

A nose by any other name would sound the same, study finds

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Credit: Paul Brennan/public domain

In a study that shatters a cornerstone concept in linguistics, an analysis of nearly two-thirds of the world's languages shows that humans tend to use the same sounds for common objects and ideas, no matter what language they're speaking. Published today in the *Proceedings of the National Academy of Sciences*, the research demonstrates a robust statistical relationship between certain basic concepts—from body parts to familial

relationships and aspects of the natural world—and the sounds humans around the world use to describe them.

"These sound symbolic patterns show up again and again across the world, independent of the geographical dispersal of humans and independent of [language](#) lineage," said Morten H. Christiansen, professor of psychology and director of Cornell's Cognitive Neuroscience Lab. "There does seem to be something about the human condition that leads to these patterns. We don't know what it is, but we know it's there."

For example, in most languages, the word for "nose" is likely to include the sounds "neh" or the "oo" sound, as in "ooze." The word for "tongue" is likely to have "l" (as in "langue" in French). "Leaf" is likely to include the sounds "b," "p" or "l." "Sand" will probably use the sound "s." The words for "red" and "round" are likely to include the "r" sound. "It doesn't mean all words have these sounds, but the relationship is much stronger than we'd expect by chance," Christiansen said.

The associations were particularly strong for words that described body parts. "We didn't quite expect that," he said. The team also found certain words are likely to avoid certain sounds. This was especially true for pronouns. For example, words for "I" are unlikely to include sounds involving u, p, b, t, s, r and l. "You" is unlikely to include sounds involving u, o, p, t, d, q, s, r and l.

Christiansen, a cognitive scientist who studies language, and a team of physicists, linguists and computer scientists from Argentina, Germany, the Netherlands and Switzerland analyzed 40-100 basic vocabulary words in 62 percent of the world's more than 6,000 current languages and 85 percent of its linguistic lineages.

The words included pronouns, body parts and properties (small, full),

verbs that describe motion and nouns that describe natural phenomena (star, fish).

They found a considerable proportion of the 100 basic vocabulary words have a strong association with specific kinds of human speech sounds. The study's results are conservative; the actual number of sound symbolism patterns may in fact be even greater, Christiansen said: "We wanted to show findings that we can really stand behind."

The findings challenge one of the most basic concepts in linguistics: the century-old idea that the relationship between a sound of a word and its meaning is arbitrary.

In the past 20 years, language scientists have seen glimmers of evidence that arbitrariness isn't necessarily an iron-clad rule. For example, studies have shown words for small objects in a variety of languages are likely to contain high-pitched sounds.

But until now, the research has looked only at specific word/sound relationships or small sets of languages. "People haven't been able to show whether sound symbolism is really something more pervasive throughout languages all over the world," Christiansen said. "And this is the first time anyone has been able to show that at such a scale."

The researchers don't know why humans tend to use the same sounds across languages to describe basic objects and ideas. But Christiansen notes these concepts are important in all languages, and children are likely to learn these [words](#) early in life. "Perhaps these signals help nudge kids into acquiring language," Christiansen said. "Likely it has something to do with the human mind or brain, our ways of interacting, or signals we use when we learn or process language. That's a key question for future research."

More information: Sound–meaning association biases evidenced across thousands of languages, *PNAS*,
www.pnas.org/cgi/doi/10.1073/pnas.1605782113

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