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## The Group as the Container of Generalized Reciprocity

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*The results of an experiment with 91 Japanese participants confirmed the hypothesis that players of a Prisoner's Dilemma game would cooperate more with an in-group member than with an out-group member in the simultaneous game but not in the sequential game. The game used in the experiment was constructed such that each player gave his or her partner a portion of his or her own endowment of 300 yen. The group membership was created on the basis of participant's preferences for Klee's or Kandinski's paintings; each participant played the game once with an in-group member and once with an out-group member. In the simultaneous game, the two players decided simultaneously how much to give to the partner without knowing what the partner would do. In the sequential game, the first player made the decision; then the second player followed with full information on the first player's behavior. All the participants in the sequential game in fact took the role of the first player. The differential effect of the partner's group membership had been predicted on the basis of Yamagishi and his colleagues' argument that expectations of generalized reciprocity from in-group members is the source of in-group favoritism in a minimal group.*

A group is clearly distinguished from a mere aggregate of people. People who sit in the waiting area of an airport, for example, hardly constitute a group, nor do all people who wear eyeglasses. They share certain characteristics such as sitting in the same place or wearing eyeglasses, but this does not make them a group. The defining feature that makes a group distinct from a simple aggregation is the existence of actual or imaginary interactions. No sociologist would dare to attach the term *group* to an aggregate of people who simply share some characteristics or category unless they believe at least that they are connected somehow with others and have the potential to influence each other.

The founders of social psychology, such as Lewin (1935) and Sherif et al. (1961),

shared this substantive view of the group with sociologists, but more recent social psychologists, especially in the tradition of social cognition, are more likely to define the group in terms of the members' perceived similarities. In their view, the essence of the group exists in the perception of group "entitativity" (Campbell 1958) or entity-ness in the eyes of the beholder, not in their interactions and interdependences. In this tradition, occupying the same salient social category is at the core of the group processes; actual interactions that take place in and between groups are considered to be generated by the perception of the group members' similarity and homogeneity in contrast to dissimilarity and heterogeneity across groups. Although this cognitive view of the group is not consistent with the traditional sociological view, the pure effect of social categories in the generation of intergroup and intragroup processes has been demonstrated empirically through a series of so-called minimal group experiments.

Tajfel et al. (1971) were the first to conduct a minimal group experiment (abbreviated MGE). The original purpose was to identify the critical factor responsible for the emergence of in-group favoritism, or the

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preferential treatment of in-group members over out-group members. They set up a minimal group consisting of people who shared only a social category as a "control condition" in which no social interactions were allowed. Specifically, they created minimal groups by dividing subjects into two groups based on a trivial criterion, such as the tendency to overestimate or underestimate the number of dots displayed on a screen or a preference for Klee's or Kandinski's paintings. No interactions or communications were allowed, either within or across the groups.

The investigators had planned to use this "control condition" to examine what extra factors would produce behavior favoring in-group members over out-group members. They found instead that no additional factor was needed for the emergence of in-group favoritism. Participants in their experiment who were asked to allocate money between one in-group member and one out-group member gave more to the former than to the latter, even though the grouping was completely arbitrary and no social interactions existed. Thus the result indicated that categorization alone, no matter how trivial, was sufficient to generate in-group-favoring behavior in allocating rewards.

The startling finding that people gave more favorable treatment to those who shared a trivial, nominal social category than to those who did not motivated Billig and Tajfel (1973) to develop a theory of intergroup behavior called social identity theory. According to this theory, in-group favoritism, often observed in real as well as laboratory groups, is a product of the supposedly universal human motive to maintain a positive self-identity. Because one's self-identity derives partly from social identity or identity with the group or social category with which one is associated, one is motivated to establish positively valued distinctiveness for such a group or category. From this perspective, participants of the minimal group experiment treated in-group members more favorably than out-group members as a means of making their group positively distinct.

The success of social identity theory spread beyond its initial focus on the mini-

mal group (Tajfel et al. 1971) to problems pertaining to intergroup relations, and resulted in an impressive array of literature on such relations (for reviews of this literature see Hogg and Abrams 1988; Messick and Mackie 1989). More recently, with the seminal effort of Turner and his associates (Turner et al. 1987) to broaden the scope of social identity theory, social categorization theory has spread its influence beyond intergroup relations into other areas of social psychology (See Brown 1988; Hogg 1992; Hogg and Abrams 1988; Turner et al. 1987).

