

Language Acquisition

The acquisition of language "is doubtless the greatest intellectual feat any one of us is ever required to perform."

Leonard Bloomfield, *Language* (1933)

Every aspect of language is extremely complex; yet very young children—before the age of 5—already know most of the intricate system we have been calling the grammar of a language. Before they can add $2 + 2$, children are conjoining sentences, asking questions, selecting appropriate pronouns, negating sentences, forming relative clauses, and using the syntactic, phonological, morphological, and semantic rules of the grammar.

A normal human being can go through life without learning to read or write. Millions of people in the world today prove it. These same millions all speak and understand and can discuss complex and abstract ideas as well as literate speakers can. Therefore, learning a language and learning to read and write are somehow different. Similarly, millions of humans grow to maturity and never learn algebra or chemistry or how to use a typewriter. They must be taught these skills or systems, but they do not have to be taught to walk or to talk.

The study of the nature of human language itself has revealed a great deal about language acquisition, about what the child does and does not do when learning or acquiring a language.

1. Children do not learn a language by storing all the words and all the sentences in some giant mental dictionary. The list of words is finite, but no dictionary can hold all the sentences, which are infinite in number.
2. Children learn to construct sentences, most of which they have never produced before.
3. Children learn to understand sentences they have never heard before. They cannot do so by matching the "heard utterance" with some stored sentence.

4. Children must therefore construct the "rules" that permit them to use language creatively.
5. No one teaches them these rules. Their parents are no more aware of the phonological, syntactic, and semantic rules than are the children.

Even if you remember your early years, you will not remember anyone telling you to form a sentence by adding a verb phrase to a noun phrase, or to add [s] or [z] to form plurals. Children, then, seem to act like efficient linguists equipped with a perfect theory of language, who use this theory to construct the grammar of the language they hear.

In addition to acquiring the complex rules of the grammar (that is, linguistic competence), children must also learn the complex rules of the appropriate social use of language, what certain scholars have called communicative competence. These rules include, for example, the greetings that are to be used, the "taboo" words, the polite forms of address, the various styles that are appropriate to different situations, and so forth.

Stages in Language Acquisition

... for I was no longer a speechless infant; but a speaking boy. This I remember; and have since observed how I learned to speak. It was not that my elders taught me words ... in any set method; but I ... did myself ... practice the sounds in my memory. ... And thus by constantly hearing words, as they occurred in various sentences ... I thereby gave utterance to my will.

St. Augustine, *Confessions* (circa 400 C.E.)

Children do not wake up one morning with a fully formed grammar in their heads or with all the "rules" of social and communicative intercourse. Linguistic knowledge develops by stages, and, it is suggested, each successive stage more closely approximates the grammar of the adult language. Observations of children in different language areas of the world reveal that the stages are similar, possibly universal. Some of the stages last for a short time; others remain longer. Some stages may overlap for a short period, though the transition between stages is often sudden.

The earliest studies of child language acquisition come from diaries kept by parents. More recent studies include the use of tape recordings, videotapes, and controlled experiments. Spontaneous utterances of children are recorded, and in addition various elicitation techniques have been developed so that the child's production and comprehension can be scientifically studied.

The First Sounds

*An infant crying in the night:
An infant crying for the light:
And with no language but a cry.*

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The stages of language acquisition can be divided into prelinguistic and linguistic stages. Most scholars agree that the earliest cries, whimpers, and cooing noises of the newborn, or neonate, cannot be considered early language. Such noises are completely stimulus-controlled; they are the child's involuntary responses to hunger, discomfort, the desire to be cuddled, or the feeling of well-being. A major difference between human language and the communication systems of other species is that human language is creative, as discussed earlier, in the sense of being free from either external or internal stimuli. The child's first noises are, however, simply responses to stimuli.

During the earliest period, the noises produced by infants in all language communities sound the same. Children who are born deaf also produce these same sounds, even though they receive no auditory stimuli.

The early view that the neonate is born with a mind that is like a blank slate is countered by the evidence showing that infants are highly sensitive to certain subtle distinctions in their environment and not to others. That is, the mind appears to be "prewired" to receive only certain kinds of information.

By using a specially designed nipple with a pressure-sensitive device that records sucking rate, it has been found that infants will increase their sucking rate when stimuli (visual or auditory) presented to them are varied, but will decrease the sucking rate when the same stimuli are presented over and over again. Experiments have shown that infants will respond to visual depth and distance distinctions, to differences between rigid versus flexible physical properties of objects, and to human faces rather than to other visual stimuli.

Similarly, newborn infants respond to phonetic contrasts found in some human languages even when these differences are not phonemic in the language spoken in the baby's home. A baby hearing a human voice over a loudspeaker saying [pa] [pa] [pa] will slowly decrease her rate of sucking; if the sound changes to [ba] or even [p^ha], the sucking rate increases dramatically. There will be no response to sound signals that are intermediate between, say, [pa] and [p^ha], differences that never signal phonemic contrasts in any human language. The infants could not have learned to make these phonetic distinctions; they seem to be born with the ability to perceive just those sounds that are phonemic in some language. Thus, children have the sensory and motor abilities to produce and comprehend speech, even in the period of life before language acquisition occurs.

Babbling

From this golden egg a man, Prajapati, was born. . . . A year having passed, he wanted to speak. He said bhur and the earth was created. He said bhuvah and the space of the air was created. He said suvah and the sky was created. That is why a child wants to speak after a year. . . . When Prajapati spoke for the first time, he uttered one or two syllables. That is why a child utters one or two syllables when he speaks for the first time.

Hindu myth

In the first few months, most children babble. This babbling is not language, but it is a

The sounds produced in this period (apart from the continuing stimulus-controlled cries and gurgles) seem to include a large variety of sounds, many of which do not occur in the language of the household. Deaf children also babble, and their babbling, like their earliest cries and coos, seems similar to that of normal children. Hearing children born of nonspeaking deaf parents also babble. Thus, babbling does not depend on the presence of acoustic, auditory input.

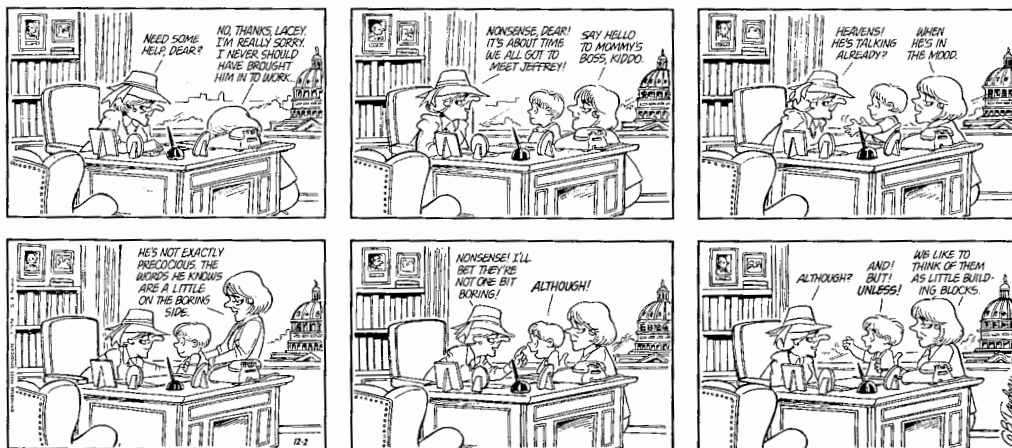
One view suggests that it is during this period that children are learning to distinguish between the sounds of their language and the sounds that are not part of the language. During the babbling period children learn to maintain the "right" sounds and suppress the "wrong" ones.

