

FILE 8.1

Theories of Language Acquisition

8.1.1 About Language Acquisition

Humans are not born talking. Instead, we typically learn to understand language and to speak during the first few years of our lives, before we even enter kindergarten or grade school. Recall from File 1.2 that language is a communication system consisting of sounds, morphemes, words, and rules for combining all of these. The knowledge of these elements enables people to understand and produce sentences they may never have heard or uttered before. So how does a child acquire this knowledge? If knowing a language were simply a matter of knowing a lot of words, language acquisition would just be a process of figuring out what the words were and memorizing them. Instead, children must acquire a grammar with all its components and rules. How do children learn these rules? For instance, how do they learn that the morpheme *un-* (meaning 'not') attaches to adjectives to form other adjectives having the opposite meanings? How do they learn to compose a sentence from a noun phrase and a verb phrase? Rules, unlike words, are never explicitly stated, so the child cannot just memorize them: he must somehow figure the rules out on his own—a remarkable intellectual feat.

Various theories have arisen that attempt to account for how children acquire language. One theory that has found a lot of support throughout the years is that at least part of the human language ability is **innate**. In the sections that follow, we will first explore the **innateness hypothesis** and the evidence for it.

However, innateness alone does not answer all of the questions about how children acquire the specific language that is spoken around them. Again, there are a number of theories that have been proposed for how additional, more specific knowledge is acquired. We will briefly consider two early ones, **Imitation Theory** and **Reinforcement Theory**, which have been refuted but which remain part of popular belief. It is therefore important to point out why these theories are inadequate. We will then consider three more current theories of language acquisition: the most influential of them is the **Active Construction of a Grammar Theory**. This theory is the one that most linguists believe today. However, there are a number of influential competing theories. Of these, we will introduce **Connectionist Theories** and **Social Interaction Theory**.

8.1.2 The Innateness Hypothesis

The first theory of language acquisition that we will consider asserts that language ability is **innate** in humans. That is, humans are genetically predisposed to acquire and use language (though not any particular language, of course). This theory claims that babies are born with the knowledge that languages have patterns and with the ability to seek out and identify those patterns. Some theorists have even claimed that humans have innate knowledge of some core characteristics common to all languages, such as the concepts of 'noun' and 'verb.' These basic features shared by all languages are called **linguistic universals**, and the theoretically inborn set of structural characteristics shared by all languages is known as

universal grammar. No one knows exactly what the contents of universal grammar are, though this is currently an active area of research in linguistics.

The claim that linguistic ability is innate in humans is supported by, for example, the work of biologist Eric Lenneberg. He studied animal behavior and developed a list of characteristics that are typical of innately determined behaviors. Innate behaviors are present in all normal individuals of a species, whereas learned behaviors are not. Walking, for instance, is a behavior for which humans are genetically predisposed (that is, humans learn to walk as a natural part of development, without being explicitly taught), but playing the piano or riding a bicycle must be specifically taught. Is talking like walking, or is it like playing the piano?

To answer this, let's examine Lenneberg's characteristics of biologically controlled behaviors. If language acquisition has each of these characteristics, we can safely assume that it is a genetically triggered behavior.

(1) Lenneberg's characteristics of biologically controlled behaviors:¹

1. The behavior emerges before it is necessary.
2. Its appearance is not the result of a conscious decision.
3. Its emergence is not triggered by external events (though the surrounding environment must be sufficiently "rich" for it to develop adequately).
4. Direct teaching and intensive practice have relatively little effect.
5. There is a regular sequence of "milestones" as the behavior develops, and these can usually be correlated with age and other aspects of development.
6. There is likely to be a "critical period" for the acquisition of the behavior.

Consider the first criterion. In what sense is language necessary? From a biological standpoint, language is a behavior that has encouraged the survival and predominance of the human species. Each individual needs the ability to use language in order to take care of other basic needs. But children ordinarily begin to speak a language between the ages of twelve and twenty-four months, long before their parents have stopped providing them with the necessities of life. So language is a behavior that, like walking, emerges well before children have to fend for themselves.

As for the second and third criteria, language is neither the result of a conscious decision nor triggered by external events. Children decide whether or not they want to learn to play baseball or checkers, but they do not make a conscious choice about acquiring a native language; it's just something that all children do. Also, language is not learned as a result of something special triggering the learning. It is not taught the way (for example) piano playing is taught. Think about this: if you grew up hearing brilliantly played piano music, would you automatically pick up that skill the way we all seem to have automatically picked up language? Clearly not. While it is true that a child has to be exposed to language—this is what is meant by the environment being "rich"—it is not the case that a child's caretakers need to make a special effort to teach the child to speak. Other than hearing normal conversation and being spoken to, the child needs no special external stimulus to begin the process of acquiring language.