At the same time, social identity theorists' claim that social category alone is sufficient to produce in-group favoritism has been subjected to serious criticisms; evidence against the pure categorization effect on in-group favoritism in the minimal group situation has accumulated. The criticisms are based on several grounds: for example, demand characteristics of the experimental situation invoking the generic norm of cooperation among group members (Berkowitz 1994; Gerard and Hoyt 1974) and a "residue" of interdependence existing in the form of mutual or "multilateral" fate control (Gaertner and Insko forthcoming; Jin and Yamagishi 1997; Jin, Yamagishi, and Kiyonari 1996; Karp et al. 1993; Kerr and Stone 1995; Ng 1980; Rabbie and Lodewijkx 1994; Rabbie, Schot, and Visser 1989; Yamagishi, Jin, and Kiyonari 1999).

The latter criticisms are based on the realization that the minimal group situation is less minimal than it originally was thought to be. The minimal group lacks interdependence of interests in the sense that one's action affects others' action and, through the altered action of others, indirectly affects one's own interest—mutual behavior control, in Thibaut and Kelley's (1959) terminology. Nonetheless, the rewards that subjects receive in MGE in fact depend on other subjects' actions. Participants in MGE allocate rewards between an in-group member and an out-group member, and the choice of allocation has no utilitarian consequence to the allocator. Tajfel and his colleagues, however, overlooked the fact that the allocator's rewards also are determined by other participants. They allocate money and, at the same time, others allocate money to them.

Investigators have repeatedly demonstrated the critical importance of this implicit interdependence of interests in the form of mutual (or multilateral) fate control—in Thibaut and Kelley's (1959) terminology—in the minimal group situation. Rabbie et al. (1989), for example, demonstrated this by letting out-group members determine rewards for the participant while the participant allocated rewards to an in-group and an out-group member; thus the allocator's own rewards depended on the allocation choice made by out-group members. In that condition, out-group rather than in-group favoritism emerged. Karp et al. (1993) removed the mutuality from the fate control by paying the participant a fixed amount. Participants in their experiment thus allocated rewards to an in-group member and an out-group member while their own rewards did not depend on other participants' allocation decisions. In that experiment, no in-group favoritism occurred at all. Furthermore, Jin et al. (1996; reported in English in Yamagishi et al. 1999) showed that only those who expected extra favors from other in-group members practiced in-group favoritism.

These findings show that participants in MGE do *not unconditionally* give preferential treatment to in-group members; rather, they treat other in-group members favorably only when they expect similar favorable treatment in return. In-group favoritism in MGE thus has been shown *not to be a matter of taste for, or liking of, in-group members per se*; if that were the case, participants should have treated in-group members favorably even when they did not expect similar favorable treatment from them. On the basis of this and other experimental evidence, Yamagishi and his colleagues proposed that in-group favoritism in minimal group experiments is based on the expectation that preferential treatment will be reciprocated by in-group members. Brewer (forthcoming) advances a similar argument, calling the expectation of in-group reciprocity "depersonalized trust"—trust that is "extended to any member of the in-group whether personally related or not" but limited to in-group members. This argument—that in-group favoritism is the product of

expectation of in-group reciprocity or depersonalized trust rather than of intrinsic tastes for, or liking of, in-group members—has been supported repeatedly by a series of Prisoner's Dilemma experiments conducted by Yamagishi and his colleagues.

#### SOCIAL CATEGORIZATION EFFECT IN THE PRISONER'S DILEMMA CONTEXT

The minimal group scheme has been applied more recently in the Prisoner's Dilemma (PD) context. A logical extrapolation of the in-group favoritism observed in the original MGE is that the level of cooperation is higher with an in-group member than with an out-group member in the PD context. This prediction of more cooperation with an in-group member has been observed repeatedly in the PD experiments that used the minimal group scheme to create the in-group/out-group distinction (Brewer and Kramer 1986; de Cremer and van Vugt forthcoming; Jin and Yamagishi 1997; Kollock 1997; Kramer 1991; Kramer and Brewer 1984; Kramer and Goldman 1995; Kramer, Pommerenke, and Newton 1993; van Vugt and de Cremer 1999; Wit and Wilke 1992).

