

Public release date: 5-Jun-2006[[Print Article](#) | [E-mail Article](#) | [Close Window](#)]

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Who are we up against? Local vs. global competition influences cooperative behavior in humans

Researchers from the University of Edinburgh have shown that humans behave less cooperatively when they think they are in direct "local" competition with each other, and more cooperatively under circumstances of "global"-scale competition. The findings hold implications for our understanding of the evolution of social animals, as well as our understanding of factors that influence the cooperative (and cheating) behavior of individuals and groups in business, government, and academia. The research is reported by Stuart West and colleagues at the University of Edinburgh, and appears in the June 6th issue of *Current Biology*.

Explaining cooperation is one of the greatest problems for evolutionary biology. Cooperation often involves shared resources, and can therefore be tainted by conflicts of interest. Why should an individual carry out a costly cooperative behavior that benefits other individuals? Doing so seems to go completely against the Darwinian idea of "survival of the fittest." Cooperation is a particularly notable puzzle in species such as humans, where there is frequent cooperation between non-relatives.

A commonly suggested solution to the problem of cooperation between non-relatives is that such individuals will interact repeatedly. This allows reciprocal cooperation to evolve: individuals cooperate because it will lead to others cooperating with them in the future. Another way of looking at reciprocal cooperation is that participation avoids any punishment that would be handed out to non-collaborators.

The impact of repeated interactions has been examined in the past by observing humans asked to play the Prisoner's Dilemma game. The dilemma in this game is that not cooperating (that is, cheating) is the best short-term option, but cooperation by both players gives greater rewards than cheating by both players. It is well known that cooperation can be favored in this game if players have repeated interactions – such a scenario sets up the possibility of reciprocal cooperation.

In the new study, students played the Prisoner's Dilemma game in small groups, with cash rewards manipulated to make competition either "local" or "global." In local competition, the top player in each group of three won money; this was found to lead to selfish conflict within groups. In global competition, the top scorers in the room won money; this was found to lead to reciprocal cooperation within groups.

The findings show that the spatial scale of competition influences cooperative behavior, and may drive evolutionary changes that affect the social behavior of a given species.

The authors point out that the responses observed in their study could be exploited by engineering the structure of human groups to favor cooperation and the benefits of competition in diverse realms of human activity.

****For further background information and discussion, be sure to see the excellent commentary on this work in Bernard Crespi's accompanying Dispatch, "Cooperation: Close Friends and Common Enemies."**

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The researchers include Stuart A. West, David M. Shuker, Tracy Reynolds, Max Burton-Chellow, Edward M. Sykes, Meghan A. Guinnee, and Ashleigh S. Griffin of the University of Edinburgh in Edinburgh, United Kingdom; Andy Gardner of the University of Edinburgh in Edinburgh, United Kingdom and Queen's University in Kingston, Canada.

This research was supported by the Royal Society, Natural Environment Research Council, and Biotechnology and Biological Sciences Research Council.

West et al.: "Cooperation and the Scale of Competition in Humans." Publishing in Current Biology 16, 1103–1106, June 6, 2006 DOI 10.1016/j.cub.2006.03.069 www.current-biology.com

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