OBJECTIVES

In this chapter, you will learn

• how first language acquisition is studied
• how children learn to understand and pronounce the sounds of their language
• how children develop a vocabulary
• how children's morphology develops
• what stages children go through in their production of sentences
• what factors influence first language acquisition

Nothing is more important to a child's development than the acquisition of language. Most children acquire language quickly and effortlessly—giving the impression that the entire process is simple and straightforward. However, the true extent of children's achievement becomes evident when we compare their success with the difficulties encountered by adults who try to learn a second language (see Chapter 11). Understanding how children the world over are able to master the complexities of human language in the space of a few short years has become one of the major goals of contemporary linguistic research. This chapter provides a brief overview of the progress that has been made in this area. We will begin by considering the research strategies used by linguists and psychol-
First, as noted in Chapter 1, mature language users are able to produce and understand an unlimited number of novel sentences. This can only happen if, as children, they have acquired the grammar for their language. Simple memorization of a fixed inventory of words and sentences would not equip learners to deal with previously unheard utterances—a basic requisite of normal language use.

A second indication that children acquire grammatical rules comes from their speech errors, which often provide valuable clues about how the acquisition process works. Even run-of-the-mill errors such as “doed”, “runned”, and “goed” can be informative. Since we know that children don’t hear adults produce words like these, such errors tell us that they have formulated a general rule that forms the past tense by adding “-ed” to the verb stem.

Because language acquisition involves the emergence of a grammar, its study is closely tied to the type of linguistic analysis with which we have been concerned in preceding chapters. Indeed, linguists and psychologists studying language acquisition must often look to the study of phonology, syntax, and other components of the grammar for help in identifying and describing the grammatical system that children acquire during the first years of life.

1.1 METHODS
The majority of research on the acquisition of language focuses on children’s early utterances, the order in which they emerge, and the kinds of errors they contain. Two complementary methods of data collection are used—naturalistic observation and experimentation—Two approaches

In the naturalistic approach, investigators observe and record children’s spontaneous utterances. One type of naturalistic investigation is the so-called diary study, in which a researcher (often a parent) keeps daily notes on a child’s linguistic progress.

Alternatively, a researcher may visit individual children on a regular basis and record (or videotape) a sample of their utterances. In both cases, attention is paid to the context in which children’s speech occurs, the toys they are playing with, the pictures they are looking at, and the like.

Naturalistic data collection provides a great deal of information about how the language acquisition process unfolds, but it also has its shortcomings. The most serious of these is that particular structures and phenomena may occur rarely in children’s everyday speech, making it difficult to gather enough information from natural speech samples to test hypotheses or draw firm conclusions. This problem is further compounded by the fact that speech samples from individual children capture only a small portion of their utterances at any given point in development. (Because of the amount of time required to transcribe and analyze recordings, researchers typically have to be content with hour-long samples taken at weekly or biweekly intervals.)

In experimental studies, researchers typically make use of specially designed tasks to elicit linguistic activity relevant to the phenomenon that they wish to study. The child’s performance is
a group of two-year-olds, a group of four-year-olds, and a group of six-year-olds—taking each of these groups to be representative of a particular stage, or “cross-section,” of the developmental process. In contrast, naturalistic studies tend to be longitudinal in that they examine language development in a particular child or group over an extended period of time (sometimes as long as several years). As the name suggests, longitudinal studies take a long time to conduct, but unlike cross-sectional studies, they have the advantage of permitting researchers to observe development as an ongoing process in individual children.

Type of experimental studies

Experimental studies usually employ tasks that test children's comprehension, production, or imitation skills. One widely used method for testing children's comprehension makes use of a picture selection format. For example, in order to test the interpretation of reflexive pronouns, an experimenter might show children a picture of Big Bird scratching himself as Cookie Monster looks on and a picture of Big Bird scratching Cookie Monster, and then ask which picture goes with the sentence Big Bird is scratching himself. A second method involves supplying children with an appropriate set of toys and then asking them to act out the meaning of a sentence—perhaps a passive structure such as The truck was bumped by the car. Children's responses can provide valuable clues about the type of grammatical rules being used to interpret sentences at particular stages of development. In a typical production task, the child is shown a picture and asked to describe it. Although production tasks can be useful for assessing certain types of linguistic knowledge, there are many structures (such as passives) that are hard to elicit even from adults, since they are used only in special contexts. Moreover, because children's ability to comprehend language is often more advanced than their ability to produce sentences of their own; production tasks can provide an overly conservative view of linguistic development unless they are accompanied by other types of tests;

Experiments that have children imitate model sentences can also provide important clues about children's grammatical development. Although imitation might appear to be easy; it has been found that children's ability to repeat a particular structure provides a good indication of how well they have mastered it. For instance: a child who has not yet acquired auxiliary verbs can be expected to have difficulty repeating a sentence such as The doggie has been barking a lot.

