

# Groups Reward Individual Sacrifice: The Status Solution to the Collective Action Problem

Robb Willer  
*University of California, Berkeley*

Running Head: Groups Reward Self-Sacrifice

Word Count: 11,239

\*Contact Robb Willer at Department of Sociology, University of California, Berkeley, CA 94720. [Willer@Berkeley.edu](mailto:Willer@Berkeley.edu), Phone: (607) 339-6466, Fax: (510) 642-0659. I thank Pat Barclay, Stephen Benard, Shelley Correll, Claude S. Fischer, David Grusky, Michael Hout, Edward J. Lawler, Michael Lovaglia, Michael Macy, Ann Swidler, David Willer, and four anonymous reviewers for contributions to earlier versions of this paper, and the National Science Foundation for supporting this research, grant number SES0405352.

## BIOGRAPHY

Robb Willer is Assistant Professor of Sociology at the University of California, Berkeley.

His research investigates the micro-foundations of basic human sociality and the social psychology of political attitudes. His research has appeared in the *American Journal of Sociology*, *Annual Review of Sociology*, and *Proceedings of the Royal Society of London B: Biological Sciences*.

GROUPS REWARD INDIVIDUAL SACRIFICE:  
THE STATUS SOLUTION TO THE COLLECTIVE ACTION PROBLEM

ABSTRACT

One of sociology's classic puzzles is how groups motivate their members to set aside self-interest and contribute to collective action. This article presents a solution to the problem based on status as a selective incentive motivating contribution. Contributors to collective action signal their group-oriented motivation and consequently earn diverse benefits from group members – in particular, higher status – and these rewards encourage greater giving to the group in the future. In Study 1, high contributors to collective action were granted higher status, exercised more interpersonal influence, were cooperated with more, and received gifts of greater value. Studies 2 and 3 replicated these findings while discounting alternative explanations. All three studies showed that giving to the group mattered because it signaled the individual's motivation to help the group. Study 4 found that participants who received status for their contributions subsequently contributed more and viewed the group more positively. These results demonstrate how the allocation of respect to contributors shapes group productivity and solidarity, offering a solution to the collective action problem.

## GROUPS REWARD INDIVIDUAL SACRIFICE

### THE STATUS SOLUTION TO THE COLLECTIVE ACTION PROBLEM

A central problem in social theory since at least Hobbes ([1651] 1972) is the question of what makes collective action – be it mobilization of a social movement, activities of a voluntary association, or even just the maintenance of social order – possible.

Chronically, situations arise in which individuals can gain more by not contributing to the public good but instead “free-riding” on the contributions of others. If individuals act in their own self-interest, therefore, it would seem impossible to produce public goods. And yet, people do overcome the “collective action problem”; society is possible (Hardin 1982; Ostrom 1990).

Generations of theorists have sought to explain how collective action is achieved in practice. Where Enlightenment philosophers invoked an implicit social contract that citizens agree to, social scientists have proposed cultural, interactional, and institutional mechanisms that lead individuals to transcend narrow self-interest. For example, Marx focused on class interests; Durkheim emphasized solidarity; Parsonian theory stressed the inculcation of common ends, and so on.

Here I propose and test another solution to the collective action problem based on the premise that groups pay respect to individuals for their contributions to the group’s efforts. By contributing, individuals display their concern for the group. The group, in turn, conveys respect for the individual. Receiving that respect further motivates the individual to contribute yet more. Below I demonstrate how these processes encourage the group-oriented behaviors of individuals, with concern for one’s standing serving to glue individuals together in collective actions. I also investigate how these dynamics

shapes macro-level phenomena of broad relevance to the collective action literature: solidarity, productivity, and feelings of collective identity.

The present research makes several contributions to the vast, multi-disciplinary body of research on the collective action problem: (1) a theory that shows how attaining status in the group helps solve the problem, specifically how successful collective action and status for contributors stimulate one another; (2) empirical demonstration of how groups reward those who sacrifice for the group (Studies 1 and 2); (3) evidence that groups do so because members see the contributor as group-motivated (Studies 1-3); (4) studies eliminating alternative explanations (Studies 2 and 3); and (5) a demonstration that individuals who receive status for their contributions give more in the future - and do so because that experience increases their group-motivation (Study 4).

I conducted a series of laboratory experiments to test predictions derived from the theory. In natural collective action settings, like activist groups, where the reciprocal relationships between contribution and status are already under way, it would be very difficult to determine the causal sequence. Experiments also permit me to manipulate the critical variable(s) of interest in isolation from other variables in order to carefully scrutinize the validity of the theory's predictions with limited concern that other, unmeasured variables (e.g., personality, skills, occupational status, etc.) are actually responsible for observed relationships between status and collective action contribution (Lucas 2003). Random assignment to experimental conditions helps control for the potential contaminating effects of individual differences. Thus, the present methodology provides for strong initial tests, though the theory's validity will in the end be a function of the number, proportion, quality, and diversity of empirical tests supporting it. In the

sections that follow I lay out the proposed theory, review relevant research, and present four experimental tests of the theory, before concluding with a discussion of the results.

## THEORY

Many solutions to the collective action problem exist, reflecting different methodologies, theoretical approaches, and levels of analysis. (see Oliver 1993, Ledyard 1995, Yamagishi 1995, and Kollock 1998 for reviews). Perhaps the most intuitive solution is that groups provide selective incentives to individuals to encourage contribution and discourage free-riding (Olson 1965). Examples of selective incentives range from the material to the solidary (Clark and Wilson 1961), and include paying blood donors, “I Voted” stickers given out to voters, tote bags and bumper stickers given to public television donors, prosecution of tax evasion, and economic sanctions for violations of international treaties.

The solution I propose considers status in the group as an implicit, selective incentive. Olson (1965: 60) noted that “people are sometimes also motivated by a desire to win prestige, respect, friendship, and other social and psychological objectives.” Here I elaborate Olson’s observation in theorizing a reciprocal relationship between status hierarchies and collective action. Status and other social and material benefits are allocated to individuals for contribution to collective action to the extent that they successfully signal their motivation to help the group. These status rewards in turn increase that motivation, leading to greater giving and more positive views of the group.

I define *status* as an individual’s relative standing in a group based on prestige, honor, and deference (Berger, Cohen, and Zelditch 1972); status hierarchies are typically

conceptualized as relative and zero-sum. Research shows that group members tend to agree on the group's status hierarchy (Ridgeway and Walker 1995; Anderson et al. 2006), evaluate the higher status more favorably than others (Foschi 1992), defer to them more (Berger et al. 1972; 1977; Wagner et al. 1986), give them more chances to speak and act (Cohen 1994), and allocate them more resources (Berger et al. 1985). In all these ways, being accorded high status by the group is valuable to individuals. Further, status research has shown that group members voluntarily - and nonconsciously (Rashotte and Webster 2005) - reorder status hierarchies based on new, salient, status-relevant information (e.g., Markovsky, Smith, and Berger 1984; Fisek, Berger, and Normon 1991; Cohen 1994; but see also Foschi 1992; 1996).<sup>1</sup>

### *Theoretical Scope and Propositions*

The scope of the theory is limited to collective action situations where a public good is (a) non-excludable (i.e. benefits all group members), (b) valued by all group members, and (c) requires costly contributions from individuals to be produced. Thus, contributions to a public television funding drive would be within the scope, but investments in a corporation would not, because “free riders” are excluded from resulting benefits.

I assume that individuals value higher status. This assumption is widely held in sociology (e.g., Sewell, Haller, and Portes 1969) and experimental research shows that people will forgo material profits to gain status (Ball and Eckel 1996; 1998; Ball et al. 2001; Huberman, Loch, and Onculer 2004). Andreoni and Petrie (2004) demonstrate greater giving in public goods games where contributions are public than when they are anonymous, suggesting that people value status in public good settings.

[Figure 1 about here]

Figure 1 presents the theory as a whole. Below I give the individual propositions and derivations and briefly discuss theoretical and empirical bases for each.

*Proposition 1:* The more highly group members evaluate (a) the cost of an individual's contributions (e.g., time, labor, money) to the group, and (b) the benefits to the group of an individual's contributions, then the more highly members will evaluate the individual's level of "group motivation."

An individual's *group motivation* is defined as how much value an individual places on the group's interests relative to his or her own. Individuals perceived to have greater group motivation will be expected to sacrifice more for the group's benefit. Significantly, I claim that the group's estimate of an individual's group motivation is not only a product of how much the group benefits, but also how much group members believe that the contribution costs the individual - and that is evaluated as a matter of how much the group believes the individual *could* contribute because it is a matter of sacrifice. So, for example, members of a club would assess an hour's volunteer work as indicative of more "group motivation" if it was donated by a busy professional than by a retiree.

*Proposition 2:* The greater an individual's perceived group motivation, the greater the individual's relative status standing.

Ridgeway (1978; 1982) has shown that a member's status in a group depends not simply on specific contributions, but on whether the individual also conveys an impression of being concerned with group welfare. Related anthropological field research and

experimental economics research have also shown that groups show greater esteem toward those members who make greater contributions to the collective good.<sup>2</sup>

*Proposition 3:* The greater an individual's status standing, the more group members will yield to the influence of the individual, cooperate with him/her, and give him/her gifts of greater value.

Proposition 3 proposes several behavioral consequences of improved status standing. Past research on status characteristics theory has consistently shown a strong and reliable relationship between status standing and influence (Berger et al. 1972; 1977).