Typically, participants play a one-shot PD game with an in-group member or an out-group member, and cooperate more with the former than with the latter. The standard explanation of this in-group favoritism effect in PD experiments is based on identity theory: cooperation toward in-group members is believed to be greater because the player and the partner belong to the same category.

This conclusion, however, was challenged seriously by Jin and Yamagishi (1997; reported in English as Experiment 6 by Yamagishi et al. 1999). They manipulated the partner's knowledge about the player's membership independently of the player's knowledge about the partner's membership. Thus, two in-group conditions and two out-group conditions existed. In either of the two in-group conditions, the player who was a member of the Klee group was informed that the partner was also a member of the Klee group. In addition, the player in the in-

group/knowledge condition was informed that the partner knew that the two shared membership in the Klee group. In the in-group/no-knowledge condition, however, the player was informed that the partner was not informed of the player's group membership. Similar manipulation was used for the two out-group conditions: out-group/knowledge and out-group/no-knowledge.

This experiment demonstrated that the mere fact that the player and the partner belonged to the same group was not sufficient to produce in-group favoritism: unless the player was aware that the partner knew they shared group membership, the partner's group membership had no effect on the level of his or her cooperation. In short, to engender in-group favoritism in the one-shot PD game, group membership had to be common knowledge whereby both participants knew their memberships, and both knew that both knew their memberships. The importance of the common knowledge of group membership was replicated more clearly in another experiment by Kiyonari and Yamagishi (1998; reported in English as Experiment 7 in Yamagishi et al. 1999). These findings again indicate that expectations of favorable treatment from in-group members are an important source of in-group favoritism in the minimal group situation.

One of the most consistent findings in PD and social dilemma (*n*-person version of PD) research is the effect of expectations on behavior. Numerous studies report strong relationship between the player's level of cooperation and the expectation of the level of the partner's cooperativeness (Dawes, McTavish, and Shaklee 1977; Marwell and Ames 1979; Messick et al. 1983; Sato and Yamagishi 1984; Tyszka and Grzelak 1976; Yamagishi 1986, 1988a, 1998b, 1992; Yamagishi and Cook 1993; Yamagishi and Sato 1986).<sup>1</sup> Furthermore, there is clear experimental evidence that players cooperate only when the partner cooperates as well (Hayashi et al. 1999). When players were

informed that the partner had already defected, all of the 13 American participants and 22 of 25 Japanese participants defected. When they were informed that the partner had already cooperated, 11 of the 18 American participants and 15 of the 20 Japanese participants cooperated.

Yamagishi and his colleagues (Jin and Yamagishi 1997; Yamagishi et al. 1999) explain the effect of knowledge commonality on in-group favoritism in their PD experiments in terms of its relationship to their expectation of the in-group partner's cooperation. Given the "generic norm" (Tajfel et al. 1971) dictating that people should cooperate with fellow group members, it is natural for players to expect a higher level of cooperation from in-group members than from out-group members. This elevated expectation of cooperation from in-group members, Yamagishi and his colleagues argue, is at the core of the in-group favoritism observed in the PD experiments involving minimal groups.

Greater cooperation from in-group members should not be expected, however, when the player knows that the partner does not know they are in the same group. From the partner's viewpoint, the player is not an in-group member, although the partner is clearly an in-group member in the player's view. Knowing that the partner would not treat them preferentially, the players in the in-group/no-knowledge condition saw no point in treating in-group members more favorably. The commonality of membership knowledge is critical because the partner's behavior does not exist without such knowledge.

The role of expectations is confirmed in the responses to the post-experimental questionnaire in the above experiments showing that in-group favoritism was practiced only by players who expected cooperation from in-group members. In short, previous findings from PD studies using the minimal group scheme indicate that players cooperate more with in-group members than with out-group members because they expect that in-group members will treat them preferentially, as they would treat other members of their own group. Again, intrinsic tastes for, or liking of, in-group members were not the cause of in-

<sup>1</sup> The causal direction between behavior and expectation has not been settled. It is most likely that it is bidirectional: people adjust their own behavior to their expectations and then project their own behavior onto others.

group favoritism; if that had been the case, participants should have cooperated more with in-group members than with out-group members regardless of the commonality of membership knowledge.

