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# SOCIAL IDENTITY AND COOPERATION IN SOCIAL DILEMMAS

Brent Simpson

## ABSTRACT

This article presents a refined explanation of why minimal group identities affect cooperation in social dilemmas. The refined approach builds on key tenets of social identity theory to argue that identity affects cooperation by leading actors to maximize ingroup outcomes and minimize ingroup inequalities. A key implication of the argument is that social identity is predicted to reduce actors' responses to the 'greed component' in social dilemmas (the incentive to 'free-ride' on others' cooperation), but that it will not affect actors' responses to the 'fear component' (the motivation to avoid being 'suckered'). These predictions stand in contrast to those of two existing explanations of social identity and cooperation. The three arguments are tested against the results of two new experiments. Overall, the results support the refined approach.

**KEY WORDS** • cooperation • prisoners' dilemma • social dilemmas • social identity

## Introduction

Social dilemmas are situations that pose a tension between individual and collective interests (Orbell and Dawes 1981; Yamagishi 1995). Because social dilemmas lie at the heart of many social problems (Messick and Brewer 1983; Kollock 1998a), researchers have devoted a lot of attention to establishing the conditions that lead to cooperative behavior in such situations. Most research efforts in the area tend to focus on one of two classes of social dilemma solutions, 'strategic' or 'motivational.' Strategic solutions entail a change in the incentive structure, such that egoistic and collective incentives become more closely aligned. Key examples of research on strategic approaches include Axelrod's (1984) work on

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how long-term interdependence can produce voluntary cooperation between egoistic actors, and Olson's (1965) work on the role of selective incentives in generating contributions to collective actions.

Whereas research on strategic solutions focuses on understanding cooperation between egoists, motivational approaches relax the assumption of self-interest to address the conditions under which extra-egoistic incentives guide behavior in social dilemmas. For example, one stream of research on motivational solutions focuses on developing measures of 'social value orientations', or individuals' stable preferences for how outcomes are distributed between themselves and others (McClintock and Liebrand 1988). Social value orientation researchers seek to explain cooperation in the absence of strategic solutions via various 'prosocial' value orientations.

The motivational approach that has arguably received the most attention from social scientists addresses how social identity or 'we-feeling' increases cooperative behavior in social dilemmas (Brewer and Kramer 1986; Brewer and Silver 2000; Dawes et al. 1988; Kollock 1998b; Udéhn 1993). According to the traditional explanation, social identification increases cooperation by reducing actors' tendency to draw distinctions between their own and others' welfare. From this perspective, cooperation with ingroup members results from 'the shared and mutual perception by in-group members of their interests as interchangeable' (Turner et al. 1987: 65).

Although few researchers disagree that social identity has strong effects on cooperative behavior with ingroup members (and negative effects on cooperation with outgroup members), there is disagreement over *why* social identity affects cooperation. One recent challenge to the traditional explanation of how identity affects cooperation comes from Yamagishi and Kiyonari (2000), who question whether identity effects stem from a tendency for ingroup members to view their interests as interchangeable, as suggested by the traditional approach. They argue instead that identity increases cooperation with ingroup members by influencing actors' expectations about fellow ingroup members' behavior. As explained in detail below, their approach predicts that group boundaries – at least as typically investigated – do not affect cooperation if actors have a more direct basis for forming expectations that others will reciprocate cooperation.

This article presents a refined approach to explain why identity affects cooperation. Like the Yamagishi–Kiyonari argument, the new approach challenges the prediction made by the traditional

approach that a salient social identity will have consistently positive effects on cooperation with fellow ingroup members. However, while the Yamagishi–Kiyonari approach argues that identity increases cooperation with ingroup members by changing actors’ expectations about others’ behavior, the refined approach argues that identity affects cooperation with ingroup members by changing how actors weigh others’ outcomes.

I outline the refined approach to identity and cooperation after reviewing the traditional approach and the Yamagishi–Kiyonari approach. I then turn to an experiment for which the three approaches give different predictions. Finally, I present the results of a second experiment, designed to clarify an anomalous finding from Study 1. But I first turn to the question of why cooperation is problematic in social dilemmas.

### Why Cooperation Is Problematic

The most commonly investigated social dilemma is the two-person prisoners’ dilemma (PD). As shown in Table 1, this dilemma confronts each of two players with two options, ‘cooperate’ and ‘defect’. The players’ joint actions can generate four different individual outcomes:  $R$  and  $P$  are the payoffs for mutual cooperation and defection, respectively, while  $T$  and  $S$  are the payoffs for unilateral defection and cooperation.

The payoffs in PD are ordered such that  $T > R > P > S$ . Given these payoff inequalities, if the game is played once, a rationally self-interested actor should defect: If alter cooperates, ego gains more from defection than cooperation ( $T > R$ ). Similarly, if alter

**Table 1.** Prisoners’ dilemma

Row player	Column player	
	Cooperate	Defect
Cooperate	$R, R$ (4, 4)	$S, T$ (0, 6)
Defect	$T, S$ (6, 0)	$P, P$ (2, 2)

Note:  $T = 6 > R = 4 > P = 2 > S = 0$ .

defects, ego gains more from defection ( $P > S$ ). Because the same reasoning applies to alter, the expected result is mutual defection – the worst possible collective outcome.

The two inequalities correspond to the ‘fear’ and ‘greed’ components in social dilemmas (Dawes et al. 1986; Komorita and Parks 1996; Yamagishi and Sato 1986). Greed is the temptation to free-ride on others’ cooperation. It addresses the question: ‘Assuming alter cooperates, how should I respond?’ For example, a person may avoid a well-attended political demonstration, content to free-ride on the impact made by others attending. Similarly, the seller of an item on eBay™ may keep the high-bidder’s payment *and* the auction item for herself. Formally, the greed component in social dilemmas is given by the difference between  $T$ , the payoff for unilateral defection, and  $R$ , the payoff for mutual cooperation ( $greed = T - R$ ).