Additionally, past theory and research suggest that material benefits accrue to higher status individuals (e.g., Berger et al. 1985; Thye 2000; Henrich and Gil-White 2001; Hardy and van Vugt 2006). Here I reason that higher status people will be cooperated with more and receive gifts of greater value from group members because the respect they command leads them to be perceived as more trustworthy and makes them less likely targets of self-interested exploitation.

*Proposition 4:* The greater the status an individual receives for past contributions, the more his or her group motivation will increase and the more he or she will tend to view the group positively - including identifying with it more and seeing the group as having more solidarity and cohesion.

*Proposition 5:* The greater an individual's group motivation, the more he or she will contribute to the group.

The above propositions make new predictions for the effects of receiving status rewards on collective action contribution. They link the micro-level dynamic of rewarding contributions with status to macro-level phenomena such as group productivity, identification, and solidarity.

On the basis of these theoretical propositions I make the following derivations to be tested in the Studies 1-3: the more an individual contributes to collective action, relative to other group members, the greater his or her status in the group and the more he or she will (a) exert influence over other group members, (b) enjoy cooperation from other group members, and (c) receive gifts from other group members. In addition, I also make the following derivations to be tested in Study 4: the greater the status an individual receives for past contributions the more he or she will contribute to the group in the future and the more positive his or her perceptions of it.

As shown in Figure 1, I argue that individuals' contributions to collective action lead them to be viewed as more group motivated and, as a result, higher status. Individuals who achieve higher status are then predicted to wield more influence, be cooperated with more, and receive gifts of greater value in interactions with other group members. Additionally, as group members express greater respect to high contributing individuals, high contributors tend to view the group more positively, as indicated by their motivation to help the group, feelings of group solidarity and cohesion, and identification with the group. Thus, self-sacrifice for group goals earns the contributor a diversity of benefits, both social and material. Further, the theory outlines a "virtuous" cycle, wherein costly contributions to group efforts signals one's concern for the group, leading to expressions of respect, which enhance one's actual motivation to help the group, increasing subsequent contributions, and so on.

## STUDY 1: SOCIAL AND MATERIAL BENEFITS FOR CONTRIBUTION

I conducted a series of laboratory experiments to study the behavior of individuals in settings where group- and self-interest were at odds. In Study 1 I predict that group members will reward a higher contributor to collective action with higher status, greater influence, greater cooperation, and greater gift-giving. In addition, I predict the effect of contribution on status standing will be mediated by perceptions of the contributor's group motivation.

Participants first worked in a computer-mediated task (a “public goods game”) that created the structural conditions of the collective action problem (group and individual interests were at odds). Afterwards they were paired with a specific other group member, either a high or low contributor from the collective action setting. Participants rated their assigned partners on several survey questions designed to measure perceived group motivation and status. Following these ratings, participants and their assigned partners collaborated in a “contrast-sensitivity task,” a standard experimental setting for assessing interpersonal influence used in research on status characteristics theory (Moore 1965; Wagner et al. 1986; Troyer 2001). Next, participants were paired with their partners in two uniquely structured dyadic economic exercises reflecting different motives for possible noncooperation. Finally, participants completed a gift-giving opportunity where they divided a pool of resources between themselves and their partners.

## METHODS

### *Design and Participants*

The study featured a two-condition (“Partner” was a high/low contributor), between-subjects design. Seventy-one undergraduates (44 women, 27 men) at a large, private University participated in the study in return for pay, plus an option of extra credit in a sociology class.<sup>3,4</sup> Five participants reported either high levels of suspicion regarding the design or not paying attention at all in phase 2 of the study, and I removed them from the data analysis. Alternate analyses including suspicious participants produced qualitatively identical results. Eliminating participants who did not pay attention or were heavily suspicious of the setting is standard in past experimental research on influence (e.g., Wagner et al. 1986).

### *Procedure*

Participants arrived at a computer classroom in groups of six at a time to participate in a “Group Interaction Study.” A research assistant seated participants at separate computer terminals in a computer classroom with dividers arranged to prevent communication between participants.

I introduced participants to the study via instructions on their computer terminal. They were told that the researchers were interested in processes of group interaction in general and that they would participate in a series of group tasks, each with its own instructions. In actuality, each participant was engaging with pre-programmed fictitious “group members.”

### *Phase 1: The Public Goods Game*

In Phase 1 of the study, participants were introduced to a 6-person public goods game. In the public goods game participants were given an initial endowment (\$5) to contribute to a public fund across five rounds. In each of five rounds, participants simultaneously decided how much of \$1 they would contribute. The public good was then doubled and divided equally between all participants (Yamagishi and Kiyonari 2000). Thus, if everyone were to contribute their entire endowment to the public good, then all would receive \$10 in study pay ( $6 \times \$5 = \$30$ ,  $\times 2 = \$60$ ,  $/6 = \$10$ ). But if no one contributed anything, all would leave with only their initial \$5 endowments. Each person is presumably tempted to free-ride on the efforts of others, saving their \$5 endowment for themselves, but also receiving their share of everyone else's contributions to the public good.

The situation is therefore a social dilemma and meets the mathematical definition of an "N-person Prisoner's Dilemma" (Hardin 1971; Komorita 1976). During these rounds of the public goods game, the five simulated group members contributed an average of \$0.49 per round, ranging from a high "contributor" who gave \$0.95 on average to a low "contributor" who gave \$0.05 on average. These contribution levels are generally consistent with observed contribution levels in past public goods research (Ledyard 1995).

At the conclusion of five rounds, the computer program displayed the total contributions and earnings of each "group member." Participants were asked to write the information down on formatted totals sheets provided at each terminal. Following the results, participants were told that in phase 2 of the study they would collaborate with

another one of the “participants” in a 2-person group task. They were then “randomly assigned” one of the other five group members to be their partner. In fact participants were randomly assigned either the second highest contributor from phase 1, or the second lowest, to work with in phase 2.

Prior to the beginning of phase 2, participants were asked on their computer to indicate how well a series of qualities described their assigned “partner” using “click and drag” 100-point scales. As measures of perceived *status*, participants indicated how “honorable,” “prestigious,” and “respected” they perceived their pseudo-partner to be (Ridgeway and Erickson 2000). To measure *perceived group motivation* – the extent to which the “partner” was perceived to value the group relative to him or herself, and could therefore be expected to act to benefit the group in the future – I asked participants to rate the “partner” on a series of individual trait dimensions (“generous,” “selfish,” “cooperative”) as well as scales assessing more group-relevant qualities (how much the partner “valued others” in general, “valued the group,” and was a “team player”).<sup>5</sup> The anchors for all scales ranged from “A great deal” to “Not at all.”

### *Phase 2: Measuring Influence*

In phase 2 participants worked with their assigned partners on a “contrast-sensitivity task.” During the task, participants and their fictional partners made initial decisions on which of two checkerboard designs on the screen contains more white area. After submitting their initial answers, participants were shown the choice made by their (programmed) partners and were given the opportunity to change their choices to agree with those of the “partners,” or to stay with their original decision. The two designs in

fact contained approximately equal amounts of white space and we programmed the “partners” to disagree with the initial choice of the participant on 20 of 25 trials.

I measure the influence of the programmed “partner” as the proportion of trials in which participants decided to switch from their initial decision toward that of the partner. Following this task, I asked participants how motivated they were to do well on the task and whether they paid attention to their partner’s answers. These are considered pre-conditions for interpersonal influence in past research using this setting (e.g., Berger et al. 1977; Troyer 2001).

### *Phase 3: Cooperation and Gift-Giving*

Upon the completion of phase 2 of the study all participants were given a packet of materials that included instructions and three economic exercises. Instructions indicated that their answers (in combination with those of their partners) would lead to real money payoffs for themselves and their partners. First, the “greed game” (Simpson 2003) features a symmetric payoff structure given in Table 1a. In the game, participants profit from defecting on a partner who is expected to cooperate, but if their partner is expected to defect then the participants are indifferent to the decision as it does not affect their own payoff. Thus, defection by participants in the game reflects a motivation to exploit their partner’s cooperation.

The “fear of greed game” (Kuwabara 2005) features a more complex, asymmetric payoff structure given in Table 1b. In this game, participants profit from defecting on a partner who they expect will defect on them, but if their partner is expected to cooperate they are indifferent to the cooperation decision since it does not affect their payoff. At

the same time, the participant's partner faces an incentive to defect on the participant if the partner expects the participant to cooperate. Thus, defection by participants in the game reflects fear of exploitation from the partner. I use these two games as measures of cooperation rather than the classic "Prisoner's Dilemma" so as to separately analyze the two motives for defection – fear of exploitation and greed – that are normally confounded in the Prisoner's Dilemma (Simpson 2003).

[Table 1 about here]

Finally, participants played a "dictator game" with their partners. In the exercise the participants were asked to indicate what division of a pool of money (\$3) between themselves and their partners they most preferred. Because the person assigned to allocate money in the dictator game (the "dictator") is free to take the entire pool, the amount of money he or she allocates to the other person represents a simple, continuous measure of gift-giving. These three economic exercises provide behavioral measures of participants' motivation to exploit (the "greed game"), trust ("fear of greed game", and generosity ("dictator game") towards their assigned partners.<sup>6</sup> In sum, the experiment exposes participants to "group members" who vary greatly in their contributions to the group, measures the participants' evaluations of assigned "partners," assesses how much the participants accept the influence of the "partners," cooperates with them, and is generous towards them. These steps test predictions derived from propositions 1-4.<sup>7</sup>

## RESULTS

### *Perceptions of High and Low Contributors*

I created composite measures for group motivation and status by averaging the results for each constituent item. Reliability analyses justified the use of these composites as measures of common, underlying factors (Cronbach's alphas = .97, .90, respectively). Table 2 gives results of t-tests comparing how participants rated levels of their "partner's" group motivation and status depending on whether that "partner" was high or low contributor. As the table shows, participants rated high contributing partners to be both more group motivated and higher status than low contributing partners. These data show that "partners" who had previously contributed more to collective action in phase 1 were subsequently viewed as more motivated to help the group and more respected than lower contributing partners.