But doesn't intensive teaching help children learn language? Surprisingly, it does not seem to have much of an effect. Children don't necessarily perceive (or correct!) their mistakes just because an adult points them out (see Section 8.1.4).

Language acquisition also exhibits Lenneberg's fifth characteristic of having a sequence of "milestones" or identifiable stages associated with its development. Specifically, children master linguistic skills in a certain order. You will read about these stages in more detail in subsequent files. Although there is some variability in the milestones and the ages

¹From Aitchinson (1976), adapted from Lenneberg (1967).

at which children achieve them, there is a path of developmental stepping stones that all children follow.

Lenneberg further proposes that innate behaviors have a **critical period** associated with their emergence. The term *critical period* describes a period of time in an individual's life during which a behavior—in this case language—must be acquired; that is, the acquisition will fail if it is attempted either before or after the critical period.

The critical period for language acquisition is assumed to extend from birth to approximately the onset of puberty. During this time, a child needs exposure to language in order to develop the brain structures necessary for language acquisition. If a child is not exposed to language at all during this time, then the child will never acquire normal language skills and, in fact, may not acquire language skills at all. If a child has acquired a native language during the critical period and starts learning a second language before the age of twelve, the child will likely achieve native competence in this second language as well. However, if the second language is learned after about age twelve, the child is likely never to acquire complete native competence in the language.

How can we tell whether there really is a critical period for first-language acquisition? To prove this, we would have to show that language skills could not be acquired normally or even at all if the learning began after the critical period had ended. This could be accomplished by depriving a child of linguistic input for the early years of life, but obviously it would be highly unethical to submit a child to such treatment. However, there are at least two sources of information available to linguists which support the claims that there is a critical period for first-language acquisition.

First, evidence for the critical period hypothesis comes from children who, owing to unfortunate circumstances, were exposed to little or no language during their early lives. These children were either neglected by their caretakers (**neglected children**) or grew up in the wild, often with animals (**feral children**). When these children were rescued or discovered, researchers attempted to help them acquire language. The success of these attempts depended largely on the age at which the children were discovered. We will consider two such cases, outlined in (2) and (3).

- (2) Genie was found in 1970 when she was nearly fourteen years old. She had been abused and isolated since the age of twenty months. When first discovered, Genie was completely silent. Thereafter her language acquisition was extremely slow, and although she did learn to speak, her speech was abnormal. She was able to memorize many vocabulary items, but her expressions were formulaic, as in *what is X* and *give me X*. She never learned grammar.
- (3) Isabelle was discovered in 1937 at the age of six and a half. Her mother was deaf and could not speak. Isabelle's grandfather had kept Isabelle and her mother isolated but had not otherwise mistreated them. Isabelle then began lessons at The Ohio State University, and although her progress was at first slow, it soon accelerated. In two years her intelligence and her language use were completely normal for a child her age.

At first sight, the cases of Genie and Isabelle seem to provide good evidence for the critical period hypothesis: Genie, discovered after the supposed critical period was over, never learned language; Isabelle, discovered before the end of the period, did. But evidence from feral or neglected children is problematic. Such children are usually traumatized or are not socialized before they are rescued or found. So it is possible that it is not the lack of exposure to language but rather a larger trauma that prevents them from acquiring language properly. For example, Genie had been beaten by her father for making noises, so her difficulty with language could have had multiple causes. The case of Isabelle is problematic for the opposite reason: prior to being found, she was locked in a room with her mother, and although her mother could not speak, they developed a rudimentary personal gesture sys-

tem to communicate. Thus, Isabelle did have some exposure to a communication system during the early years of her life. It is possible that Isabelle acquired language not because she was discovered at an earlier age than Genie, but because she had access to a rudimentary communication system. Likewise, it is possible that Genie didn't learn language not because she was discovered at an older age than was Isabelle, but rather because she had been abused.

