conversation," to say nothing of taking turns, but parents help them learn this social skill by carrying more than their share of early dialogues and by waiting for pauses in the infant's vocal or motor behaviour and then inserting an appropriate response. This supportive activity of parents may contribute not only to later give-and-take in conversation but also to social turn taking in play and formal games (Garvey, 1990b).

#### language acquisition support system (LASS)

According to Bruner, a collection of strategies and tactics that environmental influences—initially, a child's parents or primary caretakers—provide the language-learning child.



### infant-directed speech

A simplified style of speech parents use with young children, in which sentences are short, simple, and often repetitive; the speaker enunciates especially clearly, slowly, and in a higher-pitched voice and often ends with a rising intonation. Also called *motherese*.

**USING SIMPLIFIED SPEECH.** Another part of LASS is parents' habit of modifying their speech when they talk to infants and children. Typically, they use a simplified style, called **infant-directed speech** (also called *motherese*), in which they speak in short, simple sentences that refer to concrete objects and events and that often repeat important words and phrases. In this style of speech, parents also talk more slowly and in higher-pitched voices, enunciate more clearly, and often end sentences with a rising intonation (Fernald, 1992; Fernald & Morikawa, 1993). The simplified grammar and syntax may help children learn the relations between words and objects and may also give them some understanding of the rules of segmentation, that is, how speech is divided into words, phrases, and sentences. The acoustic variations can help highlight important words. For example, in reading to 14-month-olds, mothers consistently positioned a word that identified a picture ("that's a *shirt*" or "that's a *boy*") at the end of a phrase and spoke in exaggerated pitch, thus capturing their infants' attention (Fernald & Kuhl, 1987; Fernald & Mazzie, 1991).

Research has shown that newborns and four-week-olds prefer to listen to infant-directed speech than to adult-directed talk (Cooper & Aslin, 1990) and that babies are equally responsive to this style of communication whether it is used by men or women (Pegg, Werker, & McLeod, 1992; Werker & McLeod, 1989). And infants show a preference for infant-directed speech even when speech is in a non-native language. For example, even when English-learning infants listened to Cantonese, they still appeared to prefer infant-directed speech (Werker, Pegg, & McLeod, 1994). A recent study of *motherese* in the United States, Sweden, and Russia has suggested that parents everywhere emphasize three "primary vowels"—*ee*, *ab*, and *oo*—when speaking to their infants, that these vowel sounds are common to every spoken language in the world, and that hearing these sounds helps babies learn to distinguish major sound differences and makes it easier for them then to learn finer distinctions among vowel sounds (Kuhl, et al. 1997). Perhaps this helps explain why the infants learning English preferred Cantonese *motherese*!

Simplified speech does more than simply gain infants' attention, however. According to Janet Werker and her colleagues at the University of British Columbia, such changes in speech also elicit more positive emotions in babies and may actually increase the chances that children will understand the message (McLeod, 1993; Pegg et al., 1992; Werker & McLeod, 1989). But does the use of a simplified code actually facilitate children's language learning? In fact, simplified speech may not always be helpful. In one study, children who had progressed beyond the one-word stage were more likely to respond appropriately to an adult form of a command ("Throw me the ball") than to a simplified form ("Throw ball"). As we have seen in other areas of development, a level of complexity that is slightly ahead of children may be most effective in eliciting their attention and may maximize their learning (Hoff-Ginsberg & Shatz, 1982; Sokolov, 1993). When infants or children show signs that they are not comprehending, adults often revert to simpler speech (Bohannon & Warren-Leubecker, 1988). In general, parents adjust their speech to a child's level of

Many games parents play with their young children help them learn words as well as pragmatic features of language, such as turn taking and the meaning of pauses.



linguistic sophistication, using a wider and wider range of words and parts of speech as children mature (Shatz, 1983; Hoff-Ginsberg, 1997).

**OTHER INFLUENCE TECHNIQUES.** Parents facilitate early communication in several other important ways. Consider the following exchanges between a mother and her child:

- Child: Daddy juice.  
 Adult: Daddy drinks juice.
- Child: Give mama.  
 Adult: Give it to mama.

In the technique of **expansion** illustrated here, the adult imitates and expands or adds to the child's statement. Brown (1973) has estimated that among middle-class families, about 30 percent of the time parents' speech to their children is composed of such expansions but that lower-class parents use this technique much less often. Parents are especially likely to use this expansion strategy after a child has made a grammatical error (Bohannon & Stanowicz, 1988).

Although expansion sometimes helps a child's learning, a combination of expansion and **recast** is more effective. In a recast the adult listener renders the child's incomplete sentence in a more complex grammatical form. For example, when the child says, "Kitty eat," the adult may recast the sentence as a question: "What is the kitty eating?" Or a child's "My ball" might become, "Here is your ball." The more grammatical and more complicated speech that children produce spontaneously following such exchanges suggests that they do profit from them (Nelson, Carskadden, & Bonvillian, 1973). Through recasting, children's adult partners are, in effect, both correcting children's utterances and guiding them towards more appropriate grammatical usage. Moreover, some researchers have shown that children whose parents have recast their utterances appear to develop linguistically at a faster rate, using questions and complex verb forms at an earlier age than is common (Nelson, 1977, 1989; Nelson, Welsh, Camarata, Butkovsky, & Camarata, 1995). As we do not know how often parents use recasts, we cannot yet say how powerful a role recasting plays in normal language acquisition.

We do know, however, that children often imitate their parents' expansions and recasts. It is when they are wrong that children are more likely to imitate adult reworkings of their speech; when children's speech is correct, they are unlikely to imitate the adult's speech (Bohannon & Stanowicz, 1988). Perhaps children are more aware of their own mistakes than we recognize! Of particular interest is that children's imitations of their parents' expansions are often grammatically more advanced than their free speech. Table 8-2 displays some of these imitations.

#### expansion

A technique adults use in speaking to young children in which they imitate and expand or add to a child's statement.

#### recast

A technique adults use in speaking to young children in which they render a child's incomplete sentence in a more complex grammatical form.

**Table 8-2**

**Children's Imitations of Adults' Expansions**

Type of Imitation	Example	Relative Frequency	
		Adam*	Eve**
Unexpanded	Child: Just like cowboy. Adult: Oh, just like the cowboy's. Child: Just like cowboy.	45	17
Reduced	Child: Play piano. Adult: Playing the piano. Child: Piano.	7	29
Expanded	Child: Pick-mato. Adult: Picking tomatoes up? Child: Pick 'mato up.	48	54

**Source:** From Slobin, 1968.

\*From age of 2 years, 3 months to 2 years, 10 months

\*\*From age of 1 year, 6 months to 2 years, 2 months



## Is Social Interaction Crucial to Language Development?

Some theorists hold that although social interaction is necessary to language acquisition, the specific devices of expansion, recasting, and imitation may not be necessary. First, no universal pattern characterizes all parents within a cultural group; some use these methods, others do not (Hoff-Ginsberg, 1997). Indeed, there are impressive individual differences among the linguistic environments that parents within a given cultural group provide their children (Hart & Risley, 1995; Shatz, 1983). Because parents tend to use their own favourite methods very regularly, it may be consistency in the style of interacting rather than the particular style that is most important. In addition, not all cultures use the devices typical of the North American middle class (Minami & McCabe, 1995; Peters, 1983). For example, among the Kaluli of New Guinea and in American Samoa, people speak to the very youngest children as if they were adults (Ochs, 1988; Schieffelin & Ochs, 1987), despite the fact that they believe that young children are incapable of communicating intentionally. Evidently, there are forms of interaction that we do not yet entirely understand but that, nevertheless, ensure that children around the world (including American Samoans) develop language at the same general pace.

Nativists, pointing to evidence such as that from Samoa, claim that, in general, parents do not correct children's ungrammatical utterances. Children who learn a particular language, however, end up with the same basic grammar. Nativists conclude that if children can learn a language and its grammar without feedback from the social environment, there must be innate constraints on the child's learning for it to proceed as it does. Otherwise, an infinite number of grammars would be consistent with the child's uncorrected utterances.

How can we determine whether parental corrective feedback does play a role in the child's development of language? To determine whether this feedback—called **negative evidence** by language scholars because it shows the child what is not correct in her utterances—is a critical and necessary force in language learning, Pinker (1994) has proposed four criteria. Negative evidence must be *present*, *useful*, *used*, and *necessary*. To begin with, there is some suggestion that negative evidence may not always be present or, perhaps, may rarely be present. Although most language scholars, especially learning theorists and interactionists, agree that parents correct their children's grammar on occasion, some nativists disagree, and as we have seen, in some societies, parents apparently do not offer such correction (Bohannon & Stanowicz, 1988; Morgan, Bonamo, & Travis, 1995).

Second, to be useful, negative evidence needs to be provided in a form that children can process. Many nativists question whether children can use corrective feedback, not only because it occurs only a portion of the time but because the parental feedback for which we have evidence is indirect—that is, parents provide it by expanding or recasting rather than by telling a child specifically that what he said is wrong (Pinker, 1989, 1994). One researcher (Marcus, 1993) estimated that a child would have to pronounce an ungrammatical utterance 85 times before he might come to realize that the sentence was ungrammatical—not a very efficient way to learn.

Third, can we show that children actually use this type of feedback to improve their learning of grammar? In a study by Farrar (1992), children were more likely to imitate a recast, such as “The dog is running,” corrected from “The dog running” (a form of negative evidence), than they were to imitate other forms of feedback, such as topic continuations: “Would you like some water?” in response to “I'm hot.” The latter is a facilitative form of feedback but not negative evidence. Although the Farrar study suggests that negative evidence does indeed appear to be particularly helpful in grammar acquisition, others disagree and argue that negative evidence offers no special advantage for learning grammar (Morgan, Bonamo, & Travis, 1995; Morgan & Demuth, 1996).

Finally, if negative evidence were necessary, we would have to show either that all children receive it or that children who do not receive it do not learn language adequately. As we have said, no universal pattern characterizes all parents within a given cultural group, and it appears that some children who receive no corrective feedback do learn their language.

The final word on the role of parental influence in language acquisition is not yet in, as nativists and learning theory proponents continue to battle. Those who advocate the interactionist view hold that although the child is probably biologically prepared for learning language, there is also strong support for the role of environmental input in the child's development of language.

### negative evidence

According to Pinker, corrective feedback that parents may give to young language-learning children.



## FOR THOUGHT AND DISCUSSION

1. How do you think Chomsky's nativist theory of language development would account for learning disabilities related to language development? What does this say about the nature of the language acquisition device?
2. On the basis of our discussion of infants' perceptions of musical properties in Chapter 5, what might be some of the reasons that infants show a preference for infant-directed speech (motherese)?
3. As a parent, do you think you would be more likely to react to the content of your young child's speech or to the grammatical structure? What does this say about the viability of the use of negative evidence in language learning?

## THE ANTECEDENTS OF LANGUAGE DEVELOPMENT

Communication is not achieved by words alone. If we restricted our focus to verbal communication only, we could easily underestimate how early in life communication begins. To fully understand the development of human communication, we must consider the many sounds babies make as well as the many looks, movements, and gestures by which they convey meaning before they can begin to approximate adults' vocalizations. These prelinguistic achievements are important precursors of actual language use (Adamson, 1995).

### NOT BY WORD ALONE: PREVERBAL COMMUNICATION

Some of infants' earliest communications take place during interactions with their first caregivers (Fogel, 1993; Uzgiris, 1989). Parent and infant often engage in a kind of dialogue of sounds, movements, smiles, and other facial expressions. Although these may seem at first glance to be "conversations," a closer look suggests that they be described as "pseudo-conversations" or "pseudo-dialogues" because the adult alone is responsible for maintaining their flow (Schaffer, 1977). Babies have only limited control over the timing of their responses, so adults insert their behaviour into the infants' cycles of responsiveness and unresponsiveness. For instance, a baby gurgles and her mother replies by smiling and speaking to the infant. She first waits for the child's response, but if none is forthcoming, she may prompt the baby by changing her expression, speaking again, or gently touching the child. The end result, though it often looks like a mutual give and take, is really an early lesson in conversation, one that typically helps the infant to become a true communicative partner by the end of her first year (Schaffer 1977, 1996).

Between three and 12 months of age, infants improve greatly in their ability to use gestures to communicate (Fogel, 1993). By at least the time when babies are three or four months old, adults offer and show things to them, and six-month-old infants respond with smiles, gestures, movements, and sounds. When babies are seven or eight months old, adults begin to point in order to draw their attention to an object or event. Within a few months, infants begin actively to use pointing gestures themselves, and by the time they are one year old, they have become highly skilled nonverbal communicators. They can use gestures to make a kind of statement about an object or to bring an object to someone's attention; for example, they may point to the object or hold it up (Adamson, 1995). This kind of preverbal communication has been called a **proto-declarative** (Bates, 1976). Babies can also use gestures to get another person to do something for them; for example, a child may point to a teddy bear on a high shelf in a specific request for help in rescuing it. Older preverbal children use this **proto-imperative** form of communication very effectively, often checking to make sure that the listener is looking in the right direction (Bates, 1976, 1987; Bates, Thal, Whitsell, Fenson, & Oakes, 1989). All of us have seen a child tug at the pant leg of a distracted father and point with growing impatience to something she wants. Other common gestures that preverbal children use include reaching, grasping, and staring. Some children develop



their own unique gestures, such as waving their hands, jumping up and down, or nodding their heads; others do even more unusual things, such as looking between their legs or pointing with their feet, to attract adult attention to themselves or to an object of interest.

Recently, some have argued that all these forms of gestures and pointing are aspects of a more general ability called **joint visual attention**, which is the ability to follow another person's focus or gaze (Butterworth, 1998; Butterworth & Cochran, 1980). Although there has been some controversy over whether or not joint visual attention occurs within the first six months of life (D'Entremont, Hains, & Muir, 1997; Scaife & Bruner, 1975) or not until later in the first year of life (Corkum & Moore, 1995, 1996; Morrisette, Ricard, & Gouin-Decarie, 1995), all agree that joint visual attention is a major advance in infants' communicative abilities, important for social interaction and referential communication between infants and their parents (D'Entremont et al., 1997), and possibly necessary for the growth of pointing and other manual abilities (Butterworth, 1998; Butterworth & Grover, 1989) and as a precursor to language acquisition (Bruner, 1983).

As children learn language, they often combine words and gestures for more effective communication (Adamson, 1995). A toddler may point to an object and then comment verbally or gesture to emphasize the meaning of the words. However, children's ability to use and understand gestures may develop independently of verbal language. It is only in the third year of life that children begin to recognize that gestures and language can be part of the same message and that, if they are, they require an integrated response (Bates, 1987; Shatz, 1983). Across time, however, children reduce their use of gestures as they rely increasingly on their verbal skills to communicate their needs and wishes (Adamson, 1995; Bates, 1987).

