**Status Conferral in Intergroup Social Dilemmas:
Behavioral Antecedents and Consequences of Prestige and Dominance**

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Abstract

Bridging the literatures on social dilemmas, intergroup conflict, and social hierarchy, we systematically varied the intergroup context in which social dilemmas were embedded to investigate how costly contributions to public goods influence status conferral. We predicted that contribution behavior would have opposite effects on two forms of status – prestige and dominance – depending on its consequences for the self, in-group and out-group members. When the only way to benefit in-group members was by harming out-group members (Study 1), contributions increased prestige and decreased dominance compared to free-riding. Adding the option to benefit in-group members without harming out-group members (Study 2) decreased the prestige and increased the perceived dominance of those who chose to benefit in-group members via intergroup competition. Finally, sharing resources with both in-group and out-group members decreased perceptions of both prestige and dominance compared to sharing them with in-group members only (Study 3). Prestige and dominance *differentially* mediated the effects of contribution behavior on leader election, exclusion from the group, and choices of a group representative for an intergroup competition. Taken together, these findings show that the well-established relationship between contribution and status is moderated by both the intergroup context and the conceptualization of status.

Keywords: Social Dilemmas, Intergroup Conflict, Hierarchy, Leadership, Social Exclusion.

Individual actions that benefit others at a cost to the self often lead to status conferral. Individuals respect and admire those who renounce their self-interest and use their resources generously to help others. This robust finding has been replicated in both interpersonal (Flynn, 2003; Flynn, Reagans, Amanatullah, & Ames, 2006) and group situations (Hardy & Van Vugt, 2006; Willer, 2009). It is clear to see why, from society's standpoint, displays of pro-social behavior such as helping a colleague at work or contributing one's resources to a group instead of keeping them to oneself are rewarded with social status.

However, there is growing recognition among scholars that such contributions often take place in an *intergroup context*, where it comes at a direct cost not only to the self, but also to out-group members (Arrow, 2007; Bornstein, 2003; Bowles, 2008; Buchan et al., 2009; Choi & Bowles, 2007; De Dreu et al., 2010). The current research seeks to advance knowledge about the link between costly contributions and social status by investigating status conferral in social dilemmas that are embedded in broader intergroup contexts, in which individual decisions have consequences for the self, in-group members *and* out-group members. Thus, this research addresses important theoretical and practical questions such as: (a) what happens when self-sacrificial behavior entails costs (or forgone gains) not only to the self, but also to other people; (b) whether people confer status to individuals who simultaneously benefit in-group members and harm out-group members; and (c) whether contributions that benefit out-group members lead to status conferral in the same way that contributions that benefit in-group members do.

Social Dilemmas

Social dilemmas are group situations characterized by two properties: Each individual group member is always better off behaving selfishly (e.g., keeping one's resources, such as time, effort, or money, to oneself) regardless of what other group members do, yet the group as a

whole is better off if everyone cooperates (e.g., by contributing the same resources to a group pool) than if no one cooperates (Dawes, 1980). Examples of social dilemmas abound, from conservation of water in dry regions, to fund raisers to build new hospitals, to extra-role behaviors at work (Allison, Beggan, & Midgley, 1996; Hardin, 1968; Weber, Kopelman, & Messick, 2004). A prominent social dilemma in the United States involves contributions to National Public Radio (NPR: Weber & Murnighan, 2008). NPR's budget relies heavily on contributions from the public. The more people contribute, the higher the quality of the shows; without contributions, this public good would be lost.

The main question in the social dilemmas literature is how to motivate and sustain high levels of contribution to public goods in groups. The cooperation problem arises because public goods like NPR and clean air are available to all of the members of a group regardless of whether (or how much) they have contributed toward the resource. This payoff structure creates a clear incentive for individuals to free-ride the contributions of others while keeping their resources to themselves (Brewer & Kramer, 1986; Ostrom, 1998; van Dijk & Wilke, 2000).

Recent research on single-group social dilemmas suggests that one way in which groups motivate their members to contribute resources to public goods is by rewarding them with social status. Hardy and Van Vugt (2006) found that making contributions public (i.e., visible to fellow in-group members) significantly increased contribution rates in social dilemma games, and that individuals conferred higher status to cooperative group members. Compared to non-cooperative group members, cooperative group members were seen as more desirable group representatives and leaders; they were also rated higher on status-related dimensions such as prominence, respect, and influence. Finally, this research found that cooperative participants were rewarded materially, in addition to attaining higher status: The more a group member contributed to public

goods, the more money he or she received from individuals in a subsequent allocation task (Dictator Game).

A series of studies by Willer (2009) used a similar paradigm and found comparable results. Specifically, compared to low contributors, high contributors in a public goods game were conferred higher status, exerted greater influence over their counterpart, and their interaction partners cooperated with them more frequently in subsequent mixed-motive interactions. These status conferral effects were directly related to the cost of the contribution to the contributor; moreover, the status conferral effects were fully mediated by perceptions that contributions were motivated by a desire to promote group interests. Finally, this research found comparable effects for contributors' interaction partners and third-party observers who did not directly benefit from the contributions, suggesting that status conferral and the associated monetary rewards were not due to exchange-based reciprocity, but due to prevailing cultural norms (e.g., Campbell, 1972; 1975).

Intergroup Social Dilemmas

The studies by Hardy and Van Vugt (2006) and Willer (2009) focused exclusively on single-group social dilemmas in which individuals influenced their own outcomes as well as those of fellow in-group members. However, many contributions to public goods take place in various intergroup contexts, where they come at a direct cost not only to the self, but also to out-group members (Bornstein, 2003; De Dreu et al., 2010; Halevy, Bornstein, & Sagiv, 2008). Wit and Kerr (2002) give the example of a psychology department in which each faculty member can choose how to allocate her time and efforts between advancing her own research, helping her group (e.g., the experimental area) to obtain a larger share of the department's resources, and promoting the interests of the department as a whole. Critically, using one's time and efforts

generously to help one's group reduces the other group's (e.g., the clinical area's) chances of getting funding; it also comes at the expense of promoting the collective interests of the department as a whole (for parallel conflicts between globalism and localism, see Buchan et al., 2009; 2011).

Large-scale intergroup conflict (e.g., war) is another prominent context in which self-sacrificial contributions of money, time or efforts to help one's group come at a cost not only to the self, but also to out-group members and the world in general (Baron, 2001; Bornstein, 2003; Bornstein & Ben-Yossef, 1994; Halevy, Weisel & Bornstein, 2011; Probst, Carnevale, & Triandis, 1999). Campbell (1965, p. 24) noted that "group-level territoriality has always required that the soldier abandon for extensive periods the protecting of his own wife, children, and home"; and Dawes (1980, p. 170) observed that "soldiers who fight in a large battle can reasonably conclude that no matter what their comrades do they personally are better off taking no chances; yet if no one takes chances, the result will be a rout and slaughter worse for all the soldiers than is taking chances". Thus, the internal cooperation problem of groups facing an intergroup conflict takes the form of a social dilemma (Bornstein, 1992; 2003).

The need to distinguish single-group and intergroup social dilemmas arises because the same individual behavior – making a costly contribution toward a group effort – can have very different consequences for individuals depending on the social context in which it takes place. Specifically, whereas contribution behavior in single-group social dilemmas is commonly regarded as unequivocally positive and desirable, and leads to respect and admiration in the eyes of others (Hardy & Van Vugt, 2006; Willer, 2009), contribution behavior in intergroup social dilemmas might lead to more nuanced patterns of status conferral, depending on its consequences for the self, in-group members, *and* out-group members. This may be the case

because, unlike contributions in the context of single-group social dilemmas, costly individual contributions in the context of an intergroup social dilemma do not create more resources for everyone's benefit; rather, the gains to in-group members are offset by the losses to out-group members. Thus, from the collective point of view, contributions to intergroup conflict are a net waste of the resources invested in the competition (Baron, 2001; Halevy, Chou, Cohen, & Bornstein, 2010).

Status: Prestige versus Dominance

In addition to their focus on single-group social dilemmas, the studies by Hardy and Van Vugt (2006) and Willer (2009) share another important feature - their conceptualization of status as tapping primarily respect and admiration in the eyes of others. Consistent with our desire to uncover more nuanced patterns of status conferral in intergroup social dilemmas, we employ a conceptualization of status that distinguishes prestige and dominance, which are “two distinct paths to attaining status in human societies” (Cheng, Tracy & Henrich, 2010, p. 335; see also Henrich & Gil-White, 2001; Johnson, Burk, & Kirkpatrick, 2007; Maner & Mead, 2010).

Status is commonly defined as “the prominence, respect, and influence individuals enjoy in the eyes of others” (Anderson et al., 2006, p. 1094; for additional definitions, see: Berger, Cohen, & Zelditch, 1972; Fiske, 2010; Magee & Galinsky, 2008; Ridgeway, 1982; Ridgeway & Erickson, 2000; Willer 2009). However, recent research suggested that status can be conceptualized either as prestige or as dominance (Cheng et al., 2010; Henrich & Gil-White, 2001). Prestige captures standing or estimation in the eyes of others that leads to influence via respect and reverence. Perceptions of prestige are typically based on the belief that one possesses socially desirable skills or expertise. In contrast, dominance involves “the use of intimidation and coercion to attain a social status based largely on the effective induction of fear”, which is

created “by taking or threatening to withhold resources”. Thus, “dominance is typically seen in individuals who control access to resources...” (Cheng et al., 2010, p. 335; see also Henrich & Gil-White, 2001; Maner & Mead, 2010), or who enter every situation “expecting to be in charge or to compete for control” (Fiske, 2010, p. 942).¹

Prestige and dominance share certain core elements that merit viewing them as two kinds or types of status. For example, both prestige and dominance elicit deference from low-ranked group members (albeit for different reasons), and low-status group members might give or submit resources to those who are seen as high either in prestige or dominance (Fiske, 2010; Henrich & Gil-White, 2001). In addition, a recent study found that peer-ratings of both prestige and dominance correlated positively with perceived agency, narcissism, and leadership abilities (Cheng et al., 2010). Despite these similarities, there are also important social and psychological differences between prestige and dominance that warrant a conceptual and empirical distinction. For example, interaction partners tend to like those whom they respect (Hardy & Van Vugt, 2006), approach them, seek their proximity and advice, and imitate them (Henrich & Gil-White, 2001). In contrast, interaction partners tend to avoid and fear those who they see as dominant (Henrich & Gil-White, 2001; Papachristos, 2009), and display complementary (i.e., submissive) patterns of behavior in their presence rather than mimic them (Tiedens & Fragale, 2003).

