
Neuroimaging the Semantics of ideophones in Pastaza Kichwa

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Ideophones are imitative words featuring linguistic sounds, bodily gestures, intonation, and facial expressions to depict sensory perceptions, emotions, and temporal experiences of completeness, instantaneousness, and repetitiveness. Although formal properties of ideophones have been given ample attention, there are fewer studies of their lexical semantics. The research for this paper hypothesized that correlations exist between posited semantic features of ideophones from the Pastaza Kichwa language spoken in eastern Amazonian Ecuador (iso code: qvo), and subjects' neural reactions to auditory clips of ideophones bearing these posited semantic features.

Participants (N=17) were presented with audio clips of 10 ordinary Kichwa words consisting of nouns and verbs. They were then asked to listen to Kichwa ideophones from four different categories based on a sensori-semantic map (Nuckolls 2019). Data was collected on site in the Amazonian region of Ecuador. While participants listened to clips of these ideophones extracted from their sentential contexts, their hemodynamic brain responses were recorded using functional near-infrared spectroscopy (fNIRS). The examples from which the extracts were drawn are found in an open access archive, Quechua Real Words.

Preliminary analyses of the results suggest support for the four sensorisemantic categories of ideophones. There were also similarities across all four categories relative to the baseline. Each ideophone category appears to have prompted distinctive neural activity in somatosensory and motor regions of the brain. Similarly, ideophones generally differed from baseline by prompting greater neural activity in areas of the frontal cortex associated with cognition, thought and visual imagery.

Our results also contribute to research that has not typically involved subjects other than 'western-educated-industrialized' peoples, nor has been conducted as a collaboration between neurolinguists and anthropological linguistic work featuring long-term, intensive studies of ideophones' semantic properties.

References: • Nuckolls, Janis B. (2019). 'The sensori-semantic clustering of ideophonic meaning in Pastaza Quichua,' in Kimi Akita and Prashant Pardeshi (eds.), *Ideophones and Linguistic Theories*. Amsterdam: John Benjamins, 167–98. <https://doi.org/10.1075/ill.16.08nuc>. • Nuckolls, Janis B., et al. (2022). *Quechua Real Words: An Audiovisual Corpus of Expressive Quechua Ideophones* <https://quechuarealwords.byu.edu/>.