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To cooperate or not to cooperate: Using new methodologies and frameworks to understand how affiliation influences cooperation in the present and future

Poonam Arora [a,c,*], Nicole D. Peterson [b,c], David H. Krantz [c], David J. Hardisty [c,d], Kavita S. Reddy [c,e]

[a] Manhattan College, Department of Management and Marketing, School of Business, Riverdale, NY 10471, United States
[b] University of North Carolina at Charlotte, Department of Anthropology, Charlotte, NC 28223, United States
[c] Columbia University, CRED, Department of Psychology, New York, NY 10027, United States
[d] Stanford University, Graduate School of Business, Stanford, CA 94305, United States
[e] University of California, Los Angeles, Department of Psychology, Los Angeles, CA 90095, United States

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ABSTRACT

How can changes in degrees of group affiliation or identity change one's decision to cooperate or defect in a dilemma? According to the logic of appropriateness, decision changes result from changes in answer to the question, "what does a person like me do in a situation like this?" In two studies, transient group affiliation is systematically manipulated to test its influence on the appropriateness question both in the present and future. Novel methodologies (videotaping group interactions to obtain observed levels of group affiliation, implicit measures of social concept activation and aspect listing protocols) were used to obtain a better understanding of the mechanisms underlying the influence of group affiliation. Increases in group affiliation are accompanied by increases in the accessibility of social constructs, higher levels of cooperation, personal satisfaction and trust in one's group. Similar patterns are observed for decisions in the present and future. There is an order effect observed with decisions to cooperate in the future carrying over to subsequent decisions to cooperate in the present, but a decision to initially cooperate in the present does not translate as strongly to a decision to cooperate in the future. This is in part because a more analytical approach is used for decisions pertaining to the future, while decisions in the present tend to be more affect-based.

1. Introduction

Why does a resident of a small town being asked to conserve water during the summer ignore the request if it comes from the county or state government, but pay attention to it when it comes directly from the local village or neighborhood association?[1] Such behavioral variation is not rare in real world social dilemmas and accordingly to Weber, Kopelman, and Messick (2004), the variation in cooperative behavior can result from differences in the answer to the question, "what does a person like me do in a situation like this?" (hereafter referred to as appropriateness question). The answer to this question involves three

* Corresponding author. Address: 4513 Manhattan College Parkway, Riverdale, NY 10471, United States. Tel.: +1 718 862 3862.
[1] This question is based on an anecdote recounted by a town official in New Castle, NY.

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Table 1
Actual financial payoffs and social outcomes in a symmetrical 4-player game.

Number of players choosing cooperation	Financial reward for choosing		Social goals that support choosing C
	Cooperation	Defection	Gain due to an intrinsic reward
4	\$20.00	–	$+c_4$
3	\$18.00	\$23.00	$+c_3$
2	\$11.00	\$16.00	?
1	\$7.50	\$12.50	
0	–	\$10.00	

interconnected aspects: (1) recognizing the situation as a social one, which (2) activates one or multiple social identities that have rules associated with them that (3) in turn can strongly influence the final behavior.

This paper systematically examines how varying group affiliation or identity influences one's response to the appropriateness question in social dilemmas both in the present and future by using new methodologies that highlight underlying processes. Social dilemmas are defined as situations where rational behavior by individuals and organizations, i.e., acting in their best interest, makes everyone worse off. Classic examples include overgrazing or overfishing (Hardin, 1968), situations where individual decision makers gain economically from unrestricted exploitation of a resource, but where they would all gain more if exploitation were restricted.

Contrary to economic predictions based on rationality, however, in laboratory and natural social dilemmas, people do sacrifice part of their potential individual financial reward and cooperate to benefit the collective (Camerer, 2003). Explanations for such cooperative sacrifice include both individual variables such as social value orientation (Messick & McClintock, 1968), as well as contextual variables such as communication about the dilemma (Dawes, McTavish, & Shaklee, 1977; Dawes, van de Kragt, & Orbell,1988; Gintis, 2000), the creation of trust (Ostrom, 2003), social norms (Akerlof, 1980; Gouldner, 1960; Gächter & Fehr, 1999; Hayashi & Yosano, 2005; Pillutla & Chen, 1999), and group identity or affiliation with others impacted by the dilemma (Brewer & Kramer, 1986; Dawes & Messick, 2000; Kiyonari & Yamagishi, 2004; Onorato & Turner, 2004; Terry & Hogg, 1999; Turner, 1982; Yamagishi & Kiyonari, 2000) (see Dawes and Messick (2000) and Messick and Wilke (1983) for complete reviews).

When an individual aims to answer the appropriateness question, individual (e.g., social value orientation) and situational variables (e.g., group affiliation) can play equivalent roles in answering the appropriateness question: a decision maker faced with a dilemma might find multiple identities activated, each with its own goals and rules, and might use situational cues to help define the "me" to arrive at an answer to the appropriateness question.

2. Affiliation and the logic of appropriateness

Greater identification with an in-group increases observed cooperative behavior (Brewer & Kramer, 1986; Caporael, Dawes, Orbell, & van de Kragt, 1989; De Cremer & Van Vugt, 1999; Jackson, 2008; Kramer & Brewer, 1984) because affiliating with a group raises the relative importance of group outcomes (Brewer, 1999) and goals (Krantz, Peterson, Arora, Milch, & Orlove, 2008), thereby increasing the salience of group norms (Jetten, Spears, & Manstead, 1997). In other words, the greater affiliation one feels with a group, the more likely one is to highly value and adopt group/social goals, such as maximizing the good of others in the group. As a result, financial rewards can no longer accurately represent actual "best interests." This is in part because the interdependence between individuals, which can be spontaneous and automatic, prompts individuals to transform the given payoffs in a situation to more "effective" ones that better reflect their interpersonal relationships with group members (Thibaut & Kelley, 1959). In such situations, choices are made to support and fulfill multiple context-dependent goals (Krantz & Kunreuther, 2007), including social, environmental, and financial goals. In a group context, goals associated with group affiliation have been shown to mediate cooperation towards an in-group (Jackson, 2008).