The principal advantage of the experimental approach is that it allows researchers to collect data of a very specific sort about particular phenomena or structures. Experimentation is not without its pitfalls; however. In addition to the difficulty of designing a good experiment; there is always the possibility that children's performance will be affected by extraneous factors; such as inattention; shyness, or a failure to understand what is expected of them. Nonetheless; by using experimental techniques along with naturalistic observation; linguists and psychologists have made significant progress in the study of the language acquisition process. Much of this chapter is devoted to a survey of this progress, beginning with the development of speech sounds.

2 PHONOLOGICAL DEVELOPMENT

Children seem to be born with a perceptual system that is especially designed for listening to speech. Newborns respond differently to human voices than to other sounds;
From around one month of age, children exhibit the ability to distinguish among certain speech sounds. In one experiment, infants were presented with a series of identical [ba] syllables. These were followed by an occurrence of the syllable [pa]. A change in the children's sucking rate (measured by a specially designed pacifier) indicated that they perceived the difference between the two syllables; and were therefore able to distinguish between [p] and [b].

Even more amazing is the fact that infants are able to distinguish between sounds in unfamiliar languages. In one experiment; for instance, six- to eight-month-old infants who were being raised in English-speaking homes could hear contrasts among unfamiliar consonants in Hindi and Nhlakampx (an Amerindian language spoken on parts of Canada's west coast). By the time they were ten to twelve months old, though, this ability had begun to diminish.

Despite this early sensitivity to contrasts among speech sounds, children cannot initially distinguish between meaningful words. The emergence of this ability has been examined in a task in which children are presented with two toy animals named bok and pok (for instance) and are asked to respond to sentences such as Show me pok. To respond correctly; children must not only hear the difference between [p] and [b] but also recognize that it is linguistically significant—that it is used to distinguish between words in their language. Children under eighteen months have little success in this type of task.

2×1 BABBLING

The ability to produce speech sounds begins to emerge around six months of age, with the onset of babbling; It is likely that babbling provides children with the opportunity to experiment with and begin to gain control over their vocal apparatus—an important prerequisite for later speech; Children who are unable to babble for medical reasons (because of the need for a breathing tube in their throat, for example) can subsequently acquire normal pronunciation, but their speech development is significantly delayed.

Despite obvious differences among the languages to which they are exposed, children from different linguistic communities exhibit significant similarities in their babbling- The tendencies in Table 10-1 are based on data from fifteen different languages, including English, Thai, Japanese, Arabic, Hindi, and Mayan. (We focus here on consonant sounds, for which the data is somewhat more reliable than it is for vowels-)

<table>
<thead>
<tr>
<th>Frequently found consonants</th>
<th>Infrequently found consonants</th>
</tr>
</thead>
<tbody>
<tr>
<td>p b m</td>
<td>lv 9 tdn</td>
</tr>
<tr>
<td>kg</td>
<td>lr s h wj xxx</td>
</tr>
</tbody>
</table>

Such cross-linguistic similarities suggest that early babbling is at least partially independent of the particular language to which children are exposed- In fact, even deaf children babble, although their articulatory activity is somewhat less varied than that of hearing children-

2.2 THE DEVELOPMENTAL ORDER

Babbling increases in frequency until the age of about twelve months, at which time children start to produce their first understandable words; Babbling may overlap with the production of real words for several weeks before dying out By the time children have acquired fifty words or so, they begin to adopt fairly regular patterns of pronunciation

Although there is a good deal of variation from child to child in terms of the order in
• As a group, vowels are generally acquired before consonants (by age three).

• Stops tend to be acquired before other consonants.
• In terms of place of articulation, labials are often acquired first, followed (with some variation) by alveolars, velars, and alveopalatals—Interdentals (such as [6] and [0]) are acquired last.
• New phonemic contrasts manifest themselves first in word-initial position—Thus, the /p/-/b/ contrast, for instance, will be manifested in pairs such as pat-bar before mop-mob.

By age two, a typical English-speaking child has the inventory of consonant phonemes shown in Table 10.2:

<table>
<thead>
<tr>
<th>Stops</th>
<th>Fricatives</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>p b m f w</td>
<td>t d n s</td>
<td>k g</td>
</tr>
</tbody>
</table>

By age four, this inventory is considerably larger and typically includes the sounds shown in Table 10.3:

<table>
<thead>
<tr>
<th>Stops</th>
<th>Fricatives</th>
<th>Affricates</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>p b m f v č j w j</td>
<td>t d n s z l r</td>
<td>k g η :</td>
<td></td>
</tr>
</tbody>
</table>

Still to be acquired at this age are the interdental fricatives [9] and [0] and the voiced alveopalatal fricative [3].

