The Name Game

Young kids grasp new words with intriguing dexterity

By BRUCE BOWER

Two-year-old children are name-callers extraordinaire.

Consider a youngster of this age who sees a tractor for the first time. His mother says, "This is a tractor" and points to a big, yellow, smoke-belching vehicle towing farm machinery. Mother then notes with proud astonishment that the boy, who not so long ago specialized in babbling and slobbering, blurts out the correct name for every subsequent tractor that crosses his path. Neither a small, red, smokeless tractor nor a plastic toy tractor fools him.

Get used to it, Mom. By the end of their second year, toddlers learn as many as nine new words per day.

Many laboratory experiments have explored this linguistic precocity. For instance, 2-year-olds quickly make generalizations about new words based on the shape of the objects they refer to. Told that a U-shaped, spotted piece of wood is a "dax," these children dub a U-shaped piece of red wire mesh a dax, but not a blue wooden triangle or a spotted beanbag.

Yet it remains unclear why toddlers exhibit what some researchers call a "naming explosion" that vaults them headlong into mastery of their native language. One influential theoretical perspective holds that kids on the cusp of preschool already possess powerful insights into the workings of language. Such knowledge may include the assumption that nouns refer to whole objects, such as a doll, that belong to classes of items, such as toys.

But two alternative theories now vie for consideration. One approach posits that 2-year-olds possess a spongelike understanding of adults' social intentions with which they soak up vocabulary. In this view, youngsters realize that adults who talk to them use novel words or phrases to focus their attention on specific facets of the immediate situation. Thus, after watching a naming demonstration, toddlers note that they, too, can direct others' attention by using the new piece of language.

Put bluntly, youngsters expand their influence over other people through word learning.

A contrasting theory proposes that breakneck advances in vocabulary occur as a child's attention and memory capacities respond to word-learning cues in everyday situations. Children need no prior knowledge of language, social intentions, or anything else, according to this approach.

"Young children learn words incredibly quickly," says Nameera Akhtar, a psychologist at the University of California, Santa Cruz. "This is a hot topic right now among researchers who want to understand early cognitive development."

Akhtar takes the position that word learning accelerates at around age 2 as children begin to discern the social goals of word-wielding adults.

A pair of experiments—conducted by Akhtar and two colleagues at Emory University in Atlanta, Malinda Carpenter and Michael Tomasello—explores the social cues that 2-year-olds use to apply unique words voiced by adults to particular objects for which the child has no name.

The first study placed 16 children in an experimental situation and 16 in a control group. Each 2-year-old, his or her parent, and two experimenters first played with three toys that the child had never seen. None of the adults named the toys during this play period. The same three toys, now familiar to the children, were then placed in a transparent box with a fourth, novel toy.

For children in the experimental situation, a researcher excitedly grabbed the box and, without staring at any particular toy, said, "Look, I see a modi! A modi! I see a modi in there!" For those in the control group, the experimenter said "Look! Look at that in there!"

At that point, the child and adults played with all four toys for several minutes. An experimenter then placed the toys on a table and asked the child first to pick up the modi and then, when shown the fourth toy separately, to name it.

Ten youngsters in the experimental group named or pointed out the fourth toy as a modi, compared to two controls. The performance of kids in the former group is impressive, given their single exposure to the fourth toy in the presence of a modi-mentioning adult, the researchers contend.

The second study followed much the same procedure, but after the initial play session, the parent and one experimenter left the room. The child and the remaining experimenter then played with a fourth, novel toy. After the four toys were placed in a clear case, the two absent adults again entered the room. In the experimental condition, they both exclaimed, "Look, it's a gazzer! I see a gazzer in there!" They expressed variations of the generic "Look at that!" in the control situation.

Far more children in the experimental group identified the fourth toy as a gazzer, even though it represented a novel object only for the returning adults.

Children in these studies had an affinity for modis and gazzers because they

were sensitive to what they and the adults had just experienced, and they assumed that adults generally use language to comment on new objects, the researchers conclude in the June 1996 CHILD DEVELOPMENT. In the gazzer investigation, moreover, 2-year-olds apparently realized that adults can use language for objects that are novel to the speaker, not the child.

This fairly sophisticated social maneuvering falls short of the more nuanced readings of others' thoughts and feelings that emerge later in childhood (SN: 7/17/93, p. 40), Akhtar maintains.

Related studies focus on additional social cues that help toddlers associate spoken words with objects or actions, Akhtar says. These include tracking the direction of a person's gaze as he or she uses a new word and noting whether a speaker's intended behavior gets fulfilled or thwarted.

Thus, 2-year-olds who have seen an experimenter catapult a Big Bird doll off a curved platform by hitting the side of the platform often assume that the exclamation, "Let's meek Big Bird!" refers to that action. A comparable proportion of 2-year-olds who have seen someone punch the platform without anything on it proceed to launch Big Bird when an experimenter asks them for the first time to "meek" the toy doll.

By age 2, eavesdropping on others' conversations may also spur word learning, Akhtar asserts. In a study presented this month at the International Conference on Infant Studies in Atlanta, Akhtar reported that both 2- and 2-1/2-year-old children learn nonsense words for unfamiliar objects after overhearing two experimenters briefly refer to the items by name.

