

# Sign languages provide insight into universal linguistic short-cuts

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Humans have a natural drive to reduce physical effort in nearly every activity, including using language. Instead of saying "goodbye", we often say "bye", getting the same message across with half the syllables. The ways that effort-reduction affect human language have been the subject of extensive research in the field of linguistics, though the overwhelming focus has been on spoken languages. By studying this effect in sign languages, two linguists from Swarthmore College have discovered a new way in which language is shaped by our innate drive to make physical activity easier.

In their paper published in the June 2016 issue of the scholarly journal *Language*, Nathan Sanders and Donna Jo Napoli report on their discovery of "reactive effort", which is used to keep an incidental body part stable while articulating language. For example, when using a sign language, movement of the arms can produce rotational force (torque) on the torso which would cause it to twist and rock if not counteracted by the reactive effort of using various stabilizing muscles.

In this work, "Reactive effort as a factor that shapes sign language lexicons", Sanders and Napoli analyze dictionary entries of three unrelated sign languages (Italian Sign Language, Sri Lankan Sign Language, and Al-Sayyid Bedouin Sign Language), finding that certain classes of signs that produce torque on the torso are statistically underrepresented in comparison to signs that do not. That is, a sign language's vocabulary naturally avoids those signs which call for extra reactive effort. All three languages show nearly identical patterns in

reactive effort reduction, which hints at a biological universal. Thus, this work opens up new lines of research, not just for sign languages, but for all languages, and perhaps many physical activities.

Additionally, reactive effort would likely have remained undiscovered if linguists studied only spoken languages, because the relevant body parts in speech are too small to produce significant movement elsewhere in the body. Thus, this work also demonstrates the importance of studying sign languages on their own terms, because they can reveal insights into language not easily observed in spoken languages.

**More information:** A pre-print version of the article may be found at: [http://www.linguisticsociety.org/sites/default/files/archived-documents/Sanders\\_Napoli\\_92\\_2.pdf](http://www.linguisticsociety.org/sites/default/files/archived-documents/Sanders_Napoli_92_2.pdf)

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