During the babbling stage the pitches, or intonation contours, of infants' utterances begin to resemble the intonation contours of sentences spoken by adults. The semantically different intonation contours are among the first linguistic contrasts that children perceive and produce. Babbling does not seem to be a prerequisite for language acquisition. Infants who are unable to produce any sounds at this early stage due to physical motor problems begin to talk properly once the disability has been corrected. This fact supports the idea that the babbling stage is a prelinguistic stage.

First Words

DOONESBURY

Garry Trudeau



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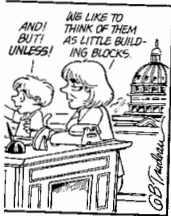
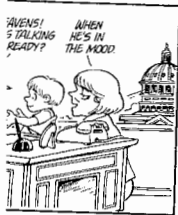
Sometime after one year (it varies from child to child and has nothing to do with how intelligent the child is), children begin to use the same string of sounds repeatedly to "mean" the same thing. They have learned that sounds are related to meanings, and they are producing their first "words." Most children seem to go through the "one word = one sentence" stage. These one-word "sentences" are

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called **holophrastic** sentences (from *holo* "complete" or "undivided" plus *phrase* "phrase" or "sentence").

One child, J.P., illustrates how much the young child has learned even before the age of two years. J.P.'s words of April 1977, at the age of 16 months, were as follows:¹

| | | | |
|--------------|--------------------|--------------|--------------------|
| [ʔaw] | "not" "no" "don't" | [s:] | "aerosol spray" |
| [bʌʔ]/[mʌʔ] | "up" | | "shoe" |
| [da] | "dog" | [sʰu:] | "hi" |
| [iʔo]/[siʔo] | "Cheerios" | [haj] | "shirt" |
| [sa] | "sock" | [sr] | "sweater" |
| [aj]/[ʌj] | "light" | | "what's that?" |
| [ma] | "mommy" | [sæ:]/[əsæ:] | "hey, look!" |
| [baw]/[daw] | "down" | | |
| [dæ] | "daddy" | | |

J.P.'s mother reports that before April he also had used the words [bʊ] for "book," [ki] for "kitty," and [tsi] for "tree" but seemed to have "lost" them.

What is more interesting than merely the list of J.P.'s vocabulary is the way he used these words. "Up" was originally restricted to mean "Get me up" when he was either on the floor or in his high chair, but later was used to mean "Get up!" to his mother as well. J.P. used his word for "sock" not only for socks but also for other undergarments that go over the feet, which illustrates how a child may extend the meaning of a word from a particular referent to encompass a larger class.

When J.P. first began to use these words, the stimulus had to be visible; but soon, it was no longer necessary. *Dog*, for example, was first only used when pointing to a real dog but later was used for pictures of dogs in various books. A new word that entered J.P.'s vocabulary at seventeen months was *uh-oh*, which he would say after he had an accident like spilling juice, or when he deliberately poured his yogurt over the side of his high chair. His use of this word shows his developing use of language for social purposes. At this time he also added two new words meaning "no," [do:] and [no]. He used these words frequently when anyone attempted to take something from him that he wanted or tried to make him do something he did not want to do. He used this negative either imperatively (for example, "Don't do that!") or assertively (for example, "I don't want to do that.>"). Even in his early holophrastic stage, J.P. was using words to convey a variety of ideas, feelings, and social awareness.

According to some child-language researchers, the words in the holophrastic stage serve three major functions: they either are linked with a child's own action or desire for action (as when J.P. would say "up" to express his wish to be picked up), or are used to convey emotion (J.P.'s "no"), or serve a naming function (J.P.'s "Cheerios," "shoes," "dog," and so on).

¹We give special thanks to John Peregrine Munro for providing us with such rich data, and to Drs. Pamela and Allen Munro, J.P.'s parents, for their painstaking efforts in recording these data.

At this stage the child uses only one word to express concepts or predictions that will later be expressed by complex phrases and sentences.

Phonologically, J.P.'s first words, like the words of most children at this stage of learning English and other languages, were generally monosyllabic with a CV (consonant-vowel) form; the vowel part may be diphthongal, depending on the language being acquired. His phonemic or phonetic inventory (at this stage they are equivalent) is much smaller than is found in the adult language. It was suggested by the linguist Roman Jakobson² that children first will acquire the sounds found in all languages of the world, no matter what language they are exposed to, and in later stages will acquire the "more difficult" sounds. For example, most languages have the sounds [p] and [s], but [θ] is a rare sound. J.P. was no exception. His phonological inventory at an early stage included the consonants [b, m, d, k], which are frequently occurring sounds in the world's languages.

Many studies have shown that children in the holophrastic stage can perceive or comprehend many more phonological contrasts than they can produce themselves. Therefore, even at this stage, it is not possible to determine the extent of the grammar of the child simply by observing speech production.

The Two-Word Stage

Children begin to produce two-word utterances around the time of their second birthday. At first these utterances appear to be strings of two of the child's earlier holophrastic utterances, each word with its own single-pitch contour. Soon after this juxtaposition, children begin to form actual two-word sentences with clear syntactic and semantic relations. The intonation contour of the two words extends over the whole utterance rather than being separated by a pause between the two words. The following "sentences" illustrate the kinds of patterns that are found in children's utterances at this stage.³

| | |
|--------------|----------------|
| allgone sock | hi Mommy |
| byebye boat | allgone sticky |
| more wet | beepbeep bang |
| it ball | Katherine sock |
| dirty sock | here pretty |

During the two-word utterance stage there are no syntactic or morphological markers—that is, no inflections for number, person, tense, and so on. Pronouns are rare, although many children use *me* to refer to themselves, and some children use other pronouns as well. Bloom has noted that in noun + noun sentences such as *Mommy sock*, the two words can express a number of different grammatical rela-

²R. Jakobson. 1941. *Kindersprache, Aphasie, und Allgemeine*. Almqvist and Wiksell. Uppsala, Sweden. (English translation by A. Keiler. 1968. *Child Language, Aphasia, and Phonological Universals*. Mouton. The Hague.)

³All the examples given in this chapter are taken from utterances produced by children actually observed by the authors or reported in the literature. The various sources are listed in the reference section at the end of the chapter.

