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Cooperation in Intergroup and Single-Group Social Dilemmas

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The fundamental intragroup problem in intergroup conflict can be characterized as a social dilemma: All group members are better off if they all cooperate in competing against the outgroup, but, at least when the group is large, each individual group member is always better off defecting. Are people less or more likely to cooperate in a social dilemma when it is embedded in the context of an intergroup conflict? To answer this question we contrasted the Intergroup Prisoner's Dilemma (IPD) team game (Bornstein, 1992) with a structurally identical (single-group) Prisoner's Dilemma (PD) game. The results indicate that subjects were almost twice as likely to cooperate in the IPD game than in the PD game even though: (a) the cost of cooperation for the individual group member is identical in the two games, (b) the external benefit to the individual's group resulting from a cooperative choice is also identical, and (c) cooperation in the intergroup dilemma is collectively deficient whereas in the single-group dilemma it is collectively optimal. The motivational implications of this finding are discussed.

Intergroup conflicts often generate social dilemmas within the competing groups. Consider the following example by Dawes (1980): "Soldiers who fight in a large battle can reasonably conclude that no matter what their comrades do they personally are better off taking no chances; yet if no one takes chances, the result will be a rout and slaughter worse for all the soldiers than is taking chances" (p. 170). The intragroup problem in Dawes's battle example has the two defining properties of a social dilemma: For each individual group member the dominant strategy is to defect, but all group members are better off when they all cooperate than when they all defect.

The intragroup dilemma in intergroup conflicts stems from the fact that

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the rewards associated with the outcome of such conflicts (national security, group pride) are public goods with respect to the members of the group and, as such, are equally available to all group members regardless of their contribution to the group success (Rapoport & Bornstein, 1987; Bornstein, 1992). This payoff structure creates a clear disincentive for a rational group member to contribute the resources (time, money, bravery) necessary for the group to win the intergroup competition and acquire the public goods. If the group wins, he/she would gain more by not contributing, or taking a "free ride." If the group loses, he/she would again be better off withholding contribution, or avoiding being "suckered." The only other possibility, namely, that the individual's contribution will be critical in affecting the competition's outcome, is usually too remote to provide a rational basis for contribution, especially in large-scale conflicts.

Are people less or more likely to cooperate in a social dilemma when it is embedded in an intergroup conflict? The existing literature provides no definite answer to this question. The social dilemma literature has paid little attention to situations involving more than one group. On the other hand, the literature on intergroup conflict has failed to conceptualize the fundamental intragroup problem in such conflicts as a social dilemma (Messick & Mackie, 1989).

In fact, much of the intergroup conflict literature has altogether overlooked the conflict of interests that exists within the competing groups. Although Campbell (1965) observed that ". . . group-level territoriality has always required that the soldier abandon for extensive periods the protecting of his own wife, children, and home" (p. 24), other researchers have assumed that if it is rational or functional for groups to compete, it must also be rational for individual group members to do so. For example, Taylor and Moghaddam (1987) present realistic conflict theory as "essentially an economic theory" that is based on the assumption "that people are selfish and will try to maximize their own rewards" (p. 34). Similarly, Burnstein, Kitayama, and Abboushi (in press) argue that "groups decide to compete because their members calculate that more is to be gained (or less to be lost) from this course of action than from [intergroup] cooperation" and that in this sense "groups are merely vessels of individual interest."

The assumption that intergroup conflict serves individual as well as group interest implies that there is no conflict of interests within the groups and therefore no problem of intragroup cooperation. [Indeed, under this assumption, each group may be treated as a unitary player (Hardin, 1982), and the intergroup conflict can be modelled as a two-person game.] Yet, the most recurrent and explicit hypothesis of the intergroup conflict literature is that intergroup conflict increases intragroup cooperation (Rabbie, 1982; Stein, 1976; Tajfel, 1982; Campbell, 1965, 1972). Obviously,

failing to recognize the existence of an intragroup dilemma in intergroup conflicts has not prevented the literature from realizing the need for intragroup cooperation that arises in such conflicts. However, we believe that this failure has deterred researchers from conceiving what would amount to a critical test of the intergroup conflict—intragroup cooperation hypothesis.