Table 1 shows a four-person payoff array, with both financial payoffs used in this research, and affiliation-dependent payoffs. The number of cooperative choices made by the group is shown in the first column; resulting financial payoffs to cooperators and to defectors are shown in the next two columns. If all four cooperate, the outcome is \$20 per person, the second highest value. But, each of the four has a financial incentive to defect, in order to get \$23 rather than \$20, at the expense of the three remaining cooperators, who would each get \$16. The situation is similar when fewer cooperate: cooperators always have an incentive to defect. The financial Nash equilibrium is 0 cooperating, each receiving \$10, the second lowest outcome.

However, if an implicit reward ($+c_4$, e.g., a good feeling associated with full cooperation or due to individual motivations such as being pro-social) is sufficiently great, the combination of \$20 and $+c_4$ may hold greater value to the individual than \$23 (the best financial outcome). Given such a reward, when all cooperate, nobody has an incentive to defect. The rewards need not be the same for all players. In particular, $+c_4$ might be small for a defector. There could, nonetheless, be sufficient intrinsic reward for cooperation ($+c_3$) for each of the other three people to produce an equilibrium where three cooperate and one defects. However, given rational behavior, all-defect remains an equilibrium: when all defect, nobody has an incentive to cooperate.

Returning to the anecdote regarding water conservation, a possible explanation is that though the requested behavior, reason for the decision, and beneficiaries of the action are the same in both contexts, compliance changes substantially

due to situational parameters. Specifically, stronger and more concrete affiliation with the more local neighborhood than with the larger more abstract notion of county or state changes which social identities are most activated, which changes the rules or goals that are viewed as being most appropriate, and ultimately influences one's final decision to cooperate (or not). Thus, the answer to the appropriateness question is influenced by group affiliation (with greater affiliation resulting in more salient social goals) independent of whether the desire to affiliate is due to chronic individual pro-social tendencies or context-dependent situational factors. We define group affiliation to include durable group affiliation (Wit & Wilke, 1992; Yamagishi & Kiyonari, 2000), or short-lived social connections (Schachter, 1959) like transiently formed laboratory groups. The strength of affiliation one feels towards the other members of the group is a central mechanism through which the appropriateness question is resolved. But how might this resolution change, given a change in the timeframe associated with the dilemma?

3. Temporal distance as a situational parameter

The temporal element in a social dilemma is part of the context of the dilemma and is thus likely to influence one's decision to cooperate or not. For example, one does not necessarily expect to be in the same situation in the future as in the present, and thus might answer the appropriateness question differently for the two contexts. Past research finds that individuals are more likely to cooperate when it results in immediate gains and delayed losses (Mannix, 1990; Messick & McClelland, 1983) – a result in line with traditionally observed temporal discounting behavior (see Chapman (1998) for a complete review).

In addition, Construal Level Theory (Trope & Liberman, 2003) posits that the future is associated with abstract and higher-level thinking, while concrete and detailed thinking typifies the present. More attention is therefore paid to the details and mitigating factors in a decision in the present, while broader principles are applied to those in the future. One consequence of this is that the concrete details of the present can evoke emotional responses that guide one's decision, while distance from the future focuses one on abstractions and can thus result in a more analytical approach to the decision at hand. This very effect was observed in a study asking participants to choose one out of two apartment choices where half the participants were told that the apartment was available for immediate occupation and the other half were told it was available for future occupation. Participants were more likely to focus on the affective elements of the choice for an apartment to be occupied immediately, and carry out an analytical analysis for the apartment to be occupied in the future (Chang & Pham, 2008).

It is therefore, reasonable to assume that a person facing a future dilemma might arrive at a different answer to the appropriateness question than when facing the same dilemma in the present, especially given the potential for emotional responses in the present (such as fear that one might be the only cooperator, or on a positive note, the ability to feel good about having cooperated and done the "right thing").

4. Present research

The central motivational questions underlying this research are: how does increasing affiliation with a truly minimal group influence the response to the question, "what does a person like me do in a situation like this?" and how does that response change with the introduction of a temporal component. In two studies reported here individuals are randomly assigned to groups of 4, and then randomly assigned to one of four conditions aimed at creating varying levels of group affiliation using a truly minimal group paradigm (transient affiliation with a temporarily formed group consisting of strangers and in the absence of an explicit out-group or any common fate lottery (Brewer, 1979)). In the baseline control (Anonymous) condition, individuals were anonymously assigned to groups of four and other than knowing that they were in a group, had no other information about the group. Three other conditions systematically varied affiliation over baseline: using an arbitrary symbol to label a group of otherwise mutually anonymous participants (Symbol condition); having the participants make decisions sitting around a table in sight of one another (Co-Present condition); and asking participants to complete an earlier unrelated task collaboratively, rather than alone (Collaborative condition). These manipulations can be seen as decreasing social distance and thus creating the potential for increasing affiliation (Weber et al., 2004).

Symbolic groups represent groups and organizations one interacts with at an arms-length or in an abstract way (such as cause-based groups like the Red Cross, World Wildlife Fund, and UNICEF), while co-present groups represent those that form naturally during commutes and in the work place when physical space is shared. Collaborative groups represent interactive teams. Although Collaborative groups communicated during an unrelated task, no communication was permitted about the decision or the dilemma in any of the conditions.

