

ASPECTS OF LANGUAGE

GENERAL OBJECTIVES OF THE SUBJECT

At the end of the course, Individuals will analyze the elements of the communication and will explain the basic principles of this course.

8. The Aspects of Language

- 8.1 Aspects of Language
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8.1 The Aspects of Language

There are four basic aspects of language that have been studied: phonology, syntax, semantics, and pragmatics. **Phonology is the study of the sounds of a language.** (To remember this term, think of the sounds that come from your *telephone*, or the word *cacophony*, meaning a lot of loud, annoying sounds!) **Syntax is the grammar of a language**—that is, how we put words in order and how we change words (for example, *play* becomes *played* when we talk about the past) so they make sense to our listeners. **Semantics is the meanings of words.** **Pragmatics is how we use language.**

For example, you probably speak in different ways to your professor, to your friends, and certainly to a 2-year-old. In each case, you are using language in a different way. When children develop the ability to communicate with language, they are developing all four of these areas (Gleason, 2005). They must understand and form the sounds of the language they are learning. They must learn what words mean and how to put them together so they make sense, and they must learn when and how to use language to accommodate to their listeners and to accomplish their goals. We will consider all of these aspects as we describe language development.

Two basic units are central to the study of language and its development: morphemes and phonemes. A **morpheme is the smallest unit that has meaning in a language.** For example, the word *cats* has two morphemes: *cat* and *s*. *Cat* refers to the animal, and *s* means more than one. A **phoneme is the smallest distinct sound in a particular language that signals differences between words.** For example, *cat* and *bat* are clearly distinct words in English, as indicated by the different beginning sounds. Different

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languages have types of phonemes that are distinct. For instance, in Japanese, the length of a vowel can indicate a different word. The word *toko* means “bed,” while *toko* with a long final *o* means “travel” (Sato, Sogabe, & Mazuka, 2010). In English, no matter how long we draw out the *a* in *cat*, it still means “cat.”

8.2 Theories of Language Development

There are many different ideas about how children learn to talk and understand language, and many controversies persist to this day. We are still learning about how this amazing process can occur so quickly in the first years of life.

According to B. F. Skinner (1957/1991), language is also shaped through operant conditioning, or reinforcement. When we respond to a baby’s babbling with a smile or some vocalization of our own, babies babble even more. If we respond to a request for “cookie” with the desired cookie, it becomes more likely that the child will use that word again the next time she wants a cookie. If we remember that reinforcement is anything that makes a behavior continue, then it is clear that we reinforce the development of a child’s language in many ways. Consistent with these ideas, research has shown that the more that mothers respond to their babies’ vocalizations, the sooner their babies develop language (Tamis-LeMonda, Bornstein, & Baumwell, 2001).

8.3 Nativism

Noam Chomsky (1968) developed a theory that proposes that the human brain is innately wired to learn language. He believes that children could not learn something as complex as human language as quickly as they do unless there is already a grammatical structure for language hardwired in their brains before they ever hear human language. He calls this **universal grammar**. According to this theory, hearing spoken language triggers the activation of this structure and does more than just promote imitation. Chomsky believes that the language that we usually hear is not adequate to explain the construction of all of the rules of language that children quickly learn.

For instance, nativists such as Chomsky point to the evidence that children will say things they have never heard, such as “The cats eated the mouses” rather than “The cats ate the mice.” We *hope* that children have never heard adults say something like “eated” or “mouses” and therefore they could not just be imitating language they have heard. However, you can easily see that, although the first sentence is grammatically incorrect, in some respects it *could be* correct. In English we do add *-ed* for the past tense and *-s* for plurals. However, we have exceptions to that rule, called irregular verbs or nouns. When

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children make this type of grammatical error they are showing that they have learned a pattern, but they are applying it to words that don't follow that pattern. This process of acting as if irregular words follow the regular rules is called **over-regularization**. Children are creating these words from their own understanding of grammar, and Chomsky believes that the basic principles of grammar are innate.

8.4 Interactionism

A third approach incorporates aspects of both behaviorism and nativism. According to **interactionism**, both children's biological readiness to learn language and their experiences with language in their environment come together to bring about language development. Just as we learned about how nature is expressed through nurture in Chapter 4, these theorists argue that both are equally necessary for the child to develop language and both must work together.

In addition, interactionism means that language is created socially, in the interaction between infant and adult. For example, adults naturally simplify their speech to young children not because they think "I need to teach this child how to speak!" but because the child then understands and responds to what the adult is saying. The adult is sensitive to the effectiveness of his communication so that when the child does not understand, he simplifies his language until the child does understand (Bohannon & Bonvillian, 2005).