Assuming that the intragroup payoff structure is a social dilemma with defection as the dominant individual choice, intergroup conflict can increase cooperation in two different ways: It can transform the "effective" matrix (Kelley & Thibaut, 1978) within the group, changing the *motivation* of individual group members toward a greater concern with the collective group goal; or it can modify the "given" matrix, changing the *actual incentives* so that selfish individuals are induced by consideration of their private interests to act in accordance with the collective group goal (Messick & Brewer, 1983). The intergroup conflict literature has typically highlighted the motivational effect of the conflict, attributing the observed increase in intragroup cooperation to ". . . an increase in solidarity and cohesion of the ingroup; the group and the people in it come to matter more to the group members" (Brown, 1988, p. 200). However, the literature has also recognized that intergroup conflict has profound effects on the actual payoff structure within the group: Punishment and rejection of defectors become more severe, more authoritative leadership emerges, and conformity pressures are intensified (Campbell, 1965, 1972; Coser, 1956; Stein, 1976; Sherif, 1966). The selective incentives (or side-payments) produced by these "solidarity mechanisms" (Campbell, 1965) can change the intragroup payoff structure so that defection is no longer the individual's rational choice.

In intergroup conflicts outside the laboratory, these motivational and structural effects are utterly confounded. It is therefore impossible to determine the extent to which the conflict of interests between the groups increases individual willingness to sacrifice their self-interest for the collective group goal. To distinguish between group-based altruism (or "patriotism"), on one hand, and narrow self-interest, on the other hand, as reasons for contribution, the intragroup payoff structure must be kept constant.

The present study created a laboratory situation which confronted groups of subjects with the same social dilemma, with and without intergroup conflict. Since in both the intergroup and the single-group dilemmas subjects are faced with the same choice between self-interest and group-interest, we are in a position to attribute any differences in cooperation between these two conditions to a motivational rather than a structural effect of the intergroup conflict. None of the previous studies has employed such a contrast.

In the classic experiments by Sherif (1966) and Blake and Mouton

(1961), preexisting groups were brought into competition with each other and observations were made of the processes that developed within and between these groups. As noted by Rabbie (1982), this before-and-after design does not distinguish among the many competing explanations for the observed effect. Most critically for our purpose, since these experiments allowed group members to actually interact (and thus permitted them to reward and punish each other), they cannot help separate the motivational effects of the intergroup conflict from its structural effects.

Rabbie, Benoist, Oosterbaan, and Visser (1974) made an effort to control for the consequences of intragroup interaction by soliciting subjects' responses before they had an opportunity to actually interact. However, rather than contrasting intergroup competition with a comparable single-group situation (namely, a single-group social dilemma), they compared intergroup competition with intergroup cooperation. Their conclusion, as summarized by Rabbie (1982), is that "intergroup competition produces sometimes more, sometimes less, or sometimes about the same degree of cohesiveness as intergroup cooperation." The crucial factor in producing more cohesiveness seems to be "whether the group members view themselves as achieving the goals they have set for themselves, whether in a cooperative or a competitive relationship with another group" (p. 133). Evidently, intergroup competition and intergroup cooperation present subjects with different functional goals (or incentive structures) making it impossible to isolate the motivational effects of these manipulations from their structural effects.

Finally, in a recent experiment, Bornstein, Erev, and Rosen (1990) created a competition between two groups, each engaged in a social dilemma ("give some") game. The two groups competed for a monetary reward which was paid to the more cooperative of the two groups (e.g., the group whose members' total contribution exceeded that of the other group) and was equally divided among all group members. Bornstein et al. (1990) reported that this manipulation resulted in higher rates of intragroup cooperation as compared with a control condition in which each group was engaged in an independent social dilemma game. However, since by paying their subjects an extra bonus for winning the competition they changed the intragroup reward structure, the motivational implications of their finding are ambiguous. It is possible, as Bornstein et al. argue, that the private benefit associated with winning transformed the intragroup payoff structure from a social dilemma into a problem of step-level public good provision (van de Kragt, Orbell, & Dawes, 1983; Rapoport & Bornstein, 1987; Bornstein & Rapoport, 1988) where defection is no longer the rational individual choice. It is also possible, however, that the intergroup competition made subjects more motivated to maximize the collective interest of their group.