A temporal delay where the dilemma was either resolved in the present or 6 months into the future was introduced in Study 2. In order to avoid priming or post-decision rationalization (as much as possible), implicit measures were used to gather data about level of affiliation, activation of social goals and decision making approach. These are detailed in the methodology sections of the studies.

The *general hypothesis* for Study 1 was that increasing awareness of the group (moving from Anonymous to Collaborative) would lead to stronger affiliation and thereby to an increase in cooperation rates and to increased satisfaction among those who cooperate successfully. In case of Study 2, the main hypothesis was that in addition to replicating the pattern of cooperation observed in Study 1, decisions pertaining to the future would be approached more analytically, while those

pertaining to the present would be arrived at more emotionally. Since all subjects received both scenarios, half the participants were presented with the Future scenario first followed by the Present scenario and the order was reversed for the other half. Specific hypotheses concerning the order effect and its interaction with affiliation are presented in conjunction with Study 2.

5. Study 1

Answering the appropriateness question requires one to recognize the situation, determine the identity most relevant given the situation and finally decide on which rules are the most appropriate and thus the action that best suits. Study 1 uses four levels of affiliation to vary the situational parameters and examine the resulting influence on cooperative behavior. Greater affiliation should result in increased willingness to cooperate due to increasing awareness of social goals and norms (recognition of the situation as a social one), an increasing level of satisfaction with the decision due to the intrinsic reward obtained from cooperation (recognition of the identity most relevant as that of a cooperator), and finally in greater levels of trust in one's group as a measure of social expectation and awareness. Thus a cooperator's outcome would be a combination of the financial amount and the intrinsic reward represented by "*c*" in Table 1.

5.1. Methods

5.1.1. Participants and procedure

Three hundred Columbia University students – 75 groups of size four – participated in a game with monetary payoffs shown in Table 1. Groups were randomly assigned to one of four conditions detailed above. In the baseline or Anonymous condition (14 groups), the four participants were isolated throughout the experiment and, although they knew they were in a group of four, they did not have any other information about their group. In the Symbol condition (15 groups), participants were similarly isolated, but shared a group symbol, such as a small blue or red star, which was pointed out and exhibited on instruction and answer sheets. In the Co-present condition (17 groups), participants sat together during the experiment, but did not interact. Finally, the 29 groups in the Collaborative condition also sat together and interacted in an initial, unrelated task. In the Co-present and Collaborative conditions, group members had no previous acquaintance and no communication pertaining to the dilemma decision occurred in any of the conditions.

All participants began by writing a letter to a Columbia University Dean about a campus issue important to them. The choice of topic and wording of the letter were left to each participant, except for in the Collaborative condition, where the group of four agreed on one issue and drafted a joint letter. Participants were informed (truthfully) that the letters would be sent to the Dean. After completing the letter(s), participants received \$10. They were then offered the opportunity to "invest" \$5 of the \$10[2] in an "investment cooperative." The instructions detailed earning for cooperators and defectors (similar to Table 1), and decisions were anonymous in that participants were able to deduce how many cooperated based on their earnings but there was no knowledge of any individual's action. Finally, participants completed a questionnaire that asked them to report their satisfaction with their decision and trustworthiness of their group on 5-point scales where increasing numbers indicated increasing levels of satisfaction and trust. It should be noted that this questionnaire was completed after decisions were made but before outcomes were known.

5.1.2. Video-coding of affiliation by independent observers

With a novel group, individuals may become more or less affiliated with the group as interactions progress and impressions solidify. Therefore, in the Collaborative condition, letter writing was videotaped and coded by two or more independent coders. Coders were asked to observe the videotaped session for each group, take note of each participant's body language (leaning towards the group, maintaining eye contact), tone (bored vs. engaged), and content of statements (relevant, interested, furthering the task rather than distracting). Coders were asked to evaluate the participant on three dimensions: open-mindedness, inclusive of others and belonging to or being affiliated with the group. They subjectively rated each participant using 5-point scales such that increasing numbers implied greater levels of the attribute. Thus participants in the Collaborative condition received an individual rating for their group affiliation as an attempt to measure affiliation that was not self-reported or post-decision. Ratings that differed by 1 point across coders were averaged. Less than 5% of all ratings varied by more than 1 point across coders; in these cases, a consensus rating was reached by discussion among the coders. Overall inter-coder reliability was 89%.

5.2. Data analysis

Throughout our presentation of the results, we try to emphasize careful description of the data more than null hypothesis testing. When inferential tests were needed, we used generalized linear mixed models with a random effect of group number (or individual subjects nested in groups, as appropriate), using variance components for the covariance structure, unless

[2] Participants were given the option to invest half (\$5) rather than their entire earnings from the letter writing task (\$10) because in a pilot test ($N = 108$), 50% of the \$10 was seen as the most neutral alternative – one without any experimenter based demand characteristics associated with it.

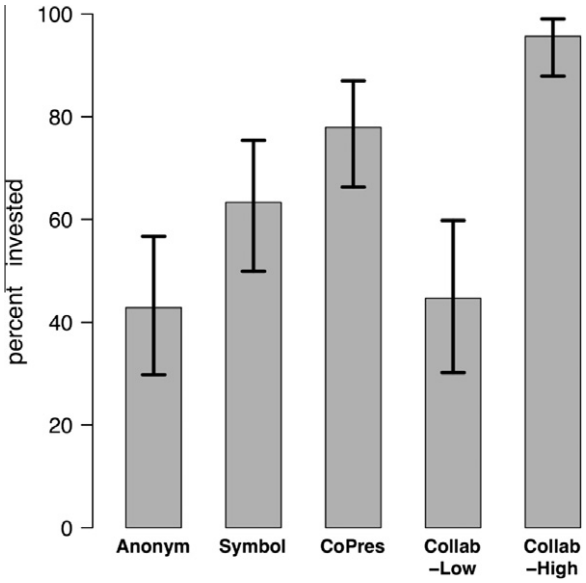

Fig. 1. Percent investment by condition in Study 1. Error bars are 95%-confidence intervals.

otherwise specified. These models are similar to traditional regression or ANOVA, but account for the fact that group members may influence each other by fitting a separate intercept for each group of four participants, thus allowing us to measure and control for the non-independence of individual observations. For each analysis, then, we report both the fixed effects (which typically compare experimental conditions) as well as the random effects (which account for the group level covariance). When the dependent variable was binary (for example, when predicting whether individuals cooperated or not), we added a logistic link function to the model. In addition, we performed standard correlations, ANOVAs, and *t*-tests, which yielded nearly identical results to the mixed models, and so are not reported here.

