People worldwide—even nomads in Tanzania—think of colors the same way

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Hadza people. Credit: Wikipedia

Would a color by any other name be thought of in the same way,

regardless of the language used to describe it?

According to new research, the answer is yes.

A new study examines how a culture of nomadic hunter-gatherers names colors, and shows that they group colors into categories that align with patterns of color grouping evident in 110 other world languages.

This study population - the Hadza people of Tanzania - has relatively few commonly shared color words in its language. During the study, the most common response by Hadza participants to a request to name a color was "Don't know."

However, the way the participants grouped the colors they did name - regardless of what name they used - tended to match color-naming conventions of Somali-speaking immigrants and native English speakers, and of many other cultures around the world.

"Looking at the Hadza data, we see a relatively modern color vocabulary emerging, but the color terms are distributed across the entire population," said Delwin Lindsey, professor of psychology at The Ohio State University Mansfield Campus and lead author of the study. "We captured a point in time culturally where the stuff for creating a complex color naming exists, but it's not in the head of any one individual. It's distributed in bits and pieces across the culture."

Scientists know a lot about how the human brain responds to seeing color - and that universality of perception makes color naming a good model for studying patterns in language change.

"This study provides a very useful framework for thinking about how the terms that are used to describe things in our environment actually emerge and evolve," Lindsey said. "You can think of the words as

species that are evolving - they are competing for space in our heads. So this is an example of cultural evolution that closely mirrors biological evolution."

The research is published in the journal *Current Biology*.

Lindsey said the finding suggests that color naming is not a matter of nature versus nurture, but a combination of the two. The result also suggests that both prevailing theories about color naming apply around the world: Cultures create color names, but individuals from vastly different societies (Hadza, Somali and American) share the same perceptions of colors in their mind.

"Clearly, there are certain constraints within the mind that guide how colors are going to be grouped together," said Lindsey, also a professor of optometry on Ohio State's Columbus campus. "But this illustrates an interesting trade-off between culture and biology as determinants of human thought. There are cultural universals, but within each culture there is dramatic diversity. If the culture were playing the preeminent role, members of a society would establish conventions that they all agree on. But they're clearly not all agreeing on anything."

How does it play out in English? One person's lilac shirt is called lavender by her neighbor.

Lindsey and collaborator Angela Brown, professor of optometry at Ohio State, reported in 2006 on their analysis of data of the World Color Survey, a collection of color names obtained by University of California, Berkeley researcher Paul Kay and associates from 2,616 people of 110 languages spoken by mostly preindustrial societies.

That analysis confirmed that, across cultures, people tend to classify hundreds of different chromatic colors into only eight distinct

categories: red, green, yellow-or-orange, blue, purple, brown, pink and grue (green or blue).

In 2009, Lindsey and Brown published a second paper describing further analysis of the World Color Survey, in which they showed that four common, distinct groupings of color categories, which they called "motifs," occur worldwide: black, white and red; black, white, red and gray; black, white, red and a single cool green or blue category; and black, white, red, green, blue and yellow. A surprising result was that the motifs observed within a society are nearly as diverse as those observed across cultures.

"We found that these motifs occurred with minor variations across 110 languages," Brown said. "A person from Cameroon, Africa, can name colors more similarly to somebody from Northwestern Australia than to his Cameroon neighbor. And that Cameroon neighbor might be more similar to a different person in Northwestern Australia."

Larger color vocabularies are generally associated in more technologically advanced societies.

"To try to get at how these motifs might emerge, we wanted to go as far back technologically as we could. That's where the hunter-gatherers fit in," Lindsey said.

He and Brown collaborated with co-corresponding author Coren Apicella and her colleague David Brainard, both on the psychology faculty at the University of Pennsylvania, to survey the Hadza people. Apicella has been working with the Hadza people for more than a decade.

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