Fear is the motivation to avoid being exploited by a non-cooperative other. The fear component entails the question: ‘Assuming alter defects, how should I respond?’ For example, the person who does not show up for the demonstration because they believe no one will be responding to the fear component; so is the high bidder on the eBay item who does not send payment out of concern the seller will not send the item in return. More formally, the fear component in social dilemmas is given by the difference between the payoff for mutual defection and unilateral cooperation ( $fear = P - S$ ).

As shown in Table 1, the PD contains an equal mix of fear- and greed-based incentives to defect (that is  $T - R = P - S$ ). By contrast, the relative size of fear and greed components differs in other types of social dilemmas. For example, the ‘assurance dilemma’ (AD) reverses the two highest payoffs, such that  $R > T > P > S$ . Thus, like the PD, because  $P > S$ , Assurance contains a fear component. However, because  $R > T$ , the AD has a ‘negative’ greed component. As a result, the self-interested actor who is certain alter will *cooperate* should cooperate. Alternatively, compared to PD, the ‘chicken dilemma’ reverses the two lowest payoffs, such that  $T > R > S > P$ . Chicken therefore contains greed, but the fear component is negative. As a result, the self-interested actor who is certain that alter will *defect* should cooperate.

Fear and greed can vary not only by the relative values of the objective (given) payoffs, but also by the order in which decisions are made. For example, in the typical eBay transaction, the seller

sends the item only after receipt of the bidder's payment. Under that ordering, the bidder (first-decider) cannot avoid sending payment (defect) and still reasonably expect the seller (the second-decider) to send the item (cooperate).

More generally, in a two-person PD in which choices are made sequentially, the first decision entails a fear component (one's cooperation may be exploited), but not a greed component. Experimental evidence is consistent with this claim. Hayashi et al. (1999) found that second deciders in sequential dilemmas do not cooperate following a non-cooperative move by the first decider and, most importantly for current purposes, that first-deciders are aware of the impossibility of 'free-riding' on the second-decider's cooperation. Conversely, following a cooperative decision by the first-decider, the second decider faces a greed component, but not a fear component. I return to the distinction between fear and greed below, where I use it to inform a refined approach to identity and cooperation.

### Three Approaches to Identity and Cooperation

In the sections to follow, I present the traditional social identity explanation of how cooperation is influenced by the salience of group boundaries, and briefly describe the 'minimal group procedure' used in experimental tests of social identity theory. I then describe Yamagishi and Kiyonari's (2000) challenge to the traditional explanation of findings from minimal group experiments. Thereafter, I turn to the refined approach to identity and cooperation, which builds on the distinction between fear and greed introduced in the preceding section.

#### *Traditional Approach to Social Identity and Cooperation*

Together social identity theory (Tajfel 1982) and the related self-categorization theory (Turner 1985) explain how group- and category-boundaries influence a wide range of behaviors, such as perception, influence, conflict and most importantly for current purposes, cooperation in social dilemmas. Key to the social identity and self-categorization approaches is the distinction between *personal identity* and *social identity*. 'Personal identity is highlighted by thinking of the self in terms of unique attributes, whereas social identity

operates when an individual thinks in terms of similarities to other members of an in-group and differences from members of an out-group' (Deaux 1996: 780).

Personal identities are assumed to magnify the distinction between the interests and attributes of individuals and collectivities. In contrast, social identities are expected to lead actors to minimize distinctions between members of a given group, and to maximize the distinctions between ingroup and outgroup members. Thus, while personal identity is predicted to make salient a motivation to maximize individual payoffs, social identity is expected to motivate actors to focus on the outcomes of the group as a whole.

Most applications of social identity theory to behavior in social dilemmas have assumed that social identity increases cooperation with ingroup members simply by reducing the tendency for actors to draw distinctions between their own payoffs and the payoffs to fellow ingroup members. For example, Kramer and Brewer (1984: 1045) argue that a key effect of social identification is that actors:

attach greater weight to collective outcomes than they do to individual outcomes alone. Inclusion within a common social boundary reduces social distance among group members, making it less likely that individuals will make sharp distinctions between their own and others' welfare.

Thus, this reasoning suggests, if cooperation increases fellow ingroup members' outcomes, we should observe an overall increase in cooperation with group members when social identity is salient.

A number of empirical studies provide support for the predicted positive effects of identity on cooperation, both for naturally occurring (Kramer and Brewer 1984: experiment 2; Van Vugt and De Cremer 1999), and experimentally created groups (Brewer and Kramer 1986; Kramer and Goldman 1995). These latter studies typically separate participants into groups based on some trivial criteria, such as a coin toss or participants' stated preferences for abstract paintings. That identity effects emerge even in these 'minimal groups' is typically taken as especially powerful evidence of the role of salient group boundaries in influencing cooperation.

