Science & Technology

How the Gesture Summons the Word

By
Mara McGinnis
|
Spring 2002

Robert Krauss has figured out one way we can get words that escape us off the tip of our tongues—by using our hands.

Krauss, a social psychologist and director of the Human Communication Laboratory at Columbia, has been studying the connection between hand gestures and speech for almost twenty years. Nearly all of his research points to the same conclusion: "We make movements with our hands to help us think," he says. "Gesturing facilitates the production of fluent speech by helping speakers to retrieve elusive words from memory."

Generally, Krauss says, people use at least three distinct types of gestures: symbolic, motor, and lexical. Symbolic gestures, such as the thumbs-up sign or the "OK" sign, convey fixed meaning and communicate a message without a spoken word. Motor gestures, which are repetitive and simple in form, occur spontaneously as people speak—often for emphasis, and convey little or no meaning in the message. Krauss suspects that motor gestures are related to the prosody of speech in that they often occur in conjunction with accented syllables. A famous example of this gesture type is former President Clinton's finger-shaking denial of the Monica Lewinsky affair: "I did not have sexual relations with that woman."

On another level, speech is a string of ideas, which is where the lexical or iconic gestures—the ones Krauss studies—come into play. Lexical gestures are nonrepetitive, complex, and vary in length and form. He theorizes that lexical gestures reflect aspects or dimensions of word concepts, and that certain physical movements activate a specific mental representation that helps lead to the right word. For example, ask someone to name a small rhythm instrument used especially by dancers, consisting of two small shells that are clicked together in one hand, and

he or she is likely to play imaginary castanets.

Each word in a person's mental lexicon probably has its own attached set of terms or concepts, according to Krauss. For example, the word *dog* may come with several other words such as *bark*, *fur*, and *pet*. When a person plans a sentence, Krauss theorizes that certain gestures help conjure up a specific bundle of concepts, which lead the speaker to the correct word. After all, he says, the average person stores about 200,000 words in his or her memory bank—a lot to look through. His theory is that lexical gestures facilitate the search.

Krauss has completed several studies that support his case. In one, actors were videotaped while answering questions about their personal experiences, feelings, and beliefs. Scripts of their answers were then given to other actors, who were asked to portray the original speakers using their responses. Krauss found that speakers answering spontaneously gestured far more often than those who had memorized answers in advance.

Another compelling study found that people gesture a lot more when trying to conjure up a picture from memory than they do when they can actually see it in front of them, says Krauss. "The memory of a word-concept is embodied in the actions associated with it," he says.

One study used a machine to record the electronic activity in the forearm muscles of subjects trying to think of words in response to definitions provided by researchers. Muscle activity increased significantly when the words in question represented tangible entities, such as *bleachers* or *abacus*, or when they conveyed a strong spatial component such as under or *adjacent*. Less electrical activity was observed when subjects searched their brains for abstract words such as *agnostic*, *evil*, or *freedom*.

Research has shown that these hand gestures serve a specific function; now the real question, Krauss says, is just how that happens. He speculates that gestures come into play at three points in the process of producing speech: At the conceptualizing stage, gesturing helps the speaker formulate the concept; at the grammatical encoding—or formulation—stage, information in the gesture helps the speaker access a word form in the mental lexicon; and at the articulation stage, gesturing aids in the retrieval of the word form. Krauss's studies suggest that the primary effect of gesturing occurs during the formulation stage, since gestures likely act as

mnemonic devices, or representations of things in memory.

For the last 25 years, researchers have thought that human memory was a lot like the memory in a computer, which translates words, pictures, and everything else into a common code. In fact, human memory is much more complicated, says Krauss. “There is a great deal of evidence that human memory is distributed among many different modalities,” he adds. “Just as I believe that the facial expression you make when you think of something disgusting is part of the memory of the disgusting thing, I also believe that the hand movement is part of the representation of a concrete object. If you prevent people from making facial expressions while recalling an experience, perhaps they wouldn’t reexperience it in the same way.” And if you prevent people from gesturing, Krauss has found, they find it harder to talk.

The evidence that gestures help speakers retrieve words from memory challenges conventional theory; until recently, most communication scholars believed that the primary purpose of gestures was to convey meaning. “Not only did this finding surprise me,” says Krauss, “I didn’t believe it. I really believed like everyone else that gestures were intended to communicate.”

But because memory structures are idiosyncratic and specific to the person, so are the gestures. “This is one of the reasons why lexical gestures don’t communicate very well,” says Krauss. “They’re a reflection of the individual’s particular memory structure.”

Though style varies from person to person, the use of lexical gestures is universal, Krauss believes. “In some cultures the gestures seem broader than in others. In some cultures they seem to occupy a smaller space or to stay closer to the body. But in all cultures people speak, and in every language there are stylistic differences.”

Krauss says his research allows for a more comprehensive understanding of speech production, which in turn may lead to more diverse ways of treating people with speech difficulties, such as stroke victims suffering from anomia, a disorder that compromises the ability to name words because of damage to a certain part of the brain.

Read more from ***Mara McGinnis***



Guide to school abbreviations

All categories >
*Read more from **Mara McGinnis***