THE EXPERIMENT

The present experiment employed a new experimental paradigm called the Intergroup Prisoner's Dilemma (IPD) game (Bornstein, 1992) to simulate intergroup conflict. The IPD game involves a competition between two groups and is structured in such a way that the intragroup payoff structure is a social dilemma, regardless of what the outgroup does. The IPD game was compared with a structurally identical (single-group) social dilemma (PD) game. The games, as operationalized in the present study, are described below. A general definition of the IPD game appears in Bornstein (1992).

The IPD game begins by dividing a set of six subjects into two equal-sized teams. Each player receives an endowment of 5 Israeli Shekels (IS 5; approximately $2.00) and has to decide whether to keep the money or contribute it for his or her team's benefit. A bonus is given to each member of a team depending on the difference between the number of ingroup and outgroup contributors. If all members of Team A contribute, while no members of Team B contribute, members of Team A receive a bonus of IS 18 while those in Team B receive no bonus. If there are two more contributors in Team A than in Team B, each member of Team A receives a bonus of IS 15, while each member of Team B receives IS 3. If Team A has one more contributor than Team B, each member of Team A receives IS 12, whereas each member of Team B receives IS 6. Finally, in case of a tie (an equal number of contributors in both teams), each member of both teams receives a reward of IS 9. In addition to the bonus, each player keeps his/her endowment if he/she does not contribute it.

The payoff to Player i (i being a member of Team A) in the IPD game, as a function of Player i's decision to contribute (C) or not contribute (NC) and the number of ingroup contributors (m_A) and outgroup contributors (m_B), is shown in Figure 1.

Three properties of the IPD team game are apparent in this figure.

(1) The noncontributing (NC) payoff function is above the contributing (C) function for every contingency in the game. In the present experiment, Player i gets IS 2 more by not contributing, regardless of what the other ingroup and outgroup members do.

(2) The right-hand extreme of the cooperating (C) function is above the left-hand extreme of the noncooperating (NC) function for any number of outgroup contributors. If all group members contribute, each gets IS 4 more than if none contribute, regardless of what the outgroup members do.

(3) The left extreme of the defecting (NC) function in the left-most figure is above the right extreme of the cooperating (C) function in the right-most figure. When all six players contribute their endowments, each gets IS 9, whereas if none contributes, each gets IS 14.

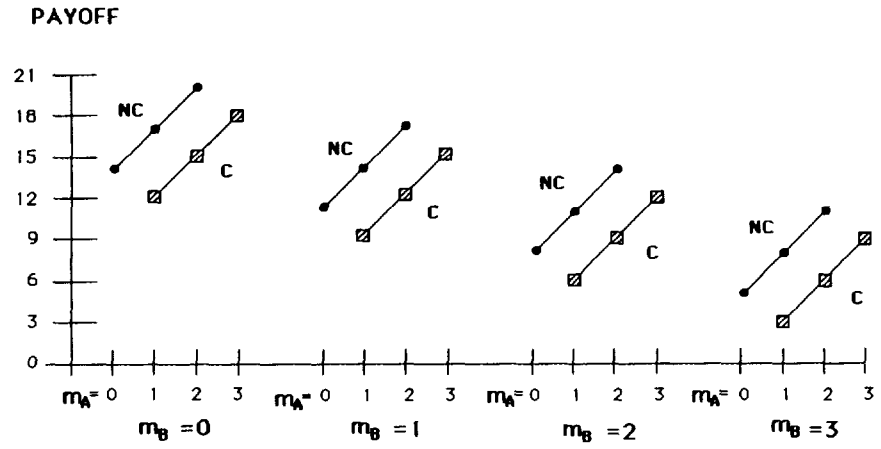

FIG. 1. Payoff for a member of group A in the IPD game as a function of his/her decision to contribute (C) or not contribute (NC) and the number of ingroup contributors (m_A) and outgroup contributors (m_B).

Property (1) means that withholding contribution is the dominating individual strategy is the IPD. Property (2) means that the optimal group strategy is for all group members to contribute. These two properties taken together define the intragroup payoff structure in the IPD game (for any number of outgroup contributors) as an n-person Prisoner's Dilemma (PD) game or a social dilemma (Dawes, 1980; Dawes & Thaler, 1988). For example, if there are no contributors in group B, group A plays the PD game depicted in the left-hand figure. If, on the other hand, all members of Team B contribute, Team A is engaged in the PD game portrayed in the right-most figure.