### *Ingroups and Expectations of Reciprocity*

Yamagishi and Kiyonari (2000) recently challenged the traditional explanation of how identity affects cooperation in social dilemmas. The key point of their argument is that minimal group boundaries

do not lead actors to attach greater weight to ingroup members' outcomes, as the identity arguments presented above suggest. Instead, Yamagishi and Kiyonari argue, identity affects cooperation in such situations by increasing an actor's expectations that ingroup members will reciprocate cooperation. According to their (2000: 122) 'ingroup reciprocity approach to ingroup favoritism, people treat ingroup members more favorably than outgroup members simply because they expect favorable treatment from ingroup members'. It follows that the key to teasing apart the reciprocity approach from the traditional approach rests on manipulating the basis of actors' expectations that others will reciprocate cooperation. To this end, Yamagishi and Kiyonari conducted an experiment comparing the effects of identity in simultaneous- and sequential-decision dilemmas.<sup>1</sup>

As noted earlier, in sequential dilemmas, the first person makes a decision knowing that the decision will be relayed to the second person. The second person, in turn, makes their decision with full knowledge of the first person's choice. Based on their ingroup reciprocity approach, Yamagishi and Kiyonari predicted that participants would cooperate more with ingroup members than with outgroup members in the simultaneous decision dilemma, but that identity would not affect the first person's decisions in the sequential decision dilemma. The different effect predicted for the simultaneous and sequential decision task is based on the different sources of expectations about alter's behavior in the two presentations of the dilemma. As they (2000: 122, emphasis added) explain:

In the sequential game, the first player, at least potentially, can affect the second player's behavior: the first player can expect directly reciprocal behavior from the partner. That is, the main source of the expectation of the second player's cooperation lies in the first player's ability to induce the second player to practice mutual cooperation. In contrast the player of the simultaneous game cannot expect reciprocation from the partner [In the simultaneous game] people treat ingroup members more favorably than outgroup members because they expect favorable treatment from ingroup members. *In the sequential game, this expectation of ingroup reciprocity would be overridden by the much stronger expectation based on direct reciprocity.*

In short, the ingroup reciprocity approach suggests that actors in simultaneous decision dilemmas base their expectations of reciprocity on a generalized norm of reciprocity among ingroup members. In sequential dilemmas, however, actors have a much stronger basis

– direct reciprocity. Thus, identity is predicted to have no effect in sequential dilemmas.

These arguments stand in contrast to the traditional approach, which predicts a positive effect of identity on cooperation with ingroup members (and negative effect on cooperation with outgroup members) in all social dilemmas, both simultaneous and sequential (Yamagishi and Kiyonari 2000). They tested the competing arguments using a standard ‘minimal group’ manipulation of identity (participants’ stated preferences for Klee versus Kandinsky paintings). Each participant made two decisions in a simultaneous PD (once each with an ingroup- and outgroup-member) and two decisions as the *first-decider* in a sequential PD (once each with a different ingroup- and outgroup-member). As predicted by the reciprocity approach, participants gave more to ingroup members in the simultaneous dilemma, and no identity effects emerged for the choices of first deciders in the sequential dilemma. They (2000: 127) concluded, ‘ingroup favoritism in the minimal group situation occurs only when expectations of ingroup reciprocity, but not of direct reciprocity, are operating’.

### *Fear, Greed and Identity*

Yamagishi and Kiyonari present a strong case against the traditional explanation of how identity affects cooperation in social dilemmas. Their argument is well reasoned and supported by clear results. In this section, however, I point to a potential limitation of their experiment suggested by an alternative approach. This alternative approach, a refinement of the traditional argument linking identity and cooperation, posits that identity effects in minimal group situations stem from changes in how actors weigh the payoffs to fellow ingroup members, rather than through changes in expectations about fellow ingroup members’ actions. In the terminology introduced above, the refined approach suggests that identity affects actors’ responses to greed, but not fear.

As noted earlier, the traditional approach argues that identity affects cooperation by leading actors to positively value fellow ingroup members’ outcomes. More specifically, the approach suggests that identity will positively impact cooperation any time cooperation increases the average payoff to the ingroup as a whole. However, I show that a rule that simply maximizes ingroup payoffs,

without regard to payoff inequalities, is inconsistent with a central tenet of social identity theory – that intergroup behavior is governed by the *metacontrast principle* (Turner 1985; Hogg 1996).

According to the metacontrast principle, ingroup–outgroup boundaries and behavioral responses to these boundaries are based on the maximization of inter-group differences and the minimization of intra-group differences (Hogg 1996; Hogg et al. 1995; Oakes 1996; Turner 1985). Minimal group resource allocation experiments show that the metacontrast principle applies not only to attributes, but also to resource distribution (for a review, see Turner 1985). When applied to resources, the metacontrast principle leads us to expect actors to strike a balance between two goals – the maximization of ingroup outcomes (to increase distinction from the outgroup), and the minimization of ingroup inequalities (to decrease distinctions within the ingroup).

Despite its central role in predicting outcomes in applications of social identity theory to phenomena such as intergroup discrimination in minimal group settings, the metacontrast principle figures less prominently in studies of the effects of social identity on cooperation in social dilemmas. Instead, social dilemma applications tend to focus solely on the maximization of ingroup payoffs. Thus, as shown below, the traditional approach leads us to expect identity to reduce responses to the fear *and* greed components. But social identity theory, as well as recent empirical work reviewed below, suggests that the metacontrast process mediates the effects of identity on cooperation. If so, as will now be shown, we should expect identity to affect responses to greed, but not responses to fear.

The metacontrast principle relates directly to the distinction between the fear and greed components of social dilemmas. Assume, following the metacontrast principle, that when social identity is salient, ego is motivated by two goals: maximization of group outcomes and minimization of ingroup inequalities. Examining the payoffs in Table 1 PD shows how realization of the two goals depends on whether the actor faces a greed or fear component. For the greed component (when alter cooperates) cooperation realizes both goals, the maximization of group outcomes (because  $2R > T + S$ ) and minimization of ingroup inequality (because  $|R - R| < |T - S|$ ). But for the fear component (when alter defects), cooperation realizes the maximization of group outcome goal (because  $T + S > 2P$ ), but *defection* realizes the goal of minimizing

ingroup inequalities (because  $|P - P| < |T - S|$ ). Thus, the two goals cancel each other out. It follows that we should not observe any effects of identity on responses to the fear component in social dilemmas.