Stronger evidence supporting both the innateness of language and the critical period hypothesis for first-language acquisition can be found in instances of deaf children and adults who were initially raised in environments without access to signed language input. One particularly illustrative example is the case of the deaf population of Nicaragua in the late twentieth century. At the end of the 1970s, following Nicaragua's civil war, the country founded a new state school for the deaf. In the late 1970s and early 1980s, deaf children and adults were able to come together in a way that had not been possible earlier in the country's history. Most children and adults arrived at the schools with idiosyncratic and rudimentary **homesign** gesture systems. Homesign gestures are communicative gestures (a form associated with a meaning) that are invented by deaf children and the people with whom they routinely interact in cases where a signed language is not made available. Homesigns may represent the names of individuals such as family members and the names of common activities ('eat') or common objects ('house') that are often referred to. However, a homesign system is not a language: it is an extremely limited lexicon without a grammar. Thus the students arrived at the school with backgrounds that involved social interactions and communication and that were normal in every way except that they did not include exposure to language.

Soon, combining the homesigns that the students brought with them as well as some newly created signs, the children at the school created a pidgin (a type of simplified language—see File 11.3) to communicate with each other. After the pidgin was created by the first students at the school, younger children came and were exposed to the pidgin. Without instruction, and based only on their exposure to the pidgin used by their older peers, these younger children created Idioma de Signos Nicaragense (ISN), which is a full-fledged language with a complex system of grammatical rules.

The creation of ISN has been cited as evidence for the innateness of language, because within two or three generations of students, children created a new and complete language. Because they did not have exposure to any other linguistic system, all of the grammatical principles that were developed in ISN must have arisen through some innate ability in the children to create a complete grammatical system.

However, those students who first came to the school as older children, and who had not acquired any linguistic communication system prior to the time that they enrolled but had otherwise grown up in a caring environment, did not perfectly acquire this new language: in adulthood, their language use still resembles the pidgin, and there are inconsistencies in their use of phonological, morphological, and syntactic principles of the sort that one would not see in a native speaker of the language. This evidence supports the critical period hypothesis because the older children came from backgrounds similar to those of the younger children, yet they were unable to fully acquire language.

Support for a critical period for second-language acquisition involves comparing the acquisition of a second language by children and by teenagers and adults. Teenagers and adults have more difficulty learning languages than do children. People who have learned a language as an adult almost always have a foreign accent, indicating that they have not acquired the phonological rules of the second language perfectly. They may also find syntactic and other rules difficult to master completely. Children, however, can acquire a second (or third) language easily and completely as long as they have sufficient input from those languages. This ability tapers off around the age of puberty. However, the idea of a

critical period for second-language acquisition is very controversial. Critics argue that there are (rare) cases of adults learning a second language perfectly. Furthermore, it is possible to learn a second language at any age. Rather than a critical period, there seems to be a steady decline in how well one can learn a second language. Finally, factors such as teaching methods, motivation, identity, dedication, utility, and so on, play a role in how successfully a second language is learned, and these factors may also change with age, confounding studies looking for critical period effects in second-language acquisition.

Another concern related to the critical period hypothesis is that different aspects of language acquisition may behave differently relative to the critical period. For example, many feral or neglected children gain the ability to learn vocabulary and to understand others' speech, but they are not able to learn to use syntax productively. Second-language learners are able to learn large amounts of vocabulary and frequently master the language's syntax, but they rarely master the phonological system. This suggests that a critical period may exist for certain aspects of language (syntax in first-language acquisition and phonology in second-language acquisition), but not for others.

Despite our lack of a complete understanding of the acquisition process, we can conclude that language acquisition shows characteristics of being an innate human behavior.

8.1.3 Imitation Theory

Moving on to how the specifics of language are acquired, we will first consider **Imitation Theory**, which claims that children learn language by listening to the speech around them and reproducing what they hear. According to this theory, language acquisition consists of memorizing the words and sentences of some language. The idea that acquiring a language is a process of learning to imitate the speech of others is at least partly true. Since the connection between the way a word sounds and what it means is largely arbitrary (see File 1.4), children cannot guess what the words of their target language are. They must hear the words used by other speakers and then reproduce or "imitate" them. This theory also helps explain the fact that children learn the language that is spoken around them by parents, caretakers, and others, regardless of what the language of their ancestors may have been. Thus a Korean child, for instance, will speak Korean if raised in a Korean-speaking environment, but Arabic if raised in an Arabic-speaking environment. In other words, a child's genetic makeup has nothing to do with which language the child will acquire.

Unfortunately, however, Imitation Theory explains little else of what we know about language acquisition. Children's speech differs from adult norms: it is full of "errors" of many types. A two-year-old might say *nana* for adult *banana*, a three-year-old might say *Mommy tie shoe*, and a four-year-old might say *hitted* or *goed* rather *hit* or *went*.