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tions that will later be expressed by other syntactic devices.⁴ Bloom's conclusions were reached by observing the situations in which the two-word sentence was uttered. Thus, for example, *Mommy sock* can be used to show a subject + object relation in the situation when the mother is putting the sock on the child, or a possessive relation when the child is pointing to Mommy's sock. Two nouns can also be used to show a subject–locative relation, as in *sweater chair* to mean "The sweater is on the chair," or to show conjunction, to mean "sweater and chair."

From Telegraph to Infinity

There does not seem to be any "three-word" sentence stage. When a child starts stringing more than two words together, the utterances may be two, three, four, or five words or longer. By studying the increasing lengths of the utterances that children use, however, a comparison across children as to stage of language acquisition can be made by the **mean length of utterances** (MLU) rather than by chronological age. That is, children producing utterances that average 2.3 to 3.5 morphemes in length seem to be at the same stage of grammar acquisition.

The first utterances of children longer than two words have a special characteristic. The small "function" words such as *to*, *the*, *can*, *is*, and so on, are missing; only the words that carry the main message—the "content" words—occur. Children often sound as if they are reading a Western Union message, which is why such utterances are sometimes called **telegraphic speech**:

Cat stand up table
What that?
He play little tune
Andrew want that
Cathy build house
No sit there

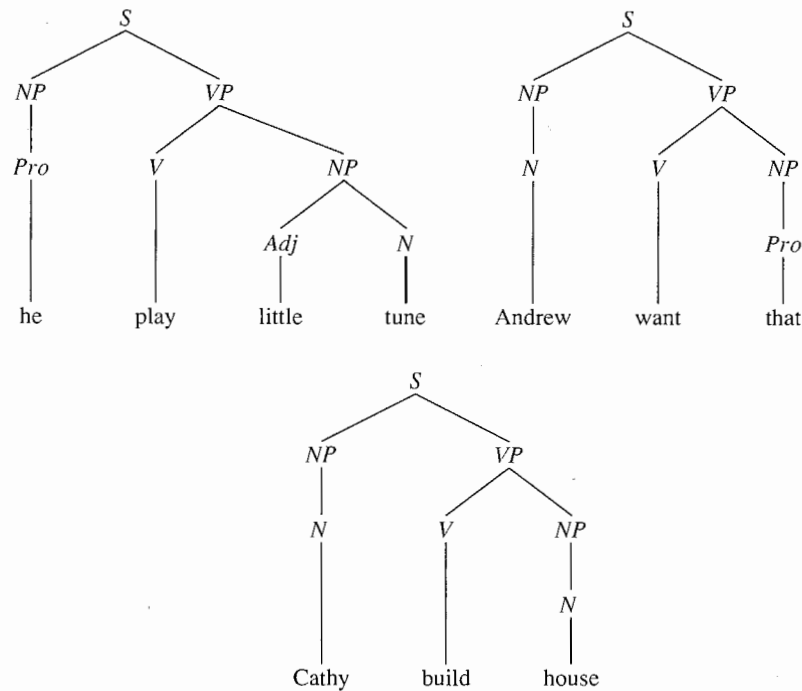
JP's early sentences were similar:

Age in Months

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|-----------|-------------------|--------------------------------|
| 25 months | [dan ?i? tʃi?] | "don't eat (the) chip" |
| | [bʷa? tat] | "(the) block (is on) top" |
| 26 months | [mamis tu hæŋ] | "Mommy's two hands" |
| | [mo bʌs go] | "where's another bus?" |
| 27 months | [dædi go] | "where's Daddy?" |
| | [?aj gat tu dʒʌs] | "I got two (glasses of) juice" |
| 28 months | [do baj? mi] | "don't bite (kiss) me" |
| | [kʌdər sʌni ber] | "Sonny color(ed) a bear" |
| | [?aj gat pwe dis] | "I('m) play(ing with) this" |
| | [mamis tak mɛns] | "Mommy talk(ed to the) men" |

⁴L. M. Bloom. 1972. *Language Development: Form and Function in Emerging Grammar*. M.I.T. Press. Cambridge, Mass.

Apart from lacking grammatical morphemes, these utterances appear to be "sentence-like"; they have hierarchical, constituent structures similar to the syntactic structures found in the sentences produced by the adult grammar.



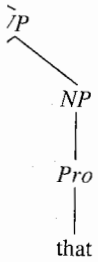
Children's utterances are not simply words that are randomly strung together, but from a very early stage reveal their grasp of the principles of sentence formation.

Though the utterances are described as "telegraphic," the child does not deliberately leave out the noncontent words as does an adult sending a telegram.

As children produce sentences that more and more closely approximate the adult grammar, they begin to use syntactic or grammatical function words and also to acquire the inflectional and derivational morphemes of the language. Brown and his associates at Harvard studied the spontaneous utterances of three children—Adam, Sarah, and Eve—over a long period of time, noting the appearance of grammatical morphemes, free and bound.⁵ They found that the sequences of acquisition of the morphemes were the same for all three children, and this finding has been replicated by others. *-ing*, the ending that represents the present progressive form of the verb, as in *Me going*, was found to be among the earliest inflectional morphemes acquired. The prepositions *in* and *on* next entered the speech of the children studied, and then the regular plural ending, as in "two doggies" /tu dɔgiz/. It is interesting that the third person singular marker (as in *Johnny comes*) and the

⁵R. O. Brown. 1973. *A First Language: The Early Stages*. Harvard University Press. Cambridge, Mass.

appear to be to the syntac-



possessive morpheme (as in *Daddy's hat*), which have the same phonological shape as the plural /s/, entered the children's speech between six months and a year later, showing that acquisition of these morphemes is syntax-dependent.

Eventually all the other inflections were added, along with the syntactic rules, and finally the child's utterances sounded like those spoken by adults.

This feat is incredible, because the syntactic rules of all languages are complex; moreover, the child must "figure out" what these rules are from very "noisy" data. The child hears sentence fragments, false starts, speech errors, and interruptions; no one tells the child "this is a grammatical utterance and this is not." Somehow the adult grammar is acquired. A basic question is how the child accomplishes this task.

Theories of Child Language Acquisition

Do Children Learn by Imitation?

CHILD: *My teacher holded the baby rabbits and we patted them.*

ADULT: *Did you say your teacher held the baby rabbits?*

CHILD: *Yes.*

ADULT: *What did you say she did?*

CHILD: *She holded the baby rabbits and we patted them.*

ADULT: *Did you say she held them tightly?*

CHILD: *No, she holded them loosely.*

Courtney Cazden⁶

Various theories have been proposed to explain how children manage to acquire the adult language. There are those who think that children merely imitate what they hear. Imitation is involved to some extent, of course, but the sentences produced by children show that children are not imitating adult speech. From whom would children hear *Cat stand up table* or any of the utterances they produce?

| | |
|-------------------|------------------------|
| a my pencil | other one pants |
| two foot | Mommy get it my ladder |
| what the boy hit? | cowboy did fighting me |

Even when children are deliberately trying to imitate what they hear, they are unable to produce sentences that cannot be generated by their grammar.

| | |
|---|---------------------------------|
| ADULT: He's going out. | CHILD: He go out. |
| ADULT: That's an old-time train. | CHILD: Old-time train. |
| ADULT: Adam, say what I say: Where can I put them? | CHILD: Where I can put them? |

⁶C. Cazden. 1972. *Child Language and Education*, Holt, Rinehart and Winston. New York. P. 92.