There are additional reasons to expect identity to not affect actors' responses to fear. One reason is that actors are normally far more certain of how they value the groups to which they belong than how other members value those same groups. This may occur for a number of reasons, not the least of which is that actors are more privy to their own internal states (e.g. attitudes) than to the internal states of others. (The suggestion here is not that actors have *accurate* knowledge of how they, relative to others, value their group memberships – only that they believe that they do.) In fact, in typical investigations of identity and cooperation, participants are not allowed to see or communicate with fellow group members. With no way of signaling identification, we should expect questions about others' group loyalties to be especially salient. As discussed in detail later, these questions will likely be even more salient in minimal group settings, where the 'group' has no history from which actors can form judgments about how others value group membership. In short, even those actors who strongly identify with the ingroup may question the extent to which others do, yet another reason we should not expect identity to affect actors' responses to fear.

The argument that social identity reduces responses to greed, but not fear, compliments previous statements by Kollock (1998b) about the effects of identity on cooperation. Kollock argues that, when interacting with ingroup members, identity leads actors to subjectively transform PD into the AD. As noted earlier, Assurance contains fear but not greed. Thus, a tendency to transform PD into Assurance when identity is salient would mean that identity affects actors' responses to the greed component, but not the fear component.

Although informed by Kollock's analysis, the arguments linking identity to different responses to fear and greed are more general. Kollock's focus was on the high rates of cooperation often observed in empirical studies of PD (in particular). Thus, he limited his analysis to PD. Because any social dilemma can be analyzed in terms of its fear and greed components, the arguments outlined here can be applied to any dilemma.

The refined approach is also consistent with Kollock's empirical evidence. Specifically, he reported evidence that suggests social identity leads actors to subjectively transform PD into Assurance: When participants were asked to imagine they were playing a PD game against a fellow ingroup member (in Kollock's survey, a member of the participant's fraternity), they ranked the desirability of outcomes in PD *as if* the payoffs were ordered like those in Assurance. (For instance, they rated mutual cooperation more favorably than exploitation of the other's cooperation.) This suggests that social identity eliminated their responses to the greed component, but did not affect their responses to the fear component. (Importantly, Kollock only measured stated preferences for various outcomes, rather than actual cooperative versus non-cooperative behaviors. Thus, we cannot tell from his study whether social identity actually eliminates responses to the greed component.) In contrast, Kollock found that participants' rankings corresponded to PD when they were asked to imagine they were playing PD with an outgroup member (e.g. a rival fraternity). This is consistent with the argument that, when paired with outgroup members, participants respond to the fear *and* greed components.

The refined approach developed in this article is also consistent with the Yamagishi–Kiyonari findings reviewed above. Because the simultaneous decision PD contains greed and fear, the higher contributions to ingroup members in the simultaneous presentation could have resulted from a tendency for participants to respond less strongly to the greed component when interacting with an ingroup, compared to an outgroup, member. Similarly, the finding that social identity did not affect the behavior of the *first decider* in the sequential dilemma is consistent with the argument that identity does not affect responses to the fear component. Importantly, Yamagishi and Kiyonari did not study the second decider, for which the refined (fear/greed) approach and the Yamagishi–Kiyonari approach give different predictions.

### *Hypotheses*

Table 2 presents the predictions of each of the approaches for three different versions of PD. The hypotheses to follow are based on the fear/greed approach introduced in this paper, but I also point out the conditions for which the three approaches give divergent predictions.

**Table 2.** Experimental conditions and predictions of three identity approaches

<i>Hypothesis/decision type</i>	<i>Will Identity Affect Cooperation?</i>		
	<i>Traditional approach</i>	<i>Reciprocity approach</i>	<i>Fear/greed approach</i>
Hypothesis 1: sequential (1st decider)	Yes	No	No
Hypothesis 2: sequential (2nd decider)	Yes	No	Yes
Hypothesis 3: simultaneous decisions	Yes	Yes	Yes

**Hypothesis 1:** First deciders in sequential dilemmas will be equally likely to cooperate with ingroup and outgroup members.

For the first decider, the incentive to defect is based purely on the fear component. Thus the fear/greed approach predicts that identity will not affect behavior. As shown in Table 2, Yamagishi and Kiyonari's (2000) reciprocity approach gives the same prediction but for a different reason. As discussed earlier, the reciprocity approach predicts that, in the sequential dilemma, the effects of identity will be overridden by expectations based on direct reciprocity. The traditional approach, on the other hand, predicts a positive effect of identity for the first decider in the sequential dilemma.

The second hypothesis focuses on the second decider in the sequential dilemma:

**Hypothesis 2:** Given cooperation by a first decider in a sequential game, second deciders will be more likely to cooperate with ingroup than outgroup members.

Because the second decider faces a greed component, but not a fear component, the fear/greed approach predicts positive effects of identity. As noted in Table 2, the traditional approach also predicts this pattern. Meanwhile, the reciprocity-based approach predicts no effect, for exactly the same reasons that it predicts no effect for the first decider in a sequential dilemma. That is, the expectation of direct reciprocity (the basis for the prediction that identity does not affect cooperation in the sequential dilemmas) is even more salient for the second person following cooperation by the first.

Thus, the reciprocity argument predicts direct reciprocity will override ingroup-based reciprocity.

Finally, as noted earlier, all three theories predict positive effects of identity in the simultaneous dilemma.

**Hypothesis 3:** Social identity increases cooperation in the simultaneous decision PD.

The next section outlines an experiment designed to test these predictions.

