Relatively speaking: Researchers identify principles that shape kinship categories across languages

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Different languages refer to family relationships in different ways. For example, English speakers use two terms — grandmother and grandfather — to refer to grandparents, while Mandarin Chinese uses four terms. Many possible kinship categories, however, are never observed, which raises the question of why some kinship categories appear in the languages of the world but others do not.

A new study published in *Science* by Carnegie Mellon University's Charles Kemp and the University of California at Berkeley's Terry Regier shows that kinship categories across languages reflect general principles of communication. The same principles can potentially be applied to other kinds of categories, such as colors and spatial relationships. Ultimately, then, the work may lead to a general theory of how different languages carve the world up into categories.

For the study, Kemp and Regier used data previously collected by anthropologists and linguists that specify kinship categories for 566 of the world's languages. Kemp and Regier used a computational analysis to explore why some patterns are found in the data set but others are not. In particular, they tested the idea that the world's kinship systems achieve a trade-off between the two competing principles of simplicity and informativeness.

"A kinship system with one word referring to all relatives in a family

tree would be very simple but not terribly useful for picking out specific individuals," said Kemp, assistant professor of psychology within CMU's Dietrich College of Humanities and Social Sciences and lead author of the study. "On the other hand, a system with a different word for each family member is much more complicated but very useful for referring to specific relatives. If you look at the kinship systems in the languages of the world, you can't make them simpler without making them less useful, and you can't make them more useful without making them more complicated. There is a tradeoff between these two explanatory principles."

Kemp and Regier found that this trade-off explains why languages use only a handful of the vast number of logically possible kinship categories.

"The kinship systems that are used by languages lie along an optimal frontier, where systems achieve a near perfect trade-off between the competing factors of simplicity and usefulness," Kemp said. "English — with two terms to refer to grandparents — is more simple than Mandarin Chinese, but arguably a little less useful."

"Interestingly, very similar principles explain cross-language variation in color categories and spatial categories, as well as kinship categories," said Regier, associate professor of linguistics and cognitive science at Berkeley, and an author on the earlier work on color and space. "It's rewarding to see similar principles operating across such different domains."

  More information: "Kinship Categories Across Languages Reflect General Communicative Principles," by C. Kemp at Carnegie Mellon University in Pittsburgh, PA; T. Regier at University of California, Berkeley in Berkeley, CA. *Science* (2012).