

## Cooperation in Social Dilemmas and the Need to Belong: The Moderating Effect of Group Size

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The present research examined the effects of the need to belong and group size on cooperation in a public goods dilemma. On the basis of previous research (R. F. Baumeister & M. R. Leary, 1995), it was expected that those high in the need to belong would cooperate most. In addition, it was expected that the need to belong would predict cooperation for large-group members but not for small-group members. Analyses supported both hypotheses. Furthermore, individual differences in the need to belong were positively correlated with frustration about individuals' (cooperative) decision, a feeling believed to emerge from the felt uncertainty over whether cooperation would be reciprocated by others, the conflicting motivations of the need to belong and personal self-interest, or both.

Social interactions in dyads, groups, or communities are frequently characterized by a conflict between personal and collective interest. One type of interdependence situation is referred to as a *social dilemma*, where if decision makers decide in favor of personal rather than collective self-interest, the final outcomes will ultimately be worse than if individuals decide to contribute to the group (at least a minimum amount of effort, time, or money). The following research is focused on one type of social dilemma called the *public goods dilemma* (Komorita & Parks, 1994). In this dilemma, individuals must contribute to a public resource to maintain the presence and use of the resource. If insufficient contributions are given to the public resource, then it will no longer exist. A critical issue, then, is what psychological processes produce cooperation in this type of dilemma. One

potential cause of cooperation in the public goods dilemma may be individuals' need to belong (Baumeister & Leary, 1995).

### The Need to Belong and Cooperation

Over the past three decades, experimental social dilemma research has identified several psychological mechanisms responsible for the emergence of cooperation (see Komorita & Parks, 1994). One solution related to individuals' self-identity is the extent to which people feel they belong to and identify with the in-group (e.g., De Cremer & Van Vugt, 1999; Kramer & Brewer, 1984): Those with strong group identification have been found to invest more in public goods dilemmas and exercise greater restraint in resource dilemmas than weak-identifying group members. Following recent claims that group identification may serve several functions (Deaux, Reid, Mizrahi, & Cotting, 1999), it has been argued that one such function may be to increase belongingness. Following this logic, it is expected that people with a strong need to belong should cooperate the most, probably because this may satisfy their need to belong. This assumption is consistent with Baumeister and Leary (1995), who argued that an important consequence of belongingness needs is that "the apparent *possibility* of social attachments seems to shift people away from the self-oriented mode toward a more coopera-

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The present research was supported by Netherlands Organization for Scientific Research Fellowship 016.005.019 awarded to David De Cremer. We thank Muriel Bakker for her help in collecting the data.

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tive, collectively beneficial mode of response” (p. 519).

According to Baumeister and Leary (1995), all people have a pervasive need to belong that is reflected in their desire to form and maintain relationships with others. Moreover, these authors argue that this need to belong applies equally to strangers and to specific (and known) individuals and relationships, which implies that the formation of *positive* and potentially *continuous* social relationships per se is the main function of belongingness needs. Because a strong need to belong motivates people to invest time and energy to develop a continuation of social relationships, it can be suggested that under such circumstances people will be more likely to exhibit relationship-serving behaviors such as cooperation. This argument is consistent with recent research showing that cooperation can increase feelings of inclusion and, hence, satisfy the need to belong (De Cremer, 2002). Although this argument seems intuitively correct, no research to date has examined this link between belongingness needs and cooperation. Therefore, we wished to test the idea that people with a high need to belong will attempt to increase their feelings of inclusion by focusing more on the collective interest and cooperate with others. In the present research, we assessed the need to belong by means of an individual-difference variable, because Baumeister and Leary (1995) argued that although this need should be pervasive among most people, “naturally one would expect there to be individual differences in strength and intensity” (p. 499).