Figure 1 shows that the four intragroup PD games (corresponding to 0, 1, 2, and 3 outgroup contributors in the IPD game) are structurally identical. Therefore, any one of these games could have been chosen to serve as a control condition. Nevertheless, to prevent possible effects of the absolute level of rewards, we included two PD control conditions in the present experiment: a High payoff condition (corresponding to the PD game played by Team A when mB = 0), and a Low payoff condition (corresponding to the PD game played by Team A when mB = 3). In the High PD condition, each group member was paid a reward of IS 18 if all three members contributed their endowments, IS 15 if two members contributed, IS 12 if only one contributed, and IS 9 if none did. In the Low PD condition, each group member was paid a reward of IS 9 if all three members contributed, IS 6 if two members contributed, IS 3 if only one contributed, and IS 0 if none did. In addition to the reward, each player kept his/her endowment if he/she did not contribute it.

There is another methodological point that is important to consider. The IPD manipulation necessarily involves the copresence of two distinctly labeled groups. Therefore, to exclude the possibility that the categorization of subjects into groups rather than the real conflict of interests between the groups is responsible for potential differences between the experimental and the control conditions, we included two groups in the PD control conditions as well. However, rather than competing against each other, each group in the control conditions was engaged in a separate (independent) PD game.

Predictions. If one assumes that individual actions are motivated solely by self-interest—the assumption of narrow rationality, as it is often called—one should expect no contribution in either the IPD or the PD conditions. On the other hand, if one assumes that individual actions are motivated only by a concern for the collective ingroup interest, one should expect full contribution in both games. Of course, these two possibilities are the hypothetical poles of a continuum. In reality, subjects are likely to be concerned with both self-interest and common group-interest to various degrees. Nonetheless, since the intragroup payoff structure in the IPD game is identical to that in the PD game, any *fixed* combination of self-interest and group-interest should lead to similar contribution rates in the two games. Subjects are expected to be more likely to contribute in the IPD experimental condition than in the PD control conditions only if the conflict of interests between the groups *increases* the relative weight they assign to the collective group-interest as opposed to self-interest.

Since both our experimental and our control conditions involve the copresence of two groups, we must consider an additional possibility, namely, that subjects take the outcome of the outgroup members into account when making their decisions. If subjects are predisposed to maximize the relative difference between the ingroup's and the outgroup's payoffs—that is, if they assign a positive weight to the ingroup's outcome and a negative weight to the outgroup's outcome—we can expect cooperation rates in the IPD game to be higher than those in the PD games. If, on the other hand, subjects attempt to maximize the joint outcome of all participants—if they assign a positive weight to the outcome received by outgroup as well as ingroup members—the reverse should be true, namely, contribution rates in the IPD game should be lower than those in the PD games. Note that property (3) of the IPD game means that the Pareto optimal solution of this game, the one that maximizes the collective payoff of all participants, is for all six players to withhold contribution.

METHOD

Subjects and design. The subjects were 90 male undergraduate students at the Hebrew University of Jerusalem. Subjects were recruited through campus advertisements promising monetary reward for participation in a group decision-making task. Subjects participated

in the experiment in sets of six. Five sets participated in the IPD experimental condition and five in each of the two PD control conditions.

Procedure. On their arrival at the laboratory, subjects were seated in a single room with arrangements to ensure their privacy. Subjects were randomly assigned to either the green or the red group with three subjects in each group and were given verbal instructions concerning the rules and payoffs of the game. The game instructions were neutral and were phrased in terms of the individual's payoffs as a function of his own decision to invest or not invest and the decisions made by the other players in his set (in the IPD condition) or in his team (in the PD conditions). Subjects were not instructed to maximize their earnings, and no reference to cooperation or defection was made. Subjects were given a quiz to test their understanding, and explanations were repeated until the experimenter was convinced that all subjects understood the payoff matrix.

