

What happens to language as populations grow? It simplifies, say researchers

January 29 2018, by Susan Kelley



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Languages have an intriguing paradox. Languages with lots of speakers, such as English and Mandarin, have large vocabularies with relatively simple grammar. Yet the opposite is also true: Languages with fewer speakers have fewer words but complex grammars.

Why does the size of a population of speakers have opposite effects on vocabulary and [grammar](#)?

Through computer simulations, a Cornell University cognitive scientist and his colleagues have shown that ease of learning may explain the paradox. Their work suggests that [language](#), and other aspects of culture, may become simpler as our world becomes more interconnected.

Their study was published in the *Proceedings of the Royal Society B: Biological Sciences*.

"We were able to show that whether something is easy to learn - like words - or hard to learn - like complex grammar - can explain these opposing tendencies," said co-author Morten Christiansen, professor of psychology at Cornell University and co-director of the Cognitive Science Program.

The researchers hypothesized that words are easier to learn than aspects of morphology or grammar. "You only need a few exposures to a word to learn it, so it's easier for words to propagate," he said.

But learning a new grammatical innovation requires a lengthier learning process. And that's going to happen more readily in a smaller speech community, because each person is likely to interact with a large proportion of the community, he said. "If you have to have multiple exposures to, say, a complex syntactic rule, in smaller communities it's easier for it to spread and be maintained in the population."

Conversely, in a large community, like a big city, one person will talk only to a small proportion the [population](#). This means that only a few people might be exposed to that complex grammar rule, making it harder for it to survive, he said.

This mechanism can explain why all sorts of complex cultural conventions emerge in small communities. For example, bebop developed in the intimate jazz world of 1940s New York City, and the Lindy Hop came out of the close-knit community of 1930s Harlem.

The simulations suggest that language, and possibly other aspects of culture, may become simpler as our world becomes increasingly interconnected, Christiansen said. "This doesn't necessarily mean that all culture will become overly simple. But perhaps the mainstream parts will become simpler over time."

Not all hope is lost for those who want to maintain complex cultural traditions, he said: "People can self-organize into smaller communities to counteract that drive toward simplification."

His co-authors on the study, "Simpler Grammar, Larger Vocabulary: How Population Size Affects Language," are Florencia Reali of Universidad de los Andes, Colombia, and Nick Chater of University of Warwick, England.

More information: Florencia Reali et al, Simpler grammar, larger vocabulary: How population size affects language, *Proceedings of the Royal Society B: Biological Sciences* (2018). [DOI: 10.1098/rspb.2017.2586](https://doi.org/10.1098/rspb.2017.2586)

Provided by Cornell University

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