[Table 2 about here]

*Mediation Analysis: The importance of perceived group motivation*

To investigate whether participants awarded high-contributors status *because* their high contributions imply group motivation, I conducted a mediation analysis (Baron and Kenny 1986). Results are given in Figure 2. First, regression analyses showed that "partner's" contribution level predicted participants' ratings of his or her group motivation and status. Further, ratings of group motivation predicted "partner's" status standing. Finally, in a regression analysis including both contribution level and perceived group motivation as independent variables, only group motivation was significantly related to perceived status. This indicates that the effect of contribution level on "partner's" status standing operated through perceptions of his or her group motivation.

This supports the idea that contributions to the public good increased group members' status to the extent that they increased perceptions of their group motivation.

[Figure 2 about here]

### *Influence*

Next I analyzed the effects of partner's contribution level on the influence the "partner" had over the participant on the "contrast sensitivity" task. The rate of "partner's" influence on the contrast sensitivity task is calculated as the proportion of trials where participant and programmed partner initially disagreed in which participants decided to switch their answer to agree with that of their partner's. As shown in Table 2, participants who interacted in the contrast sensitivity task with a previously high contributor were influenced at a significantly higher rate than were participants who interacted with a previously low contributor.<sup>8</sup>

### *Cooperation and Gift-Giving*

Table 2 gives results for the three economic exercises. In the "fear of greed game," participants interacting with partners who were previously high contributors did not cooperate at significantly higher rates than participants interacting with low contributors, though the difference was in the predicted direction. Results of participants' behavior in the "greed" game conformed to predictions. Participants interacting with "partners" who were previously high contributors in phase 1 of the study cooperated with them at higher rates than did participants interacting with partners who were previously low contributors. This result shows that participants behaved as though they had less desire to exploit high contributors than low contributors.

I also found that participants allocated a substantially higher proportion of the dictator game pool to high contributing “partners” than to low contributing ones. This result suggests that participants felt a greater desire to be generous towards high contributors than low contributors.

## DISCUSSION

Results of Study 1 strongly supported predictions derived from the theory. Participants perceived simulated higher contributors as more group motivated and higher status than their lower contributing counterparts. The effect of earlier contribution on status standing was mediated by the extent to which the “partner” was perceived as group motivated. In addition, participants submitted more to the views of relatively high contributors than low contributors, which is important in part because it suggests the promise of further social and material benefits for the high contributor. This study also shows the material benefits that accrue for contributions. Participants were more likely to cooperate with high contributors in a greed game measuring participants’ desire to exploit their “partners” for material gain. (This result is especially impressive since the high contributing partners could logically be expected to cooperate at higher rates, and were therefore more vulnerable to exploitation.) Participants were also more generous towards previously high contributing partners in a dictator game. However, participants did not cooperate at significantly higher rates with high contributors in the “fear of greed” game. In this game defection by participants indicates fear that their partners will try to exploit them. This is somewhat surprising since partners who had previously contributed at high levels to the

public good could logically be assumed to be less interested in exploiting the participant in the ensuing “fear of greed” game.

## STUDY 2: OBERSERVERS ALSO REWARD CONTRIBUTION

Alternative explanations for the results of Study 1 exist. Significantly, an exchange-theoretic explanation of Study 1’s findings based on *direct reciprocity* is possible (e.g., Blau 1964; Homans 1974; Bienenstock & Bianchi 2004; see Molm and Cook (1995) for a review). It could be that high contributors to collective action in Study 1 earned greater status than low contributors, not because group motivation is a respected trait, but instead through a reciprocal exchange of resources for improved status.

How can an exchange-theoretic account be discerned from one based on the idea that giving to the group conveys group motivation, a characteristic that is considered meritorious? The two accounts diverge in their position on whether an *observer* of apparently group motivated behavior would hold a high contributor in high esteem. The exchange-theoretic account argues that people give respect as direct reciprocity for resources received, and therefore would not give respect for contributions they do not benefit from. However, my theory predicts people need only have reliable information regarding an individual’s group motivation and value the public good in order to respect the individual for his or her contributions. For example, contributors to charities are respected even by individuals who do not benefit from the donation.

## METHODS

To empirically test these two explanations against one another I altered Study 1 in a few important respects. Most significantly, I made participants in the study no longer active participants in the collective action setting. Instead I had them simply observe the other five study participants. To maximize the contrast between high and low contribution, participants in Study 2 were paired with either the highest or lowest contributor from the public goods game. Lastly, I dropped the “contrast sensitivity” task from the follow-up study because it involved much of the deception in the study, and therefore created relatively high rates of suspicion regarding deception in the study. Besides these changes, all other aspects of the study remained the same as in Study 1. The study featured a 2-condition (Partner high/low contributor) between-participants design. Forty-one undergraduates (25 women, 16 men) at a large, private Eastern University participated in the study in return for pay, plus an option of extra credit in a sociology class.<sup>9</sup>

## RESULTS

Composite measures for group motivation and status showed acceptable levels of reliability (Cronbach’s alphas = .98, .78, respectively). Table 3 gives results of t-tests for all dependent measures in Study 2. Participants rated high contributing partners to be significantly more group motivated and higher status than low contributing partners.

[Table 3 about here]

As in Study 1, I next investigated whether perceived group motivation mediated the relationship between contribution levels and perceptions of the partners’ status. Results of this analysis are given in Figure 3. As in Study 1, “partner’s” contribution

level significantly predicted participants' ratings of "partner's" group motivation and status. In a regression analysis with perceptions of "partner's" status as the outcome variable, and "partner's" contribution level and ratings of his or her group motivation as independent variables, only perceived group motivation had a significant effect. These findings suggest that the effects of contribution level on "partner's" status operated *through* perceptions of the "partner's" motivation to help the group.

[Figure 3 about here]

In the Fear of Greed game, participants cooperated at higher rates with high contributors than with low contributors. This replicates a prior study which found that high contributors to public goods were more trusted than low contributors (Barclay 2004). Results of participants' behavior in the greed game also confirmed predictions. Participants who interacted with high contributors cooperated with them at higher rates than did participants interacting with low contributors. These results show that participants behaved as though they had less desire to exploit, and less fear of exploitation from, high contributing partners.

I also found that participants allocated a substantially higher percentage of the dictator game pool to high contributing partners than to low contributing partners. This result indicates that participants were more inclined to be generous towards high contributors than low contributors in the dictator game is consistent with past research on indirect reciprocity (Wedekind and Milinski 2000; Milinski, Semmann, and Krambeck 2002b; Semmann, Krambeck, and Milinski 2005).

## DISCUSSION

The results of Study 2 support my claim that the status and material benefits earned by high contributors in Study 1 are attributable to the respect accorded to individuals who signal high group motivation, rather than the result of a direct reciprocity process. These results further indicate that high contributors to collective action may enjoy social and material benefits even outside the group from others who do not directly benefit from the collective action. This suggests broader benefits for contribution to collective action than just those available within the group, further highlighting how status may resolve the collective action problem.

## STUDY 3: THE SIGNIFICANCE OF SELF-SACRIFICE

I argue that contributions to collective action lead to increased status by signaling an individual's underlying group motivation. However, alternative explanations are possible. While the mediation analyses from Studies 1 and 2 offer support for the group motivation account, studies in which a mediator is experimentally manipulated - rather than measured and analyzed statistically - constitute stronger evidence for claims of mediation (Spencer, Zanna, and Fong 2005). Therefore one purpose of Study 3 is to manipulate how group motivated an individual's contributions to collective action are (versus how much underlying resources they signal) in order to determine whether the social and material benefits documented in these first two studies are in fact attributable to the signaling of group motivation.

Additionally, the theory presented here argues that contributions lead to greater perceived group motivation to the extent that they entail a) group benefit, and b) self-

sacrifice. However, in Studies 1 and 2 these two factors were confounded in the experimental manipulations of partner's contribution size. So, one additional purpose of Study 3 is to address this gap by manipulating how self-sacrificing a contribution is, while holding constant how group beneficial it is, in order to study the effects of self-sacrifice on resulting status standing independent of group benefit.

The empirical strategy I use in Study 3 to address these open questions is to manipulate the *proportionality* of the “partner’s” contribution behavior (see also Hardy and van Vugt 2006). In Study 3, half of participants were asked to evaluate a “partner” who contributed a *high proportion* of his or her available resources; the other half of participants evaluated a “partner” who contributed a more *moderate proportion*, while the actual amount contributed in both instances is held constant. This allows for a manipulation of how self-sacrificing a contribution is, while holding constant how much it benefits the group.

## METHODS

Study 3 was identical to Study 1 except for a few changes. First, rather than all endowments being set at \$5, at the beginning of the public goods game participants were told that group members would be randomly assigned different sized endowments that would be known to all group members. I told the participants that they could contribute up to a fifth of their endowment in each of the 5 rounds of the public goods game. As in Study 1, participants contributed to the public good throughout phase 1 rather than acting as observers, as in Study 2. Participants were always assigned a \$6 endowment. For half of the study participants, the group member who would become their “partner” was

identified as having a \$5 endowment; for the other half, their “partner” was given a \$9 endowment. The “partner” always contributed a total of \$4.35 to the public good. In phase 2, all experimental participants rated their “partner” on survey measures of status and group motivation, and played the three economic exercises with the “partner.” As in Study 2, to reduce suspicion and the length of study sessions, I again did not use the contrast-sensitivity measure of influence from Study 1. The procedure was otherwise the same as in Study 1. The study featured a 2-condition (“Partner” was a high versus a moderate proportional contributor) between-participants design. Ninety-seven undergraduates (69 women, 28 men) at a large, private Eastern University participated in the study in return for pay, plus an option of extra credit in a sociology class.