## EARLY LANGUAGE COMPREHENSION

The foundations for receptive language skills begin to emerge early. Well before they are able to speak themselves, babies can attend selectively to certain features of others' speech. In fact, newborns prefer listening to speech or to vocal music than to instrumental music or other rhythmic sounds (Butterfield & Siperstein, 1974). As we saw in Chapter 5, infants quickly become skilled listeners. Even two-day-old infants can distinguish their mother's voice from the voice of an unfamiliar woman. Moreover, like adults, infants respond with different parts of their brain to speech and nonspeech sounds; for example, electrical activity increases in the left half of the brain in response to speech, whereas the right side responds to music (Molfese, 1973; Molfese & Betz, 1988; Neville, 1991).

### Categorical Speech Perception

One of the most remarkable discoveries of recent decades is the finding that infants perceive some consonants categorically (Aslin, et al., 1998; Werker & Polka, 1993). Infants hear "one range of acoustic signals all as /p/ and a different range of acoustic signals as /b/ but no acoustic signal is perceived as something in between a /p/ and a /b/." (Hoff-Ginsberg, 1997, p. 50) This phenomenon is known as **categorical speech perception** or, the *phoneme boundary effect*. In a classic study of such discriminatory ability, one group of five-month-old babies listened to 60 repetitions of the sound *bab*, followed by 10 repetitions of *gab*; a second group listened to 60 repetitions of *gab*, followed by 10 *bab* repetitions; and a third group heard only 70 repetitions of *bab* (Moffitt, 1971). The babies in the first two groups showed a marked heart-rate response when the experimenters suddenly presented the new consonant sound, *gab* or *bab*, respectively. Clearly, they perceived the change. This ability to discriminate speech sounds is evident from as early as one month of age and holds true for a variety of other consonants, such as *m*, *n*, and *d* (Aslin, 1987; Aslin et al., 1998; Miller & Eimas, 1994). Infants' discrimination abilities continue to improve, and by the time they are two months old, infants can tell the difference between /a / and /i /. Even more remarkably, two- to three-month-old infants can recognize the same vowel even when it is spoken by different people and at different pitches (Marean, Werner, & Kuhl, 1992).

#### proto-declarative

A gesture that an infant uses to make some sort of statement about an object.

#### proto-imperative

A gesture that either an infant or a young child may use to get someone to do something she or he wants.

#### joint visual attention

The ability to follow another person's attentional focus or gaze of direction.

#### categorical speech perception

The tendency to perceive a range of sounds that belong to the same phonemic group as the same.

Findings such as the foregoing add fuel to the nativist fire, for they seem to suggest that infants are indeed born with some innate mechanism for perceiving oral language. However, although evidence suggests that infants have an innate tendency to look for the boundaries in sound patterns, this tendency is not unique to processing the sounds of speech. Moreover, speech is more easily separable into perceptual categories than are other sound stimuli (Aslin, 1987; Aslin, Pisoni, & Jusczyk, 1983). In addition, Kuhl and Miller's (1975) finding that chinchillas show categorical speech perception and can discriminate between /b/ and /p/ casts further doubt on the notions that this ability is uniquely human and that humans are uniquely prepared for language acquisition! Instead of being a specifically linguistic property of auditory perception, categorical speech perception is, thus, seen as a property of the mammal's aural system that language simply utilizes (Kuhl, 1997; Miller & Eimas, 1994). In fact, language may have evolved "to take advantage of this pre-existing property of mammalian audition." (Hoff-Ginsberg, 1997, p. 53)

### Beyond Categorical Perception

Categorical speech perception is not the only skill that babies exhibit that may help them learn language. In Chapter 5, we discussed a study by DeCasper that suggested that infants may learn some features of language prenatally, and recent evidence suggests that infants can identify key properties of the rhythmic organization of their native language either prenatally or during the first few days of life (Aslin et al., 1998). For example, four-day-old French babies increased their sucking rate when listening to French speech as opposed to Russian speech (Mehler et al., 1988). Another study (Mehler, Dupoux, Nazzi, & Dehaene-Lambertz, 1996) suggests that infants respond to the rhythmic properties of speech. French babies were unable to distinguish changes in Japanese speech on the basis of rhythmic units, around which Japanese utterances are organized, but they could distinguish changes involving the elementary rhythmic units of French.

Whatever innate abilities infants have for perceiving speech sounds, these abilities constantly interact with experience over the language-learning period. The effects of experience in a certain language environment can be seen even before a baby begins to talk. For instance, newborns whose mothers spoke either Spanish or English preferred recordings in their native language over recordings in the unfamiliar language, a preference that apparently arose simply through exposure to the language spoken in the home (Moon, Cooper, & Fifer, 1993). Other work suggests that initially, infants can discriminate any speech contrast with which they are tested. Over the course of the first year, though, they lose this discriminative ability for sounds that are not in their native language (Werker, 1989). For example, in an extensive series of studies, Janet Werker, one of the leading researchers in infant speech perception, and her colleagues, have found that English-learning six- to eight-month-old infants could distinguish between both English and Hindi phonetic contrasts. In contrast, 10- to 12-month-olds (along with older children and adults) failed to distinguish the Hindi contrasts (Werker, Gilbert, Humphrey, & Tees, 1981; Werker & Tees, 1983, 1984). Similar findings have been found for other languages, such as Dutch (Jusczyk, Friederici, Wessels, Svenkerud, & Jusczyk, 1993). Such findings do underscore the importance of both innate and experiential factors in the early recognition of speech sounds. Werker and Lalonde (Diamond, Werker, & Lalonde, 1994; Lalonde & Werker, 1995; Werker & Lalonde, 1988), for example, suggest that such changes may be tied to aspects of cognitive functioning, such as object

Janet Werker. In this study, the experimenter is using a hand-turn response to test this young infant's ability to discriminate between sounds.





search and visual categorization (discussed in the next few chapters), along with influences arising from brain development in the prefrontal cortex.

But even though babies become highly skilled at discriminating the speech sounds of their native language at an early age, it takes time for them to learn to focus on important sound distinctions in everyday speech. As we have seen, one-month-old infants can detect the differences between the consonant sounds of /bab/ and /gab/. However, one study of children up to 18 months of age showed that these same kinds of distinctions were very difficult to make when the sounds were embedded in words and sentences. The researchers presented the children with two funny toys made up to look like people and given nonsense-syllable names, such as *Bok* and *Pok*, chosen so that they differed only by their initial consonants. The experimenters invited the children to do things with each object; for example, “Let Pok take a ride on the wagon” or “Put the hat on Bok.” The children had little success in picking out either Bok or Pok correctly (deVilliers & deVilliers, 1979).

The problem here is that part of learning a language is learning which of the many discriminable differences in speech sounds actually signal differences in meanings. Indeed, this task “requires considerable exposure to language and is not complete even at the end of the second year.” (deVilliers & deVilliers, 1979, p. 19) Thus, although infants demonstrate many specialized language abilities, including the ability to discriminate among a variety of phonemes, the child faced with recognizing a significant difference between two words, like Bok and Pok, and keeping that difference straight must be able to draw on skills that go beyond discriminating pure sounds—skills at such things as attending to and categorizing phonemic differences.

According to Aslin and colleagues (Aslin et al., 1998):

*Languages differ considerably in the ways words are formed (e.g., what sequences of segments are allowed), in what information is used to mark word boundaries, and in the nature of their inflectional systems (how many they typically allow, what kinds and in what orders). Thus, to be successful in recovering words from fluent speech, infants must learn something about the organization underlying sound patterns in their native language. (p. 41)*

Recent evidence suggests that infants can segment fluent speech and recognize words in ongoing speech better and much earlier than we had thought possible—by the end of their first year (Aslin et al., 1998). Moreover, research suggests that infants have the capacity to make the kinds of distinctions that indicate word boundaries (Hohne & Jusczyk, 1994; Morgan, 1994; Morgan & Saffran, 1995). Infants use a variety of cues, such as strong syllables (e.g., *tar* in *guitar*) pitch, pauses, stressed monosyllables (e.g., *cup*, *dog*, *bike*), a strong syllable followed by a weak one (e.g., *fowler*, *turban*), or rhythmic properties to help define the boundaries of words (Jusczyk et al., 1993; Morgan, 1994). In these studies, words are often presented in strings or lists rather than in sentences, which would be more like normal speech.

According to still other works (Saffran et al., 1996), eight-month-old infants can detect new words in the babble of an unfamiliar artificial language, even though they have no idea what the words mean and have no clues to guide them. Researchers had infants listen to two minutes of nonsense syllables mixed with “words” from an artificial language, which the researchers devised to eliminate the possibility that the infants were picking out words on the basis of what they had already learned at home. Using a habituation paradigm, the researchers noted that when the tape was played a second time, the babies did not pay attention to the words—an indication that they had already learned them. This suggests that in the second half of the first year, babies are capable of detecting words in ongoing speech. As the researchers note, “If this is the case, then the massive amount of experience gathered by infants during the first postnatal year may play a greater role in development than has been previously recognized.” (Aslin, Woodward, LaMendola, & Bever, 1996, p. 1928) It is a good thing that infants have the ability to detect words in sentences because this is how most words are introduced to the young language learner. When researchers Woodward and Aslin (1990) asked mothers to teach new words to their 12-month-olds, the mothers presented their infants with most of the words in sentences. They presented only 20 percent of the words as words alone.

Table 8-3

## Stages of Sound Production in the Infant's First Year

Stage	Begins	Description
Crying	At birth	Signals of distress
Cooing	At about 1 month	"Oo" sounds that occur during social exchanges with caregiver
Babbling	Middle of first year	Strings of consonant-vowel combinations
Patterned speech	Close of first year	Strings of pseudo-words made up of phonemes in native language and that sound like words

### BABBLING AND OTHER EARLY SOUNDS

It is not just receptive language abilities that are rapidly developing in infancy. Babies are actively producing sounds—even though not language—from birth onwards. Anyone who has been awakened in the wee hours of the morning by the sound of a baby happily “talking” to herself knows that infants are neither quiet nor passive. They make a great many sounds, as if “gearing up” for their ultimate production of speech.

The production of sounds in the first year of life follows an orderly four-stage sequence that is summarized in Table 8-3. Crying, which begins at birth, is an important way of indicating distress and serves as a rudimentary means of communication. **Cooing**, the production of vowel-like sounds, starts at the end of the first month. Cooing, so named because it often consists of *oo* sounds that resemble the sounds pigeons make, often occurs during social exchanges between infant and caregiver. **Babbling**, or producing strings of consonant-vowel combinations, begins in the middle of the first year. Finally, at the close of the first year, **patterned speech** makes its debut. In this pseudo-speech, the child utters strings of “words” that are made up of phonemes in his native language and that sound very much like real speech—including intonation—but are not. These various stages overlap, and even patterned speech and true speech may occur together as the child's first meaningful words begin to appear.

Not only does the early production of sounds follow an orderly sequence, but also the kinds of sounds made at each of the first three stages are quite similar across different language communities. For instance, young Chinese, American, and Ethiopian babies all babble similar consonant-vowel combinations, even though they are exposed to different phonemes in their native languages (Thevenin, Eilers, Oller, & LaVoie, 1985). Even the early babbling of deaf babies sounds similar to the babbling of babies who can hear (Lennenberg, Rebelsky, & Nichols, 1965). Deaf infants born to deaf parents who use sign language (rather than speak) babble with their hands and fingers at the same age as hearing children babble vocally; moreover, their movements show similar structure in terms of syllabic and phonetic patterning (Bloom, 1998). These similarities between manual and vocal babbling suggest “a unitary language capacity that underlies human signed and spoken language acquisition.” (Petitto & Marenette, 1991, p. 1495) Overall, these findings suggest that the pattern of development of early sounds that infants make is a function of maturational changes in vocal structures and in the parts of the brain that have to do with producing sounds.

In the middle of the second half year, however, cultural differences in the prespeech sounds that babies make begin to emerge. For instance, babies exposed to one of two different native languages, Arabic or French, which contrast significantly in voice quality and pitch, may begin to show differences in their babbling at around eight months of age (Ingram, 1989). Japanese and French words contain more nasal sounds than Swedish and English words, and in the latter part of the first year, French and Japanese babies' babbling contains more nasal sounds than that of their Swedish and English counterparts (de Boysson-Bardies et al., 1992). It is as if the babies are now starting to “tune in” to the language they hear spoken around them. This view is supported by the fact that older deaf

#### cooing

A very young infant's production of vowel-like sounds.

#### babbling

An infant's production of strings of consonant-vowel combinations.

#### patterned speech

A form of pseudo-speech in which the child utters strings of phonemes that sound very much like real speech but are not.



infants fail to develop the more complex forms of babbling that start to resemble real speech, as infants who can hear do (Oller & Eilers, 1988). It seems that exposure to speech is required for the development of these later, more advanced forms of babbling. Interestingly, the amount of time exposed to language, not just the baby's physical maturation, appears to be an important factor. Babies who are born prematurely, and who are therefore exposed to language earlier (in terms of their gestational age) than full-term babies are, begin complex babbling sooner than the full-term infant (Eilers et al., 1993).

Although historically linguists have argued that there is no relation between babies' early vocalizations and subsequent speech (Jakobson, 1968), more recent evidence has challenged this view. Blake and Fink (1987), for example, found that the types of sounds infants make when babbling have some relation to the action in which the infant is engaged, with particular utterances tending to occur in particular contexts. Blake and deBoysson-Bardies (1992) noted similar results in a longitudinal study of both Canadian-English and Parisian-French infants between nine and 14 months. Others have noted that infants' babbled syllables resemble the child's first meaningful words in a variety of ways (Elbers & Ton, 1985; Oller, Wieman, Doyle, & Ross, 1976). As one language expert has noted: "Late babbling contains sounds very much like those that are used in early attempts to pronounce words, independent of the language to which the child is exposed. . . . Babbling is indeed relevant to the child's developing linguistic skills." (Sachs, 1985, p. 49) Thus, a child's early vocalizations are not only orderly in their development but also related to later speech. In terms of the foundations for both receptive and productive language skills, the human infant is very well prepared for learning to talk.



### FOR THOUGHT AND DISCUSSION

1. Categorical perception of speech sounds is a fairly robust phenomenon, demonstrable in both infants and adults. What function or purpose do you think it might serve in speech perception?
2. What advantages are there for language learning due to the fact that infants start off perceiving speech contrasts that do not exist in their native language?
3. Researchers have debated for years whether or not infant babbling is actually related to early speech development. What would you take as evidence of this relation? Put differently, if babbling is related to early speech, how might you anticipate seeing this relation?