Recently, Cheng et al. (2010) found that prestige and dominance relate differently to a host of traits and attributes. Among undergraduate students, self-rated prestige related positively whereas self-rated dominance was either unrelated or related negatively to genuine self-esteem, social acceptance, agreeableness, openness, and GPA. In contrast, self-rated dominance related positively whereas self-rated prestige related negatively to aggression (see also Johnson et al., 2007; Papachristos, 2009). A second study by Cheng et al. (2010) that examined peer-reports of

prestige and dominance among male athletes found similar relationships. Moreover, peer-rated prestige related positively whereas peer-rated dominance was either unrelated or related negatively to targets' intellectual and advice giving abilities, social skills, altruism, cooperativeness, helpfulness, ethicality, and morality (Cheng et al., 2010). Many of these traits and attributes are relevant for contribution in social dilemmas (e.g., Batson et al., 1995; Liebrand et al., 1986; Van Lange, Ouwerkerk, & Tazelaar, 2002).

Research Hypotheses

Given the differences between prestige and dominance, it is important to distinguish these two forms of status when studying the links between contributions to public goods and hierarchical differentiation in groups. The present research explores the possibility that costly contributions of resources can have different effects on prestige and dominance. Specifically, we investigate the possibility that generous contributions of resources can simultaneously *increase* prestige and *decrease* dominance. Our hypothesis that contributions to public goods may increase prestige is based on the idea that group members are likely to reward acts of generosity with prestige to recognize individuals' service to the group and to motivate them (as well as other group members) to persist and even enhance their contributions to the group (Hardy & Van Vugt, 2006; Willer, 2010). In contrast, our prediction that contributions to public goods might decrease dominance is based on the idea that dominance is achieved and maintained through "taking or threatening to withhold resources" (Cheng et al., 2010, p. 335; see also Bryan, Webster, & Mahaffey, 2011; Henrich & Gil-White, 2001). Thus, giving away resources by contributing them to the group should decrease perceptions that one is dominant.

We also explore the possibility that the effects of contribution behavior on perceptions of prestige and dominance depend on the intergroup context in which the contribution is made. We

propose that, when intergroup goal incompatibility is high (Study 1), group members might see contributors who simultaneously benefit in-group members and harm out-group members as high on prestige and low on dominance, because these group members are willing to pay a personal cost to promote group goals. In contrast, when intergroup goal incompatibility is low and group members have the option to benefit in-group members without harming out-group members (Study 2), choosing to benefit in-group members via intergroup competition might lead to low prestige and high dominance compared to benefiting in-group members without harming out-group members. Put differently, we propose that choosing to compete when there is no structural reason for groups to compete decreases prestige and increases dominance. Regardless of the level of intergroup goal incompatibility, however, free-riders who keep their resources to themselves should be seen as low on prestige and high on dominance. The idea that both free-riding and displays of out-group hate may increase dominance is consistent with the view that the desires to attain superiority in interpersonal and intergroup interactions share a common source (Hornsey, 2003), and that dominance is closely linked to both personal resource accumulation (Bryan et al., 2011) and strategic displays of intergroup aggression (Gould, 1999; 2000; Papachristos, 2009).

Research Overview

The current research systematically varied the intergroup context in which social dilemmas were embedded to investigate how individual decisions that simultaneously affect the self, in-group members and out-group members influence perceptions of prestige and dominance, as well as their behavioral consequences. Specifically, we investigated the possibility that individual choices that increase the absolute outcomes of in-group members at a cost to the self (i.e., generously contributing one's resources to benefit fellow in-group members) increase

prestige and decrease dominance, whereas individual choices that indicate a desire to maximize personal gains (i.e., free-riding) decrease prestige and increase perceptions of dominance. We also investigated the possibility that the effects of engaging in intergroup competition on prestige and dominance depend on the level of intergroup goal incompatibility. Specifically, when intergroup goal incompatibility is high (Study 1), contributing one's resources by participating in intergroup conflict should increase prestige and decrease perceptions of dominance. In contrast, when intergroup goal compatibility is low (Study 2), contributing one's resources by participating in intergroup conflict should decrease prestige and increase dominance.

We conducted three experiments to address our research questions and test these hypotheses. Study 1 used the Intergroup Prisoner's Dilemma game (Bornstein, 1992), in which costly contributions to the group pool simultaneously benefit in-group members and harm out-group members. Study 2 used the Intergroup Prisoner's Dilemma – Maximizing Difference Game (Halevy, Bornstein, & Sagiv, 2008), which allows individuals to choose whether they wish their contributions to harm out-group members or not (in addition to benefiting in-group members). Study 3 used a Nested Social Dilemma paradigm (Wit & Kerr, 2002), which allowed individuals to make costly contributions that either benefitted in-group members substantially or benefitted both in-group and out-group members equally (though both to a lesser degree).

All three studies used within-subjects experimental designs. Participants in all three experiments first received instructions and made decisions in an intergroup social dilemma game. Then they rated multiple targets on both prestige and dominance. These targets were individuals whose allocation decisions in the same game that the participants played indicated an unequivocal preference for one course of action over the other (for example, a group member who kept the initial endowment in its entirety and a group member who contributed everything

to the group pool).² This design allowed us to assess how different patterns of social behavior relate to perceptions of prestige and dominance in a variety of intergroup contexts.

Finally, Studies 2 and 3 also investigated behavioral consequences of prestige and dominance perceptions. We tested the hypothesis that prestige and dominance perceptions would *differentially* mediate the effects of target behavior (e.g., making costly contributions to the public good) on important social outcomes, including electing a leader for a subsequent round of the same social dilemma game (De Cremer & Van Vugt, 2002; Van Vugt & De Cremer, 1999); excluding individuals from the group (Ouwerkerk, Kerr, Gallucci, & van Lange, 2005; Parks & Stone, 2010); and choosing a representative for an intergroup debate competition (Maner & Mead, 2010).

Study 1: Status Conferral in Intergroup Conflict

Intergroup conflict (e.g., war, strike) typically requires that group members contribute resources such as time and effort and take personal risks to promote group interests. Because the outcomes of large-scale intergroup conflicts (e.g., land, security, collective pride) are public goods that are available to all the members of the winning group regardless of how much they contributed to their group's effort, individual group members have an incentive to free-ride the contributions of fellow in-group members. Thus, the internal collective action problem of groups facing an intergroup conflict takes the form of a social dilemma (Bornstein, 1992; 2003).

To counter the hedonic tendencies to free-ride others' contributions, most groups employ powerful 'solidarity mechanisms' (Campbell, 1972; 1975; Gould, 1999), including a moral code that values self-sacrificial behavior during intergroup conflict (Cohen, Montoya, & Insko, 2006; Levine & Campbell, 1972). Thus, individuals displaying self-sacrificial behavior at times of conflict (i.e., when intergroup goal compatibility is high) are often venerated as heroes *because*

their actions serve in-group members *despite* the harm inflicted on out-group members. These perceptions plausibly reflect group members' tendencies to focus on the positive outcomes of individuals' actions for in-group members while downplaying their negative implications for out-group members and the world in general (i.e., parochialism: Baron, 2001; Bowles & Gintis, 2004; Lowery et al., 2006).

Study 1 allowed us to test two competing hypotheses. One possibility is that, consistent with the positive relationship between pro-social behavior and prestige (Flynn et al., 2006; Hardy and Van Vugt, 2006; Willer, 2009), and the negative relationship between pro-social traits and dominance (Cheng et al., 2010), costly contributions that simultaneously benefit in-group members and harm out-group members would lead to high prestige and low dominance. The alternative is that, consistent with the negative relationship between aggression and prestige and the positive relationship between aggression and dominance (Cheng et al., 2010; Study 2; Johnson et al., 2007; Papachristos, 2009), costly contributions that simultaneously benefit in-group members and harm out-group members would lead to low prestige and high dominance. Given that intergroup goal incompatibility in Study 1 was high, we expected to find support for the former hypothesis, which predicts that group members would value displays of parochial altruism (Arrow, 2007; Baron, 2001; Bowles & Gintis, 2004; Choi & Bowles, 2007).

To investigate how costly contributions during an intergroup conflict relate to perceptions of prestige and dominance, Study 1 employed the Intergroup Prisoner's Dilemma (IPD) game, an experimental task that captures the aforementioned properties of social dilemmas embedded in the context of an intergroup conflict (Baron, 2001; Bornstein, 1992; 2003; Bornstein & Ben-Yossef, 1994; Goren, 2001; Probst, Carnevale & Triandis, 1999).

Method

Participants and Procedure. Sixty-six Stanford University students (62.9% female; age: $M = 21.2$, $SD = 3.1$) were recruited from a large subject-pool. They arrived at the laboratory in groups of 8-12 participants and were each seated in a private cubicle. Participants read the instructions, made their decisions and responded to the post-decision questionnaire using the computer.