## RESULTS

The composite measures for group motivation and status were again reliable (Cronbach’s alphas = .93, .88, respectively). Table 4 gives results for all dependent measures in Study 3. Participants rated “partners” who contributed a high proportion of their resources to be significantly more group motivated and higher status than those who contributed a moderate proportion. These findings show that the greater apparent sacrifice made by the high proportional contributors in an effort to help the group earned them higher status and perceived group motivation.

[Table 4 about here]

I again conducted a mediation analysis, this time of the relationships between “partner’s” *proportion* contributed and participants’ ratings of his or her group motivation and status. Figure 4 shows that participants granted higher status to

“partners” that contributed a higher proportion of their resources to the extent that they were seen as more group motivated.

[Figure 2 about here]

Participants cooperated with high proportional contributors at higher rates in the fear of greed game, but not in the greed game. High proportional contributors also were not allocated more resources in the Dictator game. These findings suggest that participants who interacted with high proportional contributing partners had less fear that they would be exploited, but were not less inclined to exploit, nor more generous.

## DISCUSSION

Overall, the findings of Study 3 support the group motivation-signaling account of why participants granted “partners” high status for their contributions. Contributions that represented a higher proportion of a group member’s available resources were more respected and viewed as indicating greater group motivation because they represented greater individual sacrifices for the group. The results of Study 3 were less pronounced than those of Studies 1 and 2, with 2 of 3 behavioral measures showing non-significant differences. While this may indicate limitations to the material benefits enjoyed by very generous group members it may also be because Study 3 manipulated high versus moderate proportional giving as opposed to the prior studies that manipulated contribution level at high versus low levels.

It could be argued that the insignificant differences observed for the greed and Dictator games are consistent with an exchange theoretic account, since the partner contributed the same absolute amount across the two conditions. However, Study 2 offers

strong evidence against this account, and the smaller and less significant mean differences observed in Study 3 are more likely attributable to the smaller contrast in contribution behavior of the partner across conditions, as compared with Studies 1 and 2. The main effects of Study 3, combined with the mediation findings from Studies 1-3, all support the theoretical claim that contribution to collective action earns the contributor status because it indicates her underlying motivation to help the group, a trait that others view as meritorious.

#### STUDY 4: GAINING STATUS ENCOURAGES GROUP CONTRIBUTIONS

Studies 1-3 establish part of my status theory of collective action. They show that group members (in my studies, experimental participants) reward those other members (in my studies, programmed “partners”) for displaying group motivation by granting them status, deferring to them on tasks, cooperating with them, and being generous towards them.

But, I have not yet closed the circle and demonstrated that status rewards for contribution in turn enhance real group members’ motivations to help the group and, as a result, their future willingness to contribute. Status rewards for contribution should also engender positive feelings from the rewarded member towards the group – including identification, solidarity, and cohesion.

Study 4 was designed to test these predictions. I changed the design of the previous studies in a few important respects. Most significantly, after participants rated other “group members,” they received prefigured “feedback” on how the other “group members” rated them. I told half of participants that the other “members” held them in very high esteem and half that the other members held them in moderate esteem.

Participants then went through more rounds of the public goods game before answering several survey questions regarding their group motivation, identification with the group, perceptions of group solidarity, and perceptions of group cohesion. Importantly, the key question of this study was not how the experimental participants perceived their “partners” but how they themselves behaved in response to the “perceptions” of their “partners.” Did respect increase their group motivation and contributions?

## METHOD

Study 4 was identical to Study 1 except for a few changes. First, following phase 1 all participants rated both the second highest and second lowest “contributors” group motivation and status.<sup>10</sup> To minimize participant fatigue two of the group motivation questions and the three economic exercises were removed. After rating the two group members, participants saw the average ratings that two other anonymous “participants” had submitted about them so that they could “know a little more about the perspective of the other participants.” Participants were shown either high or moderate level ratings for how “prestigious” (ratings of 92.0 or 47.0), “honorable” (90.5 or 45.5), and “respected” (94.5 or 48.5) they were seen to be by the two other “group members.” Participants then continued on to phase 2 of the study where they participated in 5 more rounds of the public goods game.

Following new rounds of the public goods game, participants answered four questions regarding their group motivation (e.g., “How generous are you?”), three questions measuring their perceptions of the group’s solidarity (e.g., “How much solidarity do you think the group had?”), two questions regarding their degree of

identification (e.g., “How much do you identify with the group?”), and five questions regarding group cohesion, borrowed from past research on relational cohesion (Lawler and Yoon 1996; 1998).<sup>11</sup> The group motivation composite was reduced from six to four items to streamline the length of the survey. See Appendix A for complete list of questions.

The study featured a 2-condition (Participant received high/moderate status feedback) between-subjects design. Eighty-six undergraduates (60 women, 26 men) at a large, private Eastern University participated in the study in return for pay, plus an option of extra credit in a sociology class. I dropped seven participants from data analysis for expressing suspicion regarding either the status feedback or simulated participants *and* indicating that these suspicions affected their contribution behavior in phase 2.

## RESULTS

I predicted that participants who were randomly assigned high status feedback would contribute more to the group afterwards than would those who received moderate status feedback. I first tested this claim by creating a variable “change in contribution” which represents the difference between a participant’s average contribution before the ratings feedback and his or her average contributions after the feedback. Table 5 gives the means for change in contribution levels for the two conditions of the study. Participants in phase 2 increased their contributions when given high status feedback, but tended to decrease their contributions if given moderate level status feedback.

[Table 5 About Here]

I next conducted a mediation analysis to determine if participant's self-reported group motivation mediated the relationship between status rewards and change in contribution amount, i.e. did status rewards increase contributions by increasing participants' motivations to be generous towards the group? A reliability analysis justified making a composite for participants' self-reported group motivation (Cronbach's alpha = .88). Results of this analysis are given in Figure 5. First, as above, a regression analysis showed that the more highly participants were rated, the more they increased their contributions. Also, a regression analysis demonstrated that the more highly participants were rated, the more they described themselves as group motivated (e.g., "generous" and "cooperative"). This is an important finding, showing that participants' evaluations of their own motivations were shaped by what they think others think of them. Finally, a full regression analysis supports my claim that participants who received more praise increased their contributions because the praise raised their own estimation of their motivation to help the group.<sup>12</sup>

[Figure 5 About Here]

#### *Views of the Group: Solidarity, Cohesion, and Identification*

I created composites from the solidarity, cohesion, and identification questions. Each set of questions showed at least acceptable levels of reliability (Cronbach's alphas = .75, .88, .91, respectively). As shown in Table 5, participants who were given higher level status feedback perceived the group as having greater solidarity than those who received moderate status feedback. Participants given high status feedback also perceived the group as having greater cohesion than those who received moderate level status feedback, though this result only approached marginal significance. Finally, participants who were

given high status feedback also reported identifying with the group more than those who received moderate level status feedback, though this result was marginally significant.

### *Discussion*

Results of Study 4 confirm that status rewards for contribution to collective action encourage greater giving in the future. Importantly, the effects of status rewards on participants' contribution levels in Study 4 did not significantly interact with participants' prior levels of contribution ( $p > .90$ ). This suggests that people will give more after receiving esteem from group members, and less if they do not, regardless of how much they've given in the past. However, this should be considered in light of Studies 1-3, which showed that low contributors are unlikely to receive high status feedback in the first place; they instead receive low status feedback (and conversely for high contributors). Therefore, the present research suggests that low contributors receive low levels of respect from group members which leads them to give less in the future, while high contributors will receive higher respect from group members leading them to subsequently give more.

If this pattern held, over time, groups would tend to bifurcate into subgroups of contributors and free-riders as high contributors gain higher status, contribute more as a result, again achieve improved status, and so on. This dynamic would be at least superficially similar to Michels' "Iron Law of Oligarchy" (1962), which describes a tendency for a subgroup of early contributors to assume positions of leadership in the group and take on the majority of contributions and decision-making. This theoretical connection deserves further study.

It could be argued that status does not provide a solution to the collective action problem if this dynamic obtains; i.e. if status feedback leads some to contribute more, but other to contribute less, then status does not have a uniformly positive impact on group productivity. However, solutions to the collective action problem should not be expected to satisfy such a criterion. We do not observe maximal productivity in groups, nor uniformity in contributions across group members. The present research shows that collective action contributions earn individuals status and that this status affects further contribution patterns. Thus, status motivates at least some observed contributions to collective action. Furthermore, the present research shows how status structures the dynamics of who gives, how much, and under what conditions.

Though I have here followed the social psychology literature in assuming that groups' status hierarchies are zero-sum, this is an assumption deserving further investigation. It could also be the case that groups vary in their general rates of granting respect for contributions, with some groups offering copious respect for generous behavior and others offering less. If this were the case, the present research suggests that groups that grant more respect would also engender greater productivity. Indeed, organizational research indicates that workers are more productive when they feel respected in their workplace, and workplaces offering greater respect to workers are more generally productive (Tyler and Blader 2000). Future research should further investigate the exact macro-level implications of the findings presented here.