### SEMANTIC DEVELOPMENT: THE POWER OF WORDS

Despite children's early skills in both receptive and productive language, research suggests that children's understanding of language far exceeds their capacity to express themselves clearly (Figure 8-2). These findings may help to explain the fact that children do not develop their vocabularies in a strictly linear fashion. Like other aspects of development, vocabulary acquisition proceeds in bursts. The **naming explosion**, a term coined by Bloom (Bloom, Lifter, & Broughton, 1985), is the rapid increase in vocabulary that most children begin to show at the age of about a year and a half, when typically they know about 50 words. Children usually utter their first words between 10 and 15 months (Fenson et al., 1994). According to Flavell (Flavell, Miller, & Miller, 1993), this explosion "is a phenomenon that may be all too familiar to the parents of a toddler. The child has discovered that things have names and now—tirelessly, incessantly—demands to know what the names are." (p. 285) In one well-documented case, a 16-month-old learned 44 words in a single week!

By the age of two years, the average child knows approximately 900 root words, and by six years, when he is in either kindergarten or first grade, he knows 8,000! This remarkable growth of vocabulary is a dramatic example of the human capacity for language and communication. How do children learn words? Imagine that you have taken a job in a foreign

#### naming explosion

The rapid increase in vocabulary that the child typically shows at about the age of one year.

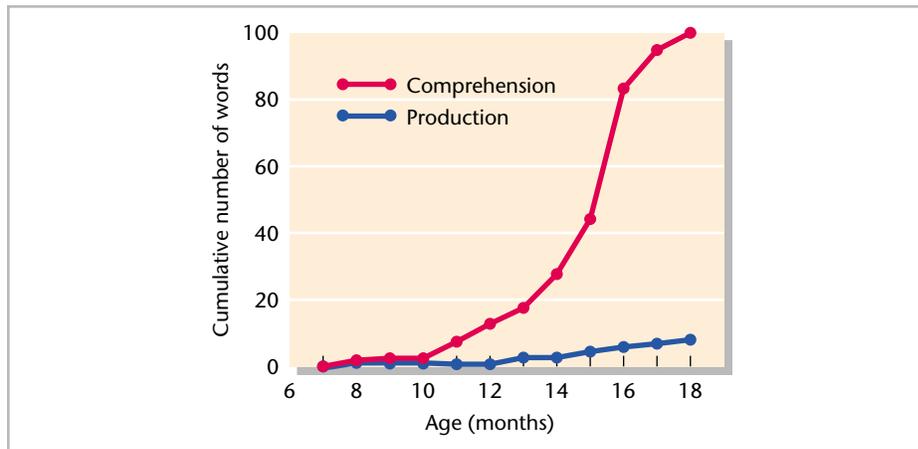


FIGURE 8-2

### Receptive and productive language in infants.

Children's comprehension outpaces their production of words; on average, children understood nearly 100 words by the time they were 18 months old but could produce only 8 to 10.

(Source: Huttenlocher, 1974)

country, and your first task is to learn the language. A native of the country points to a dog lying on a rug and says, “*Xitf*.” How do you know whether *xitf* refers to the dog, the dog’s twitching ear, the dog’s fur, the fact that the dog is sleeping on the rug, the fact that the dog is the speaker’s pet, or indeed, the rug itself? Clearly, the acquisition of object names is no simple matter. Let us look a bit more closely at this issue.

## HOW CHILDREN ACQUIRE WORDS

To learn a word, children must acquire both the appropriate concept and the appropriate phoneme and then link the two, and they do this at an astonishing rate of speed. According to Rice (1989), children may learn new words so quickly by absorbing or “mapping new meanings as they encounter them in conversational interactions.” (p. 152) In **fast-mapping**, children learn to link a new word with a concept they already understand (Carey, 1978; deVilliers & deVilliers, 1992; Mervis & Bertrand, 1994). A recent study by Mervis and Bertrand (1994) of 16- to 20-month-olds illustrates this ability. These researchers presented a child with five objects; four were familiar (e.g., ball, cup, shoe, car), and one was unfamiliar (e.g., garlic press). Children were asked to identify the shoe and then asked for the “zib.” Children who fast-mapped learned immediately that the garlic press was a zib. Similarly, Rice (1990) found that children could learn meanings for unknown words, especially object names, from a single exposure to these words presented in the context of a video display.

Interestingly, as you can see in Box 8-2, even children with severe retardation may be able to use this method of learning words. As the box discusses, investigators have helped children who are at risk for failure to develop language make use of computerized keyboards to select symbols that produce both voiced and printed words and phrases. Many of the children studied were able to learn far more rapidly than anyone expected.

What other factors may contribute to the speed of word acquisition? Recent evidence suggests that the task of acquiring vocabulary may be accelerated by a kind of screening process that enables children to focus on only the most likely of several possibilities. Ellen Markman (1991, 1994; Woodward & Markman, 1998) has conceptualized this process as one in which specific and presumably innate *constraints* operate to delimit the areas in which the child hypothesizes. First, the *whole object* constraint involves the assumption, which children as young as 18 months old make, that a new object word refers to the object itself and not to one of its parts or properties. For example, when two-year-old Jamal visits the zoo and hears the word *anteater* for the first time, he assumes that *anteater* refers to the animal, not to its nose, body, or behaviour.

The *taxonomic* constraint reflects an assumption that a new word refers to something related to a known class of things; *taxonomy* is a system of organizing objects into categories. For example, a child who learns the word *cat* will use it to refer to all types of cats. In an early study, Markman and Hutchinson (1984) taught preschoolers an artificial name for a bluejay, calling the bird a *sud*. When the researchers presented the children with a nest and a duck and asked, “Which one is the *sud*?” the children chose the taxonomically correct answer—the duck.

### fast-mapping

A technique by which a child learns to link a new word with a concept that he or she already understands.



## Box 8–2

## RISK AND RESILIENCE

## CHILDREN AT RISK FOR FAILURE TO DEVELOP LANGUAGE

Youth with moderate or severe mental retardation have been considered significantly intellectually impaired, as determined, in part, by standard intelligence tests (Chapter 11). Generally speaking, these children and young people have other disabilities, such as sensory impairments, seizure disorders, cerebral palsy, and other medical conditions, and they often exhibit behaviours that are difficult to control. Such young people typically need extensive and ongoing support in more than one major life activity. One of the most important of such activities is communication. Youth with moderate and severe retardation range from those who do learn to speak, although slowly and often with limited success, to those who are unable to develop spoken communicative skills at all, even with considerable speech and language instruction.

Using one of the methods developed by investigators of nonhuman primate communication, Mary Ann Ronski and Rose Sevcik (1996) have shown that youth with moderate and severe retardation who have never developed oral speech can learn to communicate intelligibly with adults and peers. In an approach based on Vygotskian concepts, each of 13 young boys with moderate to severe retardation worked with a partner (a teacher or a parent) who demonstrated and encouraged the child in using a computerized device that enabled them to select a particular symbol on a keyboard to produce a single word or phrase (Figure 8-3). When the child presses a given key, the computer produces a synthesized voicing of the word or phrase and also prints it on a screen. The literature on children with severe retardation had claimed that such children could learn only with continuous prompting. Ronski and Sevcik found, however, that a majority of their participants, 12 years old on average, who used the System for Augmenting Language (SAL) device learned rapidly to associate symbols with words and phrases. By the end of the first two-year experiment, most of the participants could both comprehend and produce a majority of the vocabulary words presented to them in instruction sessions. More than half the participants even demonstrated the skill of fast-mapping (see this chapter's "How Children Acquire Words"), immediately associating a new name with a new object/symbol.

Ronski and Sevcik chose to use arbitrary visual-graphic symbols rather than representational pictures in this work, in part because they wanted "to describe the process of learning to communicate symbolically." (p. 61) Hypothesizing that the

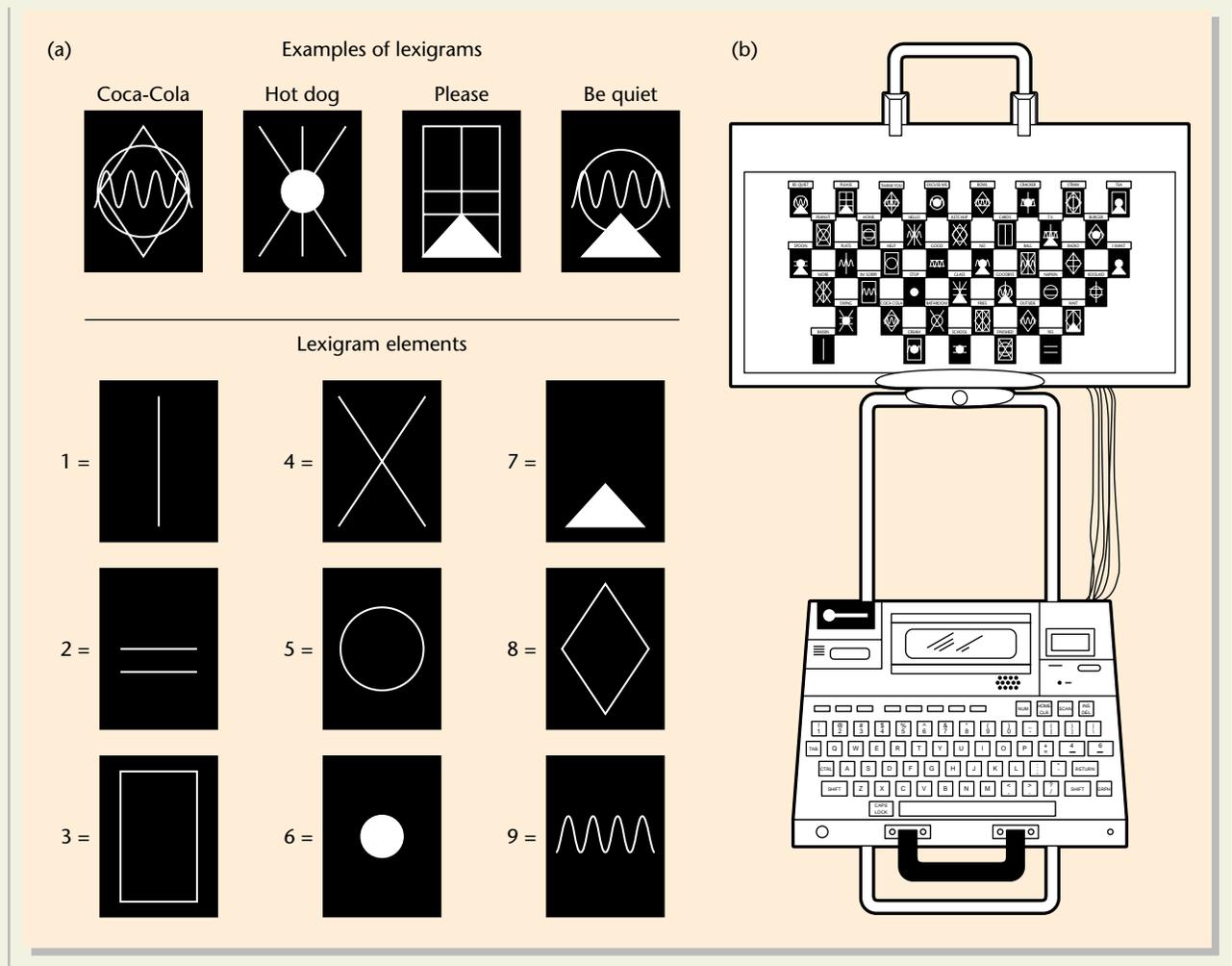
participants would be able to use symbolic communication, the basis of spoken and written language as we know it, these investigators found that their results supported this hypothesis. They introduced only a small number of symbols at a time to participants, beginning with a set of 12 symbols relevant to mealtime—symbols for specific foods, drinks, and utensils. The next group of words related to leisure time activities—for example, *ball, game, magazine, television*—and the third group of social-regulative words and phrases included *hello, excuse me, I want, and thank you*. A final group consisted of words tailored to individual participants' needs; for example, they added the word *work* to the lexicon of a participant who had a part-time job.

By the end of the two-year period, all participants had acquired 53 single words or two-word phrases in the first two categories, 16 words or phrases in the third group, and additional words or phrases in the final category. Moreover, many used their lexicons to engage in independent communication with people in the community. Because people in restaurants and stores, members of church congregations, and co-workers have no experience communicating with someone by means of a computer and synthesized speech, the participants' speech production had to stand on its own. And in many cases, participants revealed previously untapped capacities for social exchange.

One youth, classified as severely retarded, went to a mall music store and requested assistance of a clerk by asking "HELP TAPE" and then showing the clerk a photograph of the tape he wanted. With tape in hand the youth then said "THANK YOU." And in an impressive display of social communication, one youth with moderate retardation greeted a new co-worker, during a break, by saying, "HELLO." She asked him how he was, and he replied, "FINE." They sat down to have a drink and the co-worker said, "Next week we don't work." The youth responded by nodding and saying, "NO WORK" (Ronski & Sevcik, 1996, p. 145).

According to Ronski and Sevcik, some parents have been reluctant to offer SAL training to their children because they fear that it will impede the children's efforts to learn to speak, and in fact, very few data are available on the outcome of the early use of intervention with speech-output communication devices. Clearly, there is room for a great deal more research in this area. Among other things, we need to know what early predictors, such as specific behaviours, may differentiate children who will not develop speech from those who will. We also need to determine

Operating under Markman's *mutual exclusivity* constraint, the child also assumes that every word refers to a distinct referent; that is, each object has one and only one name (Markman, 1989). When children as young as 2½ years encounter an unfamiliar word in a context in which the word might refer to either a familiar or an unfamiliar object, they assume that the unfamiliar word refers to the unfamiliar object. For example, three-year-old Jessica already knows the word *spoon* but does not know the word *tongs*; if she is asked,

**FIGURE 8-3****Communicating with a computer and lexigrams.**

(a) Lexigrams like these, each made up of some combination of the nine elements shown, appear on the upper keypad of the computerized device (b). When a child presses the key for, say, hot dog, the words are sounded in synthetic speech and are also printed on the display screen of the computer (lower portion of b).

(Source: Adapted from Romski & Sevcik, 1996)

whether early intervention with SAL could not only help children who are at risk for failure to develop language to communicate but perhaps help provide the cognitive stimulation and trigger the motivation that might facilitate their learning of oral speech. Whatever its ultimate usefulness, SAL training has revealed the presence of cognitive capacities

in children with mental retardation who, by traditional measures, had been considered only minimally functional. The work suggests that such young people can learn language under the right conditions and can apply it in social interaction and even useful work.