5.2.1. Results and discussion

Results are reported in the standard format (means ± *standard deviation*), while slopes, in deference to convention, are presented as (slopes ± *standard error*) where the standard error is the standard deviation divided by the square root of the sample size, and twice the standard error provides the 95% confidence interval limits around the measure (Kenney & Keeping, 1963).

5.2.1.1. Decision to invest or cooperate. As predicted, cooperation rates were lowest for the Anonymous condition ($M = 42.9 \pm 5.0\%$) and rose for the Symbol ($M = 63.3 \pm 4.9\%$), Co-Present ($M = 78 \pm 4.2\%$), and Collaborative ($M = 75 \pm 4.4\%$) conditions ($F(3, 296) = 5.06$, $p < .01$). The similarity of cooperation levels for Co-Present and Collaborative conditions was curious. Simply knowing more about one's group did not appear to be sufficient to raise cooperation. Furthermore, the random effect of group (in other words, the group level covariance) significantly predicted cooperation ($M = 0.46$, $SE = 0.29$), indicating that group members may have influenced each other, with some group compositions leading to high cooperation rates and others to low cooperation rates. In order to better understand the underlying dynamics, the Collaborative condition was subdivided (conservatively) by groups' affiliation strengths as scored by coders (Low = affiliation score $\leqslant 3$, High = affiliation score >3). Those who were assigned ratings of low affiliation cooperated at lower levels ($M = 51.9 \pm 5.1\%$), while those with higher assigned ratings of affiliation ($M = 93.8 \pm 4.9\%$) cooperated at significantly higher levels ($F(1, 114) = 19.9$, $p < .001$). The random effect of group in this analysis was not significant, indicating that the observer ratings of group affiliation accurately captured the group effects. Participants in the Collaborative condition who did not affiliate[3] with their groups resolved the logic of appropriateness question much as an individual without any connection to a group might (mimicking those in the Anonymous condition), while those who were coded as having affiliated answered the appropriateness question in a different manner (by mostly cooperating).

Overall, as hypothesized and shown in Fig. 1, cooperation increased from Anonymous to Symbol to Co-present conditions; cooperation in the Co-present condition fell above Collaborative-Low but below Collaborative-High ($p < .01$ and $p < .05$, respectively). Within the Collaborative condition, there was a strong log-linear relation between investment probability and coded group affiliation ($Slope = 1.19 \pm 0.23$, $p < .01$). This slope is large: a logistic regression model predicts 44%

[3] Participants rated as being low in group affiliation tended to exhibit signs of boredom, move physically away from the group, make comments that were a distraction from the main letter writing task and did not maintain eye contact with other group members.

investment when coded affiliation = 2, but 89% when coded affiliation = 4. Thus cooperation increased as manipulated transitory affiliation increased even when there was no explicit out-group or common fate lottery. At first blush this result seems to be contrary to that illustrated by Dawes et al. (1977), who found that irrelevant communication did not increase cooperation in a dilemma. This apparent contradiction is discussed in the Section 7.

5.2.1.2. Post-decision satisfaction. Overall satisfaction was somewhat higher for cooperators ($M = 4.30 \pm 0.82$) than for defectors ($M = 3.98 \pm 1.04$; $F(1,298 = 6.79$, $p = .01$). This provides some preliminary evidence for the value of the intrinsic reward referred to as "c" in Table 1 and for the influence of social situational parameters on how the appropriateness question is resolved. The intrinsic reward could be the result of social norms and goals being activated; however, since these ratings were obtained post-decision (but prior to outcomes being declared), post hoc rationalization (e.g., I did the right thing so I must be happy with that) might also play a role. Either way, cooperators derive value from their cooperative action that may be a function of their social situation. Monetary payoffs alone cannot explain the cooperation and satisfaction findings: there is an additional value derived from the act of cooperating that varies as a result of increasing affiliation.

In addition, as predicted, self-reported trustworthiness of one's group varied by condition ($F(3,296) = 4.83$, $p < .01$), increasing from Anonymous ($M = 2.79 \pm 1.03$) to Symbol ($M = 2.87 \pm 1.06$), and Co-Present ($M = 3.12 \pm 1.01$). Trustworthiness was similar in the Collaborative – low affiliation ($M = 3.06 \pm 1.00$) as in the Co = Present condition, but rose again for Collaborative – high affiliation ($M = 3.70 \pm 0.91$) conditions. Thus, greater group awareness is accompanied by stronger affiliation, a stronger expectation that others will cooperate (as evidenced by the trustworthiness ratings), and stronger intrinsic rewards from successful cooperation (as evidenced by the satisfaction ratings). This leads to higher levels of cooperation. When participants do not affiliate with their groups, they do not show the same pattern (as evidenced by those given a low-score by coders), which suggests that increasing affiliation is the first step in this chain towards cooperation.