In general, the relative order in which sounds are acquired reflects their distribution in languages of the world (see Chapter 8). The sounds that are acquired early are generally found most widely in the world’s languages while the sounds that are acquired late tend to be less common across languages.

263 EARLY PHONETIC PROCESSES

Children’s ability to perceive the phonemic contrasts of their language develops well in advance of their ability to produce them. So even children who are unable to produce the difference between words like mouse and mouth, cart and card, or jug and duck may nonetheless be able to point to pictures of the correct objects in a comprehension task. Moreover, as the following experimenter’s report vividly illustrates, children distinguish phonemes they hear even when they cannot yet produce them:

One of us, for instance, spoke to a child who called his inflated plastic fish a fis. In Imitation of the child’s pronunciation, the observer said: ‘This is your fis?” “No,” said the child, “my fish.” He continued to reject the adult’s imitation until he was told, “That is your fish.” “Yes,” he said, “my fis/4

The child’s reaction to the adult’s initial pronunciation of fish shows that he could perceive the difference between /s/ and /∫/ and that he had correctly represented the word as /fis/ in his lexicon.
phonetic processes that replace certain sounds with others that children find easier to produce and/or perceive.

Syllable simplification

Another frequent process in children’s speech involves the systematic deletion of certain sounds in order to simplify syllable structure; in the data in Table 10.6; typical

Table 10.6 Reduction of consonant clusters

<table>
<thead>
<tr>
<th>[s] + stop (strategy: delete [s])</th>
</tr>
</thead>
<tbody>
<tr>
<td>stop -&gt; [tap]</td>
</tr>
<tr>
<td>small --&gt; [ma]</td>
</tr>
<tr>
<td>desk --&gt; [drk]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>stop + liquid (strategy: delete liquid)</th>
</tr>
</thead>
<tbody>
<tr>
<td>try -&gt; [tay]</td>
</tr>
<tr>
<td>crumb --&gt; [gam]</td>
</tr>
<tr>
<td>bring --&gt; [bin]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>fricative + liquid (strategy: delete liquid)</th>
</tr>
</thead>
<tbody>
<tr>
<td>from --&gt; [fam]</td>
</tr>
<tr>
<td>sleep --&gt; [sip]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>nasal + voiceless stop (strategy: delete nasal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>bump --&gt; [bap]</td>
</tr>
<tr>
<td>tent --&gt; [dit]</td>
</tr>
</tbody>
</table>

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of the speech of two- and three-year-old children, consonant clusters are reduced by deleting one or more segments;

Yet another common deletion process in early language acquisition involves the elimination of final consonants; as in the following examples.

1)

dog
[do]
bus
[bA]
boot
[bu]

Both the reduction of consonant clusters and the deletion of final consonants have the effect of simplifying syllable structure—bringing it closer to the CV template that is universally favored by children and that is generally the most widely found pattern in human language.
systematic replacement of one sound by an alternative that the child finds easier to articulate (see Table 10.7). Common substitution processes include stopping;

the replacement of a fricative by a corresponding stop; fronting, the moving forward of a sound’s place of articulation; gliding, the replacement of a liquid by a glide;

and denasalization, the replacement of a nasal stop by a nonnasal counterpart.

**Table 10.7** Substitution in early speech

<table>
<thead>
<tr>
<th>Process</th>
<th>Example</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stopping</td>
<td>sing $\rightarrow$ [tɪŋ]</td>
<td>$s \rightarrow t$</td>
</tr>
<tr>
<td>(continuant)</td>
<td>(continuant) sea $\rightarrow$ [tiy]</td>
<td>$s \rightarrow t$</td>
</tr>
<tr>
<td></td>
<td>zebra $\rightarrow$ [dɪəbrə]</td>
<td>$z \rightarrow d$</td>
</tr>
<tr>
<td></td>
<td>thing $\rightarrow$ [tɪŋ]</td>
<td>$θ \rightarrow t$</td>
</tr>
<tr>
<td></td>
<td>this $\rightarrow$ [dɪt]</td>
<td>$ð \rightarrow d, s \rightarrow t$</td>
</tr>
<tr>
<td></td>
<td>shoes $\rightarrow$ [tud]</td>
<td>$ʃ \rightarrow t, z \rightarrow d$</td>
</tr>
<tr>
<td>Fronting</td>
<td>ship $\rightarrow$ [ʃɪp]</td>
<td>$i \rightarrow s$</td>
</tr>
<tr>
<td></td>
<td>jump $\rightarrow$ [dʒʌmp]</td>
<td>$j \rightarrow dz$</td>
</tr>
<tr>
<td></td>
<td>chalk $\rightarrow$ [tsæk]</td>
<td>$c \rightarrow ts$</td>
</tr>
<tr>
<td></td>
<td>go $\rightarrow$ [dou]</td>
<td>$g \rightarrow d$</td>
</tr>
<tr>
<td>Gliding</td>
<td>lion $\rightarrow$ [jaɪn]</td>
<td>$l \rightarrow y$</td>
</tr>
<tr>
<td></td>
<td>laughing $\rightarrow$ [jaɛfɪn]</td>
<td>$l \rightarrow y$</td>
</tr>
<tr>
<td></td>
<td>look $\rightarrow$ [wʌk]</td>
<td>$l \rightarrow w$</td>
</tr>
<tr>
<td></td>
<td>rock $\rightarrow$ [wɔk]</td>
<td>$r \rightarrow w$</td>
</tr>
<tr>
<td></td>
<td>story $\rightarrow$ [ståʊri]</td>
<td>$r \rightarrow w$</td>
</tr>
<tr>
<td>Denasalization</td>
<td>spoon $\rightarrow$ [bʌd]</td>
<td>$n \rightarrow d$</td>
</tr>
<tr>
<td></td>
<td>jam $\rightarrow$ [deɪb]</td>
<td>$m \rightarrow b$</td>
</tr>
<tr>
<td></td>
<td>room $\rightarrow$ [fʌm]</td>
<td>$m \rightarrow b$</td>
</tr>
</tbody>
</table>