“Show me the tongs,” she will very likely choose the tongs rather than the spoon. Together, these constraints considerably narrow the possible meanings a new word may have and, therefore, greatly simplify the child’s word-learning task (Woodward & Markman, 1998).

What evidence is there supporting the operation of these constraints in children’s word learning? Recent work on this topic by Diane Poulin-Dubois and Susan Graham and their colleagues (Graham, Baker, & Poulin-Dubois, 1998; Graham Poulin-Dubois, & Baker, 1998;

Diane Poulin-Dubois



Poulin-Dubois, French, Graham, & Elkin, 1999; Poulin-Dubois, Graham, & Sippola, 1995) has found that these constraints do play a role in word learning, although other factors are important as well. For example, Poulin-Dubois et al. (1995) found that taxonomic information was used by 24-month-old, but not 18-month-old, children in word naming, although at both ages perceptual shape information was also important for naming novel objects. And in keeping with the exclusivity constraint, Graham et al. (1998b) found that the tendency to associate a novel object with a novel word was positively related to vocabulary at about two years.

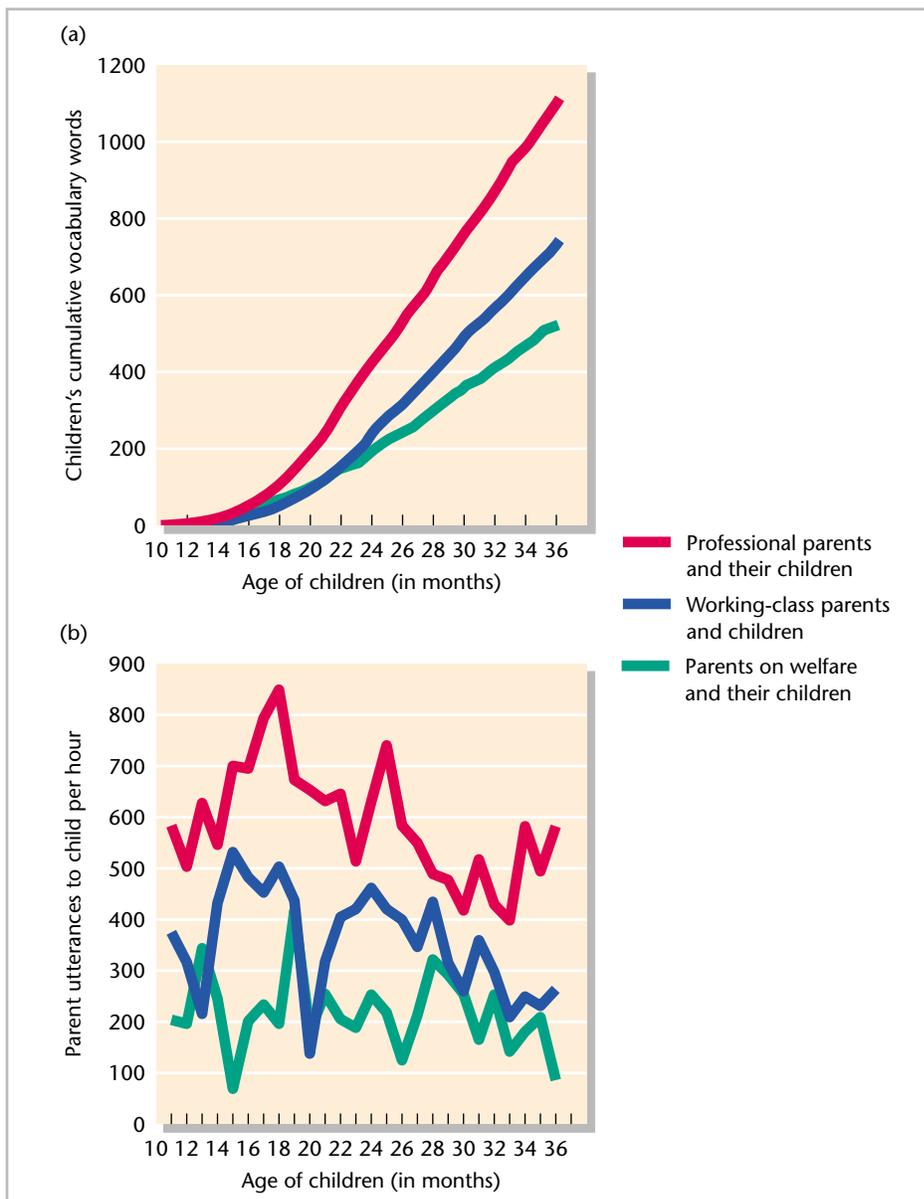
Critics of this view, however, argue that if we are to fully understand semantic development, we need to also look at the social communicative context in which a word occurs (Nelson, 1988). Some researchers have found, for example, that parents influence vocabulary development. In one example (Poulin-Dubois et al., 1995), groups of French- and English-speaking parent-child dyads were videotaped during a free play session, and measures of the parent's labelling practices and the child's categorization ability were then taken. In keeping with the importance of social context, parental labelling was related to the content of the child's vocabulary. In a similar result, another study found that the more parents talked to their children the larger the children's vocabulary became (Huttenlocher, Haight, Brzck, Seitzer, & Lyons, 1991).

**FIGURE 8-4**

**Social class and vocabulary development.**

(a) Over a period of a little more than two years, children from working-class families (middle to lower socioeconomic status) built vocabularies about two-thirds as large as those acquired by children from professional families; children from families who were on welfare acquired vocabularies only half as large as those of the children from higher-class families. (b) The frequencies with which parents in each of the three groups talked to their children correlated quite well with children's vocabulary size. Parents in professional families, whose children had the largest vocabularies, talked to their children the most; parents in working-class families, whose children had the next largest vocabularies, talked a good deal less often; and parents in welfare families, whose children had the smallest vocabularies, talked even less.

(Source: Hart & Risley, 1995)



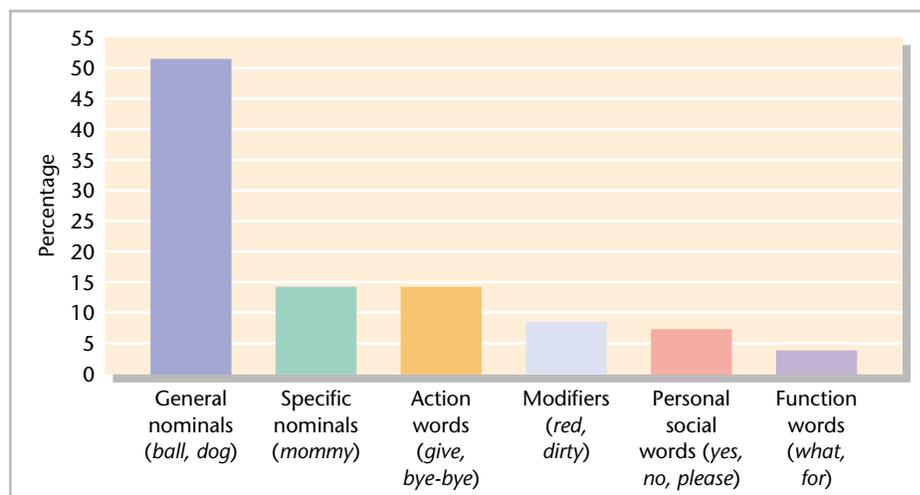
Some of the strongest support for the environmental approach comes from studies of linguistic development in children of differing socioeconomic classes. Hart and Risley (1985), for example, found that in a group of children ranging from 10 months to three years, the higher the parents' social class, the richer was the language environment, and the greater was the children's vocabulary (Figure 8-4).

Ultimately, it is likely that on the basis of the notion that both constraints and social-communicative context are important for word learning, a middle ground position will be the most useful (Hoff-Ginsberg, 1997). In this case, parents and others in the community provide the input and social context that allow the constraints to operate (Behrend, 1990). As an example, in Poulin-Dubois et al. (1995), children's ability to categorize or to recognize taxonomic similarities was related to vocabulary size, with the naming explosion actually coinciding with improvements in children's categorization abilities. Thus, both social-communicative context and constraints combined to predict children's word learning.

### WHAT KINDS OF WORDS DO CHILDREN LEARN FIRST?

Analyzing the kinds of words children acquire and the ways in which they use them can give us important information about children's cognitive development and the degree of sophistication with which they form concepts. Studying the first 50 words learned by a group of 18 young children, Nelson (1973), in a classic study of early word acquisition, classified these words into six categories. Mothers kept diaries of each new word their children produced until the children produced 50 words. On average, children reached the 50-word level by the time they were a year and a half old, but there was a great deal of individual differences. Some infants learned their first 50 words by 15 months, whereas others took 24 months. As Figure 8-5 illustrates, about 65 percent of the 50 words were naming, or object, words, whereas words denoting action made up only about 14 percent. In the Poulin-Dubois et al. (1995) study, comparisons of the acquisition of French- and English-speaking children generally found that both language groups acquired a predominance of names (between 55 and 65 percent) in their first 50 words. Gentner (1982), however, whose study encompassed the first 100 words learned by his child participants, found that some children's vocabularies included as many as 30 percent action terms.

Some cross-cultural research found a greater proportion of nouns even among children whose native languages do not emphasize object words in spoken sentences, but studies of Korean children do not find nouns as being prominent (Gentner, 1982; Gopnik & Choi, 1995; Slobin, 1985). Similarly, Tardif (1996) found that 21-month-old children learning Mandarin Chinese, used equal numbers of verbs and nouns in their speech. In part, this is because in some Asian languages (e.g., Japanese, Chinese), verbs play a more prominent role in speech and often occur in a prominent place at the end of a sentence (Hoff-Ginsberg, 1997). Moreover, the fact that Japanese mothers spend less time labelling objects than American mothers may account for the less pronounced bias towards noun produc-



**FIGURE 8-5**

Words that children use first.

According to the classic work illustrated here, naming, or object, words make up almost two-thirds of the vocabularies of children between one and two years old.

(Source: Based on data from Nelson, 1973)



tion among Japanese children (Fernald & Morikawa, 1993). And some American researchers (e.g., Bloom, 1993, 1998) have challenged the assumption that object names predominate in early vocabularies. Studying children who ranged in age from nine months to two years, Bloom found that object words represented only a third of the words the children learned.

Several researchers have reported that the object words children learn first generally represent objects that they can act on and thereby produce a change or movement. For example, the words *shoes*, *socks*, and *toys*, all of which children manipulate, are more common than words for things that they cannot move or change in some way, such as *table*, *stove*, or *tree* (Clark, 1983). As we have seen, they tend not to learn as many words for actions themselves. One explanation for these results is that the concepts that object words encode are conceptually simpler than those that action words encode (Gentner, 1982; Huttenlocher & Smiley, 1987). To learn object words, children must match objects with their appropriate linguistic referents (Gentner, 1982), but to learn action words, or verbs, children must also form an understanding of the connections between objects and actions (Huttenlocher & Lui, 1979).

What do these findings tell us about the relative importance of nature and nurture in language development? Studies of children's learning of action words and of words that describe emotions suggest vocabulary acquisition may involve not only the child's maturing ability to form concepts, but her response to parental reinforcement and her imitation of her parents. Huttenlocher and her associates (Huttenlocher, Smiley, & Charney, 1983) found that when children learned action words that require inferences about intentionality, such as *open* and *get*, they applied these words only to themselves and only later extended them to the actions of other people. Recall from Chapter 1 that Piaget described young children as egocentric and less able than older children to take the viewpoints of others.

When Huttenlocher and her colleagues studied children's use of emotional-state words, they discovered that children began to use these words at about the age of two years and applied them almost exclusively to themselves. When they did use these words to characterize other people, they generally referred to clearly visible behaviours. For example, a child might use the word *sad* to refer to his own inner feeling but use it for another child's crying rather than to describe that child's feelings. When these investigators examined the children's parents' speech, however, they found that the parents also tended to use emotional-state words to describe their children's inner feelings but to use these same words to refer only to outward signs of emotionality in other people. Thus, it would appear that the pattern of vocabulary development reflects both maturation in concept formation capabilities and the influence of the social environment.

### ERRORS IN EARLY WORD USE

Characteristic errors in children's early word use can help illuminate the learning process. Two such errors are overextension and underextension. In **overextension**, children use a single word to cover many different things. For example, everyone has heard a young child use the word *doggie* for horses, cows, giraffes, and all sorts of four-legged animals. Extensions based on perceptual similarity are common; another example is using the word *ball* for other round things like cakes, pancakes, oranges, the sun, and the moon. Overextension is common; about a third of young children's words are overextended at one time or another (Nelson, 1977). (See Table 8-4 for other examples of children's overextensions.)

Sometimes children's overextensions can be quite elaborate. For example, deVilliers and deVilliers (1992) reported an overextension made by their son, Nicholas, who learned the word *turtle* for a wind-up toy that swam in his bath:

*Within days of its first production, "turtle" was used to refer to other turtles, including ones with wheels, to a real turtle, and to pictured turtles. But other objects were also called "turtle": several toys that shared his bath, including a plastic walrus and a wind-up frog ... and a pinecone with a stem that stuck out like a turtle's head. ... Finally, Nicholas's big toe stuck out through a hole (in his pajamas) ... and he said with delight "turtle." (p. 352)*

Evidently, Nicholas had developed the concepts of the texture and/or patterning of the turtle's back and of the movement of the turtle's head. Although children show creativity

#### overextension

The use, by a young child, of a single word to cover many different things.

Table 8-4

## Children's Overextensions: Some Examples

Word	Referents
Ball	Ball, balloon, marble, apple, egg, wool pom-pom, spherical water tank
Cat	Cat, cat's usual location on top of TV even when absent
Moon	Moon, half-moon-shaped lemon slice, circular chrome dial on dish washer, ball of spinach, wall hanging with pink and purple circles, half a Cheerio, hangnail
Snow	Snow, white tail of a spring horse, white flannel bed pad, white puddle of milk on floor
Baby	Own reflection in mirror; framed photograph of self, framed photographs of others
Shoe	Shoe, sock

Source: Adapted from Hoff-Ginsberg, 1997.

and ingenuity in their overextensions, as their vocabularies develop and increase they use fewer overextended words (Bloom, 1993; deVilliers & deVilliers, 1992). Interestingly, overextensions in production do not predict overextensions in comprehension, which are infrequent (Naigles & Gelman, 1995).

In **underextension**, a less common type of error, children use a single word in a highly restricted and individualistic way. For example, a child may use the word *car* only when she sees her father's yellow Chevy and call all other automobiles, including her mother's green Ford, *trucks* (Bloom, 1993, 1998).