Subjects made 10 consecutive decisions between contributing and not contributing. Each decision was recorded on a separate page in a decision booklet. The pages were numbered from 1 to 10 and subjects were told that at the end of the experiment one page would be chosen randomly and their payoffs would be determined by the decisions made by the six members of the set (in the IPD condition) or the three members of the team (in the PD conditions) on that particular page. Subjects had no opportunity to communicate, and no feedback was provided between one decision and the next. Subjects were told in advance that to ensure the confidentiality of their decisions they would receive their payment in sealed envelopes and leave the laboratory one at a time with no opportunity to meet the other participants. Subjects were also assured that the experiment involved no deception.

Once all the decision booklets were collected, one of the 10 pages was chosen randomly and, while the experimenter calculated the payments based on the decisions made on that page, subjects responded to a questionnaire. In the questionnaire they were asked to estimate the total number of times (out of 20) the other two ingroup members decided to invest, the total number of times (out of 30) the three outgroup members decided to invest, the probability that there would be more, the same number, or fewer ingroup than outgroup investors in the payoff page, and the number of times (out of 10) that a typical subject would decide to invest. Subjects were also asked to rate on a seven-point scale the degree to which their decisions were aimed at maximizing their own payoff, the total payoff of their group, or the difference between the ingroup and outgroup payoff. Subjects were asked the same three questions with regard to a typical ingroup member and with regard to a typical outgroup member. Finally, subjects were asked to guess their payoffs in the experiment. Following the completion of the questionnaire, subjects were debriefed on the rationale and purpose of the study. They were then paid and dismissed individually.

RESULTS

Contribution decisions. The average number of investments out of the 10 decisions was 5.47 in the IPD experimental condition, and 2.37 and 3.07 in the High and the Low PD control conditions, respectively. Planned contrasts were performed to test the differences among these means. The first contrast between the IPD experimental condition and the two PD control conditions indicates that the number of contributions in the IPD game was significantly higher than in the PD games $F(1, 87) = 12.95$, $p < .0005$. The second contrast between the High and Low PD conditions was not significant.[1]

[1] Since there was no communication among the subjects and no feedback was provided, there was no way in which subjects could affect the decisions of others or be affected by them. Therefore, the above analysis used the individual subject as the unit of analysis.

TABLE 1
MEANS AND SD OF QUESTIONNAIRE ITEMS

	IPD	PD	
		High	Low
Predicted no. of contributions (out of 10) by ingroup members	4.77 (2.28)	3.21 (2.71)	4.10 (2.80)
Predicted no. of contributors (out of 10) by outgroup members	4.72 (2.25)	3.12 (2.67)	4.08 (2.46)
Predicted no. of contributions (out of 10) by average subject	5.17 (2.04)	3.20 (2.46)	4.07 (2.75)
More ingroup contributors	36.89 (17.26)	21.07 (17.59)	27.62 (16.38)
More outgroup contributors	31.11 (14.37)	19.90 (16.06)	27.83 (17.90)
Equal no. of contributors	32.00 (24.44)	59.03 (32.60)	44.55 (31.31)
I			
Max own gain	5.77 (1.50)	6.56 (1.17)	6.37 (1.22)
Max ingroup gain	4.55 (2.03)	2.57 (1.96)	2.60 (1.99)
Max ingroup–outgroup	3.47 (2.05)	1.43 (1.01)	1.53 (0.94)
In			
Max own gain	6.17 (1.17)	6.70 (0.65)	6.43 (1.01)
Max ingroup gain	4.03 (1.71)	2.23 (1.68)	2.37 (1.63)
Max ingroup–outgroup	3.07 (1.89)	1.53 (1.01)	1.70 (1.12)
Out			
Max own gain	5.57 (1.48)	6.57 (0.94)	6.40 (1.13)
Max ingroup gain	3.70 (2.00)	2.67 (1.95)	2.73 (1.89)
Max ingroup–outgroup	2.83 (1.64)	1.50 (1.01)	1.83 (1.12)
Expected payoff	11.47 (2.10)	15.03 (1.52)	7.04 (2.19)

Note. I indicates the subject's ranking concerning his own motivation, In and Out indicate his beliefs concerning the motivations of other ingroup and outgroup members, respectively.