The Intergroup Prisoner's Dilemma (IPD) game. Participants learned that they had been randomly assigned to a four-person group, and that their group was randomly yoked to another four-person group. They did not know who was in their group or in the other group and could not communicate with any of the other participants in their session. Each participant was endowed with 10 game chips and had to decide how to allocate them. Each chip that was kept paid \$2 to the individual; each chip that was contributed to the group pool added \$1 to each in-group member including the contributor; in addition, it subtracted \$1 from each out-group member. Thus, the same action simultaneously benefitted in-group members and harmed out-group members.⁴

Participants learned that one four-person group would be randomly chosen and paid based on the outcomes of the game. Thus, the participants of the randomly chosen group could earn up to \$40 each. The instructions for the decision-making task were phrased in neutral language and there was no mention of the words cooperation or competition. Finally, participants were assured that their decisions would remain anonymous even after the experiment was over.

Dependent Measures. After participants had read the instructions and made their decisions in the IPD game, they indicated on five-point scales (1 = *completely disagree*, 5 = *completely agree*) how much they agreed with each of four statements. Two items assessed perceptions of prestige: "I respect and admire people who keep all the initial endowment to

themselves (contribute all the initial endowment to the group pool)”. Two additional items assessed perceived dominance: “I see people who keep all the initial endowment to themselves (contribute all the initial endowment to the group pool) as dominant and power-seeking”. These items were phrased to closely match scholarly and lay definitions of prestige and dominance (Henrich & Gil-White, 2001, p. 168; cf. Cheng et al. 2010; Fiske, 2010; Magee & Galinsky, 2008). Throughout the paper, we refer to the “people” that our participants rated on prestige and dominance as “targets”. We contrasted perceptions of targets whose contributions behavior indicated an unequivocal preference for one course of action over the other (i.e., contributed nothing vs. contributed everything) to assess the perceived prestige and dominance of clear prototypes—free-riders versus unreserved contributors (e.g., Weber & Murnighan, 2008).

Results

On average, participants kept 60.8% of the initial endowment to themselves and contributed the remaining 39.2% to the group pool. Repeated-measures ANOVAs of the prestige and dominance items found significant effects of target behavior on prestige, $F(1,65) = 14.11$, $p < .001$ and dominance $F(1,66) = 13.02$, $p = .001$. As shown in Table 1, the targets who contributed their entire endowment to the group pool were perceived as significantly higher in prestige but significantly lower in dominance compared to the targets who kept the initial endowment to themselves.

In addition, own contribution behavior correlated in predictable ways with perceptions of prestige and dominance. The more participants contributed, the lower they rated the free-riding target on prestige ($r = -.42$, $p < .001$) and the higher they rated that target on dominance ($r = .24$, $p = .06$). The more the participants contributed, the higher they rated the contributing target on prestige ($r = .42$, $p < .001$); ratings of the contributing target on dominance were unrelated to

participants' contribution behavior ($r = -.03, p = .83$). Finally, prestige and dominance perceptions correlated negatively for the free-riding target ($r = -.36, p = .003$), but not for the contributing target ($r = -.08, p = .52$).

 Insert Table 1 about here

Discussion

Study 1 extends previous research by showing that contribution to public-goods in the context of intergroup conflict simultaneously increases perceptions of prestige and decreases perceptions of dominance. These results mirror previous findings in the context of a structurally equivalent single-group social dilemma (i.e., a four-person Prisoner's Dilemma game: Halevy & Chou, 2011). These findings are also consistent with the literature on parochialism, which suggests that people tend to care primarily about the outcomes of a course of action for their in-group and less about its consequences for out-group members (Baron, 2001; Bowles & Gintis, 2004; Lowery et al., 2006). Thus, participants plausibly interpreted contributions as selfless acts of generosity aimed at benefiting fellow in-group members rather than as competitive acts of aggression toward out-group members.

A notable limitation of Study 1 is that the structure of the IPD game does not allow us to conclude with certainty that individuals conferred prestige to contributors because their actions benefitted in-group members. Since contributors' actions also harmed out-group members, it is possible that participants conferred prestige to group members because they behaved competitively toward out-group members. Similarly, because harming out-group members co-varied with benefitting in-group members, Study 1 could not test the hypothesis that displaying aggression toward out-group members increases perceived dominance. Study 2 was designed to explore these possibilities directly. It also investigated whether prestige and dominance mediate

the effects of target behavior on leader election, exclusion from the group, and choice of a group representative for an intergroup debate competition.

Study 2: Status Conferral as a Function of In-group Love and Out-group Hate

To study the distinct effects of benefiting in-group members versus harming out-group members on perceptions of prestige and dominance, Study 2 used a different type of an intergroup social dilemma game – the Intergroup Prisoner’s Dilemma–Maximizing Difference game (IPD-MD: Halevy et al., 2008). In this experimental game, individuals have three behavioral alternatives. In addition to selfishly keeping the initial endowment, they can make a costly contribution to one of two pools: A “within-group pool” that benefits in-group members without affecting out-group members in any way (similar to the single-group public goods games employed by Hardy & Van Vugt, 2006 and Willer, 2009), and a “between-group pool” that simultaneously benefits in-group members and harms out-group members (similar to the “group pool” in the IPD game used in Study 1). Importantly, contributions to either one of these two pools are equally costly to the self and equally beneficial to in-group members; the only difference is that contributions to the latter pool also harm out-group members. Thus, this game essentially allows group members to choose whether they wish their contributions to harm out-group members or not.

Contributions to the within-group pool in this game are considered manifestations of “in-group love” whereas contributions to the between-group pool are considered manifestations of “out-group hate” (De Dreu, 2010; De Dreu et al., 2010; Halevy et al., 2010). Thus, by using the IPD-MD game, Study 2 investigates how selfishness (free-riding), in-group love and out-group hate affect perceptions of prestige and dominance. Consistent with the findings of Study 1, we expected that free-riders (those who keep all of their endowments) will be rated low on prestige

and high on dominance. Also consistent with Study 1, we predicted that generous contributions to the within-group pool will lead to perceptions of high prestige and low dominance. However, we predicted that, because contributions to the between-group pool in this context are outright aggressive (and do not benefit the in-group more than contributions to the within-group pool), they will lead to perceptions of low prestige and high dominance.

Behavioral Consequences of Prestige and Dominance Perceptions

Study 2 also investigated social consequences of displaying selfishness, in-group love, and out-group hate in the IPD-MD game, as well as the possibility that prestige and dominance perceptions differentially mediate the effects of target behavior on these outcomes.

A common organizational solution to the free-rider problem in groups involves electing or appointing a leader to regulate the provision of public goods. Previous research suggests that instrumental, relational and identity considerations all influence leadership choices in social dilemmas (De Cremer & Van Vugt, 2002; Messick et al., 1983; Van Vugt & De Cremer, 1999). Thus, group members desire leaders who will increase their material outcomes and affirm their positive social identity.

We predicted that prestige, but not dominance, will mediate the effects of the target's past behavior on leader election for a subsequent, *non-competitive*, intergroup interaction. In non-competitive intergroup interactions, a generous leader who is motivated to maximize the absolute outcomes of in-group members is likely to increase in-group members' material outcomes and affirm their positive social identity (De Cremer & Van Vugt, 2002). In contrast, we predicted that dominance, but not prestige, will mediate the effects of the target's past behavior on choices of a group representative for a subsequent, *competitive*, intergroup interaction. In competitive intergroup interactions, a competitive representative who is willing to harm others to attain

benefits for in-group members (including himself) is likely to increase in-group members' material outcomes and affirm their positive social identity (De Cremer & Van Vugt, 2002).

Finally, we investigated the possibility that perceptions of high prestige would protect a target from being excluded from the group. This prediction is consistent with previous research on perceptions of “bad apples” in social dilemmas (Kerr et al., 2009; Ouwerkerk et al., 2005; cf. Parks & Stone, 2010), which found that people show intolerance toward group members whose actions are seen as violating desirable group norms, and wish to banish them from the group. Given that admiration and respect reflect high regard for one's actions and contributions to the group (Willer, 2009) prestige should negatively predict the desire to expel an individual from the group.

Method

Participants and Procedure. Sixty Stanford University students (69% female; age: $M = 21$ years, $SD = 4.7$) were recruited from the same subject-pool as Study 1. The experimental procedures, including payment of money contingent on participants' decisions, were identical to those employed in Study 1, with three exceptions. First, Study 2 used the IPD-MD game. Second, participants in Study 2 were asked to rate three targets (instead of just two) on perceived prestige and dominance: individuals who kept the entire initial endowment; individuals who contributed everything to the within-group pool (i.e., benefitting fellow in-group members *without* harming out-group members); and individuals who contributed everything to the between-group pool (i.e., benefiting fellow in-group members *and* harming out-group members). Finally, we assessed behavioral reactions towards these three targets, as explained below.

The IPD-MD game. Participants learned that they had been randomly assigned to a four-person group and that their group had been randomly yoked to another four-person group. They

did not know who was in their group or who was in the other group and could not communicate with any of the other decision makers in their session. Each participant was endowed with 10 game chips and had to decide how to allocate them. We used the same parameters of the IPD-MD game employed in previous research (Halevy et al. 2008) as well as in the IPD game in Study 1. Thus, each chip that was kept paid \$2 to the individual; each chip that was contributed to the within-group pool added \$1 to each in-group member including the contributor; each chip that was contributed to the between-group pool added \$1 to each in-group member including the contributor and subtracted \$1 from each out-group member. We used color names to label the two group pools. Thus, participants decided how much of their initial endowment to keep for themselves, contribute to the blue pool, and contribute to the green pool.⁵

Behavioral Consequences. After the participants made their IPD-MD decisions and rated the three targets on prestige and dominance, they were informed that they would make subsequent decisions which also involved real money (to the extent that their group was chosen in the raffle). Specifically, the participants learned that they might be asked to engage in subsequent group tasks and were instructed to make three choices for these subsequent group tasks.

Leader Election. The participants were informed that they might participate in another round of the same intergroup decision-making task (i.e., the IPD-MD game). Participants were asked to indicate using a 5-point scale (ranging from “not at all” to “very much”) how much they would like to have each of the three targets (i.e., “a group member who kept all the initial endowment / contributed all of it to the green pool / contributed all of it to the blue pool”) as a group leader for this subsequent round of the IPD-MD game (De Cremer & Van Vugt, 2002). The instructions informed the participants that “The group leader will control all the tokens and

will make the decision on behalf of all the group members”, and that “The group member who best matches the description that is preferred by the group will be the elected leader.”