Parents, who, in speaking with their young children, may not initially give every variant of a class of objects its correct name may actually trigger some word errors. Mervis and Mervis (1982) found that mothers tended to use single nouns to label certain toys and objects; for example, they called both lions and leopards *kitty cats*. Although this may help the child at first, enabling him to pick out a stuffed animal, rather than a truck, from an array of toys on a shelf, it may lead to overextending categories. Both overextensions and underextensions may reflect children's gradual development (Huttenlocher & Smiley, 1987).

Another explanation for overextension is that as long as the child's vocabulary is limited, she tries to find the relation between linguistic form and an element of experience, that is, she is not just making an error (Bloom, 1993, 1998). As Bloom notes, "It seems entirely reasonable for the child to use an available word to represent different but related objects—it is almost as if the child were reasoning, 'I know about dogs; that thing is not a dog. I don't know what to call it, but it is like a dog.'" (1976, p. 23) For the child, applying words in different contexts is a type of hypothesis testing, a process that continues throughout childhood but is particularly evident in the first three years when the child begins to relate word forms with objects (Kuczaj, 1982). Gradually, as the child's discriminations improve and her conceptual categories become more stable, her accuracy in the use of words increases.

## THE ACQUISITION OF GRAMMAR: FROM WORDS TO SENTENCES

In their early years, children achieve an incredible amount of learning about language. From simply crying when in distress to forming complete sentences from a vocabulary base of several thousand words is a great leap, and the rapidity with which children learn the complexities of their languages continues to fascinate developmentalists. As Table 8-5 shows, in just 10 months, a child may go from barely intelligible speech to clear communication.

In this section, we cover a great deal of this great leap in clarity and sophistication of communication. You may find it helpful to refer to the Turning Points chart on page 291 to keep track of the sequence of development encompassed. We begin with the child's use of single-word utterances and then consider the evolution of two-word sentences, the emergence of modifications, such as plurals and possessives, the development of questions and of negating sentences, and learning how to understand the meaning of others' utterances.

### underextension

The use, by a young child, of a single word in a restricted and individualistic way.

Table 8-5

## Speech Samples 10 Months Apart

"What dat?"	"Who put dust on my hair?"
"Where birdie go?"	"You got some beads?"
"Read dat?"	"I broke my racing car."
"Have screw . . ."	"It's got a flat tire . . . when it's got flat tire it's need to go . . . to the station."
"Get broom . . ."	"The station will fix it."

**Source:** Adapted from Brown & Bellugi, 1964; McNeill, 1970.

## CAN ONE WORD EXPRESS A COMPLETE THOUGHT?

Are first words simply words? Or are they early attempts to express complete thoughts? When a young child points to a toy airplane on a high shelf and says "Down," or when he takes a spoon from his mother and says "Me," is there more to his utterance than meets the ear? In the first case, parents may assume that the child is requesting that the toy be taken down off the shelf; in the second example, they might guess that the child is saying, "I want to do it myself."

Dale (1976) has noted: "First words seem to be more than single words. They appear to be attempts to express complex ideas—ideas that would be expressed in sentences by an adult." (p. 13) The term **holophrase** has been given to such single words that appear to represent a complete thought. Whether or not children are really expressing in these single-

**holophrase**

A single word that appears to represent a complete thought.

## Box 8-3

## CHILD PSYCHOLOGY IN ACTION

## LANGUAGE LEARNING IN THE DEAF

Deaf children learning American Sign Language (ASL) produce word combinations that are very similar to those that hearing children around the world produce (Meier & Newport, 1990). Compare the examples in Table 8-6 with those in Table 8-7. In both the deaf child's phrases and those uttered by hearing children, we see locating and naming, indication of possession, making a demand, and describing-modifying. (For the ASL signs for some of the words in Table 8-6, see Figure 8-6.)

Among deaf children, the length of utterances increases steadily, just as it does among hearing children, and like hearing children, those who use sign language tend to overextend (Bellugi, van Hoek, Lillo-Martin, & O'Grady, 1993; Petitto, 1993). Nor are young signing children always accurate; as with the early language of their speaking peers, early signs are not always perfect. For example, intending to point to their mouths in signing (which might indicate "speech" or "speaking"), children may miss and point to their chins (which could mean "preference" or "favourite").

One area of debate involves the degree of similarity between the acquisition of spoken and signed language. Some researchers suggest that deaf children actually learn sign language faster and earlier than hearing children learn spoken language. In a longitudinal study of 13 infants raised by deaf

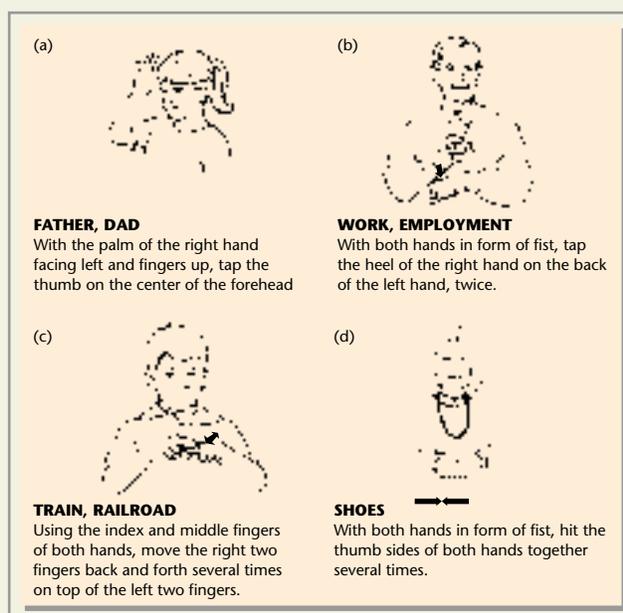


FIGURE 8-6

Some signs in American Sign Language.

The deaf child whose two-word communications are shown in Table 8-6 might combine the signs in (a) and (b) in her first communication, those in (b) and (d) in her fourth sentence.

**(Source:** Adapted from Costello, 1983)

word utterances thoughts that could be expressed in sentences—thoughts that include subjects, objects, and actions—remains an unanswered question.

## TWO-WORD SENTENCES

When the child takes his next important step in language development, our uncertainty about what he is communicating is greatly lessened. Somewhere between one and two years of age, the child begins to put two words together in what is often called **telegraphic speech**. Like telegrams, these two-word utterances include only the crucial words that are needed to convey the speaker's intent. Thus, although children generally use nouns, verbs, and adjectives, they are likely to omit other parts of speech, such as articles and prepositions. The child's speech is novel and creative and is not merely a copy of adult language. Table 8-7 shows some two-word sentences used by young children speaking either English or one of several other languages (Slobin, 1985). Note how these two-word phrases resemble one another in terms of the relation between the words, or the primitive grammar, no matter how different the languages in which they were spoken. Indeed, if you ignore word order, most of these utterances read like direct translations of one another. And this similarity in semantic relations extends to the sign language many deaf people use. As Box 8-3 shows, in acquiring American Sign Language (ASL), deaf children start out with many of the same word combinations that hearing children produce as they acquire oral language.

Why are the early utterances of children similar? Language can be viewed as a way of expressing what one knows or understands about the world. The content of what children say is closely related to their cognitive development. As their capacity for understanding events in the world around them continues to grow, they tend to have encounters with similar kinds situations. Their learning of language is tied to their beginning understanding of such things as the distinction between self and other; the concept of causality; and the

### telegraphic speech

Two-word utterances that include only the words that are essential to convey the speaker's intent.

parents, Bonvillian and his colleagues (Bonvillian, Orlansky, Novack, & Folven, 1983) found that these children learned their first signs several months earlier than hearing children spoke their first words. And by the age of 17 months, these children began to combine two or more signs, again about two to three months ahead of hearing children.

More recent work, however, argues that the development of timelines for learning spoken and sign languages are virtually identical. Pettito (2000), for example, in reviewing her own work, suggests that hearing and deaf children reach the same language milestones at exactly the same pace. According to Pettito, speaking and signing children produce

babbling, first words, two-word combinations, as well as many other subsequent grammatical and semantic developments at the same time. Given that spoken and sign languages make use of different modalities, the fact that the developmental trajectories of the two systems are so similar leads Pettito to suggest that infants, rather than being hard-wired for speech or sound, are sensitive to the patterning and structure of language, regardless of modality. In this case, so long as the environment contains the proper types of patterns, infants will learn and produce these patterns, regardless of whether the input is on the hands or in the mouth (Pettito, 2000).

**Table 8-6**

**Some Two-Word Combinations in a Deaf Child's Signing**

Sign	Meaning
Daddy work	"Daddy is at work."
Barry train	"That's Barry's [her brother's] train."
Bed shoes	(Asking where her slippers are)
Daddy shoe	(Attempting to persuade her father to take off his shoes and play in the sand)

Source: Neier & Newport, 1990.



Table 8-7

## Two-Word Sentences in Several Languages

Function of Utterance	Language					
	English	German	Russian	Finnish	Luo	Samoan
Locate, Name	<i>there book</i>	<i>buch der</i> [book there]	<i>Tosya tam</i> [Tosya there]	<i>tuossa Rina</i> [there Rina]	<i>en saa</i> [it clock]	<i>Keith lea</i> [Keith there]
Demand, Desire	<i>more milk</i>	<i>mehr milch</i> [more milk]	<i>yeshchë moloko</i> [more milk]	<i>anna Rina</i> [give Rina]	<i>miya tamtam</i> [give me candy]	<i>mai pepe</i> [give doll]
Negate	<i>no wet</i>	<i>nicht blasen</i> [not blow]	<i>vody net</i> [water no]	<i>ei susi</i> [not wolf]	<i>beda onge</i> [my-slasher absent]	<i>le'ai</i> [not eat]
Describe event or situation	<i>Bambi go</i>	<i>puppe kommt</i> [doll comes]	<i>mam prua</i> [mama walk]	<i>seppo putoo</i> [Seppo fall]	<i>odhi skul</i> [he-went school]	<i>pá u pepe</i> [fall doll]
Indicate possession	<i>my shoe</i>	<i>mein ball</i> [my ball]	<i>mami cashka</i> [mama's cup]	<i>täti auto</i> [aunt car]	<i>kom baba</i> [chair father]	<i>lole a'u</i> [candy my]
Modify, Qualify (attributive)	<i>pretty dress</i>	<i>milch heiss</i> [milk hot]	<i>mama khoroshaya</i> [mama good]	<i>rikki auto</i> [broken car]	<i>piypiy kech</i> [pepper hot]	<i>fa'ali'i pepe</i> [headstrong baby]
Question	<i>where ball</i>	<i>wo ball</i> [where ball]	<i>gde papa</i> [where papa]	<i>missä pallo</i> [where ball]		<i>fea Punafu</i> [where Punafu]

**Source:** Adapted from Slobin, 1979.

**Notes:** Luo is spoken in Kenya. The order of the two words in each “sentence” is generally fixed in all languages but Finnish, in which children are free to use both orders for some types of utterances.

notion of object permanence, or the fact that objects that they cannot see continue to exist and can be seen again. Thus, wherever they live, in whatever society, children beginning to speak express similar relations and events, such as agent–action relations, possessives, and disappearance–reappearance. The development of cognitive capacity and the development of language are undoubtedly closely related (Clark, 1983; Carey, 1994).

### LEARNING THE RULES

One of the most interesting aspects of early grammar acquisition is the way children learn how to modify the meanings of the words they use, an accomplishment that also illustrates the close ties between semantic and grammar development. Roger Brown (1973) at Harvard University, in his classic longitudinal study of Adam, Eve, and Sarah, followed these three children from two to four years of age, and noted, among many other things, that they acquired certain morphemes in a regular order. For example, during this period, the children begin to use qualifiers that indicate plurality or a possessive relation. Table 8-8 lists the 14 morphemes that Brown studied in the order in which his young participants acquired them. Although Adam, Eve, and Sarah each acquired these morphemes at different rates of speed, the order in which each child acquired them was the same.

Can we generalize from Brown’s work? Fortunately, we do not have to rely on this evidence alone. In a cross-sectional study of 21 children, deVilliers and deVilliers (1973) provided confirmation of Brown’s findings. Moreover, Brown’s claims have generally been confirmed by later investigators (e.g., Maratsos, 1989, 1998). Note that the order in which these morphemes are acquired is a sensible one. Simpler morphemes are acquired earlier than more complex ones. For example, plural forms, like *-s*, are learned before the copula (meaning a linking word) *be*. In the next two chapters, we will see that this same general principle of progressing from the simple to the more complex characterizes children’s cognitive development as well.

Slobin (1985) suggests that children go through four phases in their application of grammatical rules, such as the use of plurals. In phase 1, they try but fail. In phase 2, they succeed in memorizing some of the irregular verbs, such as “broke” and “went,” but do not yet acquire a grammatical rule. This kind of learning, of course, is quite inefficient. Imagine

Table 8-8

## English-Speaking Children's First 14 Morphemes

Form	Meaning	Example
1. Present progressive: -ing	Ongoing process	He is sitting down.
2. Preposition: in	Containment	The mouse is in the box.
3. Preposition: on	Support	The book is on the table.
4. Plural: -s	Plural: -s	The dogs ran away.
5. Past irregular: e.g., went	Earlier in time relative to time of speaking	The boy went home.
6. Possessive: -'s	Possession	The girl's dog is big.
7. Uncontractible copula be: e.g., are, was	Number; earlier in time	Are they boys or girls? Was that a dog?
8. Articles: the, a	Definite/indefinite	He has a book.
9. Past regular: -ed	Earlier in time	He jumped the stream.
10. Third person regular: -s	Number; earlier in time	She runs fast.
11. Third person irregular: e.g., has, does	Number; earlier in time	Does the dog bark?
12. Uncontractible auxiliary be: e.g., is, were	Number; earlier in time; ongoing process	Were they at home? Is he running?
13. Contractible copula be: e.g., -'s, -'re	Number; earlier in time	That's a spaniel.
14. Contractible auxiliary be: e.g., -'s, -'re	Number; earlier in time; ongoing process	They're running very slowly.

Source: Based on Brown, 1973.

how time consuming it would be if children had to learn separate, specific rules for each new word that they encountered. They might learn, for example, that two dogs is expressed as *dogs*, but they would have to learn in a separate lesson how to pluralize other words, such as *cat* or *house*. In Slobin's phase 3, children learn general grammatical rules that can be used with new as well as familiar words. Only in phase 4, however, do children—at seven or eight years—finally approach adult usage, recognizing when to apply these rules. A crucial achievement of this last phase is learning when *not* to apply a rule.