The results of Study 4 highlight the significance of Studies 1-3 by showing that the receipt of status rewards for contributions to the group may be a key factor in sustaining group productivity among rewarded group members. Status rewards also

influenced less tangible aspects of the group like feelings of solidarity and identification among group members, which themselves have important effects on the experience of group membership.

Further, status rewards affected contribution behavior by increasing participants' motivations to help the group. This suggests a novel solution to what could be called the paradox of reward-driven generosity. This paradox follows from evidence that prosocial behavior is both seemingly sincere (anonymous giving, self-reports of altruistic motives, and cases of extreme altruistic sacrifices for non-kin) but also responds to reputational incentives (people give more in public than private and often tell others about their giving). Study 4 suggests that status rewards may affect prosocial behavior not in a forward-looking, rational calculus, but instead by operating at individuals' backs, reinforcing past prosocial behavior and encouraging further giving.<sup>13</sup>

In this way, status can encourage generous behavior, not through the prospect of future rewards, but through reinforcement of past generous behavior. If such a learning dynamic were nonconscious, it would help explain how prosocial behavior in humans could be experienced as sincere and selfless, while nonetheless being responsive to past status rewards. Study 4 offers support for such an account, though other explanations for the findings of this initial test remain possible.

It's worth noting that the extent to which contributions to the group lead to greater respect will depend on the cultural beliefs shared by group members. Specifically, the more group motivation is considered a meritorious trait within a given culture, the more contributions will tend to earn an individual improved status standing among groups within, or influenced by, that culture. For example, it has been speculated that cultures

could value individual achievement and self-actualization to such an extent that self-sacrifice for others would be disrespected (Nietzsche 1989 [1887]). That said, anthropological research indicates that even highly competitive cultures, such as that of the Yanomamö (Chagnon 1988), view those perceived as making valuable contributions to group efforts as higher status.

## CONCLUSION

Collective action research investigates how people overcome the temptation to free-ride on the efforts of others, deciding instead to contribute to public goods. Until recently, status was largely overlooked as a variable in collective action research. The theory presented here asserts that individuals who contribute to collective action receive social and material benefits for their efforts, in particular improved status standing in the eyes of other group members, and that the presence of these rewards helps demystify how groups solve collective action problems. Contributions to collective action earn respect from group members by signaling that contributors value the group's well-being over their own. Experimental results show that individuals who behave in more group-motivated ways in collective action settings are seen as higher status (Studies 1-4), have more influence over other group members (Study 1), are cooperated with more often in subsequent interactions (Studies 1-3), and receive greater gifts (Studies 1 and 2). Study 2 also showed that contributors to collective action may enjoy social and material benefits from individuals outside the group as well as within.

I also found evidence that collective action contributions yield status gains for the reason specified by the theory: because they communicate the contributor's group

motivation. An exchange-theoretic alternative explanation failed to account for the results of Study 2. Mediation analyses of the results of Studies 1-3 supported the group motivation-signaling account of why collective action contributions lead to improved status. Most significantly, Study 3 demonstrated the mediating role of group motivation via a direct experimental manipulation of sacrifice a given contribution was.

The theory also proposes that individuals receiving status rewards for collective action contribution will 1) develop more positive views of the group, 2) be more motivated to help the group, and 3) will contribute more as a result. Study 4 tested these claims and showed that status rewards for collective contribution can help build group productivity, identification, and solidarity. These findings underscore the value to the group of rewarding contributions and also support a solution to the paradox of reward-driven generosity. Taken together, status rewards accrue to those who appear group-motivated in their behaviors in the group, and group motivation in turn is enhanced by status rewards, generating more contribution in the future.

This research points to a possible drawback of formal incentive systems designed to encourage contributions to public goods. Formal incentive systems likely interfere with the informal incentives of status rewards since contributions under threat of formal sanction (e.g., paying taxes, obeying the law) do not necessarily reflect concern for the group – and therefore do not earn the individual status. Though effective at maximizing group contributions, formal incentives may undermine the group's natural tendency to produce solidarity and identification among contributing members via status rewards. Indeed, recent research shows that formal sanctions can undermine trust and altruism between group members (Mulder et al. 2006; Fehr and Rockenbach 2003).

The theory also suggests that the character of a group's status hierarchy may encourage or impede contributions from its members. It is likely that groups perceived as having greater status mobility (e.g., newly formed groups without set status hierarchies) would be more likely to offer substantial status rewards that would promote future giving. For example, a union drive might be most effective at maximizing contributions of organizing time from activists when the group is new and the status hierarchy remains flexible, than later when relative position in the group is more determined. Organizations and other groups with rigid status hierarchies may struggle to promote maximal contributions from their members unless they can provide some alternative mechanism for intra-group status mobility. Groups with highly unequal status hierarchies may also face impediments to group productivity, inasmuch as group members may not be encouraged to contribute where gaps between status positions are too large.

The collective action problem is concerned not only with how social movements and other groups are organized and sustained, but also the more fundamental, Hobbesian question, *why society?* Why do individuals come together in groups to pursue collective goals, rather than pursuing purely selfish ones? Why are there groups, societies, and cultures, rather than just a population of disconnected egoists?

The status solution fits the collective action problem well in a couple of ways. The status incentive system is an informal system that does not require central, formal organization. The incentives rest in the regard members have for one another. This means that the system is not easily destroyed or undermined, and does not require any explicit management or leadership to be maintained. Also, status incentives, unlike material ones,

increase as the collective action becomes more difficult. As the task requires greater sacrifice from group members, contributing indicates even greater concern for the group.

Lest readers take these results to simply imply that it is a quid-pro-quo between group and member (status for contributions) which answers the collective action problem, I would underline the importance of both perceived and actual group motivation in the interplay of individual contributions and relative standing in the group's status hierarchy. These are critically social phenomena wherein group members carefully evaluate each other for signs of devotion to the group, far more than a simple exchange.

The collective action problem has engaged scholars for centuries before and after Hobbes. The answer to this question promises insights on the evolution of government and social institutions, as well as the movements that might be devised to reform or even overthrow them. Hobbes' *Leviathan*, the collective force we wield in the creation and maintenance of social order, is not an explicit contract. But perhaps there is an implicit social contract imbedded in our minds. That social contract, our willingness to behave in basically prosocial ways and make sacrifices for the group's welfare, may stem most fundamentally from our concern for what others think of us.

Sartre famously observed that "hell is other people," primarily because our reliance on others' considerations of us leaves us at least partly dependent on them for our own happiness (1955 [1943]). Because of this persistent concern for others' esteem, we are privately tyrannized by opinions of others even outside their presence, as even our views of ourselves are reflected to us through the eyes of many (Cooley 1902). But I suggest here that the extremity of our concern for others' opinions of us is in the end responsible for much of our happiness for the possibilities it grants: the opportunity for

society, camaraderie, and the production of public goods. Though we are pursued by our consideration of how others view us, we find ourselves at the end of the pursuit in groups, with the potential for solidarity with others.

## ENDNOTES

1. Traditionally, theories of collective action invoking selective incentives have had to answer the “second-order free-rider problem” (Oliver 1980) of “who will contribute to the administration of selective incentives?” However, if status-relevant information is automatically processed as part of normal impression formation processes, then a second-order free-rider problem need not develop.
2. Ethnographic research shows contributions to public goods, such as food production (Lemonnier 1996; Price 2003) and military service (Chagnon 1988; Patton 1996), can determine status standing, as does research in organizational settings (Flynn et al. 2006). Experimental research from evolutionary biology and economics finds group members reward generous group members with resources (Wedekind and Milinski 2000; Barclay 2004) and leadership status (Milinski, Semmann, and Krambeck 2002a; Hardy and van Vugt 2006).
3. Gender of participants did not significantly interact with any of the results of the studies reported here and is not discussed further.
4. Across all studies, those who participated for extra credit and money were assured that simply showing up was sufficient to earn the credit, thus their behavior within the study should be unaffected by the credit incentive.
5. I reran all analyses involving the group motivation composite using composites for either the individual trait ratings or the group-relevant ratings and results were qualitatively identical to those reported here.
6. Participants were given no feedback on the decisions of their “partners” after completing the economic exercises. At the completion of each session, a funnel

debriefing procedure was used to assess levels of suspicion regarding deception in the study. The goals of the research and reasons for not revealing the true nature of the study were carefully explained. Finally, participants were paid and thanked for their participation.

7. All data files are available by request from the author: willer@berkeley.edu

8. Note that none of the main effects of partner's contribution level reported in Studies 1, 3, and 4 interact with participant's contribution level in the public goods game, except the effect of partner's contribution level on influence over the participant in Study 1 did significantly interact with participant's contribution level such that the greater influence of generous partners over participants was more pronounced among selfish participants. While it is possible that higher contributing participants were less impressed by the contribution behavior of generous partners, I detect no comparable pattern in status and group motivation ratings across Studies 1, 3 and 4. Therefore, it is more likely that this interaction effect is anomalous.

9. One participant reported high levels of suspicion in the study and was removed from data analysis. Additionally, survey response results for six participants were lost due to a computer malfunction. Thus, analyses of all survey responses are limited to 34 participants, while analyses of behavior on the economic games reflect all 40 valid participants.

10. As in Studies 1-3, participants again rated high contributing group members as significantly more group motivated and higher status than lower contributing ones.

11. After these surveys, participants completed the PANAS survey of positive and negative affect (Watson, Clark and Tellegen 1988). There was no significant effect of the

study manipulation on reported positive or negative affect. This serves as evidence against the possible alternative explanation that expressions of respect increased contributions by engendering positive affect (e.g., Isen and Levin 1972).

