

## GESTURE PRODUCTION IN BROCA'S AND WERNICKE'S APHASIAS

The study of the production of gesture by persons with aphasia provides an important window into the affects that aphasia has on the semantic system. The purpose of this qualitative study was to identify the gestures produced by one person with Broca's (nonfluent) aphasia and one person with Wernicke's (fluent) aphasia during interpersonal communication. This research addresses whether there are differences in the quality and quantity of gestures produced by this sample.

### **Gesture Explained**

Gestures can be categorized into two types: those co-occurring with speech, known as "co-speech" or "co-verbal gestures," and those that occur with or without speech, known as "emblems."

There are instances when a gesture appears to "freeze" when a speaker is experiencing a period of word retrieval delay. Known as "placeholders," these gestures will freeze mid-air until the co-expressive speech returns.

### **Types of Gestures**

McNeill (1992) identified four types of co-speech gestures: iconic, metaphoric, deictic, and beat.

*Iconic gestures* use the form of the gesture to describe a feature or an event. Icons can depict the manner in which an action is carried out. A speaker may pantomime.

*Metaphoric gestures* illustrate abstract concepts with no physical form. Metaphoric gestures illustrate the meaning of what is being said.

*Deictic gestures* are pointing movements that are generally performed with the index finger, although any extensible object or body part can be used, including the head, chin, or elbow.

*Beat gestures*, also called baton gestures, are small baton-like movements that accompany prosodic emphasis, most often accompanying speech repairs. There is no imagistic value, but there is a prosodic value to signaling the self-correction.

### **Research on Gesture Production by Persons with Aphasia**

One might assume that persons with Broca's aphasia would gesture less frequently than persons with Wernicke's aphasia, due to their having nonfluent communication. However, LeMay, David, and Thomas (1988) found that persons with Broca's aphasia used more beat and iconic gestures.

### **The Present Study**

(1) Is there a difference in the quantity of gestures produced by persons with Broca's vs. Wernicke's aphasias?

(2) Are there differences in the quality of gestures produced by persons with Broca's vs. Wernicke's aphasias?

### **Methods**

Participants were two females with aphasia who attended a university speech and hearing clinic. L.M. was a 56-year-old African American woman, three years post onset of moderate Broca's aphasia. M.S. is a 70-year-old Caucasian woman, six years post onset of mild-to-moderate Wernicke's aphasia. Both women had communication skills that were functional for daily living, given family supports for more complex tasks.

Each participant engaged individually in a 30-minute structured conversation session with the first author that included the following questions: *"What is your favorite childhood memory?" "Tell me about your first job." "How did you meet your husband?" "If you could meet anyone living or dead, who would it be?"*

The session was video recorded using the cameras installed in the treatment rooms and stored on videodisk. The video file was then uploaded to a video annotation software program, EUDICO Linguistic Annotator (ELAN, Lausberg & Sloetjes, 2009; Max Planck Institute for Psycholinguistics, n.d.).

The first 15 minutes of conversation for each participant were analyzed. The conversational samples were coded for the number and types of gestures produced.

## **Results**

### **Comparisons between Participants: Quantity of Gestures**

The person with Broca's aphasia produced 316 total gestures, as opposed to the person with Wernicke's aphasia, who produced 235 gestures. Gestures per minute averaged out to be 21 per minute of conversation for the person with Broca's aphasia and 15.6 gestures per minute for the person with Wernicke's aphasia. The person with Broca's aphasia produced more gestures overall and more gestures per minute. The total number of gestures overall is greater by 81 gestures. This would be about the number of gestures produced in four minutes of conversation for the person with Broca's aphasia or in about five minutes of conversation for the person with Wernicke's aphasia.

### **Comparisons between Participants: Quality of Gestures**

The person with Wernicke's aphasia produced 106 emblems, while the person with Broca's aphasia produced 93 emblems. Emblems accounted for 45% of all gestures for the person with Wernicke's aphasia and 29% of all gestures for the participant with Broca's aphasia.

The woman with Wernicke's aphasia produced more emblematic gestures than any other type of gesture. Her second most frequently occurring type was metaphoric, at 49 instances. The woman with Broca's aphasia produced beat gestures with the greatest frequency, at 102 instances, with emblematic gesture being the second, at 93 occurrences. Iconic gesture was the least frequent for both participants. A person cannot pantomime a word that she has not retrieved for use.

Metaphoric gesture, which has moderate semantic content, occurred more frequently in the gesture production of the person with Broca's aphasia, at 79 times, in comparison with the person with Wernicke's aphasia, at 49 times. Deictic gesture, which has even less semantic content, was produced slightly more by the woman with Broca's aphasia, at 33 instances, than by the person with Wernicke's aphasia, at 27 instances. Beat gesture, which has no semantic content, was used more than twice as often by the person with Broca's aphasia, at 102 times, than by the person with Wernicke's aphasia, at 45 times. The person with Broca's aphasia produced 41 placeholders, but the person with Wernicke's aphasia produced 10.

## **Discussion**

It is important to note that when iconic gesture was observed, lexical retrieval always followed. For example, the person with Broca's aphasia pantomimed a lower floor of a building before saying "lobby." Her metaphoric gesture sometimes would freeze into a placeholder.

Indeed, she was observed to be literally holding her hand out as if waiting for the word to fall into her grasp.

For the woman with Wernicke's aphasia, metaphoric gesture was used to indicate the end of a thought, as if she were pushing the thought away. The person with Broca's aphasia produced more than twice as many beat gestures as the person with Wernicke's aphasia. This may be due to her aggravation during speech difficulty.