Adult language is full of irregularities and other exceptions to the rules. When children are first learning a language, they ignore these irregularities and rigidly apply the rules they learn. In **overregularization** of rules, children apply a rule for forming regularities in cases in which the adult form is irregular and does not follow the rule. For instance, a young child may start out using the words *went* and *came* correctly but, after learning that *-ed* forms the past tense for many verbs, he may begin to use this ending for all verbs, producing *goed* and *comed* (Slobin, 1985). Similarly, a child often uses the word *feet* until she learns the regular plural ending; then she may switch to *foots* or sometimes *feets*. Occasionally, after learning that some plurals are formed by adding *-es* (e.g., *boxes*), a child will come up with *footses* for a time.

Children also sometimes create regularized singular words from an irregular plural. For example, a child the authors knew who used the word *clothes* insisted on calling one piece of clothing a *clo*. Another child overregularized a verb form, asking "I'm magic, amn't I?" Overregularization is found not only in North America but in other parts of the world, including the Soviet Union, where children apply the rules they learn broadly to form novel "regularized" words and phrases that do not occur in adult speech (Slobin, 1982).

### APPROACHING FORMAL GRAMMAR

In the third year of life, "there is a grammatical flowering" (deVilliers & deVilliers, 1992, p. 378). Simple sentences start to become subtle and more complex as children show early signs of understanding the rules of adult grammar (Valian, 1986). Among children's many achievements is the beginning use of auxiliary and modal verbs (deVilliers & deVilliers, 1992). *Mode*, or "mood," is the capacity of verbs to convey factual statements, expressions of

#### overregularization

The mistaken application of a principle of regular change to a word that changes irregularly.



Animated conversations like this one are a sign of the “grammatical flowering” that generally characterizes the third year of life.

possibility (e.g., the subjunctive), or imperatives. For example, a child says, “Daddy *can* run,” or he commands, “*Run*, Daddy.” One of the auxiliary verbs children begin to use at this stage is the verb *to be*, which appears in many English sentence structures and, thus, opens up the possibility of new forms of expression. Children begin to use questions: “Can you run?” and they form simple negative sentences: “No run.” They also begin to use tenses other than the present: “I kicked it.” And they begin to use pronouns and articles and even begin to create complex sentences: “The teddy and doll are gonna play.” (deVilliers & deVilliers, 1992, p. 379) Let us take a closer look at two of these grammatical milestones: questions and negatives.

### Questions

To express a question, young children may first use an assertion, such as “sit chair” or “see hole,” simply raising their voices at the end to indicate that they are asking a question (deVilliers & deVilliers, 1979). For example,

*I have some?  
You like dis?*

In the latter part of the third year, children begin to ask “wh” questions—those that start with the words *what*, *when*, *who*, *why*, and *which*—as well as questions that begin with *how*. According to linguists Peter and Jill deVilliers (1979, 1992) of Smith College in Massachusetts, the child’s first such question is usually some variant of “whatsat,” “whasit,” “whatsit,” “whaddes,” “whatisdes.” The deVilliers’ son, Nicholas, learned these constructions early:

*At the age of 11 months, Nicholas picked up whatisdat as one of his first “words” and pronounced it very accurately. We were trying in vain to keep him under control in a restaurant when he lunged over a neighbouring diner’s shoulder and demanded loudly, “Whatisdat?” to which the startled woman answered, “Fish!” (deVilliers & deVilliers, 1979, p. 61)*

Between two and three years, children’s “wh” constructions may fail to include the auxiliary verb, and they can be heard to say such things as, “Where you going?” A little later, they include the auxiliary without inverting it; for example, “Where you are going?” Finally, they incorporate all the rules for producing a “wh” question; for example, “Where are you going?”

An important feature of “wh” questions is that they enable children to exercise their curiosity. “Why” and “how” questions, in particular, facilitate their learning of new things. Again, we see that language and cognitive development are closely tied, each serving the other and both together promoting the child’s overall progress.

### Negatives

Research indicates that children use different rules to form different kinds of negatives. Expanding on Bloom’s (1970) argument that three distinct types of negation appear in a particular developmental order, Tager-Flusberg (1985) proposed the following categories of negatives in the order of their appearance in young children’s speech:

Type of Negation	Explanation	Example
1. Nonexistence	Remark as to the absence of something	“No cake” or “all gone cookie”
2. Rejection	Opposition to something	“No wash hair”
3. Denial	Denial that a statement made or implied by someone else is true	“That not Daddy”

Language researchers have found that these same types of negations appear in the same order in Japanese (Bloom, 1991; Clancy, 1985) as in English.

The development of these two types of speech, questions and negatives, is only a sample of a wide range of grammatical accomplishments during the preschool years. By three years of age, children begin to use sentences so complex that they “drive nonlinguists to their descriptive grammar books.” (deVilliers & deVilliers, 1992, p. 379) Again, progress is gradual but orderly. At first children tack on relative clauses; for example, “See the ball that I got.” It is only later that they interrupt a main clause with a subordinate clause: “The owl who eats the candy runs fast.” (Slobin, 1985; Maratsos, 1998) And they ask and answer complex questions: “Where did you say you put my doll?” “These are punk rockers, aren’t they?” (deVilliers & deVilliers, 1992, p. 379)

Although most fundamental forms of grammar are acquired by 4½ to five years, the process of grammar acquisition is not over during the preschool years. Specific aspects of syntax continue to develop through the elementary school years, as children experience exceptions and try to understand them (Maratsos, 1998). In fact, mastering the intricacies of grammar is, for most of us, a lifelong process!

### HOW CHILDREN MAKE SENSE OF WHAT THEY HEAR

Children need not only to speak grammatically correct sentences, they also need to understand the meaning of sentences they hear or read. Although we have been discussing language production, it is important to remember that productive and receptive language are closely linked. Several researchers have shown that children are apparently able to use syntactic and semantic cues to help them understand sentences at a very early age, sentences that are more complex than those they can produce. In fact, children seem able to call on a great store of linguistic knowledge to set up expectations about the identity of possible words. Syntax provides clues about the meanings not only of nouns or object words but of verbs or action words as well.

Verbs can appear in different kinds of sentences. For example, a verb like *hit* means to do something to someone else; and it usually appears in such a sentence as “Tom hit Jerry,” in which the verb is preceded by one noun, the doer, and followed by another noun, the recipient of the deed. In contrast, such verbs as *laugh* that refer to an action with no recipient appear in such sentences as “Tom laughed,” in which there is just one noun, the doer. (Hoff-Ginsberg, 1997, p. 112)

According to Gleitman and her colleagues (Fisher, Gleitman, & Gleitman, 1991; Fisher, Hall, Rakowitz, & Gleitman, 1994; Gleitman, 1990), children use a kind of “syntactic bootstrapping” to figure out word meaning. According to this theory, once children learn how to parse utterances into syntactic units, they use this knowledge to distinguish the meaning of verbs they may not yet understand.

Letitia Naigles (1990, 1995), for example, demonstrated that two-year-olds can use a verb’s appearance in a transitive or intransitive form to decide whether causative or non-causative action is involved. Naigles first read the children the sentence, “The duck is gorging the bunny” and then they saw either a video in which a duck was making a rabbit do something or a video in which the duck and rabbit were both moving about but not directing their action towards each other. The fact that children were more likely to attend to the first video display indicated that they inferred a causal action from the transitive expression (“is gorging the bunny”) in the sentence. In contrast, when the toddlers heard, “The duck and bunny are gorging” they looked at the video in which the two actors gestured together, presumably inferring from the intransitive expression that neither actor was making the other do anything.

According to Goodman (1989), even one- to three-year-old children use semantic and syntactic cues to identify spoken words. In a sentence completion task, Goodman presented children with spoken sentences and asked them to fill in a final missing noun. For example, to the utterance “Mommy feeds the \_\_\_\_\_,” children responded “baby.” In a word identification task, children listened to complete sentences and pointed to pictures to identify the final word in each sentence. In one condition of this task, the word called for by the sentence meaning was among those pictured, but the word actually spoken was represented by another picture. For example, children listened to the sentence “Ann drives the duck” and then looked at pictures of a duck, a truck, a dog, and a book; although the word spoken was

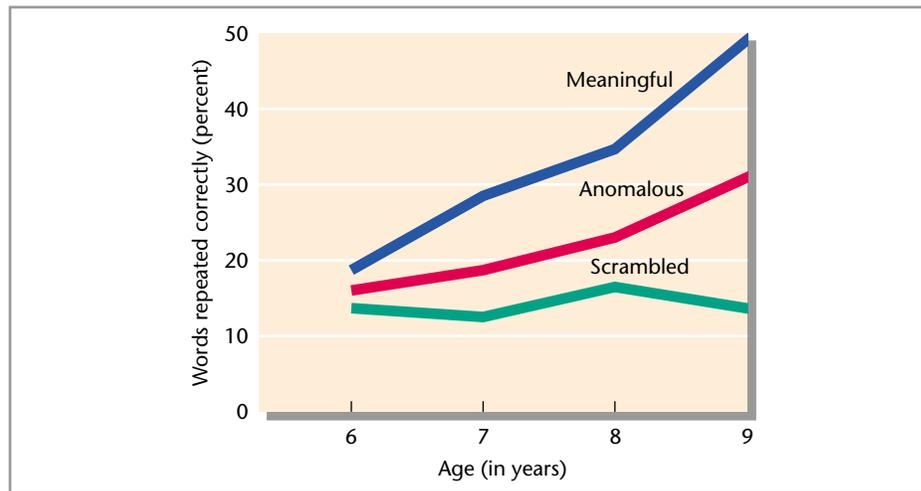


FIGURE 8-7

### Learning to use semantic and syntactic clues.

The more syntactic and semantic clues offered by sentences heard against background noise, the more successful children were at repeating the sentences. All children had difficulty with the *scrambled* sentence that lacked any clues, but when clues were present, as in the *meaningful* and *anomalous* sentences, older children made better use of them than did the younger children.

(Source: Entwisle & Frasure, 1974)



*duck*, the children chose the word *truck*. When the children heard the sentence “The man sees the duck,” however, they chose the duck picture.

Does the ability to use semantic and syntactic information improve with age? Entwisle and Frasure (1974) demonstrated that this is very probably so. Using a “noisy telephone” technique, in which background noise was used to make auditory material difficult to hear, these researchers asked groups of children six, seven, eight, and nine years old to listen to three sentences. The children were then asked to repeat the sentences as accurately as possible. Because the noise blocked out parts of the sentence, the children had to rely on their knowledge of how sentences are generally formed to fill in the missing words. Here are the sentences:

*Bears steal honey from the hive.*  
*Trains steal elephants around the house.*  
*From shoot highways the passengers mothers.*

In the first, *meaningful* sentence, both semantics and syntax are correct. The second, *anomalous* sentence is syntactically correct, although it makes no sense. In the last, *scrambled* sentence, both syntax and semantics are jumbled, making this presumably the most difficult sentence for children to reproduce. As you can see from Figure 8-7, the older the child, the more he or she was able to benefit from the available syntactic and semantic clues. At all ages, the more such clues the children had, the better they did; all age groups experienced similar difficulties with the sentence in which these clues were totally absent.

Children’s comprehension of many complex constructions remains poorly understood. We still do not know when or how children are able to understand “John was thought by Mary to have been scratched by Sam” or “Whom do you think Mary could ask Sam to talk to about that?” (Maratsos, 1983). It is quite clear that children continue to develop in both their production and understanding of complex syntax well beyond the early school years; a comparison of children’s speech at the grade 1 and grade 8 levels testifies to these developments in production. Moreover, listening to a grade 3 English lesson and a university seminar on Shakespearean sonnets clearly indicates that both comprehension and usage continue to develop for many years.



### FOR THOUGHT AND DISCUSSION

1. How would the learning theory view explain aspects of word learning, such as the naming explosion or fast mapping? How about the nativist approach?
2. At what point in the acquisition of language do you think children begin to understand aspects of humour? What language capabilities are necessary for such understanding?

## LEARNING THE SOCIAL AND CREATIVE USES OF LANGUAGE

Language, by its very nature, is a social phenomenon; it enables the child to communicate with other people. What becomes very important as children develop, therefore, is the decision as to what words and phrases to use in differing social situations. The rules for this usage, which we have already identified, are known collectively as *pragmatics*. Speakers have a variety of pragmatic intentions, such as getting people to do things for them and thanking people for their help, and they need to know how to express these intentions appropriately, depending on the situation and the other people involved. This focus on the social situation is seen even in the child's early one- and two-word expressions. When these expressions clearly refer to situations or sequences of events, rather than to just one object or action, we call these expressions **speech acts**.

Communication becomes **discourse**, or socially based conversation, when children's speech is appropriate to both audience and situation and when children have become able to listen and respond to another's speech. The latter achievement includes the important ability to recognize one's own lack of understanding and to request additional information.

Children also develop the ability to use figurative language at quite young ages. Although we often tend to think of metaphors and the like as they are used in written language, even preschool children can understand such creative devices, and this capacity builds gradually. In this section, we begin by looking at some of the rules of pragmatics and then turn to the ways children learn first to communicate and then to be good listeners. The final part of the section examines the evolution of figurative language.

### THE RULES OF PRAGMATICS

Even when a child has mastered meaning and syntax, she is not yet fully equipped to be an effective communicator. She must learn another set of rules, namely, when to use what language in what situation. To be an effective speaker requires a complicated set of skills. First, the child must engage the attention of her listeners so that they know that she wants to address them and that they should listen. Second, effective speakers have to be sensitive to listeners' feedback. If children do not know when others fail to understand them or do not know how to change their messages to make themselves clear, they are not going to be very successful communicators. Third, speakers must adjust their speech to the characteristics of their listeners, such as age and cultural and social background. For example, the grade 5 child must learn that in addressing his classmates he can use words and concepts that he cannot use when he makes a presentation to the school's kindergartners. Being a good communicator requires that you adapt your message to consider "who the listener is, what the listener already knows, and what the listener needs to know." (Glucksberg, Krauss, & Higgins, 1975, p. 329)

A fourth rule requires that children learn to adjust their speech to suit the situation. Children and adults learn to talk differently on a playground or street from how they would in a church or a classroom. A fifth guideline points out that communication is a two-way process. To participate in a conversation, one must be not only an effective speaker but a skilled listener; learning to listen is just as important as learning to speak. A sixth rule underlines the importance of understanding one's own communicative skills, that is, children must learn to evaluate both their own messages and the messages they receive from others for clarity and usefulness. They must also learn to correct their own messages, when necessary, and to let another speaker know when they do not understand the speaker's communication, often specifying the information that they need from the speaker (Glucksberg et al., 1975).

How early do children acquire these various communication skills? How do they develop? How do they shift across different types of communicative situations? We explore these questions next.

### LEARNING TO ADJUST SPEECH TO AUDIENCE

Speaker skills develop rapidly, and by two years of age, children are remarkably adept, both at engaging the attention of a listener and at responding to listener feedback. Videotaping 10 two-year-olds in their day-to-day interactions in a nursery school, Wellman and Lempers (1977)

#### speech acts

One- or two-word utterances that clearly refer to situations or to sequences of events.