### Study 1

Students were recruited from introductory classes at a large state university, using the opportunity to earn money as an incentive to participate in a study of 'social decision making'. Participants were scheduled in groups of six to eight. A total of 154 (77 male and 77 female) students participated. In addition to a block on gender, there are two between-subject factors: dilemma-type (simultaneous-decision, sequential first-decision and sequential second-decision) and whether alter is an ingroup or outgroup member.<sup>2</sup>

#### *Settings and Procedures*

Upon entering the laboratory, each participant was escorted to a private subject room equipped with a computer. Computerized instructions informed participants they would interact with persons in adjoining rooms. The instructions assured participants they would not see other participants at any point during or after the study, and that all participants would be identified only via letters and, as detailed below, group membership. (In reality, as explained later, others' choices were simulated.) After the procedure was described in detail, several practice sessions were administered and participants were given a short quiz to assess their comprehension of the procedure.

Following the quiz, participants were divided into two groups using a standard minimal group procedure (Rabbie et al. 1989; Tajfel and Billig 1974; Yamagishi and Kiyonari 2000). Participants

were told they would be assigned to groups for 'administrative purposes'. As in the Yamagishi-Kiyonari design discussed above, participants were divided into groups based on their stated preferences for Klee versus Kandinsky paintings. Specifically, participants were presented with a series of seven pairs of paintings, each pair containing one Klee and one Kandinsky painting. For each pair, the participant selected which painting she liked best. Those who indicated a preference for more Klee over Kandinsky paintings or vice versa were assigned to the 'Klee group' and 'Kandinsky group', respectively. The participant's computer screen displayed her group membership at the conclusion of the painting-preference task.

After a brief waiting period, participants were told that others had completed the painting-preference task, and that they would now be asked to make a series of decisions. The instructions emphasized that participants would be paired with a different 'other' for each decision. Prior to their decision, the participant's computer displayed a message stating 'linked to Participant X in Group Y', where X was ostensibly the other's unique identifier and Y was either the ingroup or outgroup (Klee or Kandinsky, depending on the participant's group membership).

Decisions were based on the incentive structure given in Table 1, where each point was worth US\$1.00.<sup>3</sup> In no cases were the actual choices of participants or others labeled 'cooperate' or 'defect', as in Table 1. Instead the two choices were variously labeled 'Alternative X' and 'Alternative Y'. The three presentations of the dilemma differed by whether the participant ostensibly made her decision at the same time, before, or after the other decider. In the sequential dilemma/first decider version, the participant was told that she would decide first. The other would then be informed of the participant's choice, and the other would then make his or her decision. In the sequential/second decider version, the other would make her decision first and the other's choice would then be relayed to the participant. The participant would then select her strategy with full knowledge of the other's choice. For this condition, the participant was always informed that the 'first decider' cooperated.<sup>4</sup>

Following their decisions in the dilemmas, participants responded to several Likert-scale items used to determine the extent to which they identified with members of the ingroup and outgroup. Thereafter, they completed several questionnaire items designed to assess their estimates of others' cooperation (for the simultaneous

and sequential/first decider conditions), and whether or not they were suspicious of any aspects of the procedure. After completing the post-experiment questions, participants were paid and debriefed. Participants' pay was calculated under the assumption that the 'others' cooperated in each of the three decisions. All participants earned between US\$12 and US\$18 for the entire study, depending on their choices. The procedure took approximately 40 minutes.

### Study 1 Results

Before reporting the results, I discuss the manipulation and comprehension checks. Thereafter I present tests of the arguments.

#### *Comprehension, Suspicion and Manipulation Checks*

Participants generally understood the procedure. The majority of participants gave correct responses to all three questions from the comprehension check, and most indicated in post-experiment questions that they found the procedure straightforward and enjoyable. Suspicion was checked in post-experimental questionnaires that asked participants to identify any aspects of the experiment they found 'hard to believe'. No participants commented on the reality of other decision-makers. While a few participants commented on the identity manipulation, these comments were confined to not understanding the relevance of the painting-preference task to the subsequent decisions. Such comments suggest that the identity manipulation was conservative.

Despite the few participants who stated they did not understand the pertinence of the painting-preference task, manipulation checks using standard measures (Van Vugt and De Cremer 1999; Yamagishi and Kiyonari 2000) showed that participants identified more strongly with ingroup than with outgroup members. Specifically, participants stated that they felt they had more in common with ingroup members than with outgroup members, felt closer to ingroup members than to outgroup members and that they identified more with ingroup than outgroup members ( $p < 0.001$  for all comparisons). In short, comprehension was high, suspicion was low, and the identity manipulation was successful. Thus the analyses include all participants.

### *Identity and Cooperation*

The initial analyses included terms for gender, whether the participant was paired with an ingroup or outgroup member, and an interaction term for gender and group membership of alter. I ran a logistic regression model for each dilemma, with the participant's decision (cooperate or defect) regressed on the two main effects variables and the interaction term. However, for no decision did gender influence cooperation, nor did gender interact with group membership (for all,  $p \geq 0.50$ ). Given that gender had no significant effect on behavior in any of the three social dilemmas, the analyses to follow aggregate data from males and females.

Table 3 gives the proportion of participants who cooperated in each of the three dilemmas, depending on whether alter was a member of the participant's ingroup or outgroup, and tests of significance. Tests of the three hypotheses are based on these analyses.

Hypothesis 1 predicts no effect of identity for the first decider in the sequential decision dilemma. As noted earlier, the reciprocity approach agrees, but the standard approach predicts a positive effect of identity on the first player's decision. As shown in Table 3, the choices of first deciders support the reciprocity and fear/greed approaches. First deciders were about as likely to cooperate when the second decider was an ingroup member (0.556) as when the second player was an outgroup member (0.542,  $\chi^2 = 0.921$ ). Thus, Hypothesis 1 is supported.

