

Imitation breeds war in new evolutionary theory

July 1 2019, by Rachel Sturtz



Painting of men and a hand in the Cave of the Swimmers, Wadi Sura, Western Desert, Egypt. Credit: Roland Unger. This file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported, 2.5 Generic, 2.0 Generic and 1.0 Generic license.

When anthropologists consider the origins of warfare, their evolutionary

theories tend to boil it down to the resource-scarcity trifecta of food, territory and mates—three resources that would justify the loss of life and risk to a warring group of hunter-gatherers.

But researchers from University of Colorado Denver, University of British Columbia and University of Santiago, Chile, created an evolutionary [mathematical model](#) to unearth a fourth theory. They found that acculturation—the adoption and imitation of a victor's culture following defeat—could promote the evolution of intergroup conflicts. In other words, groups may evolve to fight for fighting's sake, despite the costs.

The study was published last week in the journal *PNAS*.

"Warriors" and "shepherds" in human evolution

"I've researched the evolution of cooperation and altruism—paradoxes in the conventional evolutionary theory of survival of the fittest—by [group selection](#), but in this case, we wanted to understand the evolution of intergroup conflict," said Burton Simon, Ph.D., associate professor of mathematics at CU Denver, who has worked as a sort of "mathematical anthropologist" for the last decade.

The researchers' mathematical model is based on two classes of people: warriors, who specialize in intergroup conflicts and have a low birth rate, and shepherds, who cannot defend themselves but are highly reproductive. The amount of each within a group depended on the probability that an offspring becomes a warrior or shepherd, a cultural trait passed vertically from one generation to the next.

The study determined group dynamics through three types of events: group extinctions (a whole group dies, e.g., as the result of a drought or a bad crop), fissions (when an overly large group splits into two) and group

conflicts due to their "belligerence" (assumed to increase a group's probability of trying to conquer another group). When groups fight in the model, the winner imposes its cultural traits on the loser or eliminates the group altogether. The belligerence of a group and the probability that they will impose their culture (acculturation tendency) are two of those traits.

"You need individuals who are shepherds to reproduce and individuals who are warriors to protect the group," said Simon. "But the right numbers of each can change over time in complicated and surprising ways."

Cultural evolution may promote the spread of conflict

How might these cultures thrive or die? Depending on the initial conditions of each group and which parameters (like acculturation and belligerence) were allowed to evolve, researchers found that sometimes groups fought each other into extinction. In other cases, the whole population reached a peaceful equilibrium.

But when researchers allowed all of the parameters to evolve, they found that acculturation coevolved with belligerence and warrior production. In other words, groups became more and more belligerent over time, and they forced their cultures on their victims instead of killing them.

That cultural evolution may promote the spread of conflict, even in cases where it may hurt both the groups and the individuals, is a theory that has received little attention. A mathematical model was one way to see how it could happen, said Simon.

"I realize mathematical anthropology sounds like an oxymoron," said Simon. "Most people who theorize about why there's so much conflict between human groups use economics and political science. But when

you look at a hunter-gatherer society with a mathematical model, which forces you to state your assumptions precisely, the results can be enlightening."

Simon cautioned that the causes of today's conflicts are much too complex for a mathematical model to tackle, but his research is a glimpse into how imitation might indirectly breed [conflict](#) in evolutionary theory.

More information: Gil J. B. Henriques et al. Acculturation drives the evolution of intergroup conflict, *Proceedings of the National Academy of Sciences* (2019). [DOI: 10.1073/pnas.1810404116](https://doi.org/10.1073/pnas.1810404116)

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