#### discourse

Socially based conversation.



recorded 300 referential communicative interactions, in which the communicator's intent was to point out, show, or display a particular object or referent to another child. The results were striking in their demonstration of these children's competence as speakers. The toddlers addressed their listeners when both were either interacting or playing together (82%) or when the listeners were at least not involved with someone else (88%). The children also directed communications to others when they could see each other (97%), when they were physically close to each other (91%), and, to a lesser extent, when the listeners were looking directly at them (41%). Similarly, the children made sure that when they spoke, they were close to the thing they were talking about (92%) and that the listener was also close to the thing referred to (84%), to make it more likely that the listener would understand the message.

In light of these precautions, it is not surprising that these young speakers were very effective in engaging their listeners. In fact, 79 percent of messages met with an adequate response from listeners. Moreover, speakers showed an awareness that certain situations were particularly difficult and adjusted their communications accordingly. They communicated more in difficult situations, as for example when there was an obstacle between the listener and the thing referred to, and used shorter messages in easy situations. Finally, these children were responsive to feedback from their listeners. For example, more than half the time, when the speakers received no response, they repeated their messages in some form, but they repeated messages only three percent of the time when they received an adequate response. If the listener either just looked or gave a negative verbal reaction—an indication that she or he did not understand—the children always recomunicated. In sum, these two-year-olds were surprisingly sophisticated speakers.

Children as young as two years of age learn to adjust their speech when talking with other children of different ages. In several studies (Dunn, 1988; Dunn & Kendrick, 1982b) two- and three-year-olds used more repetitions and more attention-eliciting words (*hey*, *bello*, and *look*) when talking to their baby brothers and sisters than they did when addressing their mothers. Researchers (Gelman & Shatz, 1977; Shatz, 1983, 1994) have also found that children make the same kinds of adjustments when they speak to people outside the family. Contrast the following statements directed at an adult and a child (Shatz & Gelman, 1973):

[*Four-year-old to unfamiliar adult*]: You're supposed to put one of these persons in, see? Then, one goes with the other little girl. And then the little boy. He's the little boy and he drives. And then they back up. And then the little girl has marbles. . . .

[*Four-year-old to unfamiliar; younger child*]: Watch, Perry. Watch this. He backing in here. Now he drives up. Look, Perry, look here. Those are marbles, Perry. Put the men in here. Now I'll do it.

Despite the sophisticated level at which children can often operate, children's communicative competence does face some limitations. Preschoolers, for example, are more effective in a one-to-one conversation; they do less well when they must compete for their turn with adults and other children. Before they are 4½, according to Ervin-Tripp (1979), children interrupt and are interrupted more often when in a group of other speakers than when talking to another child alone. Children do not track the conversations of two or more people easily, and they have trouble gauging when to enter the conversation and judging when it is their turn. On the other hand, all of us know there are even adults who seem not to have learned these lessons very well either! Children are more competent when speaking about single familiar objects that are present in their immediate environment than when speaking about absent objects (absent in time or space); their own feelings, motivations, and thoughts; or relations over space and time among people, objects, or situations (Dunn, 1988; Shatz, 1983, 1994). Speaking improves as the child develops, but speaker skills develop at different rates for different kinds of communication tasks.

## TURNING POINTS

### LANGUAGE MILESTONES FROM INFANCY TO MIDDLE CHILDHOOD

**BIRTH** Crying  
Perception of others' speech  
Preference for human voices

**1–6 MONTHS** Decrease in crying  
Makes soft sounds  
Cooing, laughing, gurgling  
Imitates short string of vowel sounds; alternates making sounds with another person  
Making consonant sounds; “says” consonants increasingly often  
Responds to prosodic features of speech (e.g., inflection and pitch)  
Intonations move towards speech patterns heard most often

**6–12 MONTHS** Babbling strings of consonant-vowel combinations  
May babble more in familiar than unfamiliar settings  
Sounds resemble speech  
Increasing preference for own language over unfamiliar language  
Produces sound for familiar toy or object; experiments with sounds  
Babbling has sentence like quality  
May “say” a word—bah for bottle, mama for mother  
May say no but doesn't always mean “no”  
May say two or three words; uses same word for category, such as wah for both water and milk



**12–18 MONTHS** Sentences usually one word at first  
Tries hard to make self understood  
Symbolic gesturing  
Utterance of first words  
Imitates words; may repeatedly use a new word  
May use a few two-word sentences  
May use adjective to refer to self (good boy)  
Understanding of naming processes

**18–24 MONTHS** Beginning of naming explosion (average child goes from 50 to 900 words in about six months)  
Uses two-word sentences  
Rapid expansion of understanding

**24–36 MONTHS** Decrease in gesturing  
Disappearance of babbling  
Increase in use of plurals, past tense, definite and indefinite articles, some prepositions  
Use of three-word combinations  
Excellent comprehension  
Gradually increasing use of sentences to communicate



**36–48 MONTHS** Use of yes/no questions, why questions, negatives, and imperatives  
Embedding one sentence within another (using clauses)  
Use of overregularizations  
Vocabulary increases by about 1,000 words  
Coordination of simple sentences and use of prepositions

**48–60 MONTHS** Increasingly sophisticated use of pragmatic rules of communication  
Use of humour and metaphor

**5 YEARS and beyond** Use of more complex syntax  
Further expansion of vocabulary (to about 14,000 words)  
Development of metalinguistic awareness  
Language and Communication



**Source:** Kopp, 1994.

**Note:** Developmental events described in this and other Turning Points charts represent overall trends identified in research studies. Individual children vary greatly in the ages at which they achieve these developmental changes.



How do children acquire the ability to converse on an increasingly sophisticated level? Learning language is similar to learning other forms of social behaviour; children learn through direct instruction from parents and teachers, and they learn by observing other people who figure in their lives (Bandura, 1989; Dunn, 1988). They also learn by listening to people talk about their own and others' behaviour in one kind of situation or another—who said what to whom and how this or that person responded (Miller & Sperry, 1987).

Much of what children learn from parents about the culturally appropriate use of language involves the acquisition of social conventions and moral rules. For example, one of the child's first lessons in formal communication involves learning how to use polite, socially accepted words and phrases, such as *hello*, *good-bye*, *please*, and *thank you* (Grief & Gleason, 1980); these simple social routines are common to all cultures (Schieffelin & Ochs, 1987). But children must also learn when, where, and to whom it is appropriate to express negative feelings and thoughts, such as anger. Peggy Miller and Linda Sperry (1987) found that language plays a central role in socializing children into culturally acceptable expressions of emotion. In the working-class community these researchers studied, mothers, in their young children's presence, told stories of encounters they had had in which they and others became angry and used language to express and respond to anger. An important point to be learned here was that one's anger and aggressiveness must be justified by some instigating remark or act of another person. One mother told of being referred to as a "big-nosed bitch" by another woman and described her own rather inventive retort as, "Well, you fat slob you, I put you in a skillet and strip you down to normal size, if you mess with me." (Miller & Sperry, 1987, p. 13). Although mothers in this urban community were concerned to prepare their children to defend themselves against aggression from others, they also made it clear to their children that they needed to apologize when they were at fault and that in such situations anger and aggressive behaviour were inappropriate.

### LEARNING TO LISTEN CRITICALLY

To learn from a communication, you must be able to recognize when a message sent to you is not clear. Young children are often unaware that they do not understand a message. In one experiment, Markman (1977) gave children in grades one to three game instructions that left out critical information that was essential to playing the game. The grade-three children noticed the inadequacy of the instructions more readily than did the younger children; indeed, the latter were generally unaware that information was missing and had to be urged to try to play the game before realizing that they did not know enough to do so. Another group of researchers (Flavell, Speer, Green, & August, 1981) found a similar developmental trend among kindergarten children and grade two children: The kindergartners were less likely than the older children to recognize that guides given them for building a toy house were defective.

If the task is simple enough, even three-year-olds can recognize a breakdown in communication. In one study (Ferrier, Dunham, & Dunham, 2000), preschool children at 27 and 33 months talked with a toy robot while playing. During these conversations the robot asked either general (e.g., "what?") or specific (e.g., "Piggy's on the what?") questions in response to what the children said. An analysis of the responses to these queries indicated that in answer to the general question, children at both ages responded by repeating their earlier statement. In response to the more specific question, the older children switched their strategy and responded with a specification, sometimes elaborating their original statement or providing additional information, or repeating the key constituent component of the statement. The younger children, however, failed to switch the nature of their response, once again simply repeating their original utterance. Similar results have been found in work

Learning to listen carefully to another's message is an important achievement, and adults can help children learn to attend to objects and events in the environment.



in which adults made either ambiguous or impossible requests of three- and four-year-old children. Even the three-year-olds recognized when the request was problematic, and often, they attempted to remedy the problem by requesting more information. Both these studies suggest that children as young as three-years possess the necessary skills for monitoring conversations, such as recognizing when problems occur and knowing how to fix such problems.

Children can be taught to be more effective listeners, but there may be a minimal age at which children can learn to listen critically. Two studies have shown that when six- to 10-year-old children were encouraged to ask a speaker questions to clarify his or her communication, they performed more effectively than children who were not given this lesson in listening (Cosgrove & Patterson, 1977; Patterson & Kister, 1981). That four-year-olds did not benefit from this instruction suggests that this type of listener strategy may be a moderately advanced communication skill.

## THE USE OF FIGURATIVE LANGUAGE

Figurative expressions, such as “a seed is like a pregnant woman,” “the pillowy clouds,” and “he croaked like a frog” are powerful imaginative communications. These expressions communicate something about a concept by comparing it to a similar concept from a different conventional category. When do children begin to produce and comprehend metaphor and other forms of figurative speech? Almost as soon as they start to talk!

According to Winner, McCarthy, Kleinman, and Gardner (1979), an 18-month-old child called a toy car a snake while twisting it up his mother’s arm, and a 26-month-old exclaimed “Corn, corn!” while pointing to a yellow plastic baseball bat. Utterances like these are known as “child metaphors” because although they are not strictly metaphors, they violate the conventions of naming (they refer to things by a name different from their literal names) or compare two objects that belong to different conventional categories.

Children’s comprehension of metaphor is a continuous process that begins very early and develops gradually to encompass a wider and wider range of figurative linguistic input (Gentner & Stuart, 1983; Vosniadou, 1987; Winner, 1988). To understand increasingly complex metaphors, children need to broaden their general knowledge and to hone their linguistic skills (Vosniadou, 1987). Without adequate knowledge, even adults would find it difficult to compare things from widely different frames of reference. In addition, metaphoric expressions can take a variety of linguistic forms, some of which may be easier to understand than others. For example, similes, which are based on nonliteral similarity, make explicit comparisons, using the words *as* or *like* (our first example at the beginning of this section). This makes them easier for children to understand than metaphors, in which the comparison is implied, as in our second example (Vosniadou, 1987).

Very young children can comprehend figurative speech if metaphors are simple and occur in the appropriate context (Winner, 1988). Although the beginnings of metaphor comprehension emerge during the preschool years, development is not complete until the late childhood years, when the child’s conceptual and linguistic knowledge approximates that of the adult. Children’s ability to produce and comprehend metaphoric language depends critically on what they already know, however, and presenting children with metaphors and encouraging them to think in figurative ways may help advance and enrich their conceptual development. One kindergarten class, after listening to the teacher read Christina Rossetti’s poem “The Clouds,” came up with an amazing number of ideas as to why the poet likened clouds to sheep and the sky to a blue hill, including that clouds are “curly.” The class went on in subsequent weeks to talk about metaphors in other literature.

Metaphoric competence is based on children’s ability to see similarities among objects and events in the world around them, an ability that also plays a fundamental role in categorization. Both categorization and the use of metaphor allow children to use their existing knowledge to understand new things. Metaphors, in particular, reflect the transfer of knowledge from well-known to less familiar domains and, as such, may serve as important mechanisms in acquiring new knowledge (Vosniadou, 1987).



## METALINGUISTIC AWARENESS: KNOWING ABOUT LANGUAGE

One of the crowning achievements in language development, and one of the latest to develop, is the ability not merely to know language in the sense of being able to speak and understand it but to know about language, that is, children become aware that they know language and can think and talk about language itself.

Do children understand that words are made up of discrete sounds? Can children tell you what a word is? When can children describe the differences between grammatically correct and incorrect sentences? **Metalinguistic awareness**, the understanding that language is a rule-bound system of communicating with others, includes the ability to talk about the various properties and uses of language. This understanding and ability emerges well after children are proficient producers of sounds and sentences (Bullinger & Chatillon, 1983). Before they are five years old, children have trouble recognizing that words are groups of sounds, and they are baffled if you ask them to tell you the first sound in their names. For children, reflecting on sounds is a lot tougher than making them! Nor are words any easier to talk about. Before the age of eight years, children confuse words with the objects that they describe. Words are *cats*, *toys*, and *cars*, but children have trouble articulating the concept that words are elements of language and independent of the objects or events which they refer to (Wetstone, 1977). It is not until children are about 10 years old that they define words as “meaning something” (Berthoud-Papandropoulou, 1978).

To test children’s understanding of grammar, we can ask children to judge between grammatical and ungrammatical sentences and acceptable and unacceptable syntax. In one investigation, deVilliers and deVilliers (1972), using the clever technique of asking children to teach a puppet to talk correctly, tested children’s ability not only to judge but to correct word order in sentences describing specific actions. Sometimes, the puppet spoke in correct word order; for example, “Eat the cake.” At other times, the puppet reversed word order: “Dog the pat.” And at still other times, the puppet used correct syntax but described actions that were impossible: “Drink the chair.” The children not only told the puppet whether it was right or wrong but also helped the puppet rephrase the “right way.”

The researchers found a clear relation between the children’s level of language development and their metalinguistic awareness; as their ability to produce and comprehend sentences increased, their awareness increased as evidenced by their ability to correct the puppet’s “wrong” utterances (deVilliers & deVilliers, 1992). According to Dale (1976), the process of becoming aware of language continues throughout development and “in its highest form, it becomes the basis of aesthetic pleasure in poetry and prose.” (p. 128)

## BILINGUALISM AND LANGUAGE DEVELOPMENT

One of the most dramatic changes to occur in North America recently is the growing presence of significant portions of the population that speak more than one language. As a result, there are many children in both Canada and the United States who will grow up speaking in two or more languages. What are the implications of **bilingual education**, in which children learn two languages simultaneously, for the language acquisition process? Although many experts have expressed concern that the task of learning two languages interferes with children’s language learning, this may not be generally the case. Children who learn two languages may learn both languages more slowly than some of their peers learning one language; nevertheless, the performance gap disappears as children develop. Most evidence (Bialystok, 1991; de Houwer, 1995; Hakuta, 1986) suggests that children who are five years or older when they learn to speak two languages have smaller comprehension vocabularies than monolingual children. In contrast, studies of children between eight months and 2½ years old found that bilingual and monolingual children had comprehension vocabularies of about the same size (Pearson, Fernández, & Oller, 1993). Although a bilingual child may have in each of her languages a vocabulary that is smaller than a monolingual child’s vocabulary, her total production vocabulary—her vocabularies in both languages combined—may be equal in size to the monolingual child’s production vocabulary (Pearson et al., 1993).

