

ESSAY

Conflict: Altruism's midwife

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Groups of fire ants, chimpanzees, meerkats and other animals engage in lethal conflicts. But we humans are especially good at it, killing 'outsiders' on a scale that altered the course of our evolution. Prehistoric burials of large numbers of men and women with smashed skulls, broken forearms and stone points embedded in their bones — as well as ethnographic studies of recent hunters and gatherers — strongly suggest that warfare was a leading cause of death in many ancestral populations. Yet at the same time, humans are unusually cooperative, collaborating with non-kin, for example in hunting and sharing food, on a scale unknown in other animals.

Paradoxically, the grisly evidence of our warlike past may help explain our distinctly cooperative nature.

This 'distasteful' idea is based on the evolution of what my co-authors and I have termed 'parochial altruism'. Altruism is conferring benefits on others at a cost to oneself; parochialism is favouring ethnic, racial or other insiders over outsiders. Both are commonly observed human behaviours that are well documented in experiments. For example, people from the Wolimbka and nearby Ngenika groups, in the Western Highlands of Papua New Guinea, have no recent history of violence. Yet when asked to divide a pot of money between themselves and another, they give more and keep less for themselves if the other is a member of their own group rather than an outsider.

But parochial altruism is puzzling from an evolutionary perspective because both altruism and parochialism reduce fitness or material well-being compared with what a person would gain were he or she to eschew these behaviours. Altruistic acts, by definition, confer advantages on others at a cost to the altruist. The impediments to the evolution of parochialism are more complicated, but could also be prohibitive. Hostility towards

outsiders limits an individual's choice of partners for long-distance trade, political coalitions and help during times of adversity. Like the altruist, the parochialist bears a handicap in the evolutionary race.

The solution to the puzzle may be that parochialism and altruism act synergistically. Among ancestral humans, parochial altruists may have provoked conflicts between groups over scarce natural and reproductive resources, and at the same time contributed to a group's success in these conflicts. Altruism would have facilitated the coordination of raiding and ambushing on a scale known in few other animals, while parochialism fuelled the antipathy towards outsiders. Additionally, with the development of projectile weapons, humans became adept at killing from a distance, which would have reduced the costs of aggression.

As winning groups gained territory, an increase in reproductive opportunities and political and cultural influence could have overcome the disadvantages of parochialism. If conflicts were occurring separately, groups that differed significantly in these practices, the effects of conflict could have been

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at least one group contains a preponderance of parochialists. We also made each group's fighters the parochial altruists (non-altruists are happy to let someone else do the fighting; tolerant members prefer to stay on friendly terms with outsiders). Thus, the groups with the most parochial altruists tend to win conflicts. Our objective was to see how the frequency of warfare, and the fraction of the different types of agent, would evolve.

In millions of simulated evolutionary histories, the populations emerging after thousands of generations of selection tend to be either tolerant and selfish, with little warfare, or parochial and altruistic with frequent and lethal encounters with other groups.

Occasional transitions occur between the selfish peaceful states and the warring altruistic states. But neither altruism nor parochialism ever proliferate

singly; they share a common fate, with war the elixir of their success.

Climatic and archaeological evidence indicate that competition between groups, which underpins the process by which parochial altruism evolves, was rife during the Late Pleistocene, about 126,000 to 10,000 years ago. The extraordinary climate instability recorded in Greenland ice cores would have heightened competition for resources, forcing long-distance migrations and frequent encounters between hard-pressed and, in the later part of the period, well-armed groups. Archaeological evidence of projectile wounds found in the Channel Islands off southern California suggests that during seven millennia of human conflict among groups was common. Long periods of environmental stability seem to have reduced the fraction of deaths

"The inspiring public spiritedness, courage and generosity that are distinctive of humans bear the birthmarks of a history of conflict."



than occurred during Europe's just-concluded 'century of total war'.

Charles Darwin anticipated the contribution of warfare to the evolution of altruism, predicting that a tribe possessing a greater number of members ready to warn each other of danger, and aid and defend each other, would spread and be victorious over other tribes. Thus "the social and moral qualities would tend slowly to ... be diffused throughout the world". But he omitted to mention that among these 'moral qualities' would be hostility towards outsiders.

From genes to culture

A similar evolutionary logic extends to the present, working on timescales more appropriate for cultural than genetic evolution. Indeed, the modern European state was forged in the heat of warfare among the some 500 city states, bishoprics, principalities and other sovereign bodies that governed Europe half a millennium ago. Parochial conflict was the midwife of the novel institutions — tax compliance, respect for the rights of property, the rule of law — that spelled survival in the five-century-long shakeout that, on the eve of the First World War, had left just 27 states standing.

The making of Europe as we know it thus paradoxically owes something to the exploits of "animals possessing the virtues of courage and fighting, but nothing else" in the words of a twelfth-century Islamic soldier-scholar who lost his home and family to the Crusaders.

However, I do not want to oversell this 'red in tooth and claw' side of human origins. Even in periods and places where warfare was uncommon, environmental crises could have eliminated groups that failed to work together while cooperative groups survived.

Moreover, like the emergence of multicellular organisms, much of human distinctiveness got an evolutionary boost from practices that kept the lid on conflict among group members. Where this occurred, members would have tended to share common levels of

reproductive and cultural success. As a result, the evolutionary effect of competition between individuals would have receded in importance compared with that of competition between groups, giving cooperators the edge.

Practices that suppress competition within groups are common among recent hunters and gatherers. These include sharing food and information, and mating systems that prevent