3 **VOCABULARY DEVELOPMENT**

By age eighteen months or so, the average child has a vocabulary of fifty words or more. Common items include the words listed in Table 10.8.

**Table 10.8** Common items in the first fifty words

**Entities**

Words referring to
- people: daddy, mommy, baby
- food/drink: juice, milk, cookie, water, toast, apple, cake
- animals: dog, cat, duck, horse
- clothes: shoes, hat
- toys: ball, blocks
- vehicles: car, boat, truck
- other: bottle, key, book

**Properties**

- hot, all-gone, more, dirty, cold, here, there

**Actions**
As this table shows, noun-like words make up the single largest class in the child's early vocabulary, with verb- and adjective-like words being the next most frequent category types. Among the most frequent individual words are expressions for displeasure or rejection (such as no) and various types of social interaction (such as please and bye). Over the next months this vocabulary grows rapidly, sometimes by as much as ten or twelve words a day. By age six, most children have mastered about thirteen thousand words.

Children seem to differ somewhat in the types of words that they focus on, especially in the early stages of language acquisition. One of these differences is reflected in the number of nouns in early vocabulary. Whereas some children have a relatively high proportion of such words (75 percent or more) by age two, other learners exhibit a much lower percentage of nouns (50 percent or less). Making up for the smaller number of nouns is a larger vocabulary of socially useful expressions such as bye, go-away, stop-it, thank-you, I-want-it, and so on. (Hyphens are used here to indicate that these expressions are not yet segmented into their component words.)

3.1 STRATEGIES FOR ACQUIRING WORD MEANING

Children seem to draw on special strategies when trying to determine the meaning of a new word. This is perhaps easiest to illustrate in the case of noun-type meanings, for which the following strategies seem to be employed.

S) Three strategies for learning the meanings of new words.

The Whole Object Assumption
A new word refers to a whole object.

The Type Assumption
A new word refers to a type of thing, not just to a particular thing.

The Basic Level Assumption
A new word refers to types of objects that are alike in basic ways.

To see how these strategies work, imagine that a mother and her eighteen-month-old daughter are driving through the countryside and they encounter a sheep munching on the grass. The mother points to the animal and says “sheep.” What does the child think that the word means? Does it mean “white”? Or does it mean “woolly”? Does it refer to the animal? Or to parts of the animal? Or does it refer to the fact that a particular animal is munching on grass?

The Whole Object Assumption allows the child to infer that the word sheep refers to the animal itself, not to its parts, not to whiteness, and not to woolliness. The Type Assumption allows her to infer that sheep refers to a type of animal, not to just one particular sheep. And the Basic Level Assumption leads her to guess that sheep is used to refer just to white, four-legged, woolly animals, and not animals in general.

The fact that so many of children’s first words are names for types of whole objects suggests that language learners rely heavily on strategies such as these in the early stages of word learning. Of course, these strategies don’t always give the right result. Some words do in fact refer to parts of
erties \(\text{white, woolly}\), to individuals \(\text{Susie, Mr. Jones}\), and to broad classes \(\text{animal, plant}\)

Nonetheless, the strategies we have been considering provide children with a good way to get started, postponing the acquisition of certain types of words in favor of more basic vocabulary items;

**Contextual clues**

Another major factor in vocabulary development is the child's ability to make use of contextual clues to draw inferences about the category and meaning of new words. For instance, from early in the language acquisition process, children can use the presence or absence of determiners in English to distinguish between names and ordinary nouns. Two-year-old children who are told that a new doll is a \(\text{dax}\) will apply this label to similar-looking dolls as well. However, if they are told that the new doll is \(\text{Dax}\), they will restrict use of the new word to the doll they have actually been shown. Like adults, these children treat \(\text{dax}\) as an ordinary noun when it is preceded by \(\text{a}\), but as a name when there is no determiner.