12. Note that I did not survey participants' group motivation until after all rounds of the public goods game were concluded to avoid creating a demand effect in favor of the behavioral prediction; i.e. it could be that receiving status would lead individuals to feel greater group motivation, and then behave consistent with their self-description via a "commitment and consistency" dynamic (e.g., Cialdini 2001). However, placing measurement of the mediator at the end of the study raises the possibility that status feedback somehow affected contribution directly and only thereafter did participants perceive themselves as more group motivated. Though the mediation analysis given in Figure 5 is consistent with my theory, the present design cannot completely eliminate this alternate interpretation.

13. Other theoretical accounts of how prosocial behavior could be experienced as sincere while also responsive to past reputational rewards have emphasized evolution as the mechanism with reputational gains contributing to the reproductive fitness of humans who behave prosocially (e.g., Frank 1987; 1988).

## REFERENCES

- Anderson, Cameron, Sanjay Srivastava, Jennifer S. Beer, Sandra E. Spataro, and Jennifer A. Chatman. 2006. "Knowing Your Place: Self-Perceptions of Status in Face-to-Face Groups." *Journal of Personality and Social Psychology*. 91:1094-1110.
- Andreoni, James and Ragan Petrie. 2004. "Public Goods Experiments without Confidentiality: A Glimpse into Fund-Raising." *Journal of Public Economics*. 88:1605-1623.
- Ball, Sheryl and Catherine Eckel. 1996. "Buying Status." *Psychology and Marketing*. 13:381-405.
- Ball, Sheryl and Catherine Eckel. 1998. "The Economic Value of Status." *Journal of Socio-Economics*. 27:495-514.
- Ball, Sheryl, Catherine Eckel, Phillip J. Grossman, and William Zame. 2001. "Status In Markets." *Quarterly Journal of Economics*. 116:161-188.
- Barclay, Pat. 2004. "Trustworthiness and Competitive Altruism can also solve the 'Tragedy of the Commons.'" *Evolution and Human Behavior*. 25: 209-220.
- Baron, Reuben M. and David A. Kenny. 1986. "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations." *Journal of Personality and Social Psychology*. 51:1173-1182.
- Berger, Joseph, Bernard P. Cohen, and Morris Zelditch, Jr. 1972. "Status Characteristics and Social Interaction." *American Sociological Review*. 37:241- 55.
- Berger, Joseph, M. Hamit Fisek, Robert Z. Norman, and David G. Wagner. 1985. "Formation of Reward Expectations in Status Situations." Pp. 215-261 in *Status Rewards and Influence*, edited by Joseph Berger and Morris Zelditch, Jr. San Francisco: Jossey-Bass.
- Berger, Joseph, M.Hamit Fisek, Robert Z. Norman, and Morris Zelditch, Jr. 1977.

- Status Characteristics and Social Interaction: An Expectations States Approach.*  
New York: Elsevier.
- Bienenstock, Elisa and Alison J. Bianchi. 2004. "Activating Performance Expectations and Status Differences Through Gift Exchange: Experimental Results." *Social Psychology Quarterly*. 67:310-318.
- Blau, Peter M. 1964. *Exchange and Power in Social Life*. New York: John Wiley and Sons.
- Chagnon, Napoleon. 1988. "Life Histories, Blood Revenge, and Warfare in a Tribal Population." *Science*. 239:985-992.
- Cialdini, Robert B. 2001. *Influence: Science and Practice*, 4<sup>th</sup> edition. Boston, MA: Allyn and Bacon.
- Clark, Peter B. and James Q. Wilson. 1961. "Incentive Systems: A Theory of Organizations." *Administrative Science Quarterly*. 6:129-166.
- Cohen, Elizabeth. 1994. *Designing Groupwork: Strategies for the Heterogeneous Classroom*. New York: Teachers College Press.
- Cooley, Charles Horton. 1902. *Human Nature and the Social Order*. New York: Scribner's.
- Fehr, Ernst and Bettina Rockenbach. 2003. "Detrimental Effects of Sanctions on Human Altruism." *Nature*. 422:137-140.
- Fisek, M. Hamit, Joseph P. Berger, and Robert Z. Norman. 1991. "Participation in Heterogeneous and Homogeneous Groups: A Theoretical Integration." *American Journal of Sociology*. 97:114-42.
- Flynn, Francis J., Ray E. Reagans, Emily T. Amanatullah, and Daniel R. Ames. 2006. "Helping One's Way to the Top: Self-Monitors Achieve Status by Helping Others and Knowing Who Helps Whom." *Journal of Personality and Social Psychology*. 91:1123-37.
- Foschi, Martha. 1992. "Gender and Double Standards for Competence." Pp. 181-207

- Gender, Interaction, and Inequality*, edited by Cecilia L. Ridgeway. New York: Springer-Verlag.
- Foschi, Martha. 1996. "Double Standards in the Evaluation of Men and Women." *Social Psychology Quarterly*. 59:237-254.
- Frank, Robert. 1987. "If Homo Economicus Could Choose His Own Utility Function, Would He Want One With a Conscience?" *American Economic Review*. 77: 593-604.
- Frank, Robert H. 1988. *Passions Within Reason: The Strategic Role of the Emotions*. New York: Norton.
- Hardin, Russell. 1971. "Collective Action as an Agreeable n-Prisoners' Dilemma." *Behavioral Science*. 16:472-481.
- Hardin, Russell. 1982. *Collective Action*. Baltimore, MD: Johns Hopkins University Press.
- Hardy, Charlie L. and Mark van Vugt. 2006. "Nice Guys Finish First: The Competitive Altruism Hypothesis." *Personality and Social Psychology Bulletin*. 32:1402-1413.
- Henrich, Joseph, and Francisco J. Gil-White. 2001. "The Evolution of Prestige: Freely Conferred Status as a Mechanism for Enhancing the Benefits of Cultural Transmission." *Evolution and Human Behavior*. 22:165-196.
- Hobbes, Thomas. [1651] 1972. *Leviathan*. Penguin Books: Baltimore, MD.
- Homans, George Caspar. 1974. *Social Behavior: Its Elementary Forms* (Revised edition). New York: Harcourt, Brace and Jovanovich.
- Huberman, Bernardo A., Christoph H. Loch, and Ayse Onculer. 2004. "Status as a Valued Resource." *Social Psychology Quarterly*. 103-114.
- Isen, Alice M. and Paula F. Levin. 1972. "The Effects of 'Feeling Good' on Helping: Cookies and Kindness." *Journal of Personality and Social Psychology*. 21:384-8.
- Kollock, Peter. 1998. "Social Dilemmas: The Anatomy of Cooperation." *Annual Review of Sociology*. 24:183-214.

- Komorita, Samuel S. 1976. "A Model of the N-Person Dilemma-Type Game." *Journal of Experimental Social Psychology*. 12:357-373.
- Kuwabara, Ko. 2006. "Nothing to Fear but Fear Itself: Fear of Fear, Fear of Greed, and Gender Effects in Two-Person Asymmetric Social Dilemmas" *Social Forces*. 84: 1257-1291.
- Lawler, Edward J. and Jeongkoo Yoon. 1996. "Commitment in Exchange Relations: Test of a Theory of Relational Cohesion." *American Sociological Review*. 61:89-108.
- Lawler, Edward J. and Jeongkoo Yoon. 1998. "Network Structure and Emotion in Exchange Relations." *American Sociological Review*. 63:871-894.
- Ledyard, John O. 1995. "Public Goods: A Survey of Experimental Research." Pp. 111-168 in *The Handbook of Experimental Economics*, edited by John H. Kagel and Alvin E. Roth. Princeton, NJ: Princeton University Press.
- Lemonnier, Piene. 1996. "Food, Competition, and the Status of Food in New Guinea." Pp. 219-234 in *Food and the Status Quest: An Interdisciplinary Perspective*, edited. P. Wiessner and W. Schiefenhovel. New York: Berghahn.
- Lucas, Jeffrey W. 2003. "Theory Testing, Generalization, and the Problem of External Validity." *Sociological Theory*. 21:236-253.
- Markovsky, Barry, LeRoy F. Smith, and Joseph Berger. 1984. "Do Status Interventions Persist?" *American Sociological Review*. 49:373-382.
- Michels, Robert. 1915. *Political Parties: A Sociological Study of the Oligarchical Tendencies of Modern Democracy*. Glencoe, Il: Free Press.
- Milinski, Manfred, Dirk Semmann, and Hans-Jurgen Krambeck. 2002a. "Donors to Charity Gain in Both Indirect Reciprocity and Political Reputation" *Proceedings of the Royal Society of London B*. 269:881-883.