Research on mother-infant speech in a variety of cultures has found that mothers make many of the same modifications in their speech to infants, perhaps because these changes produce a good fit between the mother's speech and the infant's perceptual and cognitive capabilities (Fernald & Morikawa, 1993). In addition, adults often repeat what children say but **recast** it into more advanced grammar. For example, a child might say, "More cookie," and the adult might respond, "Oh, do you want more cookies?" In the process, he is modeling a slightly higher level of language proficiency, which the child can then imitate. The child in this example might then say, "Want more cookies."

Cognitive Processing Theory - The question has been raised whether social interaction is enough to explain how children learn language. Another point of view is that learning language is a process of "data crunching," in which children take in and process the language they hear (Hoff & Naigles, 2002). These theorists argue that infants are processing language even during the first year of life, before they can speak (Naigles et al., 2009).

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Therefore, their understanding of language is learned and is not innate as Chomsky's theory asserts. These theorists would say that although the learning may be *motivated by* social interaction, the actual process of learning words and their meanings may rely more on the computational ability of the human brain. Hoff and Naigles (2002) found that toddlers' language learning was not related to the level or nature of social engagement between them and their mothers. Rather, the toddlers they studied learned more words when their mothers exposed them to more language; that is, they talked to them more and used more different words and longer, more complex utterances.

Cognitive processing theorists argue that language learning happens independently of mothers' responsiveness to their children's speech and of children's social abilities. They point to the fact that even socially limited children with autism can still develop language as evidence that language development is not dependent on social interaction.

8.5 Language and the Brain

As we mentioned earlier, there are two halves or hemispheres that comprise the human brain. The left hemisphere contains two areas that are central to language: Broca's area and Wernicke's area. The **Broca's area**, which is involved in the production of speech, is located near the motor center of the brain that produces movement of the tongue and lips (Gleason, 2005). A person with damage to this area will have difficulty speaking, leaving out the "little words." For example, when a person with damage in Broca's area was asked about his upcoming weekend plans, he answered, "Boston. College. Football. Saturday" (Gleason, 2005).

The **Wernicke's area**, which has to do with understanding and creating the meaning in speech, is located near the auditory center of the brain. Someone with damage to this area of the brain has no trouble producing words, but he has difficulty making sense. For example, one patient with damage to Wernicke's area responded as follows to the question "What brings you to the hospital?"

Boy I'm sweating, I'm awful nervous, you know, once in a while I get caught up, I can't mention the tarripoi, a month ago, quite a little, I've done a lot well, I impose a lot, while, on the other hand, you know what I mean, I have to run around, look it over, trebbin and all that sort of stuff. (Gardner, 1976)

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This patient speaks without any problem but is not making any sense and makes up words, such as *trebbin*. The capabilities of these two regions do not develop at the same time. Infants *understand* words before they can *say* them. Another way we describe this is to say comprehension of language precedes production of language. When you tell a 1-year-old to put a toy in a box, she will most likely *understand* you and might follow your directions, yet she is not likely to be able to *say* anything close to “put the toy in the box.” This differential between **receptive** and **expressive language** continues throughout life (Celce-Murcia & Olshtain, 2001).

Even college students can understand a sophisticated or technical lecture in class, while their own speech and writing are likely to be less complex. The brain is not a simple organ, and we continue to learn about its complexity. For instance, although language is primarily handled by the left hemisphere of the brain, some aspects of language, such as recognition of the emotion in someone’s words, are found in the right hemisphere (Gleason, 2005). Also, language functions may be distributed differently in women than in men. When researchers watched brain function using an MRI (functional magnetic resonance imaging), they found that men responded to rhyming tasks with left-hemisphere activity, while women responded with activity from areas in both the left and the right hemispheres (Shaywitz et al., 1995).

8.6 Stages of Language Development

In this section we will describe the development of language, with particular focus on the ability to talk. We purposely de-emphasize the ages at which these developments occur because children differ enormously in the rate at which they develop language. Later in this chapter we will discuss when a caregiver should be concerned about language delays.