Since for all theoretical and practical purposes the games as operationalized in the present experiment were one-shot games, no systematic trend of contribution decisions over time was expected and, indeed, none was found. Subtracting the number of investments in the last five pages from the number of investments in the first five pages, we obtained difference scores of .10, .03, and −.07 in the IPD, PD High, and PD Low conditions, respectively. None of these scores is significantly different from 0. A similar result was obtained by comparing the decisions in the first three pages to the decisions in the last three.

Questionnaire data. The means and standard deviations of subjects' responses to the questionnaire items appear in Table 1. Planned contrasts

However, the same result holds when the analysis is performed using the set of six subjects as the unit for analysis. The contrast involving the difference between the IPD experimental condition and the two PD controls is significant $F(1, 12) = 16.95$, $p < .002$. The contrast between the two control conditions is insignificant.

were performed on these items (with the exception of the last item) using a multivariate analysis of variance (MANOVA). The contrast between the two PD control conditions was not significant. The contrast between the IPD experimental condition and the PD control conditions was significant $F(14, 69) = 4.13$, $p < .0001$. All the univariate tests associated with this second contrast were also significant. Subjects in IPD experimental condition expected more contributions by ingroup members ($F(1, 84) = 6.24$, $p < .02$), more contributions by outgroup members ($F(1, 84) = 6.43$, $p < .02$), and a higher number of contributions by the average subject ($F(1, 84) = 10.73$, $p < .002$), than those in the PD control conditions. Subjects in the IPD condition estimated the probability that there would be more ingroup than outgroup investors as higher than those in the PD conditions ($F(1, 84) = 11.57$, $p < .001$). They also estimated the probability that there would be more outgroup than ingroup investors as higher ($F(1, 84) = 3.99$, $p < .05$). (This necessarily implies that subjects in the IPD game estimated the probability that the game would be tied as lower than did those in the PD conditions.)

As compared to subjects in the PD control condition, subjects in the IPD experimental condition reported that they were less motivated to maximize their own gain ($F(1, 84) = 7.07$, $p < .01$), more motivated to maximize the collective ingroup gain ($F(1, 84) = 19.00$, $p < .0001$), and more motivated to maximize the difference between the ingroup and the outgroup ($F(1, 84) = 37.36$, $p < .0001$). A similar pattern of results was obtained with regard to subjects' beliefs about the motivation of the other players. Subjects in the IPD condition believed that the other ingroup members were less selfish ($F(1, 84) = 8.07$, $p < .01$), more concerned with the collective group interest ($F(1, 84) = 21.91$, $p < .0001$), and more competitive vis a vis the outgroup ($F(1, 84) = 17.92$, $p < .0001$) than did subjects in the PD control conditions. Subjects in the IPD condition also perceived the outgroup members to be less motivated by self-interest ($F(1, 84) = 9.81$, $p < .005$), more motivated by a concern for their group-interest ($F(1, 84) = 3.42$, $p < .07$), and more motivated to maximize their group's relative advantage ($F(1, 84) = 16.45$, $p < .0001$) than did those in the PD conditions.

Relations between contribution decisions and questionnaire items. To examine whether subjects' contribution decisions were related to their expectations and beliefs, we computed the correlations between the number of times each subject decided to invest and his responses to the various questionnaire items. Subjects' contribution decisions were highly correlated with their expectations concerning the behavior of the other players. Subjects were more likely to invest the more they expected other ingroup members to invest ($r(90) = .68$, $p < .0001$), the more they expected the outgroup members to invest ($r(90) = .71$, $p < .0001$), and the more they expected the typical subject to invest ($r(90) = .74$, $p < .0001$).

Subjects' investment scores were also correlated with their self-reported motivation. The number of investments was negatively correlated with the motivation to maximize self-interest ($r(90) = -.35$, $p < .001$) and positively correlated with both the motivation to maximize the collective ingroup gain ($r(89) = .43$, $p < .0001$) and the motivation to maximize the ingroup advantage over the outgroup ($r(90) = .34$, $p < .001$).