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Neither can the "imitation" theory account for another important phenomenon. There are children who are unable to speak for neurological or physiological reasons; yet these children learn the language spoken to them and understand what is said. When they overcome their speech impairment they immediately use the language for speaking.

Do Children Learn by Reinforcement?

CHILD: Nobody don't like me.

MOTHER: No, say "Nobody likes me."

CHILD: Nobody don't like me.

(dialogue repeated eight times)

MOTHER: Now, listen carefully, say "*Nobody likes me.*"

CHILD: Oh, nobody don't likes me.

Another theory of language acquisition suggests that children learn to produce "correct" sentences because they are positively reinforced when they say something right and negatively reinforced when they say something wrong. This view assumes that children are being constantly corrected for using "bad grammar" and rewarded when they use "good grammar." Brown and his colleagues⁷ report from their studies that reinforcement seldom occurs, and when it does, it is usually incorrect pronunciation or incorrect reporting of facts that is corrected. They report, for example, that the ungrammatical sentence *Her curl my hair* was not corrected because Eve's mother was in fact curling her hair. However, when the syntactically correct sentence *Walt Disney comes on Tuesday* was produced, her mother corrected Eve because the program on television was shown on Wednesday. They conclude that it is "truth value rather than syntactic well-formedness that chiefly governs explicit verbal reinforcement by parents—which renders mildly paradoxical the fact that the usual product of such a training schedule is an adult whose speech is highly grammatical but not notably truthful" (p. 330).

Even if syntactic correction occurred more often, it would not explain how or what children learn from such adult responses or how children discover and construct the correct rules.

In fact, attempts to "correct" a child's language seem to be doomed to failure. Children do not know what they are doing wrong and are unable to make corrections even when they are pointed out, as shown by the example above and the following one:

CHILD: Want other one spoon, Daddy.

FATHER: You mean, you want "*the other spoon.*"

CHILD: Yes, I want other one spoon, please, Daddy.

FATHER: Can you say "the other spoon"?

⁷Ibid.



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CHILD: Other . . . one . . . spoon.
FATHER: Say . . . "other."
CHILD: Other.
FATHER: Spoon.
CHILD: Spoon.
FATHER: Other . . . spoon.
CHILD: Other . . . spoon. Now give me other one spoon?

As already noted, such conversations between parents and children do not occur often. The above conversation was between a linguist studying child language and his child. Mothers and fathers are usually delighted that their young children are talking at all and consider every utterance to be a gem. The "mistakes" children make are "cute" and repeated endlessly to anyone who will listen.

Children Form Rules and Construct a Grammar

THE BORN LOSER

Art Sansom



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The "reinforcement" theory fails along with the "imitation" theory. Neither of these views accounts for the nonrandom mistakes children make, the speed with which the basic rules of grammar are acquired, the ability to learn language *without any formal instruction*, and the regularity of the acquisition process across diverse languages and environmental circumstances. Between the ages of five and seven, children from diverse backgrounds reach the same stage of grammar acquisition irrespective of whether their parents talk to them constantly or whether they are brought up to be seen and not heard and are seldom spoken to.

It appears that the child is equipped from birth with the neural prerequisites for language and language use, just as birds are biologically "prewired" to learn the songs of their species. Our linguistic ability permits us to acquire any human language to which we are exposed. Thus, children born of Zulu parents and raised in an English-speaking environment will learn English, and vice versa.

Different phrase structure rules (and later transformational rules) govern the construction of sentences as the grammar is learned. Consider, for example, the increasing complexity of one child's negative sentences. At first the child simply

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added a *no* (or some negative morpheme) at the beginning or at the end of a sentence:

no heavy
no singing song
no want stand head
no Fraser drink all tea
no the sun shining

Fraser did not hear such sentences. He used a simple way to form a negative, but it is not the way negative sentences are constructed in English. At some point he began to insert a *no* or *can't* or *don't* inside the sentence.

He no bite you
I no taste them
That no fish school
I can't catch you

The child progressed from simple rules to more complex rules, as is shown below:

| | | |
|--------------|----------------------------|--|
| Declarative: | I want some food. | |
| Negative 1: | No want some food. | (<i>no</i> added to beginning of sentence) |
| Negative 2: | I no/don't want some food. | (negative element inserted; no other change) |
| Negative 3: | I don't want no food. | (negative element inserted: negation "spread"— <i>some</i> becomes <i>no</i>) |
| Negative 4: | I don't want any food. | (negative element inserted correctly; <i>some</i> changed to <i>any</i>) |

All children do not show exactly the same development as the child described above, but they all show similar regular changes. One child studied by Carol Lord first differentiated affirmative from negative sentences by pitch; her negative sentences were all produced with a much higher pitch. When she began to use a negative morpheme, the pitch remained high, but then the intonation became normal as the negative syntactic markers "took over."

Similar changes in the grammar are found in the acquisition of questions. One child first formed a question by using a "question intonation" (a rise of pitch at the end of the sentence):

Fraser water?
I ride train?
Sit chair?

At the next stage the child merely “tacked on” a question word in front of the sentence; he did not change the word order or insert *do*.

What he wants?
 What he can ride in?
 Where I should put it?
 Where Ann pencil?
 Why you smiling?

Such sentences are perfectly regular. They are not “mistakes” in the child’s language; they reflect the grammar at a certain stage of development.

Errors or Rules?

A final word about the theory of errors. Here it is that the causes are complex and multiple. . . .

Henri Poincaré (1854–1912)

Give me fruitful error any time, full of seeds, bursting with its own corrections.

Vilfredo Pareto (1848–1923)

Children seem to form the simplest and most general rule they can from the language input they receive, and to be so “pleased” with their “theory” that they use the rule wherever they can.

Inflectional Errors This “overgeneralization” of constructed rules is clearly revealed when children treat irregular verbs and nouns as if they were regular. We have probably all heard children say *bringed*, *goed*, *doed*, *singed*, or *foots*, *mouses*, *sheeps*, *childs*.

These mistakes tell us more about how children learn language than the “correct” forms they use. The child could not be imitating; children use such forms in families where the parents would never utter such “bad English.” In fact, children may say *brought* or *broke* before they begin to use the incorrect forms. At the earlier stage they never use any regular past-tense forms like *kissed*, *walked*, or *helped*. They probably do not know that *brought* is a “past” at all. When they begin to say *played* and *hugged* and *helped* as well as *play*, *hug*, and *help*, they have “figured out” how to form a past tense—they have constructed the rule. At that point they form all past tenses by this rule—they overgeneralize—and they no longer say *brought* but *bring* and *bringed*. The acquisition of the rule overrides previously learned words and is unaffected by “practice” reinforcement. At a later time, children will learn that there are “exceptions” to the rule, and only then will they once more say *brought*. Children look for general patterns, for systematic occurrences.

