Blue, green or 'nol'? New study reveals that even before infants can talk, language shapes their cognition

July 19 2016

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A new Northwestern University study shows that even in infants too young to speak, the object categories infants form and their predictions

about objects' behavior, are sculpted by the names we use to describe them.

As English speakers, we might encounter a natural scene and describe the blue lake, green grass and light blue sky in front of us. But speakers of Berinmo, an indigenous language of Papua New Guinea, have a single term for the colors we describe as blues and greens. They would describe the lake, grass and sky all as "nol."

"This cross-linguistic difference reveals that the particular categories we impose on our experience of the world are shaped by the language we speak. And this has consequences for thinking and memory," said senior author Sandra Waxman, the Louis W. Menk Chair in Psychology in the Weinberg College of Arts and Sciences at Northwestern and faculty fellow in the University's Institute for Policy Research. "Berinmo speakers are less likely to remember distinctions among shades that English speakers describe as blue versus green."

This compelling cross-cultural evidence leaves little doubt that the categories we form bear the imprint of our language. But how early in life does naming shape the categories we perceive?

To answer this question, the Northwestern researchers created a continuum of colorful cartoon-like creatures. First, in a learning phase, 9-month-old infants had an opportunity to observe several of these creatures, presented in random order: Each appeared at the center of the screen, moved in one direction or another, and then disappeared. By experimental design, creatures from one end of the continuum moved to the left, and those from the other end moved to the right.

What varied was how the creatures were named. Some infants heard the same novel word applied to all objects along the entire continuum; others heard two different names, one for objects from one end of the

continuum and another for objects from the other end. Next, in a test phase, new creatures from the same continuum appeared in the center of the screen.

The researchers were interested in whether infants could anticipate the side to which the new objects would move, and whether this varied as a function of how the creatures had been named in the phase.

The results were striking, according to lead author Mélanie Havy of the University of Geneva.

"Infants who heard two different names discerned two categories and therefore were able to anticipate correctly the likely location to which the test objects would move," she said.

In sharp contrast, infants who heard one name formed a single overarching category and therefore searched for new test objects at both locations.

"These results constitute the first evidence that for infants as young as 9 months of age, naming not only shapes the number of categories they impose along a perceptual continuum but also highlights the joints or boundaries between them," Havy said.

"Naming influences 9-month-olds' identification of discrete categories along a perceptual continuum" will be published in an upcoming issue of the journal *Cognition*.

Provided by Northwestern University