Prenatal Development - Of course babies do not speak before they are born, yet language learning appears to begin before birth. As we described in Chapter 6, during the last trimester of prenatal development the fetus can hear its mother’s voice as shown by changes in fetal heart rate and motor activity when the mother is speaking, and this affects its preferences for language after birth in a number of ways (Karmiloff & Karmiloff-Smith, 2001). This was demonstrated in a study in which pregnant women read passages from the Dr. Seuss book *The Cat in the Hat* twice a day when they thought their fetus was awake (DeCasper & Spence, 1986). After the babies were born, those who had heard the story were more likely to try to elicit (by sucking a pacifier in a certain way) the sound of their mother reading *The Cat in the Hat* rather than a new poem they

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had never heard before. It appears that infants become familiar with and prefer “the rhythms and sounds of language” that they have heard prenatally (Karmiloff & Karmiloff-Smith, 2001, p. 43). As a result, within the first few days of life infants show a preference for the particular language their mother speaks, whether it is English, Arabic, or Chinese. This prenatal awareness of language sets the stage for language learning once the baby is born. In one study it was even shown that babies only 3–5 days old sound like the language they have been hearing when they cry. French babies cried from low pitch to high, while German babies cried from high pitch to low, mimicking the sounds of the language they hear (Mampe, Friederici, Christophe, & Wermke, 2009).

Infants’ Preverbal Communication - *Crying* - Babies cry as soon as they are born. At first this is a reflexive behavior, not intentional communication from the infant. However, crying is not pleasant for adults to hear, so we are motivated to do what it takes to make it stop. The process of communication begins when babies begin to learn that crying can act as a signal that brings relief from hunger, discomfort, and loneliness.

Although babies cry for many reasons, there does not appear to be clear evidence that they have different cries for hunger, pain, or loneliness. Research shows only that parents differentiate the intensity and severity of crying, not the specific reason for the cry (Gustafson, Wood, & Green, 2000). Knowing this should bring relief to parents who have been told that they should recognize *why* their baby is crying but realize that they cannot.

Cooing - Between 2 and 4 months after birth, babies begin to make more pleasant sounds (Menn & Stoel-Gammon, 2005). The sounds they can make are limited because of aspects of their physiology, so they sound a bit like doves “cooing.” At this stage they also begin to laugh, which is a great reward to parents! Infants at this stage begin to join in a prelanguage “conversation” with parents (Tamis-LeMonda, Cristofaro, Rodriguez, & Bornstein, 2006). The baby coos; the parent talks back; the baby looks and laughs; the parent smiles and talks. In this way, babies begin to learn how to *use* language even before they can speak.

Babbling - Babies typically begin to make one-syllable sounds, such as *ba* and *da*, when they are 4–6 months old and begin to combine those sounds (*baba*, *daga*) when they are 6–8 months old (Sachs, 2005). The most common consonant sounds are /b/, /d/, and /m/. At this point, parents get very excited, thinking that the baby means “daddy” when he says “dada” or “mommy” when he says “mama.” Although it does not appear that these first vocalizations are meaningful, babies may start to learn their meaning because of the way their parents respond to these sounds (Menn & Stoel-Gammon, 2005). It is interesting to note that in languages from around the world, even among those with no

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common origins, the words for *father*—*dada* (English), *abba* (Hebrew), and *baba* (Mandarin Chinese)—and *mother*—*mama* (English), *ahm* (Arabic), and *manah* (Greek)—start with the earliest sounds babies make.

How Adults Foster Language Development - Before we continue our description of the stages of language development, let's take a focused look at the role that adults play in fostering young children's language development. In many cultures, adults begin to shape infants' developing language ability by talking to them, even when it is clear that the babies do not understand. Adults act as if they do understand and carry on conversations, taking turns with whatever the baby responds.

Child-Directed Speech - The special way that we talk to infants and young children was once referred to as *motherese*. However, since we have found that in most cultures, *all* adults, and children too, change the way they speak to infants and young children, this type of speech is now known as **child-directed speech** (Fernald & Morikawa, 1993). Think about how you talk to babies or how you see others do so. You are unlikely to approach a baby and say in a low, monotone voice, "Hello, baby, how are you today? I hope you are having a fine day."

Toddlers' Development of Words and Sentences - Babbling sometimes leads directly to babies' first words. The sounds they play with while babbling may be the sounds they use for the first words they say (Menn & Stoel-Gammon, 2005). Through their interactions with caregivers, infants begin to associate words with familiar objects and people. When infants as young as 6 months were shown side-by-side videos of their mother and their father but heard either the word *mommy* or the word *daddy*, they spent more time looking at the parent who was being named (Tincoff & Jusczyk, 1999).

However, this behavior did *not* transfer to other men and women, so it appears that for the infant the word *mommy* refers to a specific woman, not all women. Remember that comprehension of language precedes the production of language. While infants begin to **understand** words at about 9 months, they do not begin to *say* words, on average, until about 13 months (Tamis-LeMonda et al., 2006). First words may be "made up" by the baby and may not correspond to an adult word. For example, one baby referred to any motorized vehicle as a *gogo*, and *baba* meant water. When the family took him through a

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car wash, he created a new word combination out of these two made-up words to describe his experience. He called it a *baba-gogo*!