In another experiment, three- and four-year-old children were asked to act out the meaning of sentences such as *Make it so there is \(\text{tiv}\) to drink in this \(\text{lass}\) of water*. The only clues about the interpretation of the nonsense word \(\text{tiv}\) came from the meaning of the rest of the sentence and from the child's understanding of the types of changes that can be made to a glass of water. Not only did more than half the children respond by either adding or removing water, but some even remembered what \(\text{tiv}\) meant two weeks later.

**3.2 Meaning Errors**

The meanings that children associate with their early words sometimes correspond closely to the meanings employed by adults. In many cases, however, the match is less than perfect. The two most typical semantic errors involve overextension and underextension.

**Overextensions**

In cases of overextension, the meaning of the child's word is more general or inclusive than that of the corresponding adult form. The word \(\text{dog}\), for example, is frequently overextended to include horses, cows, and other four-legged animals. Similarly, \(\text{ball}\) is sometimes used for any round object, including a balloon, an Easter egg, a small stone, and so on. As many as one-third of children's words may be overextended at the fifty-word stage of vocabulary development (see Table 10.9).

The evidence collected to date suggests that perceptual properties are the critical factor in children's first hypotheses about word meanings. As a result, children often overextend a word to include a set of perceptually similar objects that they know to have diverse functions. For example, one child used the word \(\text{moon}\) for the moon, \(\text{grapefruit}\) halves, and a crescent-shaped car light. Another child used the word \(\text{money}\) for a set of objects ranging from pennies to buttons and beads. If you reconsider the examples of overextension given in Table 10.9, you will see that they too are more plausibly explained in terms of perceptual similarities than a shared function.

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**Table 10.9** Additional examples of overextension

<table>
<thead>
<tr>
<th>Word</th>
<th>First referent</th>
<th>Subsequent extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>moon</td>
<td>the moon</td>
<td>grapefruit halves, crescent-shaped car light</td>
</tr>
<tr>
<td>money</td>
<td>a set of objects ranging from pennies to buttons and beads</td>
<td></td>
</tr>
</tbody>
</table>
There is reason to believe that many overextensions may be deliberate attempts to compensate for vocabulary limitations. One indication of this is that particular over-extensions often disappear as soon as children learn the right word for the objects that they have been mislabeling. For example, two-year-old Alien was using the word dog for dogs, cats, sheep, and other four-legged mammals, but he stopped doing so as soon as he learned the words cat and sheep. If he thought that dog meant "animal", he could still have sometimes referred to cats and sheep as dogs (just as adults sometimes refer to them as animals). The fact that he didn't suggests that he never thought dog meant "animal"; he had just been "borrowing" it until the right word came along.

A further indication that many overextensions are designed to compensate for vocabulary limitations comes from the fact that children seem to overextend more in their production than in their comprehension. In one study, for instance, five children who were overextending words were given a naming task in which they were shown pictures and asked to name them. Overextensions were identified and then used to design a comprehension test. For example, if the child overextended doggie to include cows and horses on the naming test, the comprehension test would include pictures of these animals as well as a dog. The child would then be asked "Show me the doggie" "Show me the cow" and so on. The results were quite dramatic, revealing that overextensions in comprehension were much less frequent than in production. This is not the result that one would expect if children thought that doggie meant 'animal'.

**Underextensions**

Another possible type of word-meaning error in early language involves underextension—the use of lexical items in an overly restrictive fashion. Thus, kitty might be used to refer to the family pet, but not to any other cats. Or the word dog might be used for collies, spaniels, and beagles, but not for Chihuahuas.

Underextension errors often reflect children's propensity to focus on prototypical or core members of a category. As noted in Section 2.1 of Chapter 6, the potential referents of many words differ in terms of how well they exemplify the properties associated with a particular concept. For example, among the potential referents of the word dogi collies and spaniels have more of the properties associated with the concept dog (long hair, relative size, type of bark, and so on) than do Chihuahuas. While the preference for a prototype can be overruled by factors such as the presence of a nontypical category member in the child's everyday experience (e.g., a Chihuahua as a family pet), the internal structure of concepts can have an important influence on semantic development.
pictures in Figure 10.1 is an example of filling, they choose the second series—even though the glass ends up empty!

Figure 10.1 Sample pictures used to test children’s understanding of fill. Some children believe that the action depicted in the bottom series of pictures involves filling, even though the glass remains empty-

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Not surprisingly, there is a tendency for children who make this sort of mistake to use fill in the wrong syntactic patterns as well.

