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Language may play key role in learning meanings of numbers

ANI

Washington, Tue, 08 Feb 2011

Washington, Feb 08 (ANI): A new [study](#) has concluded that people who communicate using self-developed gestures, called homesigns, were unable to comprehend the value of numbers greater than three because they had not learned a [language](#) containing symbols used for counting.

The study was based on research on deaf people in Nicaragua who never learned formal sign [language](#).



On the other hand, deaf people who acquire conventional sign language as children can learn the meaning of large numbers. Researchers believe this is because conventional sign language, like spoken languages, imparts a counting routine early in childhood.

The study illustrates the complexity of [learning](#) the symbolic relationships embedded in language, including seemingly simple numerical concepts.

"It's not just the [vocabulary](#) words that matter, but understanding the relationships that underlie the words-the fact that 'eight' is one more than 'seven' and one less than 'nine.' Without having a set of number words to guide them, deaf homesigners in the study failed to understand that numbers build on each other in value," said Susan Goldin-Meadow, the Bearsdley Ruml Distinguished Service [Professor](#) in Psychology at the [University](#).

For the study, scholars gave homesigners a series of tasks to determine how well they could recognize money. They were shown 10-unit and 20-unit bills and asked which had more value. When asked if nine 10-unit coins had more or less value than a 100-unit bill, each of the homesigners was able to determine the money's relative value.

To see if the homesigners could express numerical value outside of the context of money, the scholars showed them animated videos in which numbers were an important part of the plot. They then asked the deaf individuals to retell the video to a friend or relative using homesigns. As the numbers grew, the homesigners became increasingly less able to produce an accurate gesture for the number with their fingers.

They were then shown cards with different numbers of items on them, and asked to give a gesture that represented the number of items. The homesigners were accurate only up to the number 3. In addition, they had difficulty making a second row of checkers match a target row when there were more than three checkers in the target, despite the fact that this task did not require any comprehension or production of number gestures. Their difficulty in understanding large numbers therefore did not stem from an inability to communicate about large numbers, but rather from an inability to think about them, the researchers concluded.

The findings are reported in the paper, "Number Without a Language Model," published in the Proceedings of the National Academy of Sciences. (ANI)

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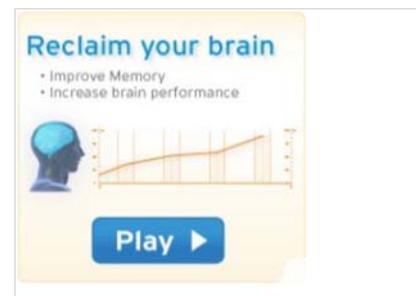
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