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# Parochial altruism: does it explain modern human group psychology?

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Parochial altruism — the human inclination toward costly intra-group cooperation and inter-group aggression without expectations of future returns — requires group selection logic to explain its evolution. We examined experimental evidence for three implications of the group selection account: the unconditional nature of intra-group cooperation; the non-instrumental, non-retaliatory, and costly nature of inter-group aggression; and the positive relationship between intra-group cooperation and inter-group aggression. Laboratory experiments revealed no support for the unconditional nature of intra-group cooperation, mostly negative evidence for the non-instrumental, non-retaliatory, and costly nature of inter-group aggression, and mixed evidence for the positive relationship between intra-group cooperation and inter-group aggression. Caution against premature conclusions about the role of group selection in the evolution of parochial altruism is advised.

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Are we humans disposed to act aggressively toward members of another group *for no instrumental reasons*? We use the term 'instrumental' to refer to behaviors in which benefits in terms of resources or access to mates exceed the personal costs of the behavior.[3] Social identity theory [2,3] provides a positive answer to this question based on unconditional and unsolicited discrimination against out-group members observed in minimal group experiments. In addition to the proximate, psychological causal mechanisms provided by social identity theory — enhancement of self-esteem by identifying oneself with a group positively distinct from other groups — the same positive answer has received an evolutionary explanation in the contemporary group selection model of parochial altruism [4–6].

The evolution of human cooperation has traditionally been explained by kin-selection or reciprocal altruism [7]. Given that kin-selection and reciprocal altruism seemingly have a difficult time explaining the widespread altruism among genetically unrelated people with no chance of future interaction, group-selection (or multi-level selection [8]) models have gained popularity by providing an evolutionary explanation of human cooperation [9–12]. According to these models, costly altruism can evolve insofar as the group-level fitness advantage generated by individuals' altruistic behavior (group-level selection pressure) exceeds the individual cost for such a behavior (within-group selection pressure). Advocates of group selection argue that this condition is met in the human species due to features unique to humans — including social norms and institutions [9–11] and punishment of norm-violators [12] — that reduce within-group selection pressure. It has also been proposed that the evolution of human cooperation was made possible via the co-evolution of intra-group cooperation and inter-group aggression [4–7].

Compared to other models such as direct and indirect reciprocity [13,14], which imply that human cooperative behavior is conditional upon actual or expected behaviors of others, the nature of cooperative behavior predicted by group selection is unconditional, because what matters is the behavior's effect on the group, not on the actors themselves. Another feature predicted by the parochial altruism model is the non-instrumental nature of inter-group aggression; whenever there is a chance to increase the inter-group differences in fitness by reducing another group's overall fitness level, group members should aggress against the other group despite a loss in their individual fitness.[4] In this sense, inter-group aggression

[3] Our distinction between instrumental and non-instrumental aggression is mostly consistent with the distinction commonly used in the aggression literature between instrumental and hostile (or impulsive) aggression [1]. Instrumental aggression is a means to achieve another goal, whereas the target's suffering is the goal of hostile (impulsive) aggression. However, our distinction is based on the effect of aggression on the aggressor's fitness level rather than his or her intentions.

[4] This does not imply that instrumental inter-group aggression is incompatible with the group selection model. What is important here is that only group selection provides explanation for non-instrumental inter-group aggression.

is expected to be offensive rather than defensive or reactive. These two predictions — the unconditional nature of intra-group cooperation and the offensive and non-instrumental nature of inter-group aggression — are the target of our investigation. Our goal is to find out if the group-selection model of parochial altruism helps us understand group psychology of modern humans.

## Unconditional intra-group cooperation

Since the publication of Tajfel and colleagues' original study [2], a large number of minimal group studies replicated the finding that people choose to provide more resources to members of their own group at a cost to another group, even when the studied groups were 'minimal groups' consisting of a trivial category with no fitness implications (see reviews [15]). Because of the lack of inter-personal contacts, absence of future interactions, and no interdependence on tangible resources in minimal groups, these findings were considered evidence of *unconditional* intra-group cooperation.