Hypothesis 2 predicts that second deciders will be more likely to cooperate following cooperation by the first decider when the first

**Table 3.** Proportion of cooperators by dilemma type and alter's group membership: Study 1

<i>Dilemma type</i>	<i>Alter's Group</i>		$\chi^2$
	<i>Ingroup</i>	<i>Outgroup</i>	
Sequential (1st decider)	0.556 ( $N = 27$ )	0.542 ( $N = 24$ )	0.921
Sequential (2nd decider)	0.633 ( $N = 30$ )	0.346 ( $N = 26$ )	4.595*
Simultaneous	0.640 ( $N = 25$ )	0.682 ( $N = 22$ )	0.763

Note:  $p < 0.05$ , two-tailed.

decider is an ingroup member than when the first decider is an outgroup member. In this case, the traditional approach agrees with the fear/greed approach that identity will positively impact cooperation, but the reciprocity approach predicts no effect of alter's (the first-decider's) identity. The results in the second column of Table 3 strongly support the fear/greed approach. Participants were nearly twice as likely to cooperate when the first decider was an ingroup member (0.633) as when the first player was an outgroup member (0.346). This difference is statistically significant ( $\chi^2 = 4.595$ ). Thus Hypothesis 2 is supported.

Finally, Hypothesis 3 predicts that participants will be more likely to cooperate with ingroup members than outgroup members in the simultaneous decision dilemma. All three approaches predict this effect. However, the results of Table 3 yield no support for the prediction. There was no difference in participants tendency to cooperate with ingroup (0.640) and outgroup (0.682) members ( $\chi^2 = 0.763$ ). Thus, these data clearly do not support Hypothesis 3. A detailed discussion of the lack of support is taken up in the discussion section to follow.

### Discussion of Study 1

Data relevant to two of three hypotheses provided support for the fear/greed approach to identity. The hypothesis that was not supported concerned the effects of identity in the simultaneous decision dilemma. Interestingly, this is the only hypothesis implied by all three approaches. What makes the lack of support for this hypothesis especially intriguing is that many studies, as noted by Yamagishi and Kiyonari (2000), have found positive effects of identity in social dilemmas where participants selected their choices simultaneously. Indeed, Yamagishi and Kiyonari report positive ingroup effects using an identity manipulation virtually identical to the one used here. Thus, the question is why the effect did not emerge in the current study. I outline two possible explanations in the remainder of this section, and then outline a second study to address these explanations.

The primary difference between the current design and previous designs is that, compared to previous studies, the current study uses *both* (1) a minimal group situation rather than naturally occurring groups and (2) binary choice cooperation (cooperate or defect),

rather than continuous levels of cooperation. Some previous studies use either the minimal group situation (e.g. Brewer and Kramer 1986: experiment 3; Kramer and Goldman 1996: experiment 1; Yamagishi and Kiyonari 2000) or binary choices (e.g. Kollock 1998b; van de Kragt et al. 1986; Van Vugt and De Cremer 1999) but I could not find a single study that employed both design features. Most studies uncovered in my review (e.g. Kramer and Brewer 1984: experiments 1 and 2; Kramer and Goldman 1996: experiment 2) investigate the effects of identity on cooperation using continuous levels of cooperation and by making salient naturally occurring group boundaries, such as university affiliation.

One possible explanation for the anomalous finding is that the combination of the two factors used in the current design – ‘minimal group’ boundaries and binary-choice cooperation – provides a much more conservative test of identity effects than previous tests. The upshot of the more conservative test, it can be argued, is a dampening of identity effects in the simultaneous decision dilemma. I briefly discuss the potential effect of each component of the design and then suggest how the two factors may interact to further reduce the effects of identity.

First consider the identity manipulation. An important difference between minimal groups (e.g. based on coin tosses or painting preferences) and naturally occurring groups (e.g. school affiliations or college major) is that only the latter provide a basis on which actors can make attributions (accurate or otherwise) about the extent to which other members identify with the group. For example, researchers often create intergroup boundaries via university affiliation (e.g. Kollock 1998b; Van Vugt and De Cremer 1999). A noteworthy feature of this basis of ingroup/outgroup distinctions is that participants regularly observe others display signs of ingroup attachment, e.g. donning sweatshirts and baseball caps bearing university insignia. Thus, participants likely conclude that fellow students (and participants) tend to identify with the group boundaries made salient in the laboratory. Similar opportunities generally do not exist for admirers of Klee’s or Kandinsky’s works.

Said differently, identity manipulations based on naturally occurring groups are more likely to produce ‘common knowledge’ about the extent to which others identify with group boundaries. Thus, we should expect such manipulations to provide participants with a sounder basis for estimating the risk that their cooperation will be exploited by suspect ingroupers.<sup>5</sup> Again, the argument is not that

these estimates are accurate, but that the participant believes they are (more or less) so.

Now compare the possible effects of binary choice cooperation scenarios with designs that allow for continuous levels of cooperation. Assume, as above, that an actor identifies with a group but is uncertain about whether alter also identifies with the group. By extension, assume that identity affects responses to greed (as suggested by support for Hypothesis 2), but not fear (as suggested by support for Hypothesis 1). Given concerns about whether alter identifies with the ingroup, the actor faced with the continuous choice dilemma can simply reduce her overall level of cooperation. In the binary choice dilemma, on the other hand, there is no such middle ground. The actor must decide whether to cooperate and risk ingroup inequality or defect and lower ingroup payoffs. As suggested in the earlier discussion of the relationship between identity and fear, these competing motives cancel each other out. Thus, we could expect this to dampen or eliminate the effects of identity. Following the above discussion, such uncertainty about others' behavior is likely to be greater in minimal groups than in naturally occurring groups. If so, it follows that, for the simultaneous decision dilemma, identity effects will be weakest when identity manipulations are based on minimal groups and cooperation is binary – exactly the conditions that resulted in no support for Hypothesis 3.

