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University of Chicago research shows that language learning is resilient

Children apparently have an inherent ability to form words and sentences independent of the capacity they have to imitate the language of their parents, research at the University of Chicago shows.

By studying two sets of deaf children in the United States and Taiwan who communicate with gestures rather than conventional sign languages, Susan Goldin-Meadow, Professor of Psychology at the University of Chicago, discovered that youngsters can develop complex sentence structures on their own without learning them first from their parents.

The discoveries support theories that emphasize the robustness of language in humans. They provide evidence for the inevitability of structured communication in children.

The findings are reported in Thursday's edition of the journal *Nature* in the article "Spontaneous Sign Systems Created by Deaf Children in Two Cultures." Carolyn Mylander, a Project Researcher in Psychology at the University of Chicago, is co-author of the article.

The researchers found that deaf children in Taiwan and the United States developed gesture systems similar to each other's--systems that do not reflect the structures of either Mandarin Chinese or English.

"Given the salient differences between Chinese and American cultures, the structural similarities in the children's gesture systems are striking," Goldin-Meadow said. "These structural properties -- consistent marking of semantic elements by deletion and by ordering, and linking of propositions within a single sentence -- are developmentally robust in humans."

Goldin-Meadow has been studying gesture in deaf children for more than 20 years. She bases her research on videotapes of children gesturing with their mothers. She studies the gestures of children who do not learn conventional sign language, because their language patterns are the least influenced by other language systems. The gestures used by children who develop their own communications through gestures are therefore capable of giving researchers clues about how the mind develops independent of behavioral influences in the child's environment.

The number of children who do not receive training in sign language is relatively small, however. For their paper, Goldin-Meadow and Mylander studied the gestures of four American

children and four Chinese children as they communicated with their mothers. The data contain more than 10,000 individual gestures between the mothers and children.

Goldin-Meadow has found in earlier research that deaf children develop language first by pointing to objects as they identify nouns. They continue their language formation by combining gestures for nouns with gestures for verbs, but the grammar they use is different from that used in English or Mandarin although some aspects are found in certain conventional languages.

The deaf youngsters put the object of the verb before the verb, Goldin-Meadow said. "If for example, a deaf child produced the gesture sentence 'boy hit,' it is likely that the boy was the hittee rather than the hitter in the scene under description."

The children who use gesture language develop complex sentence structures as they grow. Other research by Goldin-Meadow has shown that this language development in deaf children using their own gestures is similar to that of hearing children using the words of their spoken language.

One difference in the two cultures is that mothers of the Chinese children learned to communicate in their children's language, while the American mothers did not.

"Indeed, American children's gestures had more in common with Chinese children's gesture than with their own mothers'," they write. "American children thus appear to be responsible for the structural aspects of their systems.

"In contrast, Chinese mothers' gestures resemble their children's, at least in part. Chinese children may therefore have learned segments of their systems from their mothers, or, more likely given that Chinese and American children's gestures follow the same patterns, the mothers may have learned them from their children."

The researchers are not sure why the differences between the mothers exist. Goldin-Meadow is a faculty associate of the newly created Robert R. McCormick Tribune Initiative on Early Child Development and Policy.

<http://www-news.uchicago.edu/releases/98/980114.goldin.meadow.shtml>
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