In addition, the older group readily learned novel action verbs that they overheard experimenters use to label demonstrated play activities. Younger kids had problems with this task, perhaps because the observed behaviors distracted them from what the experimenters were saying.

Eavesdropping may prove particularly advantageous to language learning in non-Western societies, where adults often see no reason to interrupt their conversations in order to name objects for curious toddlers, Akhtar says. "In many cultures, if the child is to learn a new word, she must do so in the natural flow of everyday social action and interaction, often with siblings and other children."

Early word learning may rely more on basic features of attention and memory than on budding social knowledge, according to psychologist Linda B. Smith of Indiana University in Bloomington.

Memory thrives on comparing the similarity of what one notices about the context at the time of learning to the context at the moment of remembering, Smith argues. Context includes conspicuous features of the physical environment, internal feelings, and the presence or absence of others.

In addition, she notes, attention is usually grabbed by novel events, which fail to match or be predicted by events in memory. Thus, young children prefer to apply a novel word to a novel object than to a familiar object.

By Smith's reasoning, children in Akhtar's "gazzer" study appropriately label the fourth toy because they initially view it in a distinctive context. The context for the first three toys includes three adults and the child; the novel toy is introduced with only one adult present. The original context of three adults returns when the gazzer is referred to, drawing attention to the fourth toy by virtue of its having just appeared in a unique context. As a result, kids tend to label the fourth toy a gazzer.

Smith explored this theory in a study, conducted with Indiana colleague Larissa K. Samuelson, inspired by Akhtar's gazzer experiment. A child, his or her parent, and one experimenter first played with three novel toys one at a time on the floor of a playroom. The same group then played with a fourth novel toy at a table on the other side of the room. The experimenter returned to the original location, put all four toys in a clear box, looked at the child, and said, "There's a gazzer in here! A gazzer!"

The same large proportion of 2-year-olds labeled the fourth toy a gazzer as in the Akhtar investigation. Successful word learning hinged on an object's contextual novelty at the time an adult spoke the new word, not a child's appreciation of the adult's intentions in remarking on a gazzer, Smith and Samuelson contend in the February CHILD DEVELOPMENT.

The tendency to regard the fourth toy as a gazzer might stem from a child's having seen that plaything last, Smith notes. However, prior studies of 2-year-olds' memory for adults' activities find little evidence of this phenomenon.

The existence of such a "recency effect" would still support the notion that word naming arises from general cognitive mechanisms, Smith asserts.

In daily life, she theorizes, a bevy of cues collectively pulls toddlers' attention toward the appropriate objects or actions for new words. These include the unique sound of a novel word, the acoustic emphasis and falling pitch adults use in the course of pronouncing a new word, the eye gaze and gestures a speaker employs, and the repeated accompaniment of a word with the object to which it refers.

Children's word learning represents one example of the human propensity to create flexible, adaptive categories out of a mix of past experience, notable features of recent experience, and details of the moment, in Smith's view.

"Each new word learned by a child changes what that child knows about learning words," she holds. "It strengthens or weakens the attention the child pays to certain language-learning contexts and object properties. In the end, word learning looks special and predestined, but it's made out of more ordinary cognitive stuff."

A separate issue, emphasized by researchers who view children as repositories of preexisting linguistic knowledge, concerns grammar. Regardless of the relative impact of social insights and basic facets of attention and memory on early word learning, these scientists contend that an innate capacity for grasping rules of language assembly underlies toddlers' naming feats (SN: 5/3/97, p. 276).

Toddlers' naming explosion emerges from a coalition of influences rather than a distinctive source, asserts psychologist Roberta M. Golinkoff of the University of Delaware in Newark. "There is no smoking gun that's responsible for word learning," she remarks. "It's a special, complicated task that requires a variety of cues. Kids may start out with biases for making certain types of word interpretations."

For instance, Golinkoff says, although objects that are in motion or being used by someone else tend to grab toddlers' attention, the youngsters usually begin by learning nouns rather than verbs.

Further research needs to examine more closely children from 1 to 2 years old as they make the transition from amateur to expert word collectors, she holds.

During that time, kids cross crucial cognitive bridges to language understanding. Unlike 18-month-old children, 1-year-olds appear capable of learning names only for objects that have colorful or otherwise striking features, according to investigations directed by Golinkoff. The younger kids fail to grasp labels for drab or humdrum stuff, even if a novel word is spoken by an adult who blatantly stares at the item.

Research conducted by psychologist Lois Bloom of Columbia University indicates that, from around 12 to 18 months of age, children utter new words while showing no signs of emotion, a tip-off to the great mental effort they expend on this task. Shortly after 18 months, Bloom finds, emotional expressions regularly accompany new verbal pronouncements.

For scientists who hope to integrate such phenomena into a compelling explanation of early word acquisition, the theoretical dust has not yet settled.

"As we look more closely at the emergence of word-learning skills, it becomes clear that seemingly incompatible approaches, such as those of Akhtar and Smith, might all be necessary to explain these achievements," Golinkoff comments. □