- Milinski, Manfred, Dirk Semmann, and Hans-Jurgen Krambeck. 2002b. "Reputation Helps Solve the 'Tragedy of the Commons.'" *Nature*. 415:424-6.
- Molm, Linda D. and Karen S. Cook. 1995. "Social Exchange and Exchange Networks." Pp. 209-235 in *Sociological Perspectives on Social Psychology*, edited by Karen S. Cook, Gary Alan Fine, and James S. House. Boston, MA: Allyn and Bacon.
- Moore, James C., Jr. 1965. "Development of the Spatial Judgment Experimental Task." Technical Report No. 15. Stanford University Laboratory for Social Research.
- Mulder, Laetitia B., Eric van Dijk, David De Cremer, and Henk A. M. Wilke. 2006. "Undermining Trust and Cooperation: The Paradox of Sanctioning Systems in Social Dilemmas." *Journal of Experimental Social Psychology*. 42: 147-162.
- Nietzsche, Friedrich. [1887] 1989. *On the Genealogy of Morals*. New York: Vintage Books.
- Oliver, Pamela E. 1980. "Rewards and Punishments as Selective Incentives for Collective Action: Theoretical Investigations." *American Sociological Review*. 85(6):1356-1375.
- Oliver, Pamela E. 1993. "Formal Models of Collective Action." *Annual Review of Sociology*. 19:271-300.
- Olson, Mancur. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Harvard: Cambridge.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: Cambridge University Press.
- Patton, John Q. 1996. *Thoughtful Warriors: Status, Warriorship, and Alliance in the Ecuadorian Amazon*. Dissertation: University of California at Santa Barbara.
- Price, Michael E. 2003. "Pro-Community Altruism and Social Status in a Shuar Village." *Human Nature*. 14:191-208.
- Rashotte, Lisa Slattery and Murray Webster. 2005. "Gender Status Beliefs." *Social*

- Science Research*. 34: 618-33.
- Ridgeway, Cecilia L. 1978. "Conformity, Group-oriented Motivation, and Status Attainment in Small Groups." *Social Psychology*. 47:175-188.
- Ridgeway, Cecilia L. 1982. "Status in Groups: The Importance of Motivation." *American Sociological Review*. 47: 76-88.
- Ridgeway, Cecilia L. and Kristan Glasgow Erickson. 2000. "Creating and Spreading Status Beliefs." *American Journal of Sociology*. 106:579-615.
- Ridgeway, Cecilia L. and Henry A. Walker. 1995. "Status Structures." Pp. 281-310 in *Sociological Perspectives on Social Psychology*, edited by Karen S. Cook, Gary Alan Fine, and James S. House. Boston, MA: Allyn and Bacon.
- Sartre, Jean-Paul. [1943] 1955. *No Exit and Three Other Plays*. Vintage Books: New York.
- Semmann, Dirk, Hans-Jurgen Krambeck, and Manfred Milinski. 2005. "Reputation is Valuable Within and Outside One's Own Social Group." *Behavioral Ecology and Sociobiology*. 57:611-616.
- Sewell, William H., Archibald O. Haller, and Alejandro Portes. 1969. "The Educational and Early Occupational Attainment Process." *American Sociological Review*. 34: 82- 92.
- Simpson, Brent. 2003. "Sex, Fear, and Greed: A Social Dilemma Analysis of Gender and Cooperation." *Social Forces*. 82:35-52.
- Spencer, Stephen J., Mark P. Zanna, and Geoffrey T. Fong. 2005. "Establishing a Causal Chain: Why Experiments are More Effective than Mediational Analyses in Examining Psychological Processes." *Journal of Personality and Social Psychology*. 89: 845-851.
- Thye, Shane R. 2000. "A Status Value Theory of Power in Exchange Networks." *American Sociological Review*. 65: 407-432.

- Troyer, Lisa. 2001. "Effects of Protocol Differences on the Study of Status and Social Influence." *Current Research in Social Psychology*. 6: 182-205.
- Tyler, Tom R. and Steven L. Blader. 2000. *Cooperation in Groups: Procedural Justice, Social Identity, and Behavioral Engagement*. Philadelphia, PA: Psychology Press.
- Wagner, David G., Rebecca S. Ford, and Thomas W. Ford. 1986. "Can Gender Inequalities Be Reduced?" *American Sociological Review*. 51:47-61.
- Watson, David, Lee A Clark, and Auke Tellegen. 1988. "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales." *Journal of Personality and Social Psychology*. 54:1063-1070.
- Wedekind, Claus and Manfred Milinski. 2000. "Cooperation through Image Scoring in Humans." *Science*. 288:850-2.
- Yamagishi, Toshio. 1995. "Social Dilemmas." Pp. 311-334 in *Sociological Perspectives on Social Psychology*, edited by Karen S. Cook, Gary Alan Fine, and James S. House. Boston, MA: Allyn and Bacon.
- Yamagishi, Toshio and Toko Kiyonari. 2000. "The Group as the Container of Generalized Reciprocity." *Social Psychology Quarterly*. 63:116-132.

Table 1: Incentive Structures of the (a) “Greed” (Simpson 2001) and (b) “Fear of Greed” games (Kuwabara 2005). Participant chooses between rows, partner chooses between columns. Participant’s payoff is given in the lower left of each cell.

A.

	Cooperate	Defect
Cooperate	<b>\$1</b>	<b>\$2</b>
Defect	<b>\$1</b>	<b>\$0.50</b>
	<b>\$0.50</b>	<b>\$0.50</b>

B.

	Cooperate	Defect
Cooperate	<b>\$1</b>	<b>\$2</b>
Defect	<b>\$2</b>	<b>\$0.50</b>
	<b>\$0.50</b>	<b>\$0.50</b>

Table 2: Means by condition for survey and behavioral dependent measures from Study

1. Standard deviations are given in parentheses.

	Partner was High Contributor Condition	Partner was Low Contributor Condition	Mean Difference	Significance
Rating of Partner's Group Motivation	78.6 (11.8)	26.9 (19.8)	51.7	<.001
Rating of Partner's Status	66.1 (14.8)	35.8 (19.3)	30.3	<.001
Partner's Influence Rate	.406 (.171)	.302 (.143)	.104	.009
Participant's Cooperation Rate in "Fear of Greed" Game	.313 (.471)	.177 (.387)	.136	.203
Participant's Cooperation in "Greed" Game	.625 (.492)	.294 (.463)	.331	.006
Participant's Donation in Dictator Game (% Given)	.403 (.167)	.250 (.215)	.153	.002

Table 3: Means by condition for survey and behavioral dependent measures from Study

2. Standard deviations are given in parentheses.

	Partner was High Contributor Condition	Partner was Low Contributor Condition	Mean Difference	Significance
Rating of Partner's Group Motivation	85.1 (12.7)	22.4 (21.9)	62.7	<.001
Rating of Partner's Status	70.7 (16.7)	39.6 (16.0)	31.7	<.001
Participant's Cooperation Rate in "Fear of Greed" Game	.476 (.512)	.150 (.366)	.3126	.025
Participant's Cooperation in "Greed" Game	.619 (.498)	.100 (.308)	.519	<.001
Participant's Donation in Dictator Game (% Given)	.371 (.180)	.171 (.194)	.200	.001

Table 4: Means by condition for survey and behavioral dependent measures from Study

3. Standard deviations are given in parentheses.

	Partner was High Proportional Contributor Condition	Partner was Moderate Proportional Contributor Condition	Mean Difference	Significance
Rating of Partner's Group Motivation	77.1 (13.2)	59.7 (15.6)	17.3	<.001
Rating of Partner's Status	63.5 (14.1)	53.0 (10.9)	10.5	<.001
Participant's Cooperation Rate in "Fear of Greed" Game	.408 (.497)	.213 (.414)	.195	.039
Participant's Cooperation in "Greed" Game	.571 (.500)	.423 (.500)	.146	.156
Participant's Donation in Dictator Game (% Given)	.394 (.177)	.366 (.183)	.028	.443

Table 5: Means by condition for survey and behavioral dependent measures from Study

4. Standard deviations are given in parentheses.

	Participant Received High Status Feedback	Participant Received Moderate Status Feedback	Mean Difference	Significance
Participant's Change in Contribution (Phase 2 minus Phase 1)	.033 (.135)	-.031 (.137)	.064	.04
Participant's Rating of Own Group Motivation	69.0 (17.5)	60.6 (17.8)	8.4	.038
Participant's Rating of Group Solidarity	38.2 (19.6)	28.7 (16.1)	9.5	.02
Participant's Rating of Group Cohesion	39.0 (20.1)	32.3 (15.9)	6.7	.106
Participant's Rating of Identification with Group	31.8 (23.3)	22.3 (19.3)	9.5	.053

Figure 2: Results of mediation analyses for Study 1 is shown below. Dotted arrows indicate that a relationship is statistically insignificant ( $p < .05$ ) in the full model.

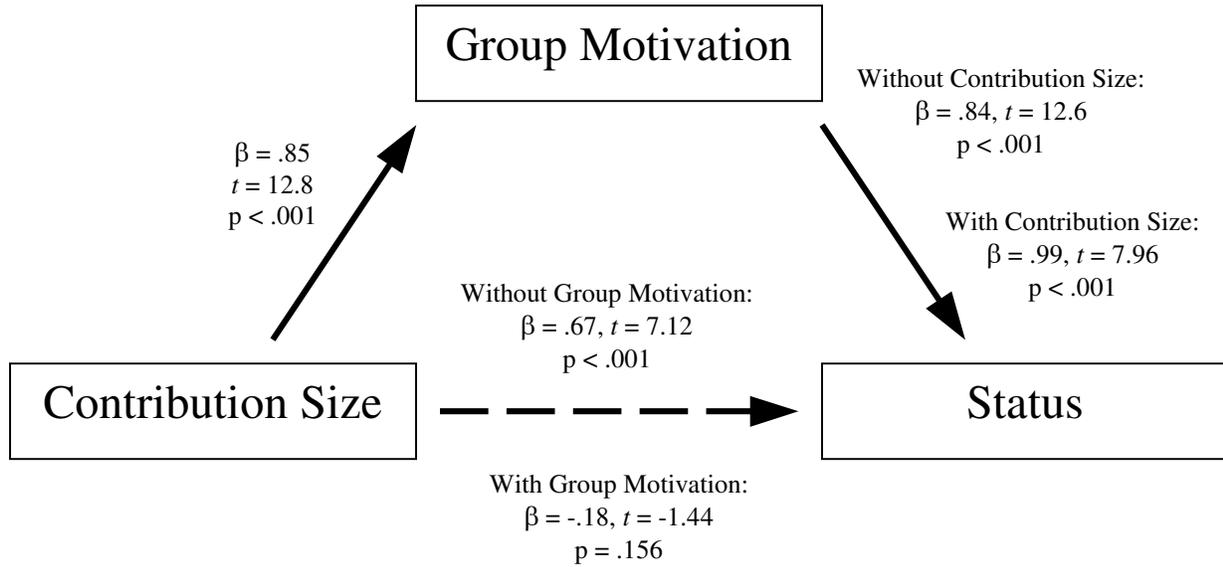


Figure 3: Results of mediation analyses for Study 2 is shown below. Dotted arrows indicate that a relationship is statistically insignificant ( $p < .05$ ) in the full model.

