Sound trumps meaning in first language learning

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A new study reveals that four-to-seven-year-old children rely on the sounds of new nouns more than on their meaning when assigning them to noun classes, even though the meaning is more predictive of noun class in the adult language. This finding reveals that children's sensitivity to their linguistic environment does not line up with objective measures of informativity, highlighting the active role that children play in selecting the data from which they learn language.

The study, "Statistical Insensitivity in the Acquisition of Tsez Noun Classes," was published in the March, 2014 issue of the scholarly journal *Language*. A pre-print version of the article may be found online.

The article examines children's acquisition of Tsez, a language spoken by approximately 6000 people in Dagestan, in the Russian Caucasus. The authors, Annie Gagliardi of Harvard University and Jeffrey Lidz of the University of Maryland, recorded the speech that two children heard at home, then analyzed this speech to see what kinds of nouns the children heard and what was common among the members of each noun class (grammatical gender). They found that both semantic and phonological characteristics helped to organize the nouns into classes, though the semantic cues were more highly predictive. For example, all animals are in Class Three (e.g., cat, dog, sheep…) and about half of the words starting with 'r' are in Class Four. But, when the researchers had children classify new words, the children relied on the less predictive phonological features than on the more predictive semantic features.

Tsez speakers use a noun's category to determine the form of verbs and adjectives in sentences. For example, the same adjective (e.g., igu = 'good') will have a different form depending on the category of the word it is modifying (bigu k'e'tu = 'good cat' vs. rigu čorpa = 'good soup'). Gagliardi and Lidz taught adult and child Tsez speakers new nouns, without revealing their class, and elicited sentences containing these new nouns. The form of the verb that the speakers used revealed the noun class that the Tsez speakers assigned to the new nouns. The new nouns consisted of three types: nouns that had highly predictive features (e.g. animals), less predictive features (e.g. beginning with 'r'), and a combination of features that made conflicting predictions (e.g. an animal that began with 'r'). The authors found that adult speakers put the nouns in the class predicted by the features, and when the features conflicted, they preferred to put the noun in the class associated with the more highly predictive feature (e.g. the class for animals when the noun was both an animal and began with 'r'). Young children, however, showed a different pattern, preferring to put the nouns in the class associated with the less predictive phonological information.

The children's behavior is surprising relative to previous research on children's sensitivity to their linguistic environment. Much recent work has emphasized how exquisitely sensitive children are to distributional features of the language they are acquiring and the role this sensitivity plays in guiding learning. The current work suggests that children play a more active role in filtering the data that they learn from. As a result, they do not always rely on the most predictive information available when learning their first language. Instead, children disproportionally value the phonological information. This preference could stem from the fact that phonological information is available earlier in development or because it's more reliably identified when a new word is learned. These findings help us understand the interaction between children's abilities to extract information from the environment and their initial expectations about language structure.