Although the findings reported above seem to unambiguously support the prediction that in-group favoritism does not occur unless players expect greater cooperation from in-group members, they do not completely rule out the explanation based on social identity theory. Though players may expect a higher level of cooperation from in-group members based on the generic norms of group behavior, they may choose to cooperate with in-group members because they identify with the in-group. That is, the effect of the expectation observed in the above experiment may be spurious, caused by the factor of sharing the same social category. Sharing a social category would make participants expect favorable treatment from members of that group and, at the same time, would make them more cooperative with in-group members.

The group membership effect in the no-knowledge conditions may be lacking because the players did not fully identify with the group in that condition. The lack of commonality of membership knowledge could have dampened the sense of identity with the group because the category seemed to be less real or less entitative when commonality of knowledge was missing. Setting aside the tautological nature of this argument—that the degree of identity is judged by the very fact that it is supposed to explain—in-group favoritism, according to this explanation, still can be fundamentally a matter of categorizing oneself as a member of a certain group, not a matter of expecting reciprocation of favors from in-group members. Thus we decided to conduct another PD experiment to examine whether in-group favoritism in the one-shot PD is a matter of social identity or of in-group reciprocity.

PURPOSE OF THE EXPERIMENT:  
SORTING OUT THE TWO  
EXPLANATIONS

The purpose of the experiment described below is to examine whether

expectations of in-group reciprocity rather than identification with the social category per se, is the cause of in-group favoritism in the one-shot PD with minimal group members. We pursue this goal not by manipulating the commonality of membership knowledge as did Yamagishi and his colleagues, but by holding constant the commonality of the knowledge while at the same time manipulating the source of expectations for the partner's cooperation. For this purpose, we compared two types of one-shot PD: the simultaneous game and the sequential game. Because the same commonality of membership knowledge exists in the two experimental conditions, and because the conditions differ only in regard to expectations, the differential levels of cooperation in the two conditions cannot be attributed to the differential levels of identification with the group. Thus we can disentangle the differential levels of identification from the differential nature of exchanges that plagued the commonality manipulation of membership knowledge in the previous experiments.

*The Simultaneous Game*

In the one-shot PD game in its ordinary form—that is, when it is played simultaneously by two players, each without knowledge of the other's behavior—the player can unilaterally affect the partner's outcome (that is, he or she has fate control over the partner), but cannot affect the partner's choice (that is, he or she has no behavioral control). On the basis of the findings from previous experiments, we argue that cooperation is greater with in-group members than with out-group members in the simultaneously played one-shot PD because expectations of cooperation from in-group members are different than those from out-group members. We believe that the greater expectation of cooperation from in-group members reflects expectation of in-group reciprocity. This expectation also has been described as based on the "generic norm of cooperation" (Tajfel et al. 1971), as the "illusion of control" (Karp et al. 1993), as the "group cooperation heuristic" (Jin and Yamagishi 1997), and as depersonalized trust (Brewer forthcoming). According to this

expectation, in-group members will reciprocate cooperation with cooperation rather than exploiting cooperation with defection.<sup>2</sup>

Although the term *reciprocity* seems to imply anticipation of *future* behavior, we emphasize here that the expectation is not limited to future behavior. For example, players of a simultaneous, one-shot PD may cooperate expecting that the partner also will make the cooperative choice. In this example, the player is reciprocating the partner's anticipated cooperation while assuming that the partner is also reciprocating the anticipated cooperation by the player.

### *The Sequential Game*

We contrast this ordinary type of PD, or the *simultaneous game*, with the *sequential game*, in which one player makes a decision and the second player follows suit with full information on the first player's choice. The sequential game is also a one-shot game in the sense that it is played only once between two players. The nature of the exchanges is different, however. In the simultaneous game, each player makes the decision to cooperate or defect without knowing the other player's choice. Thus there is absolutely no possibility that the player can affect the partner's choice. The second player in the sequential game, however, makes the decision with the full knowledge of the first player's choice, while the first player makes the decision without knowing the second player's choice. Thus the second