4)

I filled the grain up- (Adam, age 4 yrs- 11 mos-)

And fill the little sugars up in the bowl- (Mark, age 4 yrs- 7 mos-)

I didn’t fill water up to drink it- (E, age 4 yrs- 1 mo-)

Can I fill some salt into the [salt shaker]? (E, age 5 yrs-) These errors disappear as children come to realize that fill means ‘make full’ rather than ‘pour’.

4 MORPHOLOGICAL DEVELOPMENT

As is the case with the sound pattern of language and with vocabulary, the details of morphological structure emerge over a period of several years. Initially, the words produced by English-speaking children seem to lack any internal morphological structure. Affixes are
4.1 OVERGENERALIZATION

Because English has many examples of irregular inflection (men as the plural of man, ran as the past of run), children sometimes begin by simply memorizing inflected words on a case-by-case basis without regard for general patterns or rules. As a result, they may initially use irregular forms such as men and ran correctly. However, when they subsequently observe the generality of -s as a plural marker and -ed as a past tense marker (usually around age two and a half), they sometimes use these suffixes for the irregular forms—producing words such as mans and runned. (Errors that result from the overly broad application of a rule are called overgeneralizations or overregularizations.) Even occasional mixed forms such as felledi a blend of fell and failed, may occur during this period (see Table 10.11).

Table 10.11 The development of affixes

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>case-by-case learning</td>
</tr>
<tr>
<td>Stage 2</td>
<td>overuse of general rule</td>
</tr>
<tr>
<td>Stage 3</td>
<td>mastery of exceptions to the general rule</td>
</tr>
</tbody>
</table>

One of the best indications that children have mastered an inflectional rule comes from their ability to apply it to forms they have not heard before. In a classic experiment, children were shown a picture of a strange creature and told, 'This is a wug.' A second picture was then presented and the children were asked the following type of question (see Figure 10.3).

4 fl. This is a wug.  b. Now, there’s another wug. There are two of them. Now, there are two . . . ?

Figure 10.3 The “wug” test

Recent work has shown that inflectional overgeneralization, which can last into the school years, is much less frequent than previously thought: preschool children seem to overregularize verbs less than 25 percent of the time at any point in development. This suggests that the overgeneralization errors observed in early speech reflect lapses in accessing the appropriate irregular form from the lexicon rather than the failure to learn irregular forms per se.

4.3 WORD-FORMATION PROCESSES

The major word-formation processes in English—derivation and compounding—both emerge early in the acquisition of English. The first derivational suffixes to show up in children's speech
Moreover, children as young as three demonstrate an ability to use derivation to make up names for agents and instruments when presented with questions such as the following:

"I've got a picture here of someone who crushes things. What could we call someone who crushes things? Someone who crushes things is called a - - -."

"I've got a picture here of something that cuts things. What could we call something that cuts things? Something that cuts things is called a • • •."

Table 10.17 lists some of the semantic relations that children commonly express during the one-word stage.

<table>
<thead>
<tr>
<th>Utterance</th>
<th>Semantic relations in children's one-word utterances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dada down</td>
<td>as father enters the room as child sits down as agent of an action action or state</td>
</tr>
<tr>
<td>Door here Mama again</td>
<td>as child points as child gives theme location recipient recurrence</td>
</tr>
<tr>
<td></td>
<td>as father closes the door as child gives match</td>
</tr>
<tr>
<td></td>
<td>mother something as child watches lighting of a</td>
</tr>
</tbody>
</table>

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Syntactic Development

Like phonological and morphological development, the emergence of syntactic structure takes place in an orderly manner and reveals much about the nature of the language acquisition process. We will briefly survey some of the milestones in this developmental process here.

5.1 The One-Word Stage

As noted earlier, children begin to produce one-word utterances between the ages of twelve and eighteen months. A basic property of these one-word utterances is that they can be used to express the type of meaning that is associated with an entire sentence in adult speech. Thus, a child might use the word dada to assert, see Daddy, more to mean 'Give me more candy', and up to mean 'I want up'. Such utterances are called holophrases (literally 'whole sentences').

In forming holophrastic utterances, children seem to choose the most informative word that applies to the situation at hand. A child who wanted candy, for example, would say candy rather than want, since the former word is more informative in this situation. Similarly, a child who notices a new doll would be more likely to say doll than see, thereby referring to the most novel feature of the situation he or she is trying to describe.

Table 10.17 lists some of the semantic relations that children commonly express during the one-word stage.

(Note: -er also has an 'instrument' meaning [as in cutter 'something used for cutting'], but this is less frequent in children's early speech.)
**5.2 THE TWO-WORD STAGE**

Within a few months of their first one-word utterances, children begin to produce two-word "mini-sentences." Table 10.18 provides a sampling of these utterances and the types of meaning they are commonly used to express. (Although these examples are from English, similar patterns are found in the early development of all languages.)