Ultimately, this study highlights the influence exerted by the mere existence of an abstract group on decisions in social dilemmas by showing that affiliation and cooperation increases with awareness of the group, even in truly minimal groups and in the absence of explicit out-groups. Study 1 however, did not provide direct evidence that social goals were top-of-mind for cooperators, and depended on explicit post-decision measures, nor did it explore the effects of time on the affiliation created in the lab groups.

6. Study 2

Study 2 had three purposes: to replicate the findings of Study 1, to probe the social goals underlying decisions to cooperate using implicit measures as well as ratings of affiliation in all of the conditions, and to test cooperation for future transactions in order to examine temporal features of affiliation. A word completion task (detailed below) was used as an implicit measure of accessibility of social goals and concepts. Cooperators were expected to score higher on this measure than defectors. A measure of self-reported affiliation was added to the post-decision questionnaire, and self-reported affiliation was expected to increase with condition and cooperation.

A pre-decision questionnaire was also included. This asked participants to list their uncensored thoughts prior to making their decisions (procedure detailed below) as a mechanism for understanding the underlying thought processes, particularly in trying to identify differences in how Present vs. Future decisions were approached. As previously described, the temporal dimension of the game is likely to change the influence of affiliation and thus one's decision to cooperate. Specifically, affective components are expected to weigh more heavily in the concretely construed present while analytical thinking is predicted to dominate the abstractly construed future.

Since half the participants receive the Present scenario first followed by the Future one and vice versa, it is likely that the initial temporal frame will act as an anchor influencing whether or not participants switch from using one type of approach (affective or analytical) to the other and thus potentially switch decisions with the change in temporal frame. However initial decisions may not all be equally likely anchors: an initial decision to cooperate arrived at using an analytical approach (thus Future first) may be harder to reverse as it makes the reasons for cooperation or defection explicit and harder to subsequently ignore. Given findings from Study 1, such an individual is likely to value the intrinsic reward from cooperation sufficiently enough to have decided that the appropriate decision is to cooperate. To now switch to defection will require that the intrinsic reward be rejected and emotions such as fear of being the only cooperator and greed for a greater monetary outcome become primary. However, since the analytical cooperator will have most likely already reasoned through the fear and greed, switching back should be harder. It is unclear how sticky the other initial decisions (future – defect, present – cooperate, and present – defect) might be. Thus an additional motivation for Study 2 was to explore the switching behavior among decisions.

6.1. Methods

6.1.1. Participants

Three hundred Columbia University students who had not taken part in Study 1 participated in this study. Study 2 included 16 four-person groups in the Anonymous condition, 21 in the Symbol condition, 16 in the Co-present condition, and 22 in the Collaborative condition.

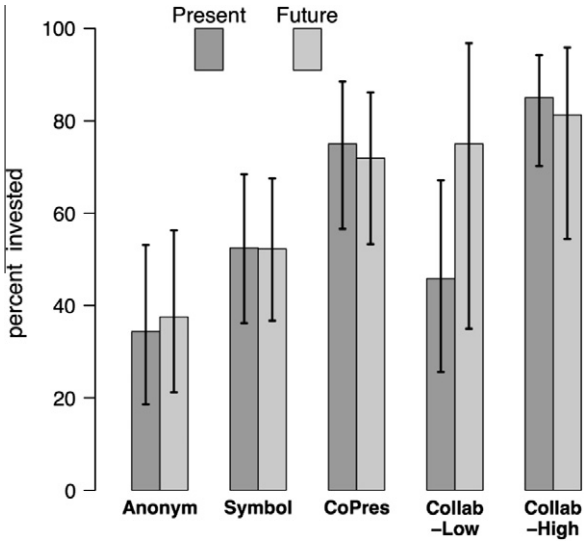

Fig. 2. Percent investment by condition for first-presented scenarios in Study 2. Error bars are 95%-confidence intervals.

6.1.2. Procedure

Only differences from Study 1 are noted. Most important, participants in Study 2 made two investment decisions – one with immediate outcomes (Present scenario) (as in Study 1) and one with outcomes delayed 6 months (Future scenario). For the Future scenario, participants were told (truthfully) that they were to make their choices in the present, but these choices would be executed in 6 months' time when outcomes would be paid out. Decisions were sequential and order-balanced: half the participants received scenarios in Present – Future order, while the other half encountered scenarios in Future – Present order. They did not learn about the second scenario until after they had made their first decision. To offset temporal discounting (i.e., the assumption that an amount of money today will be worth more in the future), future payoffs were scaled up by a factor of 1.3, a figure based on previous research conducted in the same laboratory (Hardisty & Weber, 2009).

6.1.2.1. Obtaining uncensored thoughts. Prior to each decision, subjects were asked to list their uncensored thoughts as they occurred to them using a variation of a think-aloud protocol (Johnson, Haeuble, & Keinan, 2007; Weber et al., 2007). This methodology has been successfully used to obtain some indication of the factors considered during the decision without having an impact on the actual decision *per se*. In addition, as a measure of the social impact of the decision, participants were also asked to divide 100 points in the ratio of the relative importance of one's own earnings vs. the group's earnings.

6.1.2.2. Implicit social word completion task. Following each decision, participants were asked to complete five words to test for the accessibility of social goal constructs, similar to methods used by Gilbert and Hixon (1991) and Knowles and Gardner (2008). For example, participants were given SHA_E, which can be completed as a word with a social meaning (SHARE) or in several less social ways (e.g., SHAKE or SHAPE).

Participants then reported their feeling of affiliation with the group on a 5-point scale. Upon completion of both scenarios, participants were paid for the present scenario. Payoffs for each scenario were ordered as in Table 1; all-defect was the only financial Nash equilibrium.