Another possible explanation for the lack of support for Hypothesis 3 is much simpler and shifts the focus to the unusually high level of cooperation observed in the simultaneous/outgroup condition. Comparing this condition with the two sequential decisions in which participants were paired with outgroup members suggests that the level of cooperation observed in the simultaneous/outgroup condition may be a fluke. Specifically, cooperation rates with outgroup members were higher in the simultaneous condition than in either of the two sequential conditions. (However, only the comparison with the second-decider condition is statistically significant,  $p < 0.05$ .) Because direct reciprocity is present in both sequential decisions, but not in the simultaneous decision, the reciprocity approach leads us to expect the opposite; given that the simultaneous decision contains both fear and greed, so too does the fear/greed approach.<sup>6</sup> In short, even though all approaches suggest cooperation rates in the simultaneous outgroup condition should be among the lowest, the data in Table 3 show that they are among the highest.

With the exception of the simultaneous/outgroup decision, all data presented in Table 3 are clearly explicable in terms of the fear/greed approach. The forgoing discussion suggests that, because this is the only condition that is inconsistent with the theory – indeed results from this condition are inconsistent with all approaches to identity – it is probably a fluke. This conclusion is further substantiated by results from the procedural checks presented earlier, which showed that participants understood the procedure, and that the identity manipulation was successful.

It follows from the first explanation above that we should observe higher rates of cooperation with (minimal) ingroup members than outgroup members in continuous choice dilemmas, but not binary choice dilemmas. Alternatively, if the second explanation is correct and the absence of an identity effect in the simultaneous decision dilemma (in Study 1) was simply a fluke, further study should reveal minimal group identity effects in continuous- and binary-choice dilemmas. Study 2 was designed to address these explanations.

## Study 2

The second study was conducted using the same population of participants and physical location as Study 1. A total of 114 (59 male and 55 female) students participated in Study 2. There was one between-subject factor: dilemma-type (continuous versus binary choice) and one within-subject factor (whether alter was an ingroup or outgroup member). Except where noted below, the settings and procedures were like those used in the first study.

### *Settings and Procedures*

For simplicity, participants did not make their choices on computer (as they did in Study 1), but on paper. However, the instructions were virtually identical to those used in the first study, with necessary adjustments for the continuous choice dilemma. As in the first study, the instructions informed participants they would not see other participants at any point during or after the study.

Each participant made two separate choices, once with an ingroup member and once with an outgroup member. Both decisions were based on either a binary- or continuous-choice dilemma, depending

on the condition. Prior to making their decisions, the minimal group procedure from Study 1 was to divide participants into two groups (based on their preferences for Klee versus Kandinsky paintings). After participants were informed of their group membership, they received two packets of information in succession (one for the pairing with the ingroup member, and the other for the pairing with the outgroup member). Whether the participant was first paired with an ingroup or outgroup member was randomly determined. In all cases, participants were told that they would be selecting their choice at the same time as the other with whom they were ostensibly paired.

Participants in the binary condition were presented with the payoff structure given in Table 4. As in Study 1, these participants had only two choices: cooperate or defect (generic labels were used to denote choices). But, for participants in the continuous choice condition, intermediate levels of cooperation were possible. The instructions for the continuous choice condition explained:

You and the other participant have each been given \$3.00. Both of you will decide how much of this \$3.00 (if any) you wish to send to the other and how much you wish to keep for yourself. The experimenter will double any amount you send to the other participant. (You will keep any amount that you do not send, but it will not be doubled.) Similarly, the experimenter will double any amount the other participant sends to you. (The other participant will keep any amount he/she does not send, but it will not be doubled.)

Thus, like the binary condition, the payoff structure is a PD: at the extremes (when each participant either sends all or none of his or her endowments), the payoff structure is identical to the binary choice condition. For example, imagine participant 1 keeps their entire US\$3, and participant 2 sends their entire US\$3 endowment to participant 1. Participant 1 earns US\$9 (US\$6 from the other's doubled endowment, and US\$3 from the participant's own endowment), while the other earns nothing.

**Table 4.** Payoff structure for binary choice condition of Study 2

<i>Row player</i>	<i>Column player</i>	
	<i>Cooperate</i>	<i>Defect</i>
Cooperate	\$6.00, \$6.00	\$0.00, \$9.00
Defect	\$9.00, \$0.00	\$3.00, \$3.00

After each decision, the participant was asked to indicate his or her expectations about the other's behavior. Following both decisions, participants responded to several Likert-scale items. These items were used to check the identity manipulation. Finally, participants answered a number of questions designed to assess suspicion, and were then debriefed and paid. As in the initial study, participants' pay was calculated under the assumption that the 'other' cooperated in each decision. The procedure took about 30 minutes.

## Study 2 Results

As in Study 1, participants generally understood the procedure, the identity manipulation was successful and suspicion was low. Thus the analyses to follow include responses from all 114 participants (62 in the continuous choice and 52 in the binary choice conditions).

Beginning with data from the continuous choice dilemma, participants contributed more to the other when paired with an ingroup member (US\$1.56,  $SD = 0.80$ ) than when paired with an outgroup member (US\$1.41,  $SD = 0.87$ ). While this difference is small, it is statistically significant,  $p < 0.05$ , one-tailed.

The analysis of the binary choice dilemma uses the McNemar test, designed to detect differences in within-subject manipulations for binary dependent measures. For the current study, the McNemar test will tell us whether participants were more likely to cooperate with ingroup than outgroup members. While 53.8% of participants cooperated with ingroup members, only 36.5% cooperated with outgroup members, a statistically significant difference,  $p < 0.05$ , one-tailed. Thus, the results of Study 2 show that participants were more likely to cooperate with ingroup members in both the binary- and continuous choice dilemmas.