Semantic Overgeneralizations Such overgeneralizations have also been ob-

served in children's acquisition of the semantic system. They may learn a word such as *papa* or *daddy*, which they first use only for their own father. This word may then be extended to apply to all men. As they acquire new words, the "overgeneralized" meaning becomes narrowed down until once more it has its usual referent. The linguist Eve Clark has found this process to be true of many other words and semantic features. She has observed that children make overgeneralizations which are based on shape, size, sound, taste, and texture. One child's word for "moon" /mo:i/ became the name for cakes, round marks on windows, writing on a window, round shapes in books, tooling on leather book covers, round postmarks, and the letter O. Similarly, the word for "watch," *tick tock*, was used for all objects shaped like a watch: clocks, gas meters, a fire hose wound on a spool, and a bath scale. The word for "fly" /flai/ was used for other small-sized objects, like specks of dirt, dust, all small insects, the child's own toes, and crumbs; and /dani/ was first used for the sound of a bell, and then for a clock, a telephone, and a doorbell. As more words were added and semantic features became more specified, the meaning of these words became narrowed.

Phonological and Morphological Rule Acquisition The child's ability to generalize patterns and construct rules is also shown in phonological development. In early language, children may not distinguish between voiced and voiceless consonants, for example. When they first begin to contrast one set—that is, when they learn that /p/ and /b/ are distinct phonemes—they also begin to distinguish between /t/ and /d/, /s/ and /z/, and so on. The generalizations refer, as we would expect, to natural classes of speech sounds.

The child's phonological and morphological rules emerge quite early. In 1958, Berko-Gleason⁸ conducted a study that has now become a classic in our understanding of child language acquisition. She worked with preschool children and with children in the first, second, and third grades. She showed each child a drawing of a nonsense animal like the funny creature below and gave the "animal" a nonsense name. She would then say to the child, pointing to the picture, "This is a wug."



Then she would show the child a picture of two of the animals and say, "Now here is another one. There are two of them. There are two ____?"

The child's "task" was to give the plural form, "wugs" [wʌgz]. Another little make-believe animal was called a "bik," and when the child was shown two biks, he or she again was to say the plural form [biks]. Berko-Gleason found that the

⁸J. Berko. 1958. "The Child's Learning of English Morphology." *Word* 14: 150–177.

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children applied the regular plural-formation rule to words never heard before. Because the children had never seen a “wug” or a “bik” and had not heard these “words,” their ability to add a [z] when the animal’s name ended with a voiced sound and an [s] when there was a final voiceless consonant showed that the children were using rules based on an understanding of natural classes of phonological segments, and not simply imitating words they had previously heard.

Such regular stages and patterns support the notion that language acquisition is grammar construction.

The Acquisition of Syntax

Children eventually acquire all the phonological, syntactic, and semantic rules of the grammar. This task is most difficult, and, in fact, seems to be an impossible one; yet not only is the child more successful than the most brilliant linguist, but the grammars of children, at each stage of their acquisition, are highly similar, and deviate from the adult grammar in highly specific constrained ways.

To account for the ability of children to construct the complex syntactic rules of their grammar, it has been suggested that the child’s “grammar” is semantically based. This view holds that the child’s early language does not make reference to syntactic categories and relations (Noun, Noun Phrase, Verb, Verb Phrase, subject, object, and so on) but rather solely to semantic roles (like agent or theme). Nina Hyams,⁹ however, studying the language of Italian-speaking children of about two years old, shows clearly that their utterances can only be explained by reference to syntactic categories and relations.

This point is easier to see in Italian where there is subject–verb agreement than in English. The Italian verb is inflected for person and number to agree with the subject, as shown in the following utterances produced by an Italian child:

- | | |
|-----------------------|---|
| (1) Tu leggi il libro | “you read (2nd person singular) the book” |
| (2) Io vado fuori | “I go (1st person singular) outside” |
| (3) Girā il pallone | “Turns the balloon (3rd person singular)” |
| (4) Dorme miao | “Sleeps (3rd person singular) the cat” |

Subject–verb agreement cannot be semantically based, because the subject is an agent in utterances 1 and 2 but not in 3 and 4. Instead, agreement must be based on whatever noun phrase is the subject, a syntactic relationship.

Hyams upholds this position by reference to other kinds of agreement as well, providing further support for the view that each stage of a child’s early grammar is qualitatively similar to the adult grammar in that it includes both a syntactic and a semantic component.

Thus, just as human adult languages are governed by universal characteristics, the child’s grammar, while differing from the adult grammar in specific ways,

⁹N. Hyams. 1985. “Semantically-Based Child Grammars: Some Empirical Inadequacies.” *Papers and Reports on Child Language* No. 23. Stanford University. Stanford, Calif.

also follows universal principles. This fact shows that language acquisition must be biologically based, which will be further discussed in the next section and also in Chapter 11.

The Biological Foundations of Language Acquisition

Just as birds have wings, man has language.

George Henry Lewes (1817–1878)

The ability of children to form complex rules and construct the grammars of the languages used around them in a relatively short time is indeed phenomenal. The similarity of the language acquisition stages across diverse peoples and languages supports the view that children seem to be equipped with special abilities to know what generalizations to look for and what to ignore, and how to discover the regularities of language. Children learn language the way they learn to walk. They are not taught to walk, but all normal children begin to do so at around the same age. “Learning to walk” or “learning language” is different than “learning to read” or “learning to ride a bicycle.” Many people never learn to read because they are not taught to do so, and there are large groups of people in many parts of the world that do not have any written language. However, they all have language.

The “Innateness Hypothesis”

Chomsky explains the ability to acquire language in the following way:

It seems plain that language acquisition is based on the child’s discovery of what from a formal point of view is a deep and abstract theory—a generative grammar of his language. . . . A consideration of the character of the grammar that is acquired, the degenerate quality and narrowly limited extent of the available data, the striking uniformity of the resulting grammars, and their independence of intelligence, motivation, and emotional state, over wide ranges of variation, leave little hope that much of the structure of the language can be learned by an organism initially uninformed as to its general character. . . . It may well be that the general features of language structure reflect, not so much the course of one’s experience, but rather the general character of one’s capacity to acquire knowledge.¹⁰

It is this human capacity to acquire language that has led to “the innateness hypothesis” of child language acquisition, which posits that not only is the human species genetically “prewired” to acquire language, but that the kind of language is also determined. The principles that determine the class of human languages that can be acquired unconsciously, without instruction, in the early years of life has

¹⁰Noam Chomsky. 1965. *Aspects of the Theory of Syntax*. M.I.T. Press. Cambridge, Mass.