<table>
<thead>
<tr>
<th>Utterance</th>
<th>Intended meaning</th>
<th>Semantic relation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby chair</td>
<td>The baby is sitting on the chair</td>
<td>agent-location</td>
</tr>
<tr>
<td>Doggie bark</td>
<td>The dog is barking</td>
<td>agent-action</td>
</tr>
<tr>
<td>Ken water</td>
<td>Ken is drinking water</td>
<td>agent-theme</td>
</tr>
<tr>
<td>Hit doggie</td>
<td>I hit the doggie</td>
<td>action-theme</td>
</tr>
<tr>
<td>Daddy bat</td>
<td>Daddy's hat</td>
<td>possessor-possessed</td>
</tr>
</tbody>
</table>

It is unclear whether children have acquired syntactic categories such as noun, verb, and adjective at this point in their development. This is because the markers that help distinguish among syntactic categories in adult English (e.g., inflection such as the past tense suffix and minor categories such as determiners and auxiliary verbs) are absent during this period. To complicate matters further, the relative shortness of the utterances produced during the two-word stage means that the positional differences associated with category distinctions in adult speech are often not manifested. Thus, words such as busy (an adjective in adult speech) and push (a verb) may appear in identical patterns.

5) Mommy busy. Mommy push.

While this does not show that children lack syntactic categories, it makes it difficult to demonstrate that they possess them. For this reason, linguists and psychologists are split over whether to describe children's utterances in terms of the semantic relations that they express (as in Table 10.18) or the syntactic categories of adult speech.

A notable feature of children's two-word utterances is that they almost always exhibit the appropriate word order. This suggests a very early sensitivity to this feature of sentence structure, but there is reason to believe that children do not initially have a general word-order rule. Rather, they may have a separate rule for each verb (e.g., "Put the subject in front of push"); "Put the subject in front of read"; and so on). In one experiment, for instance, children aged two to four were taught made-up verbs (such as tarn, gop, and dack) for novel actions involving puppet characters. Each verb was presented in one of the following orders:

6) **subject-verb-object order**: Elmo tammed the apple  
   **subject-object-verb order**: Elmo the apple gopped  
   **verb-subject-object order**: Dacked the apple Elmo

The two- and three-year-old children were willing to learn word-order patterns not found in English and would often employ the subject-object-verb and verb-subject-object order for new verbs if that was what they had been exposed to. In contrast...
5.3 THE TELEGRAPHIC STAGE

After a period of several months; during which their speech is limited to one- and two-word utterances; children begin to produce longer and more complex grammatical structures (see Table 10.19). Some representative utterances from the first part of this period are given in 7.

7)
Chair broken.
Daddy like book.
What her name?
Man ride bus today.
Car make noise.
Me wanna show Mommy.
I good boy.

At first; these utterances lack bound morphemes and most nonlexical categories. Because of the resemblance to the style of language found in telegrams; this acquisitional stage is often dubbed the telegraphic stage.

The telegraphic stage is characterized by the emergence of phrase structure. As the examples in 7 help show; the Merge operation can form phrases consisting of a head and a complement (like book, ride bus, show Mommy), phrases that include a modifier (such as today and good) and even full-fledged sentences.

Table 10.19 The development of phrase structure

<table>
<thead>
<tr>
<th>Stage</th>
<th>Approx- age</th>
<th>Developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holophrastic</td>
<td>1-1.5 yrs.</td>
<td>single word utterances; no structure</td>
</tr>
<tr>
<td>Two-word</td>
<td>1.5-2 yrs.</td>
<td>early word combinations; presence of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>syntactic categories unclear</td>
</tr>
<tr>
<td>Telegraphic</td>
<td>2-2.5 yrs.</td>
<td>emergence of phrase structure; especially</td>
</tr>
<tr>
<td></td>
<td></td>
<td>head-complement and subject-VP patterns</td>
</tr>
</tbody>
</table>

Language development from this point onward is rapid. As the examples in Table 10.20 help illustrate: children move from relatively primitive two- and three-word utterances at the beginning of the telegraphic stage to a broad range of syntactically intricate sentence types that include affixes and nonlexical categories in the space of just a few months.

CHAPTER TEN Table 10.20 Sample utterances from a child's speech over a 12-month period

| Age Sample utterances | Page 430 |
28 mos; Play checkers; Big drum; I got horn; A bunny-rabbit walk;
30 mos. Write a piece of paper; What that egg doing? I lost a shoe; No, I don't want to sit seat;
32 mos; Let me get down with the boots on; Don't be afraid of horses; How tiger be so healthy and fly like kite? Joshua throw like penguin;
34 mos; Look at that train Ursula brought; I simply don't want put in chair; Don't have paper; Do you want little bit, Cromer? I can't wear it tomorrow;
36 mos; I going come in fourteen minutes; I going wear that to wedding; I see what happens; I have to save them now; Those are not strong mens; They are going sleep in wintertime; You dress me up like a baby elephant.
38 mos; So it can't be cleaned? I broke my racing car; Do you know the lights went off? What happened to the bridge? Can I put my head in the mailbox so the mailman can know where I are and put me in the mailbox?