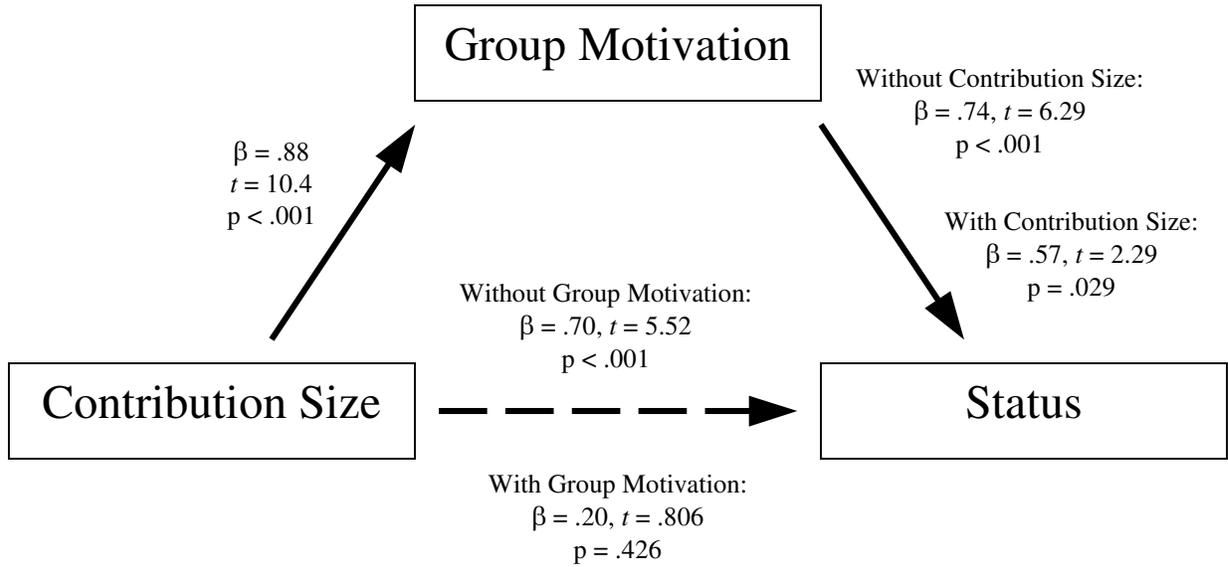


Figure 4: Results of mediation analyses for Study 3 is shown below. Dotted arrows indicate that a relationship is statistically insignificant ( $p < .05$ ) in the full model.

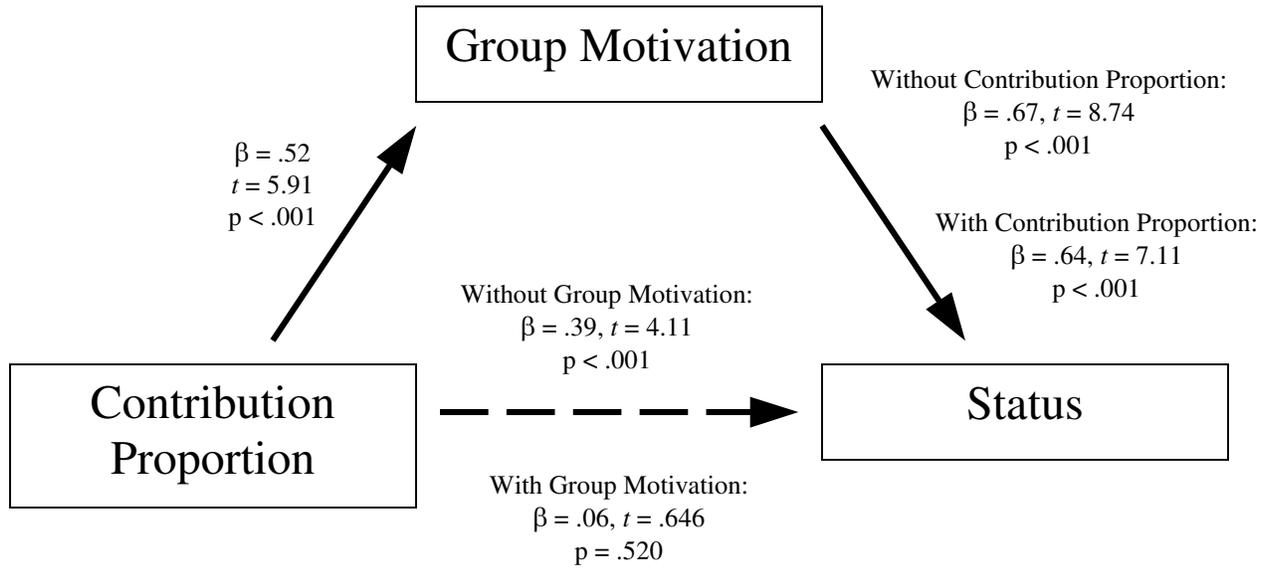
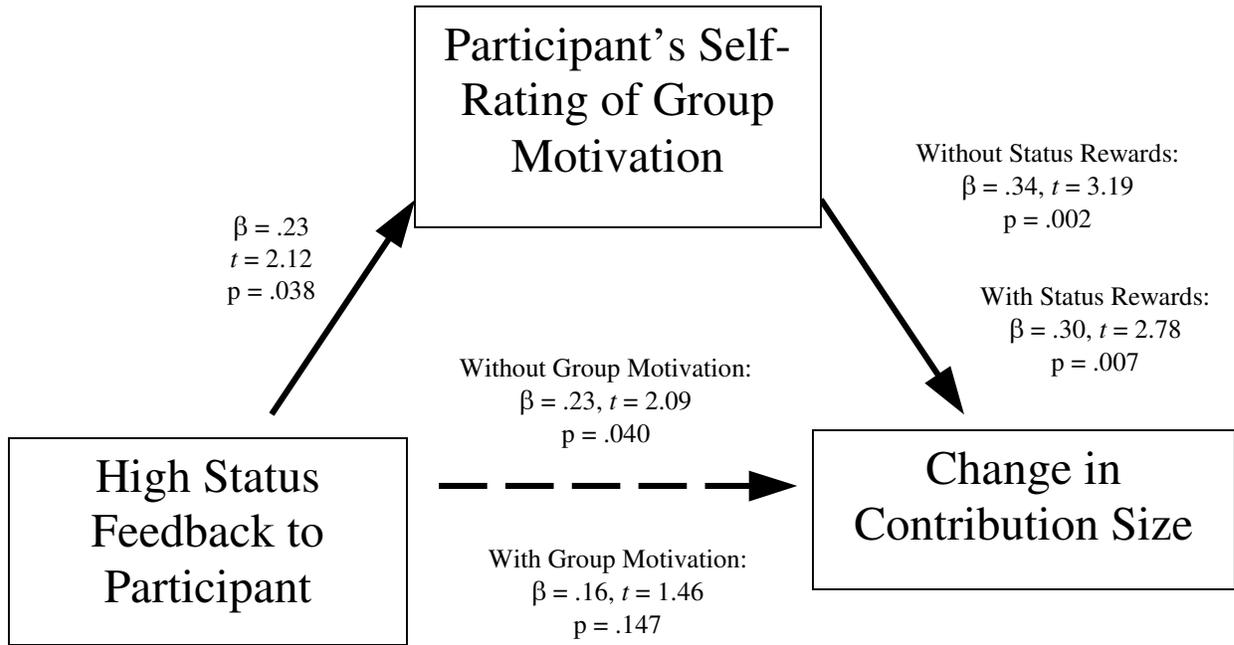


Figure 5: Results of mediation analysis for Study 4 are shown. A dotted arrow indicates that a relationship is statistically insignificant ( $p < .05$ ) in the full model.



## Appendix A: Complete Text of Questions Asked After Study 4

### *Self-Ratings of Group Motivation*

How selfish are you? [Extremely Selfish, Not Selfish At All] (Reverse-scaled)

How generous are you? [Extremely Generous, Not Generous At All]

How cooperative are you? [Extremely Cooperative, Not Cooperative At All]

How much of a team player are you? [Not a Team Player At All, Really a Team Player]

### *Perceived Group Solidarity*

How much solidarity do you think the group had? [No Solidarity At All, A Great Deal of Solidarity]

How much did the group feel like a team? [Not At All, A Great Deal]

How much do you think the group stuck together? [Not At All, A Great Deal]

### *Self-Reported Group Identification*

How much do you identify with the group? [Not At All, A Great Deal]

How much do you feel connected with the group? [Not At All, A Great Deal]

### *Group Cohesion*

“For the following questions, please indicate how you would describe the group using the two adjectives at either end of the scale below.”

[Close, Distant]

[Coming Together, Coming Apart]

[Solid, Fragile]

[Cohesive, Divisive]

[Converging, Diverging]