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been referred to as the Universal Grammar (or the UG). This Universal Grammar underlies the specific grammars of all languages. We are still far from understanding the nature of our genetic "prewiring," or the specific details of the language-learning device or Universal Grammar with which the human animal appears to be born; but there seems to be little doubt that the human brain is specially equipped for language acquisition. Chapter 11 will consider some aspects of the organization of the brain that appear to underlie our language abilities.

Sign Languages: Evidence for the Biology of Language

People talking without speaking,

People hearing without listening

Paul Simon, "The Sounds of Silence"¹¹

It is not the want of organs that [prevents animals from making] . . . known their thoughts . . . for it is evident that magpies and parrots are able to utter words just like ourselves, and yet they cannot speak as we do, that is, so as to give evidence that they think of what they say. On the other hand, men who, being born deaf and mute . . . are destitute of the organs which serve the others for talking, are in the habit of themselves inventing certain signs by which they make themselves understood.

René Descartes, *Discourse on Method*

Deaf children, who are unable to hear the sounds of spoken language, do not acquire spoken languages as hearing children do. However, deaf children of deaf parents who are exposed to sign language learn sign language in stages parallel to language acquisition by hearing children learning oral languages. These sign languages are human languages that do not utilize sounds to express meanings. Instead, hand and body gestures are the forms used to represent morphemes or words. Sign languages are fully developed languages, and those who know sign language are capable of creating and comprehending unlimited numbers of new sentences, just like speakers of spoken languages.

Current research on sign languages has been crucial in the attempt to understand the biological underpinnings of human language acquisition and use. Some discussion on sign languages is therefore essential.

About one in a thousand babies is born deaf, or with a severe hearing deficiency. One major effect is the difficulty the deaf have in learning a spoken language. It is nearly impossible for those unable to hear language to learn to speak naturally. Normal speech depends to a great extent on constant auditory feedback. Hence a deaf child will not learn to speak without extensive training in special schools or programs designed especially for the deaf.

Although deaf persons can be taught to speak a language intelligibly, they can never understand speech as well as a hearing person. Seventy-five percent of the words spoken cannot be read on the lips with any degree of accuracy. The ability of

¹¹Paul Simon. "The Sounds of Silence." Copyright 1974, 1965. Used by permission.

many deaf individuals to comprehend spoken language is therefore remarkable; they combine lip reading with knowledge of the structure of the language and the semantic redundancies.

If, however, human language is universal in the sense that all members of the human species have the ability to learn a language, it is not surprising that nonspoken languages have developed as a substitute for spoken languages among nonhearing individuals. The more we learn about the human linguistic ability, the more it is clear that language acquisition and use are not dependent on the ability to produce and hear sounds, but on a much more abstract cognitive ability, biologically determined, which therefore accounts for the similarities between spoken and sign languages.

American Sign Language (ASL) The major language used by the deaf in the United States is American Sign Language (or AMESLAN or ASL). ASL is an independent, fully developed language that historically is an outgrowth of the sign language used in France and brought to the United States in 1817 by the great educator Thomas Hopkins Gallaudet. Gallaudet was hired to establish a school for the deaf, and after studying the language and methods used in the Paris school founded by the Abbé de l'Épée in 1775, he returned to the United States with Laurent Clerc, a young deaf instructor, establishing the basis for ASL. Like all living languages, ASL continues to change; only 60 percent of the present ASL vocabulary is of French origin. Not only have new signs entered the language, but the forms of the signs have changed, in ways similar to the historical changes in the phonological structure of words in spoken language. For example, many signs that were originally formed at waist or chest level are now produced at a higher level near the neck or upper chest.

ASL has its own morphological, syntactic, and semantic systems. Its formal units, corresponding to the phonological elements of spoken language, were originally called **cheremes**¹² (to correspond to the term phoneme) and are now more often referred to as **primes**. The signs of the language that correspond to morphemes or words of spoken language can be specified by primes of three different sets: hand configuration, the motion of the hand(s) toward or away from the body, and the place of articulation or the locus of the sign's movement.

Figure 10-1 illustrates the hand configuration primes.

There are minimal pairs in sign languages just as there are in spoken languages. Figure 10-2¹³ shows minimal contrasts involving hand configuration, place of articulation, and movement.

The sign meaning "arm" can be described as a flat hand, moving to touch the upper arm. Thus it has three prime features: flat hand, motion toward, upper arm.

Just as spoken language has sequences of sounds that are not permitted in the

¹²W. C. Stokoe, Jr., D. Casterline, and C. Croneberg. 1965. *A Dictionary of American Sign Language on Linguistic Principles*. Gallaudet College Press. Washington, D.C.

¹³Figures 10-1 and 10-2 are from E. S. Klima and U. Bellugi. 1979. *The Signs of Language*. Harvard University Press. Cambridge, Mass. Pp. 46 and 42.

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|---|---|--|---|---|---|
| /B/ | /A/ | /G/ | /C/ | /S/ | /V/ |
|  |  |  |  |  |  |
| flat hand | fist hand | index hand | cupped hand | spread hand | V hand |

| | | | | | |
|---|---|--|---|---|---|
| /O/ | /F/ | /X/ | /H/ | /L/ | /Y/ |
|  |  |  |  |  |  |
| O hand | pinching hand | hook hand | index-mid hand | L hand | Y hand |

| | | | | | | |
|--|--|---|--|--|--|--|
| /8/ | /K/ | /I/ | /R/ | /W/ | /3/ | /E/ |
|  |  |  |  |  |  |  |
| mid-finger hand | chopstick hand | pinkie hand | crossed-finger hand | American-3 hand | European-3 hand | nail-buff hand |