Exclusion from the Group. Participants were also asked to indicate, using the same 5-point scale, how much they would like to expel each of the three targets from the group, knowing that the group member who best matches the description of the target that most group members voted to expel from the group would not participate in the subsequent round of the IPD-MD game.

Choice of a Representative for an Intergroup Debate Competition. Participants also indicated, using the same 5-point scale, how much they would like each of the three targets to represent their group in an intergroup debate competition. They were informed that the winner of this competition will win \$10 for each of their group members (including themselves), and that the group member who best matches the description that is preferred by the group will be chosen as the group representative for this task.

Results

Tables 2 and 3 summarize the main effects and the results of the mediation tests for Study 2. The cells below the diagonal in Tables 4-6 present the correlations between participants' contribution behavior, prestige and dominance perceptions, and the social outcome measures.

Contribution Behavior. On average, participants kept 54.7% of the initial endowment, contributed 30.8% of their resources to the within-group pool and the remaining 14.5% to the between-group pool.

Prestige. Consistent with our hypothesis, a repeated-measures ANOVA of prestige found a significant effect of target behavior, $F(2,118) = 24.90, p < .001$. As shown in Table 2, targets who displayed in-group love were rated significantly higher on prestige compared to both targets

who kept the initial endowment and those who displayed out-group hate. Perceptions of prestige were not significantly different for targets who kept the initial endowment and those who simultaneously benefited in-group members and harmed out-group members by contributing to the between-group pool.

Dominance. Also consistent with our hypothesis, a repeated-measures ANOVA of dominance found a significant effect of target behavior, $F(2,116) = 24.65, p < .001$. As shown in Table 2, targets who displayed in-group love were seen as significantly less dominant compared to both targets who kept the initial endowment to themselves and those who displayed out-group hate. Self-interested accumulation of resources led to similar perceptions of dominance as displaying aggression toward out-group members.

Leader Election. A repeated-measures ANOVA of leadership endorsements found a significant effect of target behavior, $F(2,118) = 24.55, p < .001$. As shown in Table 2, participants endorsed targets who displayed in-group love significantly more strongly as their group leader than both targets who kept the initial endowment and those who displayed out-group hate. Leadership endorsements were similar for targets who kept the initial endowment and those who simultaneously benefited in-group members and harmed out-group members.

Exclusion from the Group. A repeated-measures ANOVA of exclusion choices found a significant effect of target behavior, $F(2,118) = 15.36, p < .001$. The desire to expel targets who displayed in-group love from the group was significantly weaker than the desire to expel either those who kept the initial endowment to themselves or those who displayed out-group hate from the group. Desire to expel from the group did not significantly differ for targets who kept the initial endowment and those who simultaneously benefited in-group members and harmed out-group members.

Group Representative for Intergroup Debate Competition. A repeated-measures ANOVA of the endorsements for the group representative role did not find a significant effect of target behavior, $F(2,118) = 1.34, p = .27$. As shown in Table 2, targets who displayed in-group love were endorsed as strongly for the representative role as targets who kept the initial endowment, and both of these targets were endorsed only slightly less than targets who simultaneously benefited in-group members and harmed out-group members.

Mediation Analyses. We subsequently analyzed whether the effects of target behavior on behavioral consequences were mediated by prestige and dominance perceptions. Because our design involved within-subject comparisons, we followed the analytical procedure recommended by Judd, Kenny, and McClelland (2001) for testing mediation in a within-subject design. Essentially, we tested whether the difference scores in prestige and dominance perceptions between different targets predicted the difference scores in behavioral consequences for the same targets using a series of regression analyses (Judd et al., 2001; for similar applications see: Dotsch & Wigboldus, 2008; Ito, Thompson, & Cacioppo, 2004).

As a first step, we mean centered prestige and dominance perceptions by subtracting the mean of prestige from each participant's prestige perception, and the mean of dominance from each participant's dominance perception. Second, we calculated three sets of difference scores: (a) for prestige perceptions; (b) for dominance perceptions; and (c) for each of the three behavioral measures. Third, based on the main effects depicted in Table 2, we contrasted the free-riding and out-group hate conditions with the in-group love condition. For example, the difference score for leader election was calculated by assigning the coefficients (1, 1, -2) in the following equation: $Y_{Free-riding\ i} + Y_{Out-group\ Hate\ i} - 2Y_{In-group\ Love\ i}$, with Y being the leader endorsement score. Following Judd et al.'s (2001) recommendation, we scaled the mean-

centered prestige and dominance perceptions to relate positively to each of the three outcome measures. However, for ease of interpretation, we use minus signs where necessary when reporting the results in Table 3 to indicate both the magnitude of the behavioral differences that could be explained by the prestige and dominance differences and the direction of the relationship. Finally, using SPSS, we analyzed the data using the following regression expression:

$$\begin{aligned}
 Y_{Di} &= Y_{ai} + Y_{bi} - 2Y_{ci} \\
 &= (\delta_{10} + \delta_{20} - 2\delta_{30}) + \left(\frac{\delta_{a1} + \delta_{b2} - 2\delta_{c3}}{6} \right) Prestige_{Di} \\
 &\quad + \left(\frac{\delta_{a1} + \delta_{b2} - 2\delta_{c3}}{6} \right) Dominance_{Di} + (\varepsilon_{ai} + \varepsilon_{bi} - 2\varepsilon_{ci})
 \end{aligned}$$

with Y_{Di} being the difference scores for each of the three outcome measures. A significant coefficient for either Prestige or Dominance would indicate that people's perception of prestige or dominance mediated the behavioral outcome measures across the three targets.

As shown in Table 3, consistent with our hypotheses, prestige and dominance differentially mediated the effects of target behavior on social outcomes. Specifically, prestige mediated the effects of target behavior on leader election and desire to expel individuals from the group and dominance completely mediated (James, Mulaik, & Brett, 2006) the effects of target behavior on endorsements for a group representative role.

 Insert Tables 2 and 3 about here

Correlations between Contribution Behavior, Prestige and Dominance Perceptions, and Behavioral Reactions

We also explored the relationships between participants' contribution behavior, their prestige and dominance ratings of the targets, and the participants' behavioral reactions. Three

main findings emerge from Tables 4-6. First, individuals tend to confer prestige to those who behave in the same way that they did. Thus, free-riders respect and admire free-riders whereas “in-group lovers” respect and admire “in-group lovers”; the correlation for “out-group haters” was similarly positive but did not reach significance. These findings plausibly show an egocentric bias in ratings of prestige. Second, for each of the three targets, prestige increased leader endorsement and decreased the desire to expel that target from the group. Finally, for all three targets, prestige and dominance were either uncorrelated or negatively correlated.

 Insert Tables 4-6 about here

Discussion

There are two important findings to Study 2. The first concerns the opposite effects of contributions to the within-group pool versus the between-group pool on perceptions of prestige and dominance. Contributors to both pools paid a personal cost – they were willing to accept lower payments to themselves. Moreover, contributors to both pools benefitted in-group members exactly to the same degree. Nonetheless, contributors to the within-group pool were seen as high in prestige and low in dominance, whereas contributors to the between-group pool were seen as high in dominance and low in prestige. Thus, individuals conferred prestige to others who benefitted in-group members, but saw those who harmed out-group members for no obvious reason (i.e., no additional benefit to the self or to in-group members) as dominant, and did not confer prestige on them despite the fact that they paid the same personal cost and provided as much benefit to the in-group members as those who contributed to the within-group pool.

This pattern of findings also clarifies the findings of Study 1. Recall that in Study 1, the same behavior – simultaneously benefitting in-group members and harming out-group members

– led to high prestige and low dominance perceptions. Adding the option to benefit in-group members without harming out-group members in Study 2, which decreased intergroup goal incompatibility, reversed this pattern of status conferral. This finding suggests that the social meaning attached to a particular course of action depends on the alternative courses of action that are available in the choice set. Study 2's findings also suggest that our Study 1 participants probably weighted the positive outcomes for in-group members more heavily than the negative outcomes for out-group members when evaluating contributors in the IPD game. Put differently, these targets' contributions were probably attributed to in-group love rather than out-group hate (Halevy et al., 2008).

The second important finding is that prestige and dominance differentially mediated the effects of target behavior on important social outcomes, including leader and representative elections and exclusion from the group. Overall, these findings add to those of Study 1 in highlighting the importance of decomposing status by showing that perceptions of prestige and dominance result from profoundly different behaviors of group members, and lead to profoundly different social consequences.

So far, our studies have consistently shown that benefitting in-group members by contributing resources to help the in-group leads to higher perceptions of prestige compared to free-riding. Study 2 also showed that, when intergroup goal incompatibility is low, trying to maximize the in-group's relative advantage over an out-group (by contributing to the between-group pool) rather than its absolute outcomes (by contributing to the within-group pool) decreases prestige and increases perceived dominance. These findings raise the question of how generous contributions to public goods that benefit both in-group and out-group members to the same extent affect perceptions of prestige and dominance. Study 3 addressed this question.

Study 3: Status Conferral as a Function of In-group Love and Universalism

Individuals have limited resources (e.g., time, money, effort). Hence, sharing them with both in-group and out-group members potentially disadvantages in-group members compared to sharing the same resources only with in-group members. This rationale plausibly underlies the consistent findings concerning the pervasiveness of in-group favoritism in resource allocation (for reviews, see: Buhl, 1999; Hewstone, Rubin & Willis, 2002). Thus, one possibility is that group members will not attribute prestige to individuals who use their limited resources to benefit in-group members and out-group members equally (rather than favoring in-group members over out-group members in their resource allocation). If, on the other hand, perceptions of high prestige follow from acts of generosity irrespective of the identity of the recipients, then individuals who generously contribute personal resources either to help only in-group members (i.e. display in-group love) or to help both in-group and out-group members equally (i.e., display in-group and out-group love, or universalism: Schwartz, 1992) should be seen as high on prestige.

