The innate ability to learn language

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Psychology professor Iris Berent is using behavioral and neuroimaging techniques to investigate whether our ability to learn language is innate. Credit: Mary Knox Merrill

All human languages contain two levels of structure, said Iris Berent, a psychology professor in Northeastern's College of Science. One is syntax, or the ordering of words in a sentence. The other is phonology, or the sound structure of individual words.

Berent - whose research focuses on the phonological structure of language - examines the nature of linguistic competence, its origins and its interaction with reading. While previous studies have all centered on adult language acquisition, she is now working with infants to address two core questions.

"First," she said, "do infants have the capacity to encode phonological rules? And, second, are some phonological rules innate?"

To address the first issue, Berent collaborated with neuroscientists Janet Werker, of the University of British Columbia, and Judit Gervain, of the Paris-based Centre National de la Recherche Scientifique.

By utilizing an optical brain imaging technique called near-infrared spectroscopy, or NIRS, the researchers found that newborns have the capacity to learn linguistic rules. This finding - published this month in the *Journal of Cognitive Neuroscience* - suggests that the neural foundations of language acquisition are present at birth.

Armed with this knowledge, Berent has begun conducting behavioral studies on more than two-dozen infants to explore whether linguistic rules are innate or entirely learned.

"We want to see whether infants prefer certain sound patterns to others even if neither occurs in their language," Berent explained. "For instance, we know that human languages prefer sequences such as bnog over bdog. Would six-month-old infants show this preference even if their language (English) does not include either sequence?"

For the study, each child is placed in front of a video screen that displays an image pulsing in coordination with rotating sounds, such as "bnog" and "bdog." Berent hypothesized that infants would look longer at the video screen when they hear sounds to which they are innately biased.

Preliminary results have upheld the hypothesis, but Berent is still accepting new subjects for the study. Her entire research program forms part of a new book called "The Phonological Mind," which will be published by Cambridge University Press this year.

More information: A symposium on the nature, origins and use of language will take place on March 30 at 12:30 p.m. in the Curry Student Center Ballroom.

Provided by Northeastern University