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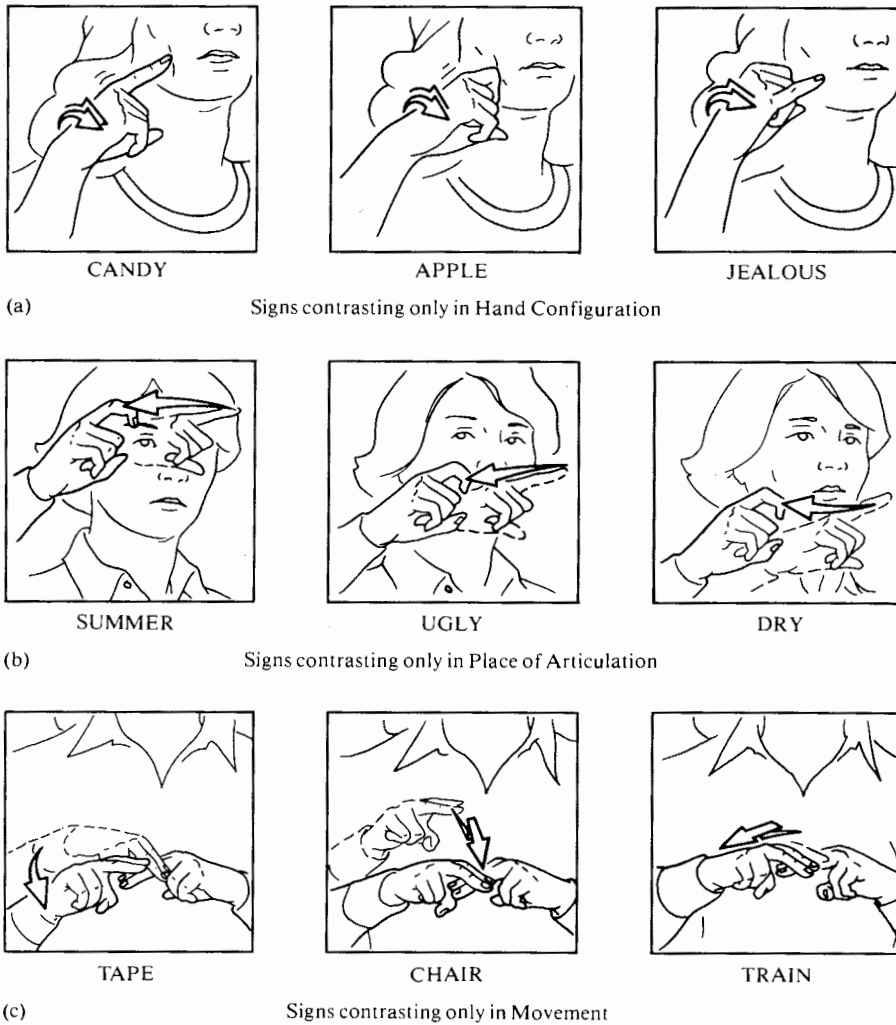
FIGURE 10-1 Hand configuration primes arranged in order of frequency (with descriptive phrases used to refer to them).

language, so sign languages have forbidden combinations of features. They differ from one sign language to another, just as the constraints on sounds and sound sequences differ from one spoken language to another. A permissible sign in a Chinese sign language may not be a permissible sign in ASL, and vice versa.

The linguistic study of ASL also reveals a complex system of morphological and syntactic rules that parallel those found in spoken languages.¹⁴

The other sign language used in the United States is called Signed English (or

¹⁴T. Supalla and E. Newport. 1978. "How Many Seats in a Chair? The Derivation of Nouns and Verbs in American Sign Language." In P. Siple, ed., *Understanding Language Through Sign Language Research*. Academic Press. New York. Pp. 91-132.



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FIGURE 10-2 Minimal contrasts illustrating major formational parameters.

Siglish). Essentially, it consists in the replacement of each spoken English word (and morpheme) by a sign. The syntax and semantics of Signed English are thus approximately the same as those of ordinary English. It is thus a rather unnatural language similar to speaking French by translating every English word or morpheme into its French counterpart. Of course, there is not always a corresponding morpheme, and that would create problems just as it does in signing English.

If there is no sign in ASL, signers utilize another mechanism, the system of finger spelling. This method is also used to add new proper nouns or technical vocabulary. Sign interpreters of spoken English often finger spell such words. A



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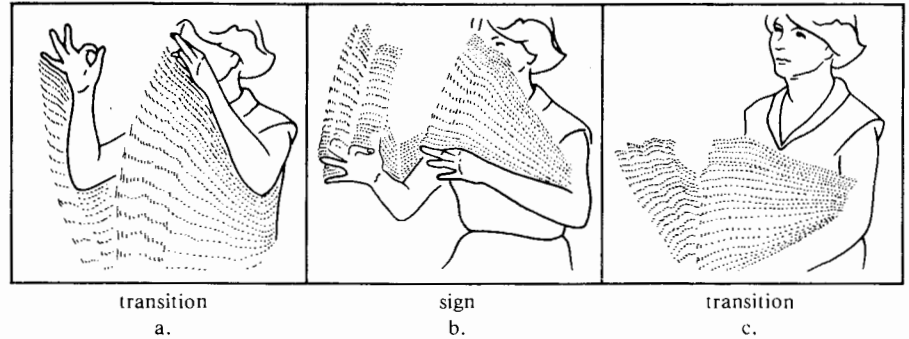
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TRAIN

manual alphabet consisting of various finger configurations, hand positions, and movements gives visible symbols for the alphabet and ampersand.

Signs, however, are produced differently than are finger-spelled words. "The sign DECIDE cannot be analyzed as a sequence of distinct, separable configurations of the hand. Like all other lexical signs in ASL, but unlike the individual finger-spelled letters in D-E-C-I-D-E taken separately, the ASL sign DECIDE does have an essential movement [but] [t]he handshape occurs simultaneously with the movement. In appearance, the sign is a continuous whole."¹⁵ This sign is shown in Figure 10-3.



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FIGURE 10-3 The ASL sign DECIDE. (a) and (c) show transitions from the sign; (b) illustrates the single downward movement of the sign.

An accomplished signer can "speak" at a normal rate, even when there is a lot of finger spelling. Television stations sometimes have programs that are interpreted in sign for the deaf in a corner of the TV screen. If you have ever seen such a program, you were probably amazed at how well the interpreter kept pace with the spoken sentences.

Language arts are not lost to the deaf. Poetry is composed in sign language, and stage plays such as Sheridan's *The Critic* have been translated into sign language and acted by the National Theatre of the Deaf (NTD). Sign language was so highly thought of by the anthropologist Margaret Mead that, in an article discussing the possibilities of a universal second language, she suggests using some of the basic ideas that sign languages incorporate.

The Acquisition of ASL Given the universal aspects of sign and spoken languages, it is not surprising that deaf children of deaf signing parents parallel the stages of spoken language acquisition. They start with single signs similar to the single words in the holophrastic stage and then begin to combine signs. There is also a telegraphic stage in which the "grammatical" signs are omitted. Grammatical or function signs appear at around the same age for deaf children as function words in spoken languages.

¹⁵Klima and Bellugi, pp. 38 and 62.

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Bellugi and Klima¹⁶ point out that deaf children's acquisition of the negative morphemes in American Sign Language (ASL) shows much the same pattern as in spoken language. NO and NEG (a headshake) are frequently used signs in adult ASL, with different restrictions on their use. The children acquiring ASL use them interchangeably in initial position of a signed sentence, like hearing children starting negative sentences with *no* but unlike the ways in which negative signs are used in adult ASL. We see that the acquisition of ASL cannot be simple imitation any more than spoken language is acquired simply by imitation.

Hearing children of deaf parents acquire both sign language and spoken language when exposed to both, although studies have shown that the child's first signs emerge a few months before the first spoken words. It is interesting that deaf children appear to begin producing signs earlier than hearing children produce spoken words. It has been suggested that this timing may be because control of hand muscles develops earlier than the control of oral and laryngeal muscles.