However, with the discovery that minimal groups are not completely devoid of interdependence of interest [16,17], the conditional nature of in-group cooperation has been made clear. For one, the in-group-favoring resource allocation between minimal groups vanishes when the lack of resource contingency is made explicit by making it salient that the participants will not be allocated resources by other participants [18,19]; the seemingly unconditional in-group-favoring resource allocation is actually contingent upon expectations of hidden indirect reciprocity, that is, by the expectation that most group members would treat their fellow members including the participants favorably.

Another series of experiments using the prisoner's dilemma game demonstrates that the previously found intra-group cooperation [20–23] vanishes when the players' group membership is made private information, and thus the players cannot expect a favorable treatment by their in-group partners [24–27]. This finding was also confirmed in an experiment that used nationality as the basis for groups [28]. These findings, together with the findings of group-based trust — in which players trust in-group partners only when they can expect in-group favoring treatment from the partners [29,30] — provide evidence that expectation of in-group-favoring treatment from fellow group members (i.e., expectation of indirect reciprocity) is the necessary condition for intra-group cooperation observed in minimal group studies. A recent meta-analysis of minimal group studies [31••] found a strong support for this conclusion.

## Non-instrumental and non-retaliatory inter-group aggression

It is the costly nature of inter-group aggression, which reduces the aggressors' fitness advantage relative to non-aggressors, that requires group selection as an explanation. This eliminates instrumental aggression or aggression with the goal to acquire valued resources from the list of phenomena that requires a group selection explanation. Defensive inter-group aggression or collective retaliation (see Box 1) that deters future aggression by another group does not require group selection either. At the level of the individual, it is argued that retaliation works as a commitment device to deter future aggression [32], leading to the retaliator's fitness advantage [32,33]. At the group level, the use of collective retaliation or retaliatory aggression on any member of a target group also provides a cost-effective means to deter future aggression from the target group. The prospect that any member of the target group can be a target of retaliation gives all target-group members incentives to control fellow group members from engaging in inter-group aggression that could invite collective retaliation [34,35]. Furthermore, the cost of collective retaliatory aggression can be small when it takes the form of ambushing the weakest member of the target group. Joining the ambush of the weakest does not require a large cost, and thus the benefit of deterring future aggression can outweigh the cost.

Only the non-instrumental, non-retaliatory (or unprovoked), and costly aggression (to be abbreviated as 'NNC aggression') should be treated as unequivocal evidence of group selection. Although the choice of maximization of inter-group difference observed in minimal group experiments [2,3] has often been used as evidence of inter-group NNC aggression, these minimal group findings actually do not qualify as evidence of inter-group NNC aggression for the following three reasons. Firstly, resource allocation in such studies, in which participants allocate money to an in-group member and an out-group member, is costless because participants do not earn any money as a consequence of their choices.

**Box 1 Defensive Inter-group Aggression.**

The medieval institution of community responsibility system [35] is an example of successful collective retaliation. In medieval inter-city trades in Europe, a merchant *a* from city *A* exploited by merchant *b* from another city *B* could not litigate *b*, simply because city B was outside the jurisdiction of city A. The community responsibility system is the practice that the city A's government confiscated merchandize of *any* merchant from city B. This practice gave incentives for the powerful merchants in B to control malpractice by other merchants from B, to avoid the risk of being a target of collective retaliation. Less controlled collective retaliation, however, often triggers a spiral of vendettas. Another means to defend in-group members against aggression from another group is preemptive strike [40•], aggression aimed to eliminate the potential enemy's aggressive capability, as stated in the logic of the 'Bush Doctrine' — '[t]he greater the threat, the greater the risk of inaction—and the more compelling the case for taking anticipatory action to defend ourselves' [51]. Inter-group aggression stemming from defensive — and thus instrumental — motives should not be considered examples of the NNC aggression — aggression for the sake of reducing the out-group's fitness level.