The last example clearly cannot be a case of imitation because children would not have heard an adult say *hitted* or *goed*. Rather, it seems that the child who says *hitted* has a rule in her internal grammar which adds *-ed* (pronounced as /d/, /t/ or /əd/) to a verb to make it past tense. The child has not mastered the fact that there are exceptions to this rule, such as the use of *hit* rather than *hitted* in the past tense. However, Imitation Theory fails to acknowledge that a child has any sort of internal mental grammar that includes rules for combining words and other elements in systematic ways, so it would incorrectly predict that a child would not produce words like *hitted*.

The most serious fault of Imitation Theory is that it cannot account for how children and adults are able to produce and understand new sentences. If children learned only by imitation, the only way they could understand a sentence is if they had heard it before. However, we know that there are an infinite number of possible sentences in any language, and speakers (even children) are able to understand and produce completely novel utterances.

8.1.4 Reinforcement Theory

Reinforcement Theory asserts that children learn to speak like adults because they are praised, rewarded, or otherwise reinforced when they use the right forms and are corrected when they use wrong forms. However, the claim that parents and other caretakers frequently correct their children's grammatical mistakes and praise their correct forms is unfounded. Such corrections seldom happen, for although parents often do correct their children, their corrections generally have more to do with the accuracy or truth of a statement than with its grammatical form. Thus, *The dog wants to eat* may receive the response *No, the dog doesn't want to eat* if the dog has just finished its dinner, whereas the sentence *Robin goed to school today* may receive the response *Yes, he did* if Robin did go to school that day.

Reinforcement Theory is also contradicted by the fact that even when adults do try to correct a child's grammar, the attempts usually fail entirely. Consider the following conversation:

- | | |
|---------------------------|---|
| (4) Child: | Nobody don't like me. |
| Mother: | No, say "nobody likes me." |
| Child: | Nobody don't like me. |
| (repeated 8 times) | |
| Mother (now exasperated): | Now listen carefully! Say, "Nobody likes me." |
| Child: | Oh! Nobody don't likes me. |

Notice that although the child does not form negative sentences in the same way the adult does, the child's utterances follow a pattern just as the adult's do. The child's way of forming negative sentences involving *nobody* is completely regular: every such sentence contains *nobody* + a negative auxiliary verb, such as *Nobody can't spell that* or *Nobody won't listen*. If the child produces a variety of such sentences, then he or she must possess a rule that defines this pattern, but the rule is not the same as the one in the adult's grammar. Reinforcement Theory can explain neither where the child's rule came from nor why the child seems impervious to correction. (Incidentally, the conversation sample above is a good example of how direct teaching does not help children to acquire language—recall the criteria for innate behaviors in Section 8.1.2.)

8.1.5 Active Construction of a Grammar Theory

The **Active Construction of a Grammar Theory**, the most influential theory of language acquisition, holds that children actually invent the rules of grammar themselves. The theory assumes that the ability to develop rules is innate, but that the actual rules are based on the speech children hear around them; this is their input or data for analysis. Children listen to the language around them and analyze it to determine the patterns that exist. When they think they have discovered a pattern, they hypothesize a rule to account for it. They add this rule to their growing grammar and use it in constructing utterances. For example, a child's early hypothesis about how to form the past tense of verbs will be to add an allomorph of *-ed*. All past tense verbs would then be constructed with this rule, producing forms such as *holded* and *eated* alongside *needed* and *walked*. Notice that at this point the child would have already learned the rules of when the regular past tense ending is pronounced /d/, /t/, or /əd/. When children discover that there are forms in the language that do not match those produced by this rule, they modify the rule or add another one to produce the additional forms. Eventually, the child has created and edited his or her own grammar to the point where it matches an adult's grammar. At this point, there are no significant discrepancies between the forms produced by the child and those

produced by the adults. Clearly, the child has a complete working grammar all along, even before it is essentially adultlike. The child uses this grammar to produce utterances; when those utterances differ from adult speech, they are reflecting the differences in the two grammars.

Within this framework, children's mistakes are expected to occur and to follow non-random patterns. This is because the child is forming utterances according to grammatical rules even though the rules are often different from those that adults use. It is important to note also that active reinforcement by adults about a child's mistakes is not enough to help the child "discover" what is wrong with his or her own utterances; the child must make the connection in his or her own time.

