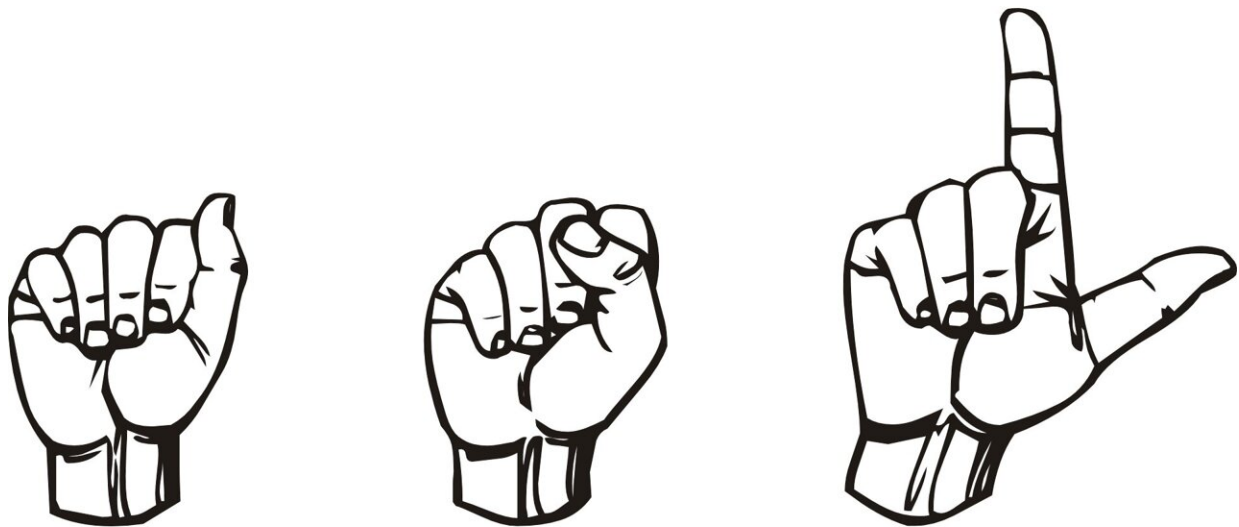


# Infants link language and cognition, whether the language is spoken or a sign language

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Sign language, like spoken language, supports infant cognitive development in hearing infants, according to a groundbreaking new study by Northwestern University researchers.

Cognitive developmental scientists from Northwestern University discovered that observing American Sign Language (ASL) promotes cognition in hearing infants who had never been exposed to a signed

[language](#).

For 3- and 4-month-old infants, [sign language](#) offers infants a cognitive advantage in forming object categories. This advantage goes above and beyond the effects of pointing to and gazing at objects. This finding expands our understanding of the powerful and inherent link between language and cognition-language in humans.

The lead researcher is Sandra Waxman, the Louis W. Menk Chair in psychology at Weinberg College of Arts and Sciences, director of the Infant and Child Development Center at Northwestern and a faculty fellow in the University's Institute for Policy Research.

Co-authors of the study include Miriam A. Novak, research scientist in Northwestern's department of medical social sciences, as well as Diane Brentari and Susan Goldin-Meadow, professors of linguistics and psychology, respectively, at the University of Chicago.

"Sign language, like spoken language, promotes object categorization in young hearing infants" will publish in the October 2021 issue of the journal *Cognition*.

The new study builds on prior research from Waxman's lab showing that very young infants initially link a broad range of acoustic signals to cognition. These signals include spoken human languages as well as vocalizations of non-human primates.

"We had already established a precocious link between acoustic signals to infant cognition. But we had not yet established whether this initial link is sufficiently broad to include sign language, even in infants never exposed to a sign language," Waxman said. "This study is important because it shows the power of language, writ large," said Waxman.

Because object categorization is fundamental to cognition, the researchers built upon an object categorization task that they had used in previous investigations. This was the first time, however, that the researchers presented language in the visual modality.

The experiment was conducted with 113 hearing infants, ranging from 4 to 6 months. None had previously been exposed to ASL or any other sign language.

During a familiarization phase, infants viewed eight distinct images from a single category, for example, eight fish. For those in the ASL condition, these images were introduced by a woman signing about the objects. For infants in the non-linguistic control condition, the same woman merely pointed to and looked at the objects but did not produce any language.

Next, in the test phase, all infants viewed two static images: a new member of the same category (e.g. a new fish) or a new object from an entirely different category (e.g. a dinosaur).

The researchers found that at 3 and 4 months, infants in the ASL condition, but not the control condition, successfully formed the object category (e.g. fish). This result mirrored the effects observed at this age when infants listen to their native spoken language. But by 6 months, infants had narrowed this link and ASL no longer provided this cognitive advantage.

The study demonstrates that human infants, whether hearing or deaf, are equipped to link language—whether spoken or signed—to core cognitive processes like object categorization.

"What surprised us the most was that it was specifically the linguistic elements of the ASL that did the trick—not merely pointing and

gesturing. Pointing and gesturing are communicative signals for sure, but they are not linguistic signals," said Waxman.

"The message is that even before they can speak, babies learn a lot from language—even if it is not their own native language. Envelope them in your language. They will tune to the signal of their language, whether it is spoken or signed."

**More information:** Miriam A. Novack et al, Sign language, like spoken language, promotes object categorization in young hearing infants, *Cognition* (2021). [DOI: 10.1016/j.cognition.2021.104845](https://doi.org/10.1016/j.cognition.2021.104845)

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