Deaf children of hearing parents who are not exposed to manual sign language from birth suffer from a great handicap in acquiring language; yet language learning ability seems so strong in humans that even they begin to develop their own manual gestures to express their thoughts and desires. A study of six such children revealed that they not only developed individual signs but joined pairs and formed sentences (up to thirteen "words") with definite syntactic order and systematic constraints.

This fact, of course, should not be surprising; sign languages are as grammatical and systematic as are spoken languages. We saw in Chapter 1 that the signs are conventional or arbitrary and not imitative. Furthermore, because all languages change in time, just as there are many different spoken languages, there are many different sign languages, all of which (spoken and sign) reveal the same linguistic universals. Deaf children often sign themselves to sleep just as hearing children talk themselves to sleep; deaf children report that they dream in sign language as French-speaking children dream in French and Hopi children dream in Hopi. Deaf children sign to their dolls and stuffed animals; slips of the hand occur similar to slips of the tongue; finger fumblers amuse signers as tongue twisters amuse speakers. We see that sign languages resemble spoken languages in all major aspects, showing that there truly are universals of language despite differences in the modality in which the language is performed. This universality is predictable because it is language, not speech, that is biologically based.

Learning a Second (or Third or . . .) Language

He that understands grammar in one language, understands it in another as far as the essential properties of Grammar are concerned. The fact that he can't speak, nor comprehend, another language is due to the diversity of words and their various forms, but these are the accidental properties of grammar.

Roger Bacon (1214–1294)

¹⁶U. Bellugi and E. S. Klima. 1976. "The Roots of Language in the Sign Talk of the Deaf." *Psychology Today* 6:60–64.

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DENNIS THE MENACE

Hank Ketcham



"Gina is by lingal . . . that means she can say the same thing twice, but you can only understand it once."

DENNIS THE MENACE® used by permission of Hank Ketcham and © by North America Syndicate.

Anyone who has attempted to learn a second language in school or when visiting a foreign country knows that it is different from learning our first, native language. Even "talented language learners" require some instruction, or at least find a dictionary and "grammar" useful. Some of us are total failures at second language learning. We may be extremely fluent in our native language, we may get all As in composition and write beautiful poetry, but still find we are unable to learn another language.

The younger you are, the easier it seems to be to learn a language. Language is unique in that no other complex system of knowledge is more easily acquired at the age of two or three than at the age of thirteen or twenty.

Young children who are exposed to more than one language before the age of puberty seem to acquire all the languages equally well. Many bilingual and multilingual speakers acquired their languages early in life. Sometimes one language is the first learned, but if the child is exposed to additional languages at an early age they will also be learned.

It has been suggested that there is a “critical age” for language acquisition, or at least for language acquisition without special teaching and without the need for special learning. We will review some neurological views of this special period in Chapter 11.

Learning a second language (often referred to in the literature as L2) differs qualitatively from learning a first language (L1). To see why, various factors—psychological, physical, and sociological—must be considered in addition to the linguistic structure of L2 and how it differs from the native language. Individuals who are self-conscious about making mistakes often find learning L2 difficult, which is not a problem for children, who are unconcerned or unaware that they are making mistakes.

On the other hand, due to the universal characteristics of human language, adults who know one language already “know” much about the underlying structure of every language. This fact is shown by the stages in second language acquisition, which are similar to those in first language acquisition. For example, Carol Chomsky¹⁷ found that in the earliest years, children learning English natively interpret sentences like *John is easy to see* as *It is easy for John to see*. French speakers learning English seem to go through a similar stage; yet this difficulty cannot be due to any “interference” from French grammar, because in this sense, French is similar to English. The acquisition of grammatical morphemes (both bound and free) in learning English as a second language proceeds in similar order as in children’s acquisition, no matter what the system is in the native language of the learner.

However, *interference* from native phonology, morphology, and syntax can create difficulties that persist as a foreign “accent” in phonology and in the use of nonnative syntactic structures.

Second Language Teaching Methods

Many approaches to foreign language instruction have developed over the years. In one method, **grammar-translation**, the student memorizes words, inflected words, and syntactic rules and uses them to translate from English to L2 and vice versa. The **direct method** abandons memorization and translation; the native language is never used in the classroom, and the structure of the L2 language or how it differs from the native language is not discussed. The direct method attempts to simulate learning a language as if the students found themselves in a foreign country without anyone except natives to speak to. In other words, the direct method assumes that adults can learn a foreign language in the way they learned their native language as children. Practically, it is difficult to duplicate the social, psychological, or physical environment of the child, or even the number of hours that the learner is exposed to the language to be learned, even if there is no “critical age” factor.

An **audio-lingual** language teaching method is based on the assumption that language is acquired mainly through imitation, repetition, and reinforcement. Be-

¹⁷C. Chomsky. 1969. *The Acquisition of Syntax in Children from Five to Ten*. M.I.T. Press. Cambridge, Mass.

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.I.T. Press. Cambridge,

cause language use is creative and is not a form of habitual behavior, it is unfortunate that this method is still quite widely used.

Most specific methods have serious limitations; and probably a combination of many methods is required, as well as motivation on the part of the student, intensive and extensive exposure, native or near-native speaking teachers who can serve as models, and instruction and instructional material that is based on linguistic analysis of all aspects of the language.

Acquiring Versus Learning?

Stephen Krashen has proposed a distinction between acquisition—the process by which children unconsciously acquire their native language—and learning, which he defines as “conscious knowledge of a second language, knowing the rules, being aware of them, and being able to talk about them.”¹⁸

It is clear that children *acquire* their first language without explicit learning. A second language is usually *learned* but to some degree may also be acquired or “picked up,” depending on the environmental setting and the input received by the second language learner.

Can Chimps Learn Human Language?

... *It is a great baboon, but so much like man in most things. . . . I do believe it already understands much English; and I am of the mind it might be taught to speak or make signs.*

Entry in Samuel Pepys' *Diary*, August 1661

In this chapter, the discussion has centered on the biologically determined *human* language acquisition ability. Recently, much effort has been expended to determine whether nonhuman primates (chimpanzees, monkeys, gorillas, and so on) can learn human language. In their natural habitat, primates communicate with each other in systems that include visual, auditory, olfactory, and tactile signals. Many of these signals seem to have meaning associated with the animals' immediate environment or emotional state. They can signal “danger” and can communicate aggressiveness and subordination. Females of some species emit a specific call indicating that they are anestrous (sexually quiescent), which inhibits attempts by males to copulate. However, the natural sounds and gestures produced by all nonhuman primates show their signals to be highly stereotyped and limited in the type and number of messages they convey. Their basic “vocabularies” occur primarily as emotional responses to particular situations. They have no way of expressing the anger they felt yesterday or the anticipation of tomorrow.

Despite these characteristics of nonhuman primate *natural* systems of communication, there has been an interest in whether these animals may have a capacity

¹⁸Stephen D. Krashen. 1982. *Principles and Practice in Second Language Acquisition*. Pergamon Press. Oxford, England.