8.1.6 Connectionist Theories

Connectionist theories of language acquisition assume that children learn language by creating neural connections in the brain. A child develops such connections through exposure to language and by using language. Through these connections, the child learns associations between words, meanings, sound sequences, and so on. For example, a child may hear the word *bottle* in different circumstances and establish neural connections every time the word is heard. Such connections can be to the word itself, to the initial sound /b/, to the word *milk*, to what the bottle looks like, to the activity of drinking, and so on. Eventually, all of these connections become the child's mental representation of the meaning and the form of the word (see Section 1.4.7). Connections can have different strengths, and language acquisition involves adjusting the strengths of the connections appropriately. The strength of a connection is dependent on input frequency. For example, if a child hears the word *bottle* more frequently in connection with *milk* than with *water*, then the connection between *bottle* and *milk* will be stronger than that between *bottle* and *water*. Thus, instead of developing abstract **rules**, according to connectionist theories, children exploit statistical information from linguistic input. Such theories assume that the input children receive is indeed rich enough to learn language without an innate mechanism to invent linguistic rules (though note that the ability to make statistical generalizations must be innate).

To get a better feel for how this theory works and how it differs from other theories, let's look at the acquisition of the past tense of verbs again. The Active Construction of a Grammar Theory assumes that children produce words like *goed* or *growed* because they have formed a rule that tells them to add *-ed* to a verb to form the past tense. Connectionist models assume that the child merely exploits statistical information about forming past tenses. Thus, the child says *goed* and *growed* because the existence of forms like *showed*, *mowed*, *towed*, and *glowed* makes this pattern statistically likely.

Evidence for the exploitation of statistics as opposed to the development of abstract rules comes from experiments in which, for example, children create the past tense of nonsense verbs. For instance, when asked to complete the phrase "This man is fringing; Yesterday, he _____," many children create nonsense irregular forms such as *frang* or *frought* instead of the nonsense regular form *fringed*. Such data pose a problem for the Active Construction of a Grammar Theory, but the data can be explained in terms of a connectionist model. If children invent rules and then learn exceptions to the rules, they should produce *fringed* as the past tense of *fring* because it is not one of the learned exceptions. However, if children exploit statistical data, they would be expected to sometimes produce irregular forms because of their exposure to words like *sing*, *ring*, or *bring*.

Of course, it is possible that children both develop rules and also make use of statistical data. That is, it is possible that acquisition of grammatical rules proceeds according to a hybrid model and that children actively construct a grammar by establishing and exploiting neural connections.

8.1.7 Social Interaction Theory

Social Interaction Theory assumes that children acquire language through social interaction, with older children and adults in particular. This approach holds that children prompt their parents to supply them with the appropriate language experience they need. Thus, children and their language environment are seen as a dynamic system: children need their language environment to improve their social and linguistic communication skills, and the appropriate language environment exists because it is cued by the child. Like those who advocate the Active Construction of Grammar Theory, social interactionists believe that children must develop rules and that they have a predisposition to learn language. However, social interaction theorists place a great deal of emphasis on social interaction and the kind of input that children receive, instead of assuming that simply being exposed to language use will suffice. According to this approach, the ways in which older children and adults talk to infants play a crucial role in how a child acquires language. In many Western societies, speech to infants (so-called **child-directed speech**) is slow and high-pitched and contains many repetitions, simplified syntax, exaggerated intonation, and a simple and concrete vocabulary (see File 8.4). Consider the following examples from Berko Gleason and Bernstein Ratner (1998):

- (5) See the birdie? Look at the birdie! What a pretty birdie!
- (6) Has it come to your attention that one of our better-looking feathered friends is perched upon the windowsill?

When pointing out a bird on the windowsill to an infant, adults and older children are likely to say something like (5) in a slow, high-pitched voice with exaggerated intonation. In addition, they are likely to point at the bird. The social aspect of the interaction involves sharing an observation with the child. All of this helps the child to decode what the speech might mean. No adult would point out a bird to an infant by uttering something like (6). Social interactionists believe that the way adults speak to children and interact with children is crucial to acquiring language.

Of course, one of the problems with this theory is that children eventually do acquire the ability to utter and understand sentences like those in (6). While child-directed speech may be crucial early on, it is unclear how long a child must be exposed to it. Furthermore, the characteristics of child-directed speech vary from culture to culture, and we do not at this point know what specific aspects of such speech might, in fact, be crucial.

At the same time, this theory is also not completely incompatible with either of the two previous theories. That is, the types of social interactions that infants have may, in fact, be invaluable to language acquisition, which may develop through neural connections and involve the hypothesizing of particular grammatical rules on the part of the child.