6.1.3. Results and discussion

6.1.3.1. Effects of condition and present/future scenario on first decisions. Fig. 2 displays investment percentage for each condition in Study 2, for both the Present and the Future scenario, when each was presented first. At first glance, the results appear to diverge for the Future-first Collaborative – low affiliation Condition. However, there were only four participants in that Condition and thus no conclusions can be drawn from it. Results are similar for all other Conditions for both the Present and Future, and are similar to Fig. 1, except that overall percentage of investment was 59%, compared to 67% in Study 1. Note that all error bars signify 95% confidence levels. Specifically, the overall rate of cooperation rose with increasing level of manipulated affiliation as observed in Study 1. In summary, Condition strongly affects initial cooperation, $F(3,296) = 8.3$, $p < .001$.

6.1.3.2. Second thoughts: within-subject shifts between present and future. Table 2 gives the within-subject profiles for Present and Future investment for the two presentation orders. Experimental condition did not predict switching behavior nor did it interact with order (both $p > .5$), so Table 2 collapses across condition. There is a powerful effect of presentation order on second decision. When the Present scenario was offered first (Present-first), half of the investors declined to invest in the

Table 2
Order effect on response profiles for present and future investment.

		Order: present first (N = 168) Future investment		Order: future first (N = 132) Future investment	
		No (%)	Yes (%)	No (%)	Yes (%)
Present investment	No	32	8	27	11
	Yes	30	30	15	47

Table 3
Number of participants with analytic and emotional thoughts by order (present first vs. future first).

Mode of thoughts prior to first decision	Present first	Future first
Analytic	26	67
Emotional	81	13

second decision, i.e., the Future scenario ($t(167) = 4.78$, $p < .01$), or as shown in Table 2, 30% of those who cooperated in the present switched to defection in the future, while only 8% of those who defected in the present switched to cooperation in the future. In contrast, when the Future scenario was offered first (Future-first), less than one-fifth of those who invested declined to invest in the subsequent decision i.e., Present scenario with immediate payoff. The asymmetry of the secondary diagonal (11% vs. 15%) was much smaller ($t(131) = 0.84$, $p = ns$). This difference in the change: From Present-to-Future vs. Future-to-Present, was statistically reliable in a multi-level logit model ($slope = 1.41 \pm 0.39$, $F(1,176) = 13.3$, $p < .001$). A random effect of group ($M = 0.40$, $SE = 0.37$) indicated that some groups were more likely to have members switch from cooperation to defection than others. In summary, participants who initially commit to future cooperation do not often switch for Present outcomes. By contrast, many participants who initially commit to cooperation with Present outcomes switch when the scenario shifts to future.

6.1.3.3. Analytic vs. emotional reasoning. Evidence that this switch may be due to differences in processing is provided by the spontaneous thoughts shared by subjects prior to making their decision. These thoughts were coded for the presence of analytic thoughts (e.g., those pertaining to risk, return, probability and expected value) vs. affective thoughts (e.g., those pertaining to feelings and ideas of right and wrong) by two independent coders. Both coders independently coded 82% of the thoughts identically. Coders discussed and arrived at a joint rating for the remaining 18% of thoughts. Not all participants provided thoughts and not all thoughts could be classified as analytic or emotional, despite discussion. These participants were excluded from this analysis resulting in 187 first-decision thoughts and 154 second-decision thoughts.

As shown in Table 3 and in keeping with the above predictions, participants receiving the Future decision first had significantly more analytic and fewer emotional thoughts compared with those who received the Present decision first, $F(1,185) = 53.8$, $p < .001$. In order to examine the influence of the analytic vs. emotional modes of thinking on choice in the second decision, each participant was assigned a "Switch-Mode" score of either 0 (for no change in thought mode between thoughts listed for the first and second decisions) or 1. In addition, a "Switch-Choice" score was also assigned to each participant such that 0 implied the there was no change in choice between the two decisions (i.e., both were either defect or cooperate) and 1 implied that the participants had changed from defect to cooperate or vice-versa. Switch-Mode was a significant predictor of Switch-Choice, ($slope = 2.28 \pm 0.41$, $F(1,138) = 30.4$, $p < .001$). The random effect of group was not significant; indicating that there was little group level variability in Switch-Choice once the effect of Switch-Mode was taken into account. Table 4 illustrates this with counts of participants by Switch-Mode and Switch-Choice for both Present-first and Future-first. Thus, the time-frame of the initial decision influences whether an analytic or emotional mode is used in thinking about the decision and changes in the actual decision are accompanied by changes in the thought mode, which may be more likely when moving from present to future rather than from future to present.

6.1.3.4. Post-decision satisfaction. Post-decision satisfaction was probed after each scenario. Replicating the pattern observed in Study 1, satisfaction after the Present decision was vastly greater for Present cooperators ($M = 4.16 \pm 0.59$) than defectors ($M = 2.56 \pm 0.93$, $F(1,166) = 188.9$, $p < .001$), and even quite appreciably greater for Future cooperators ($M = 4.11 \pm 0.80$) than defectors ($M = 3.3 \pm 0.98$, $F(1,130) = 17.6$, $p < .001$), independent of condition and scenario order. Simply being asked to think about one's attitude can push it to an extreme – both for positive as well as negative attitudes (Wilson, Lisle, & Kraft, 1990): Perhaps asking participants how they felt was sufficient to make cooperators feel more satisfied. Satisfaction after the Future decision, however, was unrelated to both Present and Future cooperation. Although participants make a choice in the Future scenario, the decision is not executed until 6 months in the future: Thus, participants may have found it difficult to report satisfaction for a decision that is essentially incomplete.

6.1.4. Variables associated with decisions to cooperate

6.1.4.1. Own earnings. The weight assigned to own rather than group earnings predicted both Present ($slope = 0.08 \pm 0.01$, $F(1,298) = 68.6$, $p < .001$) and Future ($slope = 0.09 \pm 0.01$, $F(1,298) = 69.4$, $p < .001$) cooperation. Significant random effects

Table 4
Changes in thought mode and changes in choice between first and second decisions.