Subjects' contribution decisions were correlated with their beliefs concerning the motivation of the other players. Subjects were less likely to contribute the more they believed that other ingroup members were motivated to maximize their self-interest ($r(90) = -.30$, $p < .005$), but more likely to contribute the more they believed that other ingroup members were motivated to maximize the collective ingroup interest, ($r(90) = .38$, $p < .005$), and more likely to contribute the more they believed that other ingroup members were motivated to maximize the ingroup's advantage over the outgroup ($r(90) = .26$, $p < .02$). Subjects' contribution decisions were similarly correlated with their beliefs concerning the outgroup's members. The number of investments was negatively correlated with the belief that the outgroup members were motivated by self-interest ($r(90) = -.21$, $p < .05$) and positively correlated with the belief that the outgroup members were motivated to maximize their collective group gain ($r(90) = .24$, $p < .05$) or the difference between the groups ($r(90) = .30$, $p < .005$).

Since the correlations reported above might have been somewhat amplified by the fact that the experimental and the control conditions differed with regard to both the mean number of contributions and the mean responses on the questionnaire items, we computed the correlations once again for the experimental and the control conditions separately. This had little effect on the correlations between subjects' decisions and their expectations concerning the decisions of others. Subjects in the IPD condition were more likely to invest the more they expected other ingroup members to invest ($r(30) = .59$, $p < .001$), the more they expected the outgroup members to invest ($r(30) = .56$, $p < .002$), and the more they thought that the typical subject is likely to invest ($r(30) = .67$, $p < .0001$). Similarly, subjects in the two PD control conditions were more likely to invest the more they expected other ingroup members to invest ($r(60) = .71$, $p < .0001$), the more they expected the outgroup members to invest ($r(60) = .76$, $p < .0001$), and the more they thought that the typical subject is likely to invest ($r(60) = .75$, $p < .0001$).

Subjects' investment scores in the PD control conditions were also correlated with their self-reported motivation. The number of their own investments was negatively correlated with their motivation to maximize self-interest ($r(60) = -.31$, $p < .02$) and positively correlated with their motivation to maximize the collective ingroup gain ($r(60) = .37$, $p < .005$). The motivation to maximize the ingroup's advantage over the out-

group was not significantly related to decisions. Subjects were less likely to contribute the more they believed that the other ingroup members were motivated to act selfishly ($r(60) = -.42$, $p < .001$), but were more likely to contribute the more they believed that the other ingroup members are motivated to maximize the collective ingroup payoff ($r(60) = .39$, $p < .005$).

The correlations between subjects' contribution decisions and their responses on the various motivational items in the IPD condition were in the same direction. However, none of these correlations reached conventional levels of significance.

Expected earnings. The last questionnaire item referred to the subjects' estimate of their earnings and can thus be considered a manipulation check. Subjects in the High PD condition should have expected to earn more than those in the Low PD condition. The expected earnings of subjects in the IPD condition should have equalled the mean of the two PD conditions. Indeed, the contrast between the High and Low PD conditions was highly significant ($F(1, 84) = 238.21$, $p < .0001$), whereas the contrast between the IPD condition and the two PD conditions was insignificant.

DISCUSSION

The observation that intergroup conflict increases individual willingness to sacrifice self-interest for group causes is one of the most agreed-upon observations in social psychology. However, natural observations of altruism are suspect (van de Kragt, Dawes, & Orbell, 1988): Intergroup conflicts often produce selective incentives or side-payments that are absent (or are less extreme) in single-group dilemmas. Such incentives, when entered into the decision calculus, could make group-based "altruism" (or "patriotism") in intergroup conflicts individually rational.

Under natural circumstances, intergroup conflicts may also involve higher stakes for the group as a whole as compared with single-group social dilemmas (Stein, 1976). Thus, if individuals are rational altruists (van de Kragt et al., 1988) who maximize, not simply their self-interest, but some combination of self-interest and group-interest, they should be more likely to cooperate in such conflicts, if the private benefits from cooperation remain constant. In other words, we can explain the increase in cooperation observed in intergroup conflict without having to assume that individuals become more concerned with the collective group goal. Instead, it is sufficient to assume that individuals become more likely to cooperate as, with the cost of cooperation constant, the total group benefits from cooperation are increased. A similar argument can be made in terms of self-efficacy. Kerr (1992) suggested that cooperation in social dilemmas is positively related to self-efficacy. The higher one's ability to affect the total group's outcome, the more likely he/she is to cooperate.

Thus, individuals may be more likely to cooperate in an intergroup conflict than in a single-group dilemma, not because they are more altruistic, but because they are more efficacious.