By the same token, if bounded generosity that is directed at benefitting in-group members only is seen as a way of maximizing relative group gains via in-group favoritism, then it should lead to higher perceptions of dominance compared to non-discriminatory generosity that benefits both in-group and out-group members equally. However, if any display of generosity decreases dominance irrespective of the identities of the beneficiaries, then in-group love and universalism should lead to equally low levels of perceived dominance. Study 3 investigated how free-riding, in-group love, and universalism affect perceptions of prestige and dominance by using a Nested Social Dilemma paradigm (Buchan et al., 2009; 2011; Wit & Kerr, 2002). Similar to Study 2, it

also investigated the possibility that prestige and dominance perceptions differentially mediate the effects of target behavior on social outcomes.

Method

Participants and Procedure. Sixty-one Stanford University students (60% female; age: $M = 22$, $SD = 4.4$) were recruited from the same subject-pool as the previous studies. The experimental and data analytic procedures, including payment of money contingent on participants' decisions, assessment of prestige and dominance, and measurement of behavioral consequences, were identical to those employed in Study 2 with two exceptions. First, Study 3 used a Nested Social Dilemma paradigm (Buchan et al., 2009; 2011; Wit & Kerr, 2002). Second, the participant rated on prestige and dominance the following targets: individuals who kept the initial endowment in its entirety; individuals who contributed everything to the within-group pool (thereby benefitting only in-group members); and individuals who contributed everything to the collective pool (thereby benefitting both in-group and out-group members). Pools were presented to participants using color labels as in Study 2.

The Nested Social Dilemma game. Participants learned that they had been randomly assigned to a four-person group and that their group has been randomly yoked to another four-person group. They did not know who was in their group or who was in the other group and could not communicate with any of the other participants in their session. Each participant was endowed with 10 game chips and had to decide how to allocate them. Each chip that was kept paid \$2 to the individual; each chip that was contributed to the within-group pool added \$1 to each in-group member including the contributor; each chip that was contributed to the collective pool added \$0.50 to each in-group member including the contributor as well as to each out-group member. Thus, contribution of a chip to either pool created a total of \$4; by deciding between the

within-group pool and the collective pool participants essentially chose whether they wanted this sum to be shared just among in-group members or among everyone.⁶

Results

Tables 2 and 3 summarize the main effects and the results of the mediation tests for Study 3. The cells above the diagonal in Tables 4-6 present the correlations between participants' contribution behavior, prestige and dominance perceptions, and the social outcome measures.

Contribution Behavior. On average, participants kept 61.3% of the initial endowment, contributed 26.7% of their resources to the within-group pool and the remaining 12% to the collective pool.

Prestige. A repeated-measures ANOVA of prestige found a significant effect of target behavior, $F(2,118) = 9.10, p < .001$. As shown in Table 2, free-riders were rated significantly lower on prestige compared to both targets who showed in-group love and targets who showed universalism. Targets who showed universalism, in turn, were rated marginally lower on prestige compared to the targets that showed in-group love by sharing resources with in-group members only.

Dominance. A repeated-measures ANOVA of dominance found a significant effect of target behavior, $F(2,118) = 32.16, p < .001$. As shown in Table 2, free-riders were seen as significantly higher on dominance than the targets who showed in-group love by contributing to the within-group pool, which in turn, were rated significantly higher on dominance compared to the targets that showed universalism by contributing to the collective pool.

Leader Election. A repeated-measures ANOVA of leadership endorsements found a significant effect of target behavior, $F(2,118) = 6.832, p = .002$. As shown in Table 2, targets who displayed in-group love were endorsed significantly more strongly for the group leader role

compared to both the targets who kept the initial endowment and those who displayed universalism. Leadership endorsements were similar for targets who kept the initial endowment and those who simultaneously benefited in-group and out-group members.

Exclusion from the Group. A repeated-measures ANOVA of exclusion choices found a significant effect of target behavior, $F(2,118) = 6.828, p = .002$. The desire to expel from the group targets who displayed in-group love was significantly weaker than the desire to expel from the group either those who kept the initial endowment to themselves or those who displayed universalism. Desire to expel from the group did not significantly differ for targets who kept the initial endowment and those who benefited both in-group and out-group members.

Group Representative for Intergroup Debate Competition. A repeated-measures ANOVA of the endorsements of targets for the representative role found a significant effect of target behavior, $F(2,118) = 6.32, p = .002$. As shown in Table 2, the targets who displayed either selfishness or in-group love were endorsed for the group representative role more strongly than the targets who showed universalism. Free-riders and contributors to the within-group pool were endorsed for this role at similar levels.

Mediation Analyses. Similar to Study 2, we subsequently analyzed whether the effects of target behavior on behavioral consequences were mediated by prestige and dominance perceptions using the procedure recommended by Judd et al. (2001). Also similar to Study 2, we used the main effects from Table 2 to inform our contrasts. In Study 2 we consistently contrasted free-riding and out-group hate with in-group love because a clear and consistent pattern emerged that differentiated the targets that showed in-group love from the other two targets. In Study 3, our contrast coefficients changed for different dependent variables depending on the results depicted in Table 2. Thus, for leader election and exclusion from the group, we contrasted the

targets that displayed free-riding and those who displayed universalism with those who displayed in-group love. For endorsements for a group representative role we contrasted the targets that displayed free riding and those who displayed in-group love with those who displayed universalism.

As shown in Table 3, the pattern of mediations for social consequences replicated the pattern observed in Study 2, with prestige and dominance differentially mediating the effects of target behavior on social outcomes. As in Study 2, prestige mediated the effects of target behavior on leader election and desire to expel individuals from the group, whereas dominance mediated the effects of target behavior on endorsements for a group representative role.

Insert Tables 4 and 5 about here

Correlations between Contribution Behavior, Prestige and Dominance Perceptions, and Behavioral Reactions

Similar to Study 2, we also explored the relationships between participants' contribution behavior, their prestige and dominance ratings of the targets, and the participants' behavioral reactions. The pattern of associations was consistent with the pattern of associations observed in Study 2. Study 3's participants also tended to confer prestige to others who behaved in the same way that they did, providing additional support to the idea that conferral of prestige is biased in self-serving ways. For all three targets, prestige increased leader endorsement; prestige also decreased the desire to expel free-riders and universalists from the group. Finally, prestige and dominance were uncorrelated for all three targets.

Discussion

Unlike previous research on status conferral in social dilemmas, Study 3 allowed group members to make costly contributions to benefit either only in-group members or both in-group

and out-group members. The findings show that the identity of the recipients shapes the social consequences of generosity, with contribution behavior that benefits in-group members only leading to higher prestige and dominance than contribution behavior that benefits both in-group and out-group members equally. The findings of Study 3 further show that people see individuals who display universalism as least fit to represent the group in contentious intergroup interactions, presumably because their propensity toward out-group love will not allow them to serve their group well in that role. Consistent with the findings of Studies 1 and 2, free-riders were seen as low on prestige but high on dominance.

Study 3 found that harming out-group members passively by showing in-group favoritism in resource allocation (i.e., contributing to the within-group pool) is sufficient to increase perceived dominance compared to showing universalism. Unlike the IPD-MD game, harm in the Nested Social Dilemma game was associated with forgone gains to out-group members rather than actual losses. These findings also highlight the role of the choice set in constructing the social meaning of behavior: The same behavior that led to low perceptions of dominance in Study 2 – benefitting in-group members without affecting out-group members in any way – led to high perceptions of dominance in Study 3 when the third behavioral alternative changed from out-group hate to out-group love. Finally, Study 3 replicated the differential mediation of important social consequences such as leader election, exclusion from the group and endorsement of a group representative by prestige and dominance perceptions, highlighting once again that these two types of status have distinct behavioral antecedents and consequences.

General Discussion

In this paper we sought to advance previous research on status conferral in social dilemmas in three ways. First, we systematically varied the intergroup context in which social

dilemma situations were embedded to investigate how contribution decisions that have consequences for the self, in-group members and out-group members influence individuals' social standing within their groups. Second, we decomposed status into prestige and dominance to investigate whether costly contributions to public goods differentially influenced these distinct types of status. Third, we investigated social consequences of prestige and dominance perceptions, namely leader election, exclusion from the group and endorsement of a group representative for an intergroup competition. Overall, our three studies investigated both behavioral antecedents and behavioral consequences of prestige and dominance perceptions in intergroup social dilemmas.

Study 1 extended previous research on status conferral in single-group social dilemmas (Hardy & Van Vugt, 2006; Willer, 2009) by showing that costly contributions to public goods that simultaneously benefit in-group members and harm out-group members increase prestige and decrease dominance compared to free-riding. This finding raised important questions concerning the motivational attributions underlying these perceptions. Study 2 addressed these questions by using the IPD-MD game to disentangle in-group love and out-group hate. Study 2 investigated the consequences of costly contributions that benefit fellow in-group members either with or without harming out-group members, and showed that the former course of action decreases prestige and increases dominance whereas the latter increases prestige and decreases dominance. Thus, it appears that contributions to the group that reflect in-group love but not out-group hate (Brewer, 1999; Halevy et al., 2008) are rewarded with prestige, and that displays of out-group hate but not in-group love lead to perceptions of high dominance. Study 3 used a Nested Social Dilemma game and showed that the group membership of the recipients influences the consequences of displaying generosity. Specifically, sharing resources with both in-group

and out-group members leads to lower prestige and dominance compared to sharing them only with in-group members. Across all three studies, free-riding was associated with low prestige but high dominance.