### The Role of Group Size

One relevant factor in social dilemmas that influences individuals' tendency to cooperate is group size (for a review, see Pruitt, 1998; for empirical work in public goods dilemmas, see Brewer & Kramer, 1986; Sato, 1988; Yamagishi, 1992). Previous social dilemma research has shown that cooperation decreases in large groups, mainly because people feel less efficacious, are less identifiable, and may feel less responsibility to pursue the group's welfare (Kerr, 1989; Liebrand, 1984). It appears, then, to some extent, that certain social constraints that promote collective interest are present to a greater degree with membership in small groups

relative to membership in large groups. When such social constraints that promote cooperation are absent (or at least present to a lesser degree), cooperation may depend on psychological needs, such as personal self-interest or the need to belong. If so, then individual differences in the need to belong may be more likely to predict cooperation among large-group members than among small-group members (*Hypothesis 1*).

### Decisional Frustration and the Need to Belong

Individuals in large groups with a high need to belong may be more likely to cooperate than individuals with a low need to belong, but ironically, this cooperation may come at a price; they may be frustrated about their decision to cooperate. First, such cooperation can conflict with individuals' tendency in large groups to decide in favor of personal self-interest (Komorita & Parks, 1994). Komorita and Parks have demonstrated that the incentive structure changes as a function of group size: Holding all else constant, personal self-interest outcomes are more attractive in large groups than in small groups. However, individuals in a large group with a high need to belong may feel conflicted between their need to belong and this tendency to defect, which is consistent with the assumption that frustration results from a threat or harm to one's goals or motives (cf. Frijda, 1994). More important, however, is that individuals who try to meet their need to belong through cooperation cannot guarantee others will accept them. It is sensible to assume that when individuals cooperate out of a need to belong, they are looking for that cooperation to be reciprocated. If cooperation is reciprocated, individuals will be able to meet their belongingness need. However, individuals do not know whether other group members will cooperate or defect. If others defect, then individuals with a high need to belong can lose in two ways: They are left with a lower supply of the resources, but also they may feel rejected by others. Such risks are expected to create doubt about whether others will reciprocate (see Carver & Scheier, 1990). Consequently, decisions to cooperate that are caused by a need to belong are believed to result in psychological conflict, whether as a

result of competing needs, a concern that others may not reciprocate cooperation, or both.

The following research tested whether the need to belong would yield greater frustration about the decision to cooperate. Consistent with the predicted interaction on cooperation, the need to belong could be positively correlated with decisional frustration for large-group members only, as these members are the ones who are motivated to cooperate out of a need to belong (*Hypothesis 2a*). Here, the social constraints expected to operate in the small group make it likely that these group members will cooperate, regardless of their need for belonging. However, perhaps in small groups, people with a high need to belong cooperate as a result of their need, but those with low need cooperate as a result of one of these social constraints. If so, and if the other social constraints (e.g., accountability) are unlikely to produce decisional frustration (which seems likely), then the need to belong and frustration may be positively correlated in small and large groups, even though the need would not be correlated with small-group cooperation (*Hypothesis 2b*). Both predictions were tested.

## Method

### *Participants and Design*

In all, 42 Dutch psychology undergraduate students participated in exchange for course credit. The study consisted of a group size (small vs. large)  $\times$  need to belong (continuous) between-participants design. Students were randomly assigned to the group size conditions.

### *Procedure*

Four participants at a time were invited to a behavioral laboratory in the Department of Psychology. They were each greeted by the experimenter (making interaction among participants impossible) and placed in separate cubicles containing a table, chair, and pen.

*Need to belong.* Participants' need to belong was assessed using the Need to Belong Scale (Leary, Kelly, Cottrell, & Schreindorfer, 2001). This scale includes 10 items rated on a 5-point scale (1 = *not at all characteristic of me*, 5 = *extremely characteristic of me*). Leary,

Cottrell, and Philips (2001) demonstrated that the Need to Belong Scale is correlated positively with acceptance-responsive self-esteem ( $r = .53$ ), indicating that being accepted or rejected represents a fundamental dimension to individuals' self-worth. After reverse-scoring necessary items, we combined the items to form one average need to belong score, where higher numbers indicated a higher need to belong (Cronbach's  $\alpha = .82$ ). Other research using the Need to Belong Scale has also revealed reasonably good internal homogeneity (De Cremer & Alberts, 2002,  $\alpha = .82$ , and De Cremer, in press,  $\alpha = .73$ ).