5.4 LATER DEVELOPMENT

In the years following the telegraphic stage, children continue to acquire the complex grammar that underlies adult linguistic competence, including the Move operations outlined in Chapter 5:

Subject-Verb Inversion

In the very early stages of language acquisition, children signal yes-no questions by means of rising intonation alone; (Recall that auxiliary verbs are a relatively late development;)

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S)
See hole? I ride train? Ball go?
Sit chair?

Even after individual auxiliary verbs appear in child language; there is often a delay of a few months before they appear at the beginning of the sentence in yes-no questions- In one study, for example, a young boy began using the auxiliary verb can at age two years five months, but it did not undergo Inversion in questions until six months later;
Can he can look?
What shall we shall have?
Did you did came home?

In these sentences, the auxiliary verb occurs twice—once to the left of the subject (in the position that it occupies after Inversion) and once to the right (in the position it occupies in deep structure). It has been suggested that this pattern reflects an error in the application of the Inversion transformation in that a copy of the moved auxiliary is left behind in its original position.

Wh questions

Wh questions emerge gradually between the ages of two and four. The first wh words to be acquired are typically what and where followed by who, how, and why; when, which, and whose are relatively late acquisitions.

10
Where that? What me think?
Why you smiling? Why not me drink it?

QUESTIONS

1. One piece of evidence that children acquire a grammar is their production of forms like doed, leaved, and goed. From recollections of your experience with children, what are some other forms (not related to the past tense rule) that children produce that indicate they are acquiring and overgeneralizing grammatical rules?

2. In one naturalistic study, a search for passive structures in a sample of 18,000 utterances from sixty children yielded only nineteen examples produced by twelve of the children.

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i) Is this evidence that the other forty-eight children had not yet mastered the passive structure? Why or why not? ii) How are the disadvantages of the naturalistic method exemplified here?

3. The following transcriptions represent the pronunciation of a two-year-old child. Indicate which phonetic processes have applied in each case.

a) skin      [kid]               h)  tent         [det]
b) spoon    [bun]            i) teddy        [dedi]
c)  zoo       [du]                j)  brush       [bAt]
d)  John     [dan]            k)  bump      [bAp]
e)  bath      [baet]               l) play         [pwej]
41 Drawing on the phonetic processes posited for the preceding exercise, predict one or more plausible immature pronunciations for each of the following words:

a) show  e) juice

b) please  f) thumb

c) spit  g) zebra

d) under  h) ring

5. Consider the following examples of overextensions, all of which have actually been observed in children's speech. What is the basis for each of these overextensions?

<table>
<thead>
<tr>
<th>Word</th>
<th>First Referent</th>
<th>Overextensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) sch</td>
<td>sound of a train</td>
<td>music, noise of wheels, sound of rain</td>
</tr>
<tr>
<td>b) bow-wow</td>
<td>dog</td>
<td>sheep, rabbit fur, puppet</td>
</tr>
<tr>
<td>c) baby</td>
<td>baby</td>
<td>people in pictures</td>
</tr>
<tr>
<td>d) sizo</td>
<td>scissors</td>
<td>nail file, knife, screwdriver, spoon</td>
</tr>
<tr>
<td>e) policeman</td>
<td>policeman</td>
<td>mailman, sailor, doctor</td>
</tr>
<tr>
<td>f) strawberry</td>
<td>strawberry</td>
<td>grapes, raspberry</td>
</tr>
<tr>
<td>g) fireworks</td>
<td>fireworks</td>
<td>matches, light, cigarette</td>
</tr>
<tr>
<td>h) Batman</td>
<td>Batman logo on a T-shirt</td>
<td>any logo on a T-shirt</td>
</tr>
</tbody>
</table>

6. Since children have a tendency to focus on the prototypical members of categories in the acquisition of words, how might you expect children to underextend the following words? What members of the category might you expect children not to include?

a) car

b) tree

c) ball

10. Considering children's tendency to overgeneralize morphological rules, what might we expect a young child to use in the place of the following adult words? Justify your choice in each case.

a) fish (plural)  f) geese
14. The following utterances were produced spontaneously by Holly, age three years.

a) I learned about loving moms.

b) Put him in the bathtub.

c) We eated gummy snakes.

d) Thank you for giving these books us.

e) I don't know.

f) He bited my finger. (When corrected, she said: He bitted my finger.)

g) I runned in the water.

h) I rided on a elephant.

i) Has Holly acquired the past tense morpheme? How do you know?

ii) What is the evidence that words such as eat, know, and ride are verbs for Holly and that words such as bathtub, books, and water are nouns?

iii) What is the evidence in Holly's speech that she has learned the phrase structure schema for English?