Studies 2 and 3 also showed that individual behavior in intergroup social dilemmas affects social outcomes. In addition, prestige and dominance perceptions differentially mediated the effects of target behavior on important social outcomes, such as leader election, exclusion from the group and choice of a group representative for an intergroup competition. The fact that our mediation analyses resulted in the same overall pattern of findings across Studies 2 and 3 strengthens our confidence in the robustness of these findings. Overall, this research has consistently found that prestige and dominance have distinct behavioral antecedents and consequences, which merit viewing them as two distinct types of status (Cheng et al., 2010; Henrich & Gil-White, 2001).

Theoretical Implications

This research makes a number of contributions to the literatures on social dilemmas, intergroup conflict, and social hierarchy. First, we extend previous research on social dilemmas (and more specifically, on status conferral as a solution to the free-rider problem in social dilemmas: Hardy & Van Vugt, 2006; Willer, 2009) by investigating status conferral in social dilemmas that are embedded in intergroup situations (Bornstein, 1992; 2003). By using systematic variations of the intergroup context in which the social dilemma was embedded, this research provided insight into how contributions to public goods which influence both in-group and out-group members shape social perceptions. Second, we extend recent research on social motives in intergroup conflict (De Dreu, 2010; De Dreu et al., 2010; Halevy et al., 2008; 2010; 2011) by showing that the structure of an intergroup conflict (e.g., IPD versus IPD-MD versus

Nested Social Dilemma) has important consequences not only on intergroup behavior and the conflict's outcomes, but also on social perceptions, attributions and actions, and through them, on intra-group processes such as the emergence of social hierarchy. Finally, we contribute to the literature on social hierarchy by illustrating the usefulness and importance of decomposing status into prestige and dominance (Cheng et al., 2010; Henrich & Gil-White, 2001). Our studies consistently show that contributions to public goods have opposite effects of these two distinct types of status.

Taken together, the studies reported in this paper provide a rich picture of the dynamics of status emergence in groups. They also highlight the social and structural bases for status beliefs and the role that discrete individual behaviors play in the construction of status (Ridgeway, Boyle, Kuipers, & Robinson, 1998). Although previous research tended to focus on prestige-based hierarchies (e.g., Ames & Flynn, 2007; Anderson, Spataro & Flynn, 2008) in which “overly aggressive behaviors have been identified as attributes that can ‘break a leader’” (Cheng et al., p. 336), recent research has started to explore the role of dominance in social hierarchies (e.g., Maner & Mead, 2010; Papachristos, 2009). Researchers have found that perceived dominance correlated positively with perceptions of agency and high leadership abilities (Cheng et al., 2010) and that individuals high in trait dominance, a consistent predictor of leadership (Lord, de Vader, & Alliger, 1986), attain influence in group interactions because others perceive them as more competent (Anderson & Kilduff, 2009). Although prestige and dominance may both lead to greater social influence (French & Raven, 1959) and higher social standing (albeit through different paths and for different reasons), the findings of the current research suggest that perceptions of prestige versus dominance follow from opposite patterns of social behavior. Specifically, a concern with the maximization of relative gains – either within

groups (free-riding) or between groups (out-group hate) – feeds perceptions of high dominance, whereas paying a personal cost to benefit fellow in-group members (and to a lesser degree also out-group members) feeds perceptions of high prestige. Hence, this research bolsters the need to distinguish the constructs of prestige and dominance in studying status emergence and social hierarchies in groups (Anderson & Brown, 2010; Halevy, Chou, & Galinsky, 2011).

Strengths, Limitations, and Future Directions

The set of studies reported here has a number of strengths and limitations, which also point to a number of interesting possibilities for future investigations. Following previous research on social dilemmas, we used established experimental paradigms to systematically vary the nature of interdependence within and between groups. Although these laboratory paradigms provide high internal validity, they lack the richness of real-world interactions. Thus, one fruitful direction for future investigation involves adding elements such as communication among group members and a history of prior relations among groups. Since both intergroup conflict and social hierarchy may evolve over time, future studies might also explore the dynamics of perceptions of prestige and dominance in repeated interactions within and between groups (e.g., Halevy et al., 2011).

Another direction for future investigation concerns the role that out-group threat plays in shaping social hierarchies within groups. Specifically, can displays of out-group hate lead to high prestige in situations characterized by high out-group threat? We posit that competitive behavior against a potentially threatening out-group can enhance prestige (as observed in Study 1) to the extent that it is seen as aimed at protecting the welfare of in-group members or providing valuable benefits to them above and beyond other possible courses of action. This assertion is consistent with Willer's (2009) findings that attributing contributions to a group-serving

motivation mediated the effects of contribution behavior on status conferral in social dilemmas. Given that out-group hate as behaviorally defined in this work involves actively harming out-group members in a way that neither protects nor benefits in-group members more than in-group love, displays of out-group hate should not enhance prestige (as observed in Study 2). Nonetheless, future research that directly manipulates out-group threat in the IPD-MD game (which is characterized by low intergroup goal incompatibility) might be better situated to answer this question (e.g., Halevy et al., 2010).

Other interesting directions for future investigations concern the relative weights that individuals assign (either consciously or unconsciously) to prestige and dominance in making leadership choices. The findings of Studies 2 and 3 provide an initial answer to this question by showing that these weights may vary as a function of the leadership tasks and the intergroup context, with the relative importance of dominance increasing when group members choose a representative for a competitive intergroup interaction compared to a leader for a non-competitive intergroup interaction. In both studies, high dominance predicted being chosen to represent the group in a zero-sum, intergroup debate competition whereas high prestige predicted being elected for a leader in relatively benign intergroup interactions (i.e., subsequent rounds of the IPD-MD or Nested Social Dilemma games). These findings raise a number of interesting questions for the future, concerning the extent to which individuals consciously and strategically display particular behaviors in the hopes of attaining social standing on specific dimensions; their ability to shape hierarchical differentiation processes in groups; and the malleability of prestige and dominance perceptions (Anderson & Kilduff, 2009; Hardy & Van Vugt, 2006). Clearly, there are ample opportunities for future research on the distinct antecedents and consequences of prestige and dominance in group and intergroup interactions.

References

- Allison, S.T., Beggan, J.K., & Midgley, E.H. (1996). The quest for “similar instances” and “simultaneous possibilities”: Metaphors in social dilemma research. *Journal of Personality and Social Psychology*, 71, 479-497.
- Ames, D. R., & Flynn, F. J. (2007). What breaks a leader: The curvilinear relation between assertiveness and leadership. *Journal of Personality and Social Psychology*, 92, 307–324.
- Anderson, C., & Brown, C.E. (2010). The functions and dysfunctions of hierarchy. In A. Brief & B. Staw (Eds.), *Research in Organizational Behavior* (Vol. 30, pp. 55-89). San Diego, CA: Elsevier.
- Anderson, C., & Kilduff, G. J. (2009). Why do dominant personalities attain influence in face-to-face groups? The competence-signaling effects of trait dominance. *Journal of Personality and Social Psychology*, 96, 491-503.
- Anderson, C., Spataro, S.E., & Flynn, F.J. (2008). Personality and organizational culture as determinants of influence. *Journal of Applied Psychology*, 93, 702-710.
- Anderson, C., Srivastava, S., Beer, J.S., Spataro, S.E., & Chatman, J.A. (2006). Knowing your place: Self-perceptions of status in face-to-face groups. *Journal of Personality and Social Psychology*, 91, 1094-1110.
- Arrow, H. (2007). The sharp end of altruism. *Science*, 318, 581–582.
- Baron, J. (2001). Confusion of group-interest and self-interest in parochial cooperation on behalf of a group. *Journal of Conflict Resolution*, 45, 283-296.
- Batson, C.D., Batson, J.G., Todd, M.R., Brummett, B.H., Shaw, L.L., & Aldeguer, C.M.R. (1995). Empathy and the collective good: Caring for one of the others in a social dilemma. *Journal of Personality and Social Psychology*, 68, 619-631.

- Berger, J., Cohen, B. P., & Zelditch, M. J. (1972). Status characteristics and social interaction. *American Sociological Review*, 37, 241–255.
- Bornstein, G. (1992). The free rider problem in intergroup conflicts over step-level and continuous public goods. *Journal of Personality and Social Psychology*, 62, 597-606.
- Bornstein, G. (2003). Intergroup conflict: Individual, group and collective interests. *Personality and Social Psychology Review*, 7, 129-145.
- Bornstein, G. & Ben-Yossef, M. (1994). Cooperation in intergroup and single-group social dilemmas. *Journal of Experimental Social Psychology*, 30, 52-67.
- Bowles, S. (2008). Conflict: Altruism's midwife. *Nature*, 456, 326–327.
- Bowles, S., & Gintis, H. (2004). Persistent parochialism: trust and exclusion in ethnic networks. *Journal of Economic Behavior and Organization*, 55, 1-23.
- Brewer, M. B. (1999). The psychology of prejudice: In-group love or out-group hate? *Journal of Social Issues*, 55, 429–435.
- Brewer, M. B., & Kramer, R. M. (1986). Choice behavior in social dilemmas: Effects of social identity, group size, and decision framing. *Journal of Personality and Social Psychology*, 50, 543-549.
- Bryan, A.D., Webster, G.D., & Mahaffey, A.L. (2011). The big, the rich, and the powerful: Physical, financial, and social dimensions of dominance in mating and attraction. *Personality and Social Psychology Bulletin*, 37, 365-382.
- Buchan, N.R., Brewer, M.B. Grimalda, G., Wilson, R.K., Fatas, E., & Foddy, M. (2011). Global social identity and global cooperation. *Psychological Science*. DOI: 10.1177/0956797611409590

- Buchan, N.R., Grimalda, G., Wilson, R., Brewer, M.B., Fatas, E., & Foddy, M. (2009). Globalization and human cooperation. *Proceedings of the National Academy of Sciences*, 46, 4138-4142.
- Buhl, T. (1999). Positive-negative asymmetry in social discrimination: Meta-analytical evidence. *Group Processes and Intergroup Relations*, 2, 51–58.
- Campbell, D.T. (1965). Ethnocentric and other altruistic motives. In D. Levine (Ed.), *Nebraska Symposium on Motivation* (pp.283-301). Lincoln: University of Nebraska Press.
- Campbell, D.T. (1972) On the genetics of altruism and the counter-hedonic components in human culture. *Journal of Social Issues*, 3, 21-37.
- Campbell, D.T. (1975). On the conflicts between biological and social evolution and between psychology and moral tradition. *American Psychologist*, 30, 1103-1126.
- Cheng, J.T., Tracy, J.L., & Henrich, J. (2010). Pride, personality, and the evolutionary foundations of human social status. *Evolution and Human Behavior*, 31, 334-347.
- Choi, J. K., & Bowles, S. (2007). The co-evolution of parochial altruism and war. *Science*, 318, 636–640.
- Cohen, T.R., Montoya, R.M., & Insko, C.A. (2006). Group morality and intergroup relations: Cross-cultural and experimental evidence. *Personality and Social Psychology Bulletin*, 32, 1559–1572.
- Dawes, R.M., (1980). Social dilemmas. *Annual Review of Psychology*, 31, 169-193.
- De Cremer, D., & Van Vugt, M. (2002). Intergroup and intragroup aspects of leadership in social dilemmas: A relational model of cooperation. *Journal of Experimental Social Psychology*, 38, 126-136.