*The public goods dilemma.* After completing the Need to Belong Scale, participants received a hypothetical endowment of 30 Dutch guilders (DFL, approximately U.S.\$12) and were told to split the 30 DFL in any way they wanted between two accounts: a group account and a personal account. The total amount contributed to the group account would be multiplied by 2 and split equally among members, regardless of their contribution. The amount kept in the personal account would accrue totally to oneself. To provide an incentive (as they knew they would not keep the 30 DFL), participants were told that after the study, their decisions would be evaluated by the experimenter and that the best decision makers (across all conditions and sessions) would be rewarded a 20 DFL token (approximately U.S.\$8; see also Aquino, Steisel, & Kay, 1992). Even though participants made only one decision, they were told that several decisions would be made, to avoid end-play (see Murnighan & Roth, 1983). Finally, an example was given to illustrate the decision situation.

Following instructions, the group size manipulation was introduced. In the *large-group* condition, participants were informed that they and seven others would participate in this study. More specifically, they were told that in the department's other behavioral laboratory (which was known to participants), four more people were participating in the present study and that, combined with the people present in the second laboratory (where the actual participants were seated), the group would consist of eight people (debriefing interviews indicated that we were successful in inducing this belief of eight group

members).<sup>1</sup> In the *small-group* condition, participants were informed that they were participating in a four-person group. Prior social dilemma research has demonstrated that the effects of group size asymptote with groups of more than eight individuals (see Liebrand, 1984); consequently, the large group was placed at the maximum level to obtain the strongest effect of group size.

Thereafter, all of the information about the public goods dilemma (endowment, number of group members, etc.) was summarized, and a few examples about the payoff structure were presented. Then the dependent measures were presented. The first was decisional frustration, in which participants rated their level of agreement with the following statement: "I felt frustrated about the decision I had to make in this situation" (1 = *not at all*, 7 = *very much so*). Second, participants were asked (only once) how much they were willing to contribute to the group's account, which represented our measure of cooperation (ranging from 0 to 30 DFL). Finally, participants were debriefed, thanked, and dismissed.

## Results

### *Group Contributions*

Following standard procedures (Cohen & Cohen, 1983), we conducted a hierarchical regression analysis in which cooperation was predicted by main effect terms (group size and need to belong) at Step 1 and the product of the two variables (to test for the two-way interaction) at Step 2. To simplify interpretability of analyses (Aiken & West, 1991), the need to belong scores were centered (i.e., by subtracting the mean from each score to set the mean equal to 0), and the interaction term was based on these centered scores. The group size variable was dummy-coded: The small-group category was assigned the value 0, and the large-group category was assigned the value 1. All analyses were conducted in this way, unless otherwise noted.

Consistent with Hypothesis 1, analysis revealed a marginally significant interaction between need to belong and group size ( $\beta = .47$ ,  $p = .07$ ). Following standard procedures (Aiken & West, 1991), this interaction was plotted us-

ing predicted means at one standard deviation below and above the mean of the Need to Belong Scale (for low and high need to belong, respectively). The predicted means are presented in Figure 1. Simple effect and simple slope analyses were conducted to further analyze this interaction (Aiken & West, 1991). When need to belong was high, group size was positively related to cooperation, and this effect was marginally significant ( $\beta = .63$ ,  $p = .06$ ); members of large groups were more likely to contribute than members of small groups. However, when need to belong was low, members of small groups were more likely to contribute than members of large groups, but this group size effect was not significant ( $\beta = -.45$ ,  $p = .18$ ). In addition, for small-group members, the relation between need to belong and cooperation was not significant ( $\beta = -.30$ ,  $p = .25$ ). For large-group members, the relation between need to belong and cooperation was not significant, although it was in the predicted direction ( $\beta = .31$ ,  $p = .14$ ): For large-group members, cooperation increased as need to belong increased.