## Conclusion

The results of Study 2 suggest that the absence of support for Hypothesis 3 in the Study 1 results was a fluke (i.e. due to the unusually high level of cooperation with outgroup members in the simultaneous decision dilemma). More generally, the Study 2 results provide two forms of support for Hypothesis 3, which predicts greater cooperation with ingroup members for simultaneous

decision social dilemmas containing fear and greed. Participants were more likely to cooperate with ingroup members in both the continuous- and binary-choice versions of the dilemma. Thus, overall, the results from the two studies support the fear/greed approach to identity and cooperation presented in this article. I conclude by discussing some implications of the approach.

As noted in the introduction, many researchers view social identity as the key motivational solution to social dilemmas and collective action problems (Brewer and Silver 2000; Dawes et al. 1988; Klandermans 1997). If so, a clearer understanding of how identity operates – e.g. by leading actors to give positive weight to others' outcomes versus by affecting actors' expectations of others' behavior – should have a number of implications for how such problems can be resolved. In this regard, the fear/greed approach introduced in this paper offers a number of potential insights that go beyond the traditional approach to identity and cooperation. For example, as discussed earlier, social dilemmas differ according to whether the incentive to defect stems from fear, greed or some combination of the two factors. In contrast to the traditional approach to identity and cooperation, the fear/greed approach suggests that identity-based measures can be effective solutions to social dilemmas when the incentive to defect stems primarily from greed, but not when the incentive to defect stems primarily from fear. In the latter cases, the approach suggests, other solutions (e.g., sanctioning systems) will likely be more effective than identity.

An important feature of the fear/greed approach is that it maps directly onto insights from theories of collective action. For instance, collective action theorists (Heckathorn 1996; Marwell and Oliver 1993) argue that mobilization is characterized by an 'S-shaped' (third order) production function. The three segments of the production function (accelerating, linear, and decelerating) differ according to whether the incentive to not contribute to a collective action stems from fear, greed, or both. In the initial stages of collective action (with an accelerating production function), the motivation for not contributing is based on fear (a concern that the movement will not garner subsequent contributions). As the function becomes linear, the collective action problem is transformed into PD, where the incentive to not contribute stems from fear and greed. The motivation for not contributing in the final stage of mobilization, where the production function is decelerating, is based on greed.

According to the fear/greed approach to identity, *ceteris paribus*, we should expect social identity to have the largest effects during the latter stages of collective action, as the fear component is eventually replaced by greed. This suggests that organizers of collective actions will benefit more by appealing to potential contributors' identification with the movement's benefactors during these later stages (e.g. as in the call for contributions 'many others *just like you* have already done their part'). Conversely, the approach suggests that appeals to identity will be less effective during the earlier stages. Instead, the most effective organizing calls may center on personal identities, such as the possibility of being seen as a trail-blazer, or other strategic methods of aligning individuals' interests and *personal* identities with group interests. Future research should investigate the effects of identity on contributions to various stages of real world collective actions.

Summing up, as noted earlier, most scholars agree that social identity affects cooperation, but disagree on the exact mechanisms through which the effect occurs. As a result, an increasing number of studies have been directed at uncovering this process. The theory and experiments presented in this paper add to this growing body of work. Like another recent approach (Yamagishi and Kiyonari 2000), the one introduced in this article suggests a more conditional role of identity in increasing cooperation than that suggested by the traditional explanation of identity. As such, it provides a more fine-tuned account of the conditions under which group identity provides an effective solution to collective action problems, and the conditions under which other types of solutions may be more effective.

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## NOTES

1. Yamagishi et al. (1999) report the results of a previous approach to manipulating expectations of ingroup reciprocity (whether ego is told that her partner knows the two share a group membership). However, as Yamagishi and Kiyonari (2000: 120) note, this approach does not clearly distinguish between the traditional and reciprocity approaches. Thus, this previous experiment is not addressed here.
2. The study was planned as a within-subjects design (with decision type and alter's identity as between-subject measures) in which participants would make decisions in three one-shot social dilemmas, each with a different alter. However, a programming error involving whether participants were assigned to ingroup or outgroup members made their second and third decisions unusable. The first decision, on which the analyses reported below are based, was not affected by this error.
3. Study 1 uses a binary-choice dilemma (cooperate or defect), rather than a continuous contribution design. The binary-choice is used because there is no a priori way of determining whether a second decider will interpret a given level of cooperation by the first decider in the continuous cooperation/sequential version as 'cooperative' or 'non-cooperative'. For example, a contribution of nothing is clearly defection and a 100% contribution of is clearly cooperation. But it is not evident how participants would have labeled more realistic interim values. Thus, using the continuous cooperation design would have introduced an unnecessary complication for the second-decider condition of the experiment and created an unnecessary disjuncture between conditions. The current design therefore employed the simpler binary-choice approach.
4. The condition in which alter, as first decider, defects is not theoretically interesting because, as reported by Hayashi et al. (1999), second deciders do not cooperate following a non-cooperative choice by a first decider. Furthermore, the only model that predicts an effect of identity in this case is the traditional explanation and the remaining conditions provide enough information to distinguish this model from the ingroup reciprocity and fear/greed approaches to identity (see Table 2). Thus, the condition in which participants are faced with a non-cooperative decision by a first decider was not included in the design.
5. By extension, according to this common knowledge argument, even if an actor identifies with the ingroup and concludes (on whatever basis) that alter likely identifies with the ingroup, there is still the problem of whether alter knows that ego knows that alter identifies with the ingroup. Because past experiences in naturally occurring groups can generate common knowledge (Chwe 2001), compared to participants in minimal group experiments, participants in studies that make salient naturally occurring groups are likely to think they know more about others' loyalties, that others know that they know more about those loyalties, and so on.
6. The traditional approach doesn't yield as much insight here, given that it predicts a main effect of identity on cooperation. At a minimum, however, it predicts no differences in cooperation with outgroup members in the simultaneous and sequential dilemmas.

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