The present experiment provided evidence that cannot be dismissed in terms of either individual or group rationality. By contrasting the Intergroup Prisoner's Dilemma game with a structurally identical single-group Prisoner's Dilemma we were able to keep constant the utilitarian value of cooperation to the acting individual as well as the external payoffs to the *ingroup* resulting from his choice. Therefore, the observed difference in cooperation rates between the two conditions cannot be explained by assuming that subjects were motivated by self-interest, group-interest, or some fixed combination of both.

Natural intergroup conflicts are different from single-group situations in yet another important aspect. They necessarily involve the copresence of (at least) two distinct groups. Thus, to the extent that social categorization per se increases intragroup cooperation (Tajfel & Turner, 1979), it is impossible to determine the unique contribution of the real conflict of interest to the observed effect (Rabbie, 1982). In our laboratory experiment we were able to eliminate this problem by including two groups in the control as well as the experimental condition. The only difference between these conditions was that in the IPD condition the two groups were negatively interdependent whereas in the PD conditions they were structurally independent. Therefore, the fact that subjects were almost twice as likely to contribute in the IPD game than in the PD game must be attributed to the real conflict of interests that exists in the former, but not the latter, condition.

Having established that real intergroup conflict increases intragroup cooperation, and having ruled out all plausible structural explanations for this effect, we must provide a motivational explanation. Assume with Campbell (1965) and Rabbie, Schot, and Visser (1989) that real intergroup conflict serves as a unit-forming factor that enhances group identification beyond categorization and labeling alone. A series of experiments performed by Brewer and Kramer (Brewer & Kramer, 1986; Kramer & Brewer, 1984, 1986) showed that enhancing the strength of group identification increases cooperation in social dilemmas. They suggest that enhanced group identity blurs the distinction between self-interest and group-interest, leading individual group members to substitute group regard for egoism as the principle guiding their choices. The findings that (a) subjects in the IPD condition viewed themselves (as well as the other participants) as less motivated by self-interest and more motivated by the collective group interest than those in the PD control conditions, and (b) subjects' contribution behavior was negatively correlated with the motivation to maximize their own payoffs and positively correlated with the motivation

to maximize the collective payoffs of their group, are consistent with this interpretation.

Enhanced group identification may also increase subjects' motivation to differentiate themselves in a positive way from the outgroup (Turner, Brown, & Tajfel, 1979). This somewhat different interpretation of positive group identity receives support from the data, which indicate that (a) subjects in the IPD condition were more motivated to maximize the difference between the two groups than those in the PD conditions, and (b) the decision to cooperate was positively correlated with this competitive intergroup orientation.[2] Thus, whereas the present experiment enables us to conclude that intergroup conflict *changes* the individual's motivation, we do not know whether this change involves an increase in the weight assigned to the ingroup outcome, a decrease in the weight assigned to the outgroup's outcome, or both.

Finally, stimulated by intragroup problems of resource depletion, pollution, and overpopulation, much of the research on social dilemmas has been concerned with how to get people to cooperate (consume less energy, buy recyclable products, have fewer children). However, cooperation is a good thing by definition only in the limited context of a one-group social dilemma (van de Kragt et al., 1988). In intergroup conflicts as modeled by the IPD game, universal cooperation is collectively deficient. Let us reconsider Dawes's battle example. Dawes (1980), taking the perspective of one side, describes the situation as a social dilemma with defection being the individually rational but collectively deficient choice. However, if one takes a wider perspective, which includes all soldiers on both sides, defection is both individually rational and collectively optimal. All soldiers in the battle will be better off if no one takes chances. Yet, as the present study demonstrates, people are more likely to cooperate in an intergroup conflict than in a single-group social dilemma. In his paper on "ethnocentric and other altruistic motives," Campbell (1965), following a similar observation, remarks: ". . . We have tended to see the altruistic as moral, as the imposed achievement of civilization. Under a broader framework we must now, in some cases, be willing to see altruistic social motives as irrational and immoral, or at least amoral" (p. 307).

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[2] Of course, positive ingroup differentiation may be achieved by minimizing the outcome of the outgroup. However, we did not ask our subjects to what extent their behavior was motivated by this goal, since obviously such a question would have made little sense to subjects in the PD control conditions.

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