- De Dreu, C.K.W. (2010). Social value orientation moderates in-group love but not out-group hate in competitive intergroup conflict. *Group Processes and Intergroup Relations*, 13, 701-713.
- De Dreu, C. K. W., Greer, L. L., Handgraaf, M.J.J., Shalvi, S., Van Kleef, G. A., Baas, M., Ten Velden, F. S., VanDijk, E., & Feith, S. W. W. (2010). The neuropeptide oxytocin regulates parochial altruism in intergroup conflict among humans. *Science*, 328, 1408–1411.
- Dotsch, R., & Wigboldus, D. H. J. (2008). Virtual prejudice. *Journal of Experimental Social Psychology*, 44, 1194-1198.
- Fiske, S. T. (2010). Stratification. In S. T. Fiske, D. T. Gilbert & G. Lindzey (Eds.), *Handbook of Social Psychology* (5th ed., pp. 941-982). Hoboken, NJ: Wiley.
- Flynn, F. J. (2003). How much should I give and how often? The effects of generosity and frequency of favor exchange on social status and productivity. *Academy of Management Journal*, 46, 539-553.
- Flynn, F. J., Reagans, R. E., Amanatullah, E. T., & Ames, D. R. (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, 1123-1137.
- French, J. R. P., & Raven, B. (1959). The bases of social power. In D. Cartwright & A. Zander, *Group dynamics* (pp. 150-167). New York: Harper & Row.
- Goren, H. (2001). The effect of out-group competition on individual behavior and out-group perception in the Intergroup Prisoner's Dilemma (IPD) game. *Group Processes and Intergroup Relations*, 4, 160-182.

- Gould, R.V. (1999). Collective violence and group solidarity: evidence from a feuding society. *American Sociological Review*, 64, 356-380.
- Gould, R.V. (2000). Revenge as sanction and solidarity display: An analysis of vendettas in nineteenth-century Corsica. *American Sociological Review*, 65, 682-704.
- Halevy, N., Bornstein, G., & Sagiv, L. (2008). “In-group love” and “out-group hate” as motives for individual participation in intergroup conflict: A new game paradigm. *Psychological Science*, 19, 405-411.
- Halevy, N., & Chou, E.Y. (2011). Status conferral in social dilemmas. *14th International Conference on Social Dilemmas*. Amsterdam, Netherlands.
- Halevy, N., Chou, E.Y., Galinsky, A.D. (2011). A functional model of hierarchy: Why, how and when hierarchical differentiation enhances group performance. *Organizational Psychology Review*, 1, 32-52.
- Halevy N., Chou, E.Y., Cohen. T.R., & Bornstein, G. (2010). Relative deprivation and intergroup competition. *Group Processes and Intergroup Relations*, 13, 685-700.
- Halevy, N., Weisel, O., & Bornstein, G. (2011). In-group love and out-group hate in repeated interaction between groups. *Journal of Behavioral Decision Making* (DOI: 10.1002/bdm.726).
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162, 1243-1248.
- Hardy, C. L., & Van Vugt, M. (2006). Nice guys finish first: The competitive altruism hypothesis. *Personality and Social Psychology Bulletin*, 32, 1402-1413.
- Henrich, J., & Gil-White, F. J. (2001). The evolution of prestige: freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evolution and Human Behavior*, 22, 165-196.

- Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology*, 53, 575–604.
- Hornsey, M.J. (2003). Linking superiority bias in the interpersonal and intergroup domains. *Journal of Social Psychology*, 143, 479-491.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Ito, T. A., Thompson, E., & Cacioppo, J. T. (2004). Tracking the timecourse of social perception: The effects of racial cues on event-related brain potentials. *Personality and Social Psychology Bulletin*, 30, 1267-1280
- James, L. R., Mulaik, S. A., & Brett, J. M. (2006). A tale of two methods. *Organizational Research Methods*, 9, 233–244.
- Johnson, R. T., Burk, J. A., & Kirkpatrick, L. A. (2007). Dominance and prestige as differential predictors of aggression and testosterone levels in men. *Evolution and Human Behavior*, 28, 345–351.
- Judd, C.M., Kenny, D.A., & McClelland, G.H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods*, 6, 115-134.
- Kerr, N.L., Rumble, A.C., Park, E.S., Ouwekerk, J.W., Parks, C.D., Galluci, M., & van Lange, P.A.M. (2009). “How many bad apples does it take to spoil the whole barrel?”: Social exclusion and toleration for bad apples. *Journal of Experimental Social Psychology*, 45, 603-613.
- Levine, R. A., & Campbell, D. T. (1972). *Ethnocentrism: Theories of conflict, ethnic attitudes and group behavior*. New York: Wiley.

- Liebrand, W. B. G., Jansen, R. W. T. L., Rijken, V. M., & Suhre, C. J. M. (1986). Might over morality: Social values and the perception of other players in experimental games. *Journal of Experimental Social Psychology, 22*, 203-215.
- Lord, R. G., de Vader, C. L., & Alliger, G. M. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology, 71*, 402-410.
- Lowery, B. S., Unzueta, M. M., Knowles, E. D., & Goff, P. A. (2006). Concern for the in-group and opposition to affirmative action. *Journal of Personality and Social Psychology, 90*, 961-974.
- Magee, J. C., & Galinsky, A. D. (2008). Social hierarchy: The self-reinforcing nature of power and status. *The Academy of Management Annals, 2*, 351-351.
- Maner, J. K., & Mead, N. L. (2010). The essential tension between leadership and power: When leaders sacrifice group goals for the sake of self-interest. *Journal of Personality and Social Psychology, 99*, 482-497.
- Messick, D. M., Wilke, H. A. M., Brewer, M. B., Kramer, R. M., Zemke, P. E., & Lui, L. (1983). Individual adaptations and structural change as solutions to social dilemmas. *Journal of Personality and Social Psychology, 44*, 294-309.
- Ostrom, E. (1998). A behavioral approach to the rational choice theory of collective action: Presidential address of the American Political Science Association. *American Political Science Review, 92*, 1-22.
- Ouwerkerk, J. W., Kerr, N. L., Gallucci, M., & Van Lange, P. A. M. (2005). Avoiding the social death penalty: Ostracism and cooperation in social dilemmas. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast: Ostracism, social*

- exclusion, rejection, and bullying*. New York: The Psychology Press.
- Papachristos, A.V. (2009). Murder by structure: Dominance relations and the social structure of gang homicide. *American journal of Sociology*, 115, 74-128.
- Parks, C.D., & Stone, A.B. (2010). The desire to expel unselfish members from the group. *Journal of Personality and Social Psychology*, 99, 303-310.
- Probst, T.M., Carnevale, P.J. & Triandis, H.C. (1999). Cultural values in intergroup and single group social dilemmas. *Organizational Behavior and Human Decision Processes*, 77, 171-191.
- Ridgeway, C.L. (1982). Status in groups: The importance of motivation. *American Sociological Review*, 47, 76–88.
- Ridgeway, C. L., Boyle, E. H., Kuipers, K. J., & Robinson, D. T. (1998). How do status beliefs develop? The role of resources and interactional experience. *Annual Sociological Review*, 63, 331-350.
- Ridgeway, C.L., & Erickson, K.G. (2000). Creating and spreading status beliefs. *American Journal of Sociology*, 106, 579–615.
- Schwartz, S.H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Ed.) *Advances in Experimental Social Psychology* (vol. 25, pp. 1-65). New-York: Academic Press.
- Tiedens, L. Z., & Fragale, A. R. (2003). Power moves: Complementarity in dominant and submissive nonverbal behavior. *Journal of Personality & Social Psychology*, 84, 558–568.

- Van Dijk, E., & Wilke, H. (2000). Decision-induced focusing in social dilemmas: Give-some, keep-some, take-some, and leave-some dilemmas. *Journal of Personality and Social Psychology*, 78, 92–104.
- Van Lange, P.A.M., Ouwerkerk, J.W., & Tazelaar, M.J.A. (2002). How to overcome the detrimental effects of noise in social interaction: The benefits of generosity. *Journal of Personality and Social Psychology*, 82, 768-780.
- Van Vugt, M., & De Cremer, D. (1999). Leadership in social dilemmas: The effects of group identification on collective actions to provide public goods. *Journal of Personality and Social Psychology*, 76, 587-599.
- Weber, J.M., Kopelman, S., & Messick, D.M. (2004). A conceptual review of decision making in social dilemmas: Applying a logic of appropriateness. *Personality and Social Psychology Review*, 8, 281-304.
- Weber, J.M., & Murnighan, J.K. (2008). Suckers or saviors? Consistent contributors in social dilemmas. *Journal of Personality and Social Psychology*, 95, 1340-1353.
- Wit, A. P. & Kerr, N. L. (2002). “Me versus just us versus us all”: categorization and cooperation in nested social dilemmas, *Journal of Personality and Social Psychology*, 83, 616–637.
- Willer, R. (2009). Groups reward individual sacrifice: The status solution to the collective action problem. *American Sociological Review*, 74, 23–43.