The overall interaction was consistent with hypotheses; however, the analysis resulted in a marginally significant, not a significant, interaction. This analysis was conducted a second time using an analysis of variance (ANOVA) in which need to belong was dichotomized into high and low scores before conducting the analysis.<sup>2</sup> A 2 (need to belong)  $\times$  2 (group size) ANOVA revealed a significant interaction between need to belong and group size,  $F(1, 38) = 6.05$ ,  $p < .05$ . The means were similar to those calculated for the regression analysis. Simple effect analysis indicated that when need to belong was high, group size yielded a significant difference on contributions,  $F(1, 38) = 5.31$ ,  $p < .05$ . Members of the large group ( $M = 21.25$ ,  $SD = 7.91$ ,  $n = 8$ ) reported higher

<sup>1</sup> For some sessions, fewer than four people arrived to participate. Regardless of how many individuals actually arrived for each session, however, all participants were led to believe that four or eight participants had arrived for that session (depending on their condition for the group size manipulation). This procedural detail is consistent with that used by others (see Kerr & Kaufman-Gililand, 1994).

<sup>2</sup> A median split ( $Mdn = 3.45$ ) on need to belong scores was used to classify participants as high or low in need to belong.

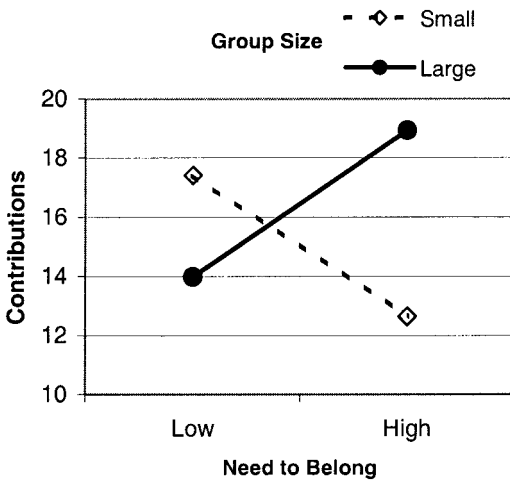


Figure 1. Predicted mean contributions to the group by need to belong and group size.

levels of contributions than members of the small group ( $M = 13.46$ ,  $SD = 4.98$ ,  $n = 13$ ). By contrast, when need to belong was low, there was no significant difference between members of the large group ( $M = 12.15$ ,  $SD = 7.60$ ,  $n = 13$ ) and the small group ( $M = 16.12$ ,  $SD = 10.16$ ,  $n = 8$ ),  $F(1, 38) = 1.38$ ,  $p = .25$ . Additional simple effect tests revealed that for large-group members, need to belong had a significant effect on cooperation,  $F(1, 38) = 7.24$ ,  $p = .01$ . For large-group members, those with a high need to belong reported greater cooperation than those with a low need to belong. By contrast, for small-group members, need to belong did not yield a significant effect on cooperation,  $F(1, 38) = 0.62$ ,  $p = .44$ . Consequently, the ANOVA yielded effects consistent with the regression analysis. In addition, it demonstrated that the predicted positive association between need to belong and cooperation was significant for large-group members.<sup>3</sup>

### Decisional Frustration

It was predicted that the need to belong would be positively correlated with decisional frustration and that this may occur for large-group members only or for both large- and small-group members. Frustration scores were submitted to a hierarchical regression analysis with need to belong and group size as predictors. Analysis revealed a significant main effect

of need to belong ( $\beta = .41$ ,  $p = .01$ ). As need to belong increased, decisional frustration increased. However, the interaction was not significant ( $\beta = -.31$ ,  $p = .20$ ). Thus, this correlation was present for members of large and small groups, supporting Hypothesis 2b.