A recent study (Hirsch & Kim, 1997) has suggested that when children learn two languages simultaneously, from infancy, the languages share the same brain region that is

### metalinguistic awareness

The understanding that language is a system of communicating with others that is bound by rules.

### bilingual education

Teaching children two languages at the same time

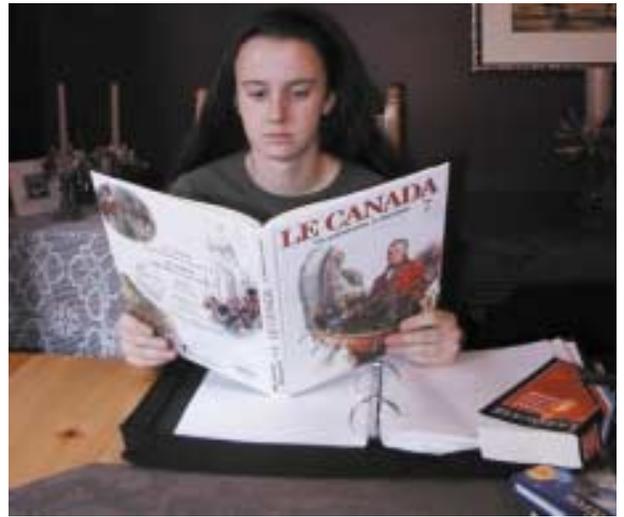
responsible for the execution of speech as well as for some grammatical aspects of language (called *Broca's area*). However, when children learn a second language later in childhood or adulthood, this brain region is divided, with a distinct area reserved for the second language. Although others have disagreed with the idea that the two languages in bilinguals have separate anatomical representations (Paradis, 1990, 1996), if these findings are valid, we might speculate that they underlie the apparent greater ease of learning a second language early in childhood. Perhaps, future studies will shed more light on this issue.

How do children learn a second language? The most obviously influence on second language learning is the sociocultural environment, including such factors as the family, the school, and the overall community in which one lives (Caldas & Caron-Caldas, 2000; Gardner & Clément, 1990; Gardner, Masgoret, & Tremblay, 1999). R.C. Gardner of the University of Western Ontario and collaborators (Gardner & Clément, 1990; Gardner, Lalonde, & Pierson, 1983; Gardner et al., 1999), for example, have for a number of years been looking at the types of sociocultural variables that play a role in children's second language learning. These researchers have identified a number of factors that play a role in such acquisition, including parental encouragement, motivation, and the number of French speakers in the home community. Other researchers (Caron & Caldas-Caron, 2000) closely examined the impact of home, school, and community on three French-English bilingual children's language preference and found that the greatest impact on choice of language was the community in which the children lived. Interestingly, because these children spent part of their time in English-speaking Louisiana, and in French-speaking Québec, these authors were actually able to track rapid shifts in their children's language choice, often observing changes of between 80 and 90 percent in language preference from one month to the next! Clearly, the cultural influences on language learning and use are quite strong.

In both Canada and the United States, another significant context for language learning involves using the two languages as part of children's academic instruction. In Canada, such French-immersion programs were originally introduced in 1965 in response to concerns of English-speaking parents in Québec that their children were not receiving adequate instruction in learning French (Genessee, 1985; Lambert & Tucker, 1972). In French-immersion programs, students receive anywhere from 50 to 100 percent of their school instruction in French. Currently, the most common model nationally is 100 percent immersion from kindergarten through grade 2, and at least 50 percent immersion through the rest of elementary school (Genessee & Gándara, 1999).

What is the impact of immersion programs, or of bilingualism in general, on social, cognitive, and linguistic development? In fact, learning a second language often has specific benefits. Studies have shown that children who learn two languages exhibit any number of cognitive enhancements, such as better concept formation and more flexibility in their thinking (Diaz, 1983, 1985; Genez & Kodzopeljic, 1991; Rosenbluum & Pinker, 1983). For example, Ellen Bialystok (Bialystok, 1993; Bialystok & Majumber, 1998) has found that bilingual children are better than monolingual children at controlling their attention and are less susceptible to distraction while problem solving. Such findings imply that the benefits observed from being bilingual are evident in both linguistic and nonlinguistic domains.

Other research, focused more specifically on the impact of immersion programs, also found that such advantages are not limited to just cognitive processing but can also be seen in terms of social behaviour and interaction. In a series of studies by Wallace Lambert, Fred Genessee and others (Genessee & Gándara, 1999; Holobow, Genessee, Lambert, Gastrich, and Met, 1987; Holobow, Genessee, & Lambert, 1991; Lambert, Genessee, Holobow, & Chartrand, 1993), the authors have reported on the effects of French immersion on an array of linguistic, cognitive, and social behaviours. Lambert (1987), for example, reports that in comparison to control children, immersion children have less stereotypical attitudes towards French-Canadians and have more mature and productive social perspectives. Although other work (Holobow et al., 1987, 1991) has tended not to find any



Canada introduced bilingual education program in 1965, with students receiving up to 50% of their daily instruction in French.

Bilingualism





differences in academic achievement between immersion and nonimmersion students, this research has similarly found that foreign language immersion tended to diminish the effects of social class background. In a recent review of the literature relevant to bilingual education programs in the United States and Canada, Genesee and Gándara (1999) found that immersion programs had a positive impact on intergroup attitudes and reduced prejudicial feelings towards members of the other language group. Although these authors admit that these influences were not as substantial, or as long-lasting, as some researchers had hoped, clearly second language learning and immersion provides both an advantage and an opportunity for children.



### FOR THOUGHT AND DISCUSSION

1. Much of our discussion concerning language development has involved aspects of communication. Yet language has a very important social function as well. How well do current theories of language development (learning theory, nativist theory, interactionist theory) capture the social aspect?
2. What cognitive abilities might underlie the understanding of metalinguistic awareness? More generally, what is the relation between cognition and language?
3. What do you think of the status of bilingual education in Canada? Given the rise in different language groups over recent years, should bilingual education be expanded to become multilingual education and include more languages?

## SUMMARY

- **Language** serves a variety of purposes for the developing child. It facilitates interpersonal communication, helps organize thinking, and aids in learning. The development of **communicative competence** is an important part of children's language learning.
- Communication requires us to use both **productive language**, transmitting messages to others, and **receptive language**, in which we receive and understand messages others send us.

### THE COMPONENTS OF LANGUAGE: PHONOLOGY, SEMANTICS, GRAMMAR, AND PRAGMATICS

- The study of language can be divided into four areas. **Phonology** describes a language's systems of sounds, or the way basic sound units, called **phonemes**, are connected to form words. **Semantics** is the study of the meaning of words and sentences. **Grammar**, which describes the structure of a language, includes **syntax** and **morphology**; **morphemes** are a language's smallest units of meaning. **Pragmatics** consists of rules for the use of appropriate language in particular social settings.

### THEORIES OF LANGUAGE DEVELOPMENT

- The traditional learning view explains language development by the principle of reinforcement. Other learning theorists see the child learning language primarily through imitation. Although learning

principles seem to be important in modifying language usage, they do not explain how children might acquire the enormous number of reinforcement linkages required to communicate effectively. Neither do they account for the regular sequence of language development, children's creative utterances, or the fact that children learn to speak grammatically even when parents fail to reinforce grammar.

- According to Noam Chomsky's nativist approach to language development, children have an innate **language acquisition device (LAD)** that enables them to learn language early and quickly. Support for this position comes from the finding of certain universal features in all languages, such as the use of a relatively small set of sounds and the combination of words into what in English are called "sentences," as well as from evidence that there may be a **critical period** for learning language. Critics point out that there is little agreement about the exact nature of the early grammatical rules that children learn and argue that language is not acquired as rapidly as the nativists once thought. They also point out that the wealth of variant grammatical and syntactic rules around the world argues against any sort of universality and that the nativist view ignores the social context in which language develops.
- Most modern theorists take an interactionist position, recognizing that children are biologically prepared for language but require extensive experience

with expressed language for adequate development. According to this view, children play an active role in acquiring language by formulating, testing, and evaluating hypotheses about their languages' rules.

- In proposing a **language acquisition support system (LASS)**, Jerome Bruner emphasizes the critical roles of parents and other early caregivers in the child's language development. American middle-class mothers, in particular, support a child's beginning language by using **infant-directed speech**, or simplified language with their children, by playing nonverbal games with them, by using the technique of **expansion** to expand or add to children's statements and by **recasting** children's incomplete sentences in grammatical form. Many cultures do not use such specific techniques, nor do they demonstrate that **negative evidence** is a critical force in language learning.

### THE ANTECEDENTS OF LANGUAGE DEVELOPMENT

- Infants acquire early training in the give and take of conversation through "pseudo-dialogues" with their parents, and by the time they are one year old, they are highly skilled at nonverbal communication. Using **proto-declaratives** and **proto-imperatives**, young children can make statements about things and get other people to do things for them.
- Infants' capacity for receptive language begins as early as the first month of life, as demonstrated in their **categorical speech perception**, the ability to discriminate among consonant sounds as well as their ability to recognize some vowel sounds by the age of two months.
- Initially, babies can distinguish sounds in languages other than that of their parents, but as children are exposed to their native languages, their abilities to distinguish and categorize phonemes continue to be refined and specialized for the sounds of their own languages.
- Some evidence indicates that infants may be able to segment speech and to recognize words in the context of ongoing speech earlier than we had thought.
- Precursors to productive language include **cooing**, **babbling**, and **patterned speech**. Babbling occurs in many cultures, and the babbling of deaf babies is very similar to that of hearing infants. Babbling has also been shown to resemble a child's first meaningful words, a finding that suggests its importance in the development of linguistic skills.

### SEMANTIC DEVELOPMENT: THE POWER OF WORDS

- Children's acquisition of vocabulary proceeds in bursts, the first of these occurring at about a year and a half in the **naming explosion**. To build their vocabularies, children use **fast-mapping** to connect a

new word with a concept they already understand. Other aids to rapid learning of new words include a number of constraints that allow children to make certain narrowing judgments about a new word, such as that it refers only to an object or that it is entirely different from other words they already know.

- Infants' speed at learning words may be increased by certain kinds of constraints—whole object, taxonomic, and mutual exclusivity—that limit the kinds of hypotheses the child entertains in figuring out the meaning of a new word.
- Children may learn object or naming words first, although some research has suggested that such words make up only a third of early vocabularies. A common error is that of **overextension**, in which a single word covers many different things. In **underextension**, a child may restrict a word to only one representative of a category.

### THE ACQUISITION OF GRAMMAR: FROM WORDS TO SENTENCES

- The one-word utterances that children begin to produce from about one year on are known as **holophrases** to indicate that these words often appear to represent a complete thought.
- Somewhere between one and two years, children begin to use **telegraphic speech**, which generally includes only nouns, verbs, and adjectives. Probably because language development and cognitive development go hand in hand, these two-word communications are semantically similar across cultures and languages, including the sign language used by the deaf.
- Children appear to learn qualifying morphemes in the same order. Typically, they learn simpler morphemes, such as the suffix *-ing* and the plural form *-s*, earlier than more complex ones, such as the contractions *that's* and *they're*. In **overregularization**, children apply rules for regular formations in all cases, including those where formations are properly irregular.
- At about the age of three years, children begin to form more complex sentences, showing signs of understanding some of the rules of adult grammar. In the latter part of the third year, the questions they have started to frame begin to include "wh" questions and questions that begin with "how"; these questions facilitate gathering a great deal of new information. Negative statements may express recognition that something is absent or has disappeared or rejection or denial of something.
- The process of acquiring grammatic forms and achieving grammatic accuracy continues throughout the elementary school years and to some degree is a lifelong task.



- Using a kind of “syntactic bootstrapping,” children as young as one or two years old use semantic and syntactic cues to help them understand sentences. This ability improves both as a function of an increasing number of cues and with age, but children’s comprehension of complex sentence structures continues to develop for many years.

### LEARNING THE SOCIAL AND CREATIVE USES OF LANGUAGE

- Because language is a social phenomenon, children must learn **pragmatics**, or the rules for the appropriate use of language in differing social situations. Children must be able to send their own messages to other people as well as receive and understand the messages others send them.
- To raise their level of communication beyond **speech acts** to true **discourse**, children must learn a complicated set of skills, including how to engage the attention of listeners, how to be sensitive to listeners’ feedback, how to adjust speech to characteristics of listeners and to particular situations, how to be good listeners, and how, as listeners, to let others know that their messages are unclear and that they need to provide more information.
- Even preschoolers are remarkably sophisticated speakers, but because they have difficulty tracking multiple speakers and judging when it is their turn to speak, they are more effective on a one-to-one basis than in a group. Children improve their conversational sophistication through direct instruction and by observing/listening to others speak.
- Children must learn not only how to express positive thoughts and feelings, through polite linguistic conventions, but how to give expression to such potentially negative things as anger and aggressiveness. They must also learn when expression of the latter is inappropriate and requires apology.

- Children’s ability to recognize that messages directed to them are unclear improves with age. Although children can be taught to be more effective listeners, there may be a minimal age at which they can benefit from such instruction.
- Perhaps as early as a year and a half, children can understand and even produce some forms of figurative speech, although some early efforts, known as “child metaphors,” are not true metaphorical expressions. Presenting children with metaphors, along with encouraging their skills at categorization, may facilitate their learning to use existing knowledge in understanding new things.

### METALINGUISTIC AWARENESS: KNOWING ABOUT LANGUAGE

- When children achieve **metalinguistic awareness**, about the age of 10 years, they can understand that language is a system of rules for communication as well as discuss the properties and uses of language. Although they can use many rules at an earlier age, they have difficulty separating words from the object or events they represent and grasping the concept that words are elements of language.

### BILINGUALISM AND LANGUAGE DEVELOPMENT

- The evidence indicates that **bilingual education**, in which children learn two languages simultaneously, does not place children at a disadvantage in terms of language proficiency. In fact, learning two languages may have specific benefits, such as advanced cognitive skills, more flexibility of thought, and greater acceptance of peers of other cultural backgrounds.