Growth of Vocabulary - At 1 year, babies typically have only a few words, but by 2 years of age they generally have between 200 and 500 words (Fernald, Pinto, Swingley, Weinberg, & McRoberts, 2001). Although they initially learn new words slowly, over this second year of life they begin to learn them more quickly (Ganger & Brent, 2004). For some babies, the learning of new words explodes in what has been called a **vocabulary burst**, but for others the learning is more gradual. This is one of those aspects of development where there is quite a wide range that falls within what would be considered normal. Later in this chapter, we will describe some patterns of language development that fall outside of this normal range and can indicate serious problems, but language delays are not uncommon or necessarily a sign of a disorder.

How do toddlers manage to master their native language so quickly? First, it is during the second year that children begin to understand that words are symbols that stand for objects in the world (Woodward, Markman, & Fitzsimmons, 1994). This provides a strong incentive for children to acquire and use language. Second, researchers have described several assumptions and principles that children use, which seem to facilitate this process. These assumptions are called **constraints** because they limit or constrain the alternatives that the child considers when learning a new word, and this makes the process of acquiring vocabulary easier (Woodward et al., 1994).

One of these constraints is the **whole object bias**. When a child sees a giraffe for the first time and someone points to the animal and says “giraffe,” the child assumes the word describes the entire animal—not its strange, long neck; not its skinny legs; and not its brown spots. Children make this assumption even when the new object obviously has two parts to it, and even if one of the parts is more prominent than the other (Hollich, Golinkoff, & Hirsh-Pasek, 2007). Another constraint is the **mutual exclusivity constraint**. Children assume that there is one (and only one) name for an object. If they hear a novel word, they assume the new word describes an object that they do not already know the name for because the object wouldn’t have two different names (Hansen & Markman, 2009).

The **taxonomic constraint** leads children to assume that two objects that have features in common can have a name in common, but that each object also can have its own individual name (Markman, 1990). For example, both dogs and cats have four legs and a tail and are covered with fur so they are both *animals*, but they each have some unique

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characteristics that distinguish between them so they also can have their own individual name. As children apply these principles to their acquisition of new words, they can quickly learn new words, often based on a single exposure, in a process called **fast mapping**. The constraints allow the child to form an initial hypothesis, which can be tested in future situations that provide a basis for rapid acquisition of words (Pan, 2005). The first time a child sees a bus but says “truck,” someone will probably point out how a bus and a truck are different. As the child continues to see buses, the use of that particular word will be quickly refined.

English-speaking children typically add nouns to their vocabulary before they add verbs. Nouns are thought to be easier to learn because they refer to objects in the child’s world and the child has realized that things should have names (Woodward et al., 1994). However, children learning other languages do not necessarily follow this pattern. In Asian languages such as Korean, nouns can be omitted. In English, nouns often appear at the end of a sentence (for example, “Get the *book*” or “Throw the *ball*”). In Korean and Japanese, verbs often appear at the end of sentences (Fernald & Morikawa, 1993). The end position in a sentence is considered more prominent and therefore easier to learn. This is one explanation for why American infants have larger noun vocabularies than infants from Asian countries at a comparable age, and why Asian infants have larger verb vocabularies.

However, grammatical differences between English and Japanese are not the only factor at work. Fernald and Morikawa (1993) observed several differences in mother-infant interactions that reflect cultural values. While American mothers tended to focus on teaching and naming objects in their speech with their infants, Japanese mothers were more interested in creating a sense of harmony in their interactions. They encouraged empathy by encouraging their infants to express positive feelings and mutual dependence by relying on baby talk more extensively and for longer duration than American mothers. Of course both groups of infants learn to use both nouns and verbs, but they learn them in a different way.

Just as infants can use fast mapping to learn new words, they can use specific types of fast mapping called **syntactic bootstrapping** to use syntax to learn the meaning of new words (Gleitman, 1990) and **semantic bootstrapping** to use conceptual categories (action words or object names) to create grammatical categories (verbs or nouns) (Pinker, 1984). To pull yourself up by your bootstraps is an expression that means to solve a problem using your own resources. In this case, children use knowledge that they have in one domain of language to help them learn another domain (Karmiloff & Karmiloff-

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Smith, 2001). For example, children might figure out syntax through an understanding of the meanings of words (semantics), or they might figure out word meanings through the placement of the words in a sentence (syntax). Children use their knowledge of the various aspects of their native language as clues (Johnson & de Villiers, 2009).