### Discussion

Taken together, the results reveal that need to belong was positively associated with cooperation, but only for members of large groups (Hypothesis 1). In addition, need to belong was associated with greater decisional frustration for members of large and small groups (Hypothesis 2b). Thus, evidence supports the hypotheses that the need to belong is positively associated with cooperation and with decisional frustration.

These results are consistent with the hypothesis that individuals may be more likely to act on the need to belong in large groups than in small groups because social constraints (e.g., accountability, personal identifiability, felt responsibility) that promote cooperation are present to a lesser degree among large than small groups. As a result, members of large groups may be more likely to act on their psychological needs or preferences; thus, those with a high need to belong will exhibit group-oriented behaviors like cooperation in an effort to meet their need to belong (see also De Cremer, 2002). It must be noted that we did not determine whether these social constraints were indeed stronger in small groups. Therefore, it is advised that future research include measures of accountability, identifiability, felt social responsibility, and so forth.

Further, the need to belong predicted higher levels of decisional frustration, regardless of group size, suggesting that some members in

<sup>3</sup> Running an ANOVA with a small sample size may lead to problems of homogeneity of variance, especially when cell variances are uneven. When cell variances are uneven, pairwise comparisons should preferably be conducted using *t* tests that do not assume equal variances (Howell, 2002). For these comparisons, *t* tests that adjusted for unequal cell variances revealed results similar to those of our simple effects tests using ANOVA. That is, for those high in need to belong, contributions were higher in large than in small groups,  $t(10.47) = -2.50$ ,  $p < .05$ . Further, for large groups, contributions were higher for those high in need to belong than those low in need to belong,  $t(14.50) = -2.60$ ,  $p < .05$ .

small groups may also cooperate out of a need to belong and that they also are uncertain about whether such cooperation will be reciprocated. Our alternative hypothesis did indeed assume that members of small groups may feel frustrated as a function of need to belong, even though need to belong would not necessarily have to be correlated with cooperation. Interestingly, additional analyses showed that cooperation was positively and marginally significantly correlated with frustration in large groups ( $r = .38, p < .09$ ) but not in small groups ( $r = -.13, p < .56$ ). This effect is consistent with the reasoning that cooperating in a public goods dilemma, when motivated by a need to belong, may produce psychological conflict that stems from the competing tendencies for personal self-interest and belongingness, from the concern that others may not reciprocate cooperation, or both. Individuals who cooperate out of a need to belong look for others to signal acceptance; in this context, cooperation by others could be interpreted as acceptance. However, because their cooperation does not guarantee that others will cooperate, they risk losing resources and feeling rejected by others. That cooperation was positively correlated with decisional frustration for large group members is consistent with these predictions. Future research might examine the validity of this prediction.

Finally, the present research also emphasizes the potential value of a second individual-difference variable in predicting cooperation in social dilemmas. With respect to individual differences, social dilemma research has focused almost exclusively on *social value orientation*, a variable that refers to the way people evaluate outcomes for themselves and others in interdependent situations (Messick & McClintock, 1968; Van Lange, 1999). Specifically, people with a prosocial orientation are consistently more cooperative than those with a proself orientation. It is conceivable that both social value orientation and need to belong interact in predicting cooperation. That is, those with a prosocial orientation are aimed at maximizing joint outcomes and restoring equality (Van Lange, 1999), actions that contribute to positive and enjoyable relationships with others, in turn facilitating inclusiveness in relationships. In contrast, those with a proself orientation do not

assign importance to the other's outcomes, consequently revealing rather unpleasant social interactions. Therefore, it could be suggested that the willingness to cooperate of people with a particularly proself orientation might depend on the level of belongingness need, an interesting idea that deserves further examination in the social dilemma area.

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Received January 22, 2001

Revision received June 17, 2002

Accepted December 6, 2002 ■



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