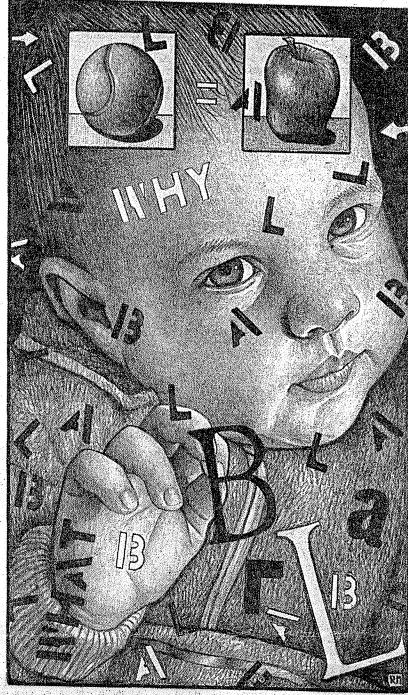
Science/Medicine

Cornerstones of Conversation

Researchers Study the Formation of Speech



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By MARGIE PATLAK

child enters the world with only one tool of communication—his cry—but by the time he enters kindergarten, he knows more than 8,000 words as well as how to put those words to work in understandable sentences. Learning language, a commonplace miracle, is within the grasp of any toddler, yet researchers are just beginning to pinpoint how children are able to do it so quickly and adeptly. Investigators are also uncovering how parents can boost their children's burgeoning language

skills.

Although a baby's picking up of words and eventually combining them into sentences seems haphazard, studies show that there is a pattern to language development that every child follows. Whether they're learning English, Hebrew or Swahili, for example, toddlers learn a language in the same order—they learn the word for "in" and "on" before "under," and in the two-word stage they ask for more of something or say no to something before they put a person together with a verb, such as "Daddy eat."

"Ing" is tagged on to the end of verbs before "ed," and "why" questions may not surface for as long as a year after a toddler asks his first "what" question. Even mistakes in grammar, such as saying "bringed" rather than "brought," are predictable and occur at a specific point in the child's language development. Remarkably, children learning sign language make the same kinds of "grammatical" mistakes as children learning English.

Some linguists have argued that these findings indicate that language development is innate and will evolve relatively unaided in toddlers, just like crawling or walking. But most developmental psy-

chologists say that the universal order to language learning is due to the dependence of language on more general problem-solving skills and knowledge of the world, which develops in each child over a specified time period. Although a baby may be born with certain innate qualities that aid language development, such as the ability to distinguish between the types of sounds the human mouth utters, a child won't learn to speak unless he is guided by other speaking people

by other speaking people.

Videotapes taken by Scottish researchers reveal that 2-month-old babies already carry on rudimentary "conversations" with their mothers. Typically a mother will say something to the baby and the infant will coo or move his arms. Or the mother will smile and the baby will smile back. What is striking about these interactions is the turn-taking that takes place; mother and baby will almost never talk-coosmile at the same time, but rather will take turns responding to one another. At 2 months of age, these infants are already able to wait their turn and pay attention to another person—critical conversation skills. As the months go by, the babies will come to substitute words and phrases for coos and gestures.

"The baby learns that when he imitates this ridiculous thing we do of moving our mouths and making noise," said Harvard University's developmental psychologist Catherine Snow, "he gets exactly what he wants—amuse ment and social interaction. It's the first proof of the power of words."

Snow and other Harvard researchers wading through extensive videotapes of babies interacting with their families have also discovered a distinctive "motherese" that parents and even siblings as young as 4 years old use

when speaking to babies. This motherese is typified by simple, concrete and repetitive phrases with exaggerated and high-pitched intonation.

The high pitch of motherese clues the baby in to knowing that he is being spoken to and signals him to start linking what's being said to the actions or objects around him. The simple and concrete phrases, in addition, make it easier for him to make those links. Mothers also tend to talk about topics in which the child is interested. "A kid isn't going to learn words from listening to Dukakis give a speech on women's abortion rights," Snow said, "because he's not interested in the subject."

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There are other subtle clues in speech a child uses to make sense out of language. In one study, one group of 17-month-old girls were told, "This is zav" when being shown a new doll. Another group was told, "This is a zav" while being shown the same doll. Both groups were then shown similar dolls. The first group called only the original doll zav; the lack of an "a" before the word zav signified to these girls that zav was a pronoun. The second group, however, called all similar dolls zav, treating the word like a common noun. The toddlers used the presence or absence of an "a" in the sentence as a clue to the meaning of "zav."

Once toddlers master some words and phrases, their parents often fine tune their speech when talking to the child to a slightly higher level, and demand words from their children and not mere babbles. Several studies show that at this point in the child's language development, there are tricks parents often use that spur their children's language skills.

One of these tricks is to affirm what the child says and expand it. If the child says "Book chair," for example, his mother says, "Yes, the book is on the chair." This allows the child to pick up small bits of new words—"is on the" in this case. No response or a response that quickly changes the subject hampers language development.

It is also helpful to recast the information supplied by the child into a question such as, "Who put the book on the chair?" Recasting not only gets children to talk more about a topic in which they are interested, but it also shows them how to use the same words—book and chair—in a new structure such as a questioning format. "The child doesn't have to waste a lot of mental energy figuring out what is being talked about," Snow said, "and can just focus on learning the structure of the utterance."

Book-reading can also help expand a toddler's vocabulary. A recent study by Grover Whitehurst and his colleagues at the State University of New York at Stony Brook reveals, however, that it is not the amount of time spent reading books to a child that is critical but how the child is read to that makes a difference.

The researchers taught one group of parents of 2- to 3-year-olds to ask open-ended questions when reading to their children, such as "What is Eeyore doing?" instead of "Is Eeyore eating?" They were also told to praise their children's correct answers and expand on them, asking additional, more difficult questions.

A month later, the children in this experimental group were 8.5 months ahead of a control group of youngsters on a test of verbal expression and six months ahead on a vocabulary test. (Children in the control group had the same language skills as those in the experimental group at the beginning of the study and they were also read to as frequently during the study.)

But this technique will not work for all children. "Some kids just like being read to," Snow said, "and it's crazy to try to engage them in a conversation while reading them a book."

She added that peek-a-boo games, expansions and recastings are just some of the techniques helpful to a child's language development, but not the only ones. "There is enormous variation in the ways babies are successfully turned into talking beings," she said.

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