Number of participants	Same mode for thoughts preceding both decisions	Different modes for thoughts preceding both decisions
Present first: same choice for 1st and 2nd decisions	35	10
Present first: different choice for 1st and 2nd decisions	14	23
Future first: same choice for 1st and 2nd decisions	39	5
Future first: different choice for 1st and 2nd decisions	3	11

of group (0.27 ± 0.30 for Present and 0.68 ± 0.37 for Future) indicated that group composition influenced cooperation rates above and beyond the own earnings measure. (For a complete account and analysis of these group level effects, see the *Log-Linear Models for Cooperation* section, below.) Participants ratings of the importance of own earnings decreased from Anonymous to Collaborative conditions: the means points assigned to own earning in the Present decision are: Anonymous ($M = 75.38 \pm 19.12$), Symbol ($M = 71.88 \pm 17.81$), Co-Present ($M = 70.00 \pm 17.45$), and Collaborative ($M = 63.60 \pm 19.86$; $F(3,296) = 5.3$, $p < .001$). Points assigned in the Future decision follow a similar pattern. Since Study 1 effects were replicated in Study 2, it can be concluded that this pre-decision probe had little effect on the decision process.

6.1.4.2. Implicit social word completion. Three (of five) social word completions following the Present decision correlated strongly with one another and with Present cooperation: U_ (completed as "us" vs. other choices), _AIR ("fair" vs. other), and O_RS ("ours" vs. other). Two (of five) completions following the Future decision correlated with Future cooperation: GRO__ ("group") and SHA_E ("share"). Total number of social word completions increased from Anonymous and Symbol conditions to Co-present and Collaborative, and predicted cooperation in the Present (*slope* = 1.3 ± 0.2, $F(1,298) = 57.0$, $p < .001$) and Future(*slope* = 2.0 ± 0.2, $F(1,298) = 93.7$, $p < .001$). The random effect of group was significant for Future (0.40 ± 0.36) but not Present.

6.1.4.3. Self-reported affiliation. These ratings also predicted cooperation for both Present (*slope* = 1.45 ± 0.17, $F(1,298) = 72.9$, $p < .001$) and Future (*slope* = 1.23 ± 0.15, $F(1,298) = 67.6$, $p < .001$) scenarios. The random effect of group was significant for Future (0.27 ± 0.29) but not Present. Ratings of group affiliation increased monotonically and reliably across conditions: the mean reported affiliations in the Present scenario are: Anonymous ($M = 2.70 \pm 1.20$), Symbol ($M = 2.8 \pm 1.21$), Co-Present ($M = 2.98 \pm 1.05$), and Collaborative ($M = 3.89 \pm 1.04$; $F(3,296) = 19.0$, $p < .001$). Ratings of affiliation in the Future scenario follow a similar pattern.

6.1.4.4. Log-linear models for cooperation. The three variables just described (Own Earnings, Social Completion, and Affiliation) were tested simultaneously in multi-level log-linear models for probability of investment. Random effects of group are not significant once Affiliation and Social Completion are included in the models, so we chose to proceed with standard fixed-effect logistic regressions. In other words, although there were important group level effects, they were captured by our Affiliation and Social Word Completion variables. The logistic regressions are similar in all four conditions and for both Present and Future scenarios. All 24-regression coefficients (3 variables × 4 conditions × 2 scenarios) had the expected sign; all but one differed significantly from 0 ($p < .05$). Of course, coefficients varied somewhat across eight log-linear fits, but their similarity suggested a unified model, with dummy variables for condition. Since scenario order was important (Table 3), it was also incorporated as a variable. The same variables were tested for both Present and Future scenarios. Table 5 shows estimated logistic regression coefficients (with estimated standard errors) for present and future investment. The Symbol and Co-Present conditions show substantial positive effects (compared with Anonymous, the reference level, absorbed into the Intercept). Co-presence had a larger effect in the Present-first order, especially for Future investment. Own Earnings,

Table 5
Models for investment: estimated coefficients and standard errors.

Variable	Present scenario		Future scenario	
	Coefficient	(Std. error)	Coefficient	(Std. error)
0. Intercept	−6.73	1.05	−8.55	1.29
1. Symbol	+1.41	0.58	+1.79	0.74
2. Co-present: (present 1st)	+2.88	0.91	+3.05	1.13
3. Co-present: (future 1st)	+1.66	0.72	+1.57	0.87
4. Collaborative	−0.42	0.59	−1.31	0.86
5. Word completion	+0.83	0.22	+2.47	0.36
6. Reported affiliation	+1.62	0.26	+1.57	0.30
7. Order (future 1st)	+0.11	0.45	+0.89	0.59
8. Own earning: (present 1st)	−0.10	0.02	−0.17	0.04
9. Own earning: (future 1st)	−0.05	0.02	−0.07	0.02

Social Word Completion, and Affiliation all show large effects (rows 5–9). Moreover, Own Earnings interacts strongly with Order. With Future presented first, those who rate own earnings highly are less likely to act on an abstract construal of group affiliation by investing, either for the Future or the Present scenario. These three explanatory variables produced an accurate model, with Order and Own Earning/Order interaction also contributing. However, these variables do not mediate the effects of Condition; to the contrary, coefficient estimates for the Symbol and Co-present conditions in Table 5 were similar to those for a model based on Condition alone. Thus, the three probe variables explain much of the variation in investment, but do not adequately capture the effects of Symbol or Co-presence.