Footnotes

1. The distinction between prestige and dominance share certain similarities with the distinction between status and power (cf. Fiske, 2010; Magee & Galinsky, 2008). Our review of the literature suggests that, although status is frequently conceptualized in terms of prestige, dominance is not equivalent to power, as it may or may not involve actual control over valuable resources. In this paper, we use an inclusive definition of dominance, which incorporates motivational, social, structural, and relational aspects (Bryan et al., 2011; Henrich & Gil-White, 2001; Cheng et al. 2010; Fiske, 2010).

2. To allow comparisons across different groups, these targets were hypothetical individuals (rather than actual group members) who made allocation decisions that indicated a clear preference for one course of action over the other. However, the same behaviors were also enacted by our actual experimental participants (in varying frequencies and intensities).

3. The three behavioral consequences (i.e., leader election, exclusion from the group, and electing a representative for an intergroup debate competition) were assessed in Studies 2 and 3 but not in Study 1. Therefore, we introduce these social outcomes in greater detail in the introduction to Study 2.

4. To illustrate, consider the following possible outcomes. If all four group members on both sides keep their initial endowment in its entirety, each of them ends the game with \$20. If all four group members on both sides contribute everything to the group pool, each of them ends the game with \$0, because what is gained by in-group members' contributions is offset by out-group members' contributions. However, if all the members of one group contribute everything while all the members of the other group contribute nothing, the members of the former group earn \$40 each whereas the members of the latter group lose \$20 each. Finally, the dominant (i.e.,

unconditionally best) individual strategy is to keep the initial endowment because a group member who keeps the initial endowment in its entirety will always end the game with more money regardless of what other in-group and out-group members do.

5. To illustrate, consider the following possible outcomes. If all four group members on both sides keep their initial endowment in its entirety, each of them ends the game with \$20. If all four group members on both sides contribute everything to the within-group pool, each of them ends the game with \$40. If all four group members on both sides contribute everything to the between-group pool each of them ends the game with \$0 because what is gained by in-group members' contributions is offset by out-group members' contributions. Finally, there are various asymmetric outcomes that might result when different players in each group allocate their resources differently.

6. To illustrate, consider the following possible outcomes. If all four group members on both sides keep their initial endowment in its entirety, each of them ends the game with \$20. If all four group members on both sides contribute everything to the within-group pool, each of them ends the game with \$40. If all four group members on both sides contribute everything to the between-group pool each of them also ends the game with \$40. However, if all the member of one group contribute everything to the within group-pool and all the members of the other group contribute everything to the between-group pool, the former will end the game with \$60 each, whereas the latter will end the game with \$20 each.

Tables

Table 1. Means (SDs) of prestige and dominance perceptions in the IPD game.

	Free-riding	Contribution
Prestige	2.65 (.98) _a	3.42 (1.02) _b
Dominance	3.17 (1.13) _a	2.45 (.94) _b

Note. Cell means in rows with different subscripts are significantly different at $p < .05$.

Table 2. Means (SDs) of prestige and dominance perceptions and social consequences in the IPD-MD (Study 2) and Nested Social Dilemma (Study 3) games.

	IPD-MD			Nested Social Dilemma		
	Free-riding	In-group love	Out-group hate	Free-riding	In-group love	Universalism
Prestige	2.48 (.97) _a	3.63 (1.01) _b	2.62 (.96) _a	2.75 (1.04) _a	3.53 (.89) _b	3.25 (1.04) _{c#}
Dominance	3.20 (.96) _a	2.29 (.89) _b	3.32 (1.01) _a	3.13 (1.16) _a	2.30 (.77) _b	2.03 (.84) _c
Leader election	2.28 (1.21) _a	3.80 (1.13) _b	2.53 (1.20) _a	2.56 (1.40) _a	3.49 (1.30) _b	2.84 (1.16) _a
Exclusion from the group	3.25 (1.32) _a	1.97 (1.07) _b	2.97 (1.25) _a	3.13 (1.51) _a	2.23 (1.26) _b	2.72 (1.24) _a
Representative for intergroup competition	3.02 (1.32) _a	2.98 (1.24) _a	3.35 (1.16) _a	3.44 (1.26) _a	3.20 (1.09) _a	2.66 (1.17) _b

Note. In each game, cell means in rows with different subscripts are significantly different at $p < .05$.

[#] $p = .03$ for the a-c contrast and $p = .06$ for the b-c contrast.

Table 3. Prestige and dominance as mediators of the effects of target behavior on behavioral outcomes in the IPD-MD (Study 2) and Nested Social Dilemma (Study 3) games.

	IPD-MD			Nested Social Dilemma		
	Leader election	Exclusion from the group	Representative for intergroup competition	Leader election	Exclusion from the group	Representative for intergroup competition
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Prestige	.73*** (.11)	-.57*** (.11)	.31 (.17)	.92*** (.19)	-.46* (.18)	.21 (.13)
Dominance	.11 (.13)	-.15 (.13)	.47* (.20)	-.05 (.24)	-.08 (.23)	.57** (.18)
Intercept	-2.90*** (.31)	2.44*** (.33)	-.08 (.48)	-1.54*** (.37)	1.38*** (.35)	1.36*** (.33)
<i>F</i>	23.91***	12.70***	3.68*	11.87***	3.66*	5.46**
<i>R</i> ²	.46	.31	.11	.29	.11	.16

Note. Within-subject mediation analyses resulted from the following regression expression:
$$Y_{Di} = Y_{ai} + Y_{bi} - 2Y_{ci} = (\delta_{10} + \delta_{20} - 2\delta_{30}) + \left(\frac{\delta_{a1} + \delta_{b2} - 2\delta_{c3}}{6} \right) X_{Di} + (\varepsilon_{ai} + \varepsilon_{bi} - 2\varepsilon_{ci}),$$
 with Y_{Di} being the behavioral difference coded by its corresponding contrast and X_{Di} being the mean-difference of the within-subject prestige and dominance perceptions, coded by its corresponding contrast. The mean-centered prestige and dominance perceptions are scaled to relate positively to the behavioral measures; for ease of interpretation, we added minus signs where necessary to indicate both the magnitude and the direction of the relationships.

*p<.05; **p<.01; ***p<.001

Table 4. Correlations between own contribution behavior, prestige and dominance perceptions, and behavioral reactions towards free-riders.

	1	2	3	4	5	6	7	8
1. Number of token kept		-.70**	-.59**	.47**	-.19	.59**	.37*	-.52**
2. Number of tokens contributed within	-.71**		-.16	-.33*	.12	-.40**	-.16	.49**
3. Number of token contributed between	-.46**	-.30*		-.30*	.13	-.36*	-.32*	.15
4. Prestige	.41**	-.39*	-.07		-.15	.54**	.11	-.29*
5. Dominance	-.13	.04	.13	-.19		-.12	.26*	.10
6. Leader endorsement	.36*	-.28*	-.13	.59**	.02		.42**	-.67**
7. Exclusion from the group	-.50**	.33*	.25*	-.56**	.14	-.68**		-.15
8. Endorsement of representative for intergroup competition	.33*	-.39*	.05	.34*	-.23	.36*	-.15	

Note. * $p \leq .05$, ** $p \leq .001$.

Cells below the diagonal depict correlations from the IPD-MD game (Study 2).

Cells above the diagonal depict correlations from the Nested Social Dilemma game (Study 3).

Table 5. Correlations between own contribution behavior, prestige and dominance perceptions, and behavioral reactions towards contributors to the within-group pool.

	1	2	3	4	5	6	7	8
1. Number of token kept		-.70**	-.59**	-.32*	-.14	-.29*	-.43**	.21
2. Number of tokens contributed within	-.71**		-.16	.49**	.00	.44**	.40*	-.25*
3. Number of token contributed between	-.46**	-.30*		-.11	.19	-.10	.14	-.00
4. Prestige	-.01	.26*	-.31*		.12	.43**	.18	-.08
5. Dominance	-.17	.10	.11	.06		-.04	.09	.32*
6. Leader endorsement	-.07	.38*	-.39*	.57**	-.11		.59**	-.60**
7. Exclusion from the group	.02	-.33*	.39*	-.36*	.08	-.54**		-.40*
8. Endorsement of representative for intergroup competition	-.10	.31*	-.25*	.24	-.03	.44**	-.27*	

Note. * $p \leq .05$, ** $p \leq .001$.

Cells below the diagonal depict correlations from the IPD-MD game (Study 2).

Cells above the diagonal depict correlations from the Nested Social Dilemma game (Study 3).

Table 6. Correlations between own contribution behavior, prestige and dominance perceptions, and behavioral reactions towards contributors to the between-group pool.

	1	2	3	4	5	6	7	8
1. Number of token kept		-.70**	-.59**	-.21	.21	-.33*	-.24	.15
2. Number of tokens contributed within	-.71**		-.16	.05	-.23	-.02	.07	.08
3. Number of token contributed between	-.46**	-.30*		.24	-.02	.47**	.26*	-.30*
4. Prestige	.06	-.24	.21		.02	.44**	.20*	-.31*
5. Dominance	-.06	.05	.02	-.26*		.06	.24	.27*
6. Leader endorsement	-.18	-.15	.43**	.27*	.18		.48**	-.51**
7. Exclusion from the group	.07	.15	-.29*	-.29*	-.04	-.75**		-.13
8. Endorsement of representative for intergroup competition	-.01	-.14	.19	-.09	.49**	.39*	-.33*	

Note. * $p \leq .05$, ** $p \leq .001$.

Cells below the diagonal depict correlations from the IPD-MD game (Study 2).

Cells above the diagonal depict correlations from the Nested Social Dilemma game (Study 3).