In summary, the models of Table 5 were selected on the basis of how well they reduced deviance compared with the null deviance obtained from an intercept-only model (thus the model with the lowest residual deviances were chosen), theoretical interpretability of effects, inclusion of interpretable interactions for which there is at least weak evidence, and including analogous variables for Present and Future scenarios. These models fit the data well: The Nagelkerke R square for the present-first model is .73 while for the future-first model it is .84. Despite the similarity of Present and Future models, there is a large psychological difference, as shown by the order effects (Table 2) and by the fact that in the Collaborative condition, observer-rated affiliation predicts only Present investment.

7. General discussion

A social dilemma may not truly be a dilemma when intrinsic rewards outweigh financial gain from defection over cooperation. The small town resident mentioned at the start of this paper does not really face a dilemma when asked to conserve water by the local neighborhood if the answer to the question, "what does a person like me do in a situation like this" is simply a function of recognizing that the situation is a social one where social norms and goals are important, the identity that matters most is that of being a good neighbor, and thus the obvious action is to cooperate with the request (Brewer & Gardner, 1996). The intrinsic reward derived from "doing the right thing for my neighborhood" is arguably higher here than the reward that may be derived from using more water. The presented studies suggest that this may be a function of group affiliation as evidenced by the increasing levels of cooperation with increasing affiliation, and satisfaction derived from cooperation in Study 1.

A further connection bears mentioning: our resident may never discuss the water conservation request with neighbors but communicating with them about other issues (however irrelevant) serves to solidify the affiliation felt and thus its impact on the decision to cooperate. This appears to be in direct conflict with Dawes, McTavish, and Shaklee (1977) where irrelevant communication did not serve to increase cooperation in a dilemma. In that study, participants were assigned to friendship groups and were then re-assigned to a communication condition with others not part of their initial friendship group with the goal of bringing back the most amount of money to share with their original friendship group. The relevant affiliation here is with the friendship group, and thus irrelevant discussion with others has no impact. However, when the irrelevant discussions are with others in one's group, they serve a useful purpose of helping define one's level of affiliation and thus commitment to the group (as is evidenced by the predictive ability of coder ratings of group affiliation based on the video-taped discussions).

Hinkley and Anderson (1996) posit that when people view themselves as connected to others, they shift to a relational paradigm where social constructs are more easily accessible. This allows social goals to exert stronger influence on the decisions at hand (Higgins, 1996) and thus change the answer to "what does a person like me do in a situation like this?".

Study 2 extends these findings to include the impact of a temporal delay: increasing affiliation continues to result in increasing levels of cooperation independent of temporal frame and is accompanied by increasing points assigned to how much one is concerned with other's earnings in the group, greater accessibility of social constructs as measured by a word completion task and greater self-reported group affiliation. Together, these provide stronger evidence for the influence of contextual factors on how the logic of appropriateness question might be resolved in favor of cooperation in the presence of group affiliation. One could argue that the affiliation serves to reduce the uncertainty created by the introduction of what is essentially a temporal dilemma within a social dilemma (Hendrickx, Poortinga, & van der Kooij, 2001).

The order effect in within-subject decisions in Study 2 illustrates that a temporal delay does not simply attenuate the impact of affiliation by reducing the salience of social goals or contextual factors. Rather, the changes in cooperative behavior are subtler and better explained by the difference in the preference of affective reasoning for the concrete present vs. analytic reasoning for the abstract future (Chang & Pham, 2008; Trope & Liberman, 2003). Hence, once a participant analytically arrives at a decision to cooperate in the future-oriented scenario, there is little reason to change that decision for the present.

However, the more affective approach applied to the present does not translate as well temporally, resulting in a switch from cooperation in the present to defection in the future. One possible explanation for this is that having emotionally decided that one's group members are trustworthy and thus one should cooperate in the present, one is then faced with the objective reality of the transient nature of affiliation in a lab study. This combined with the greater financial reward from defection when analytically approaching the abstract future might suffice to motivate a switch to defection.

8. Limitations and future directions

Changes in affiliation result in changes in the decision to cooperate or not. However, this relationship does not appear to be a straight line between affiliation and the final decision, as we did not find any mediation effects of self-reported

affiliation on the final decision in Study 2. Stronger affiliation or greater recognition of the group may result in changes in which rules are viewed as relevant and how the situation is recognized (the other elements that constitute the appropriateness question). Clearly this is a limitation of the current work and an area for future research.

In addition, more work is needed to better understand the interaction of construal and affiliation. Recent findings highlight the importance of construal level and action congruency (Sanna, Lundberg, Parks, & Chang, 2010) as a way of encouraging cooperation, i.e., cooperation is more likely when its construal and the action required to achieve it (contribute money or consume less) are both at the same level of abstraction (or concreteness). Clearly the interaction of construal level and affiliation along with temporal distance is an area where more research is needed to better understand the interactions and why some decisions are not as "sticky."

Another area worth exploring is to understand how individual variations in the importance placed on social consequences or concern for others (as measured by say, Social Value Orientation) interact with construal levels and temporal factors. Are pro-socials equally pro-social when the decision is in the future vs. the present? And is the influence of how the dilemma or the options are construed identical for all social value orientations or is the impact likely to be greater on pro-socials?

As a final note, having a psychologically realistic account of why people cooperate could lead to less costly and more effective designs for interventions and institutions that promote cooperation. Rewards for cooperation have both economic and social components that can be construed in various ways. For mainly private choices, symbols and labels can help to delineate a group of similarly situated individuals; even the weak group affiliations thereby created may transform what people think of as their "best interests." For example, when individuals are made aware of pro-social actions of others like themselves, they tend to follow suit (Goldstein, Griskevicius, & Cialdini, 2007). Where decisions are more public – ranging from negotiations between family members to those between nations – the temporary affiliations arising in face-to-face interactions may have powerful effects on participants' goals. Such factors need to be better understood so that their full potential can be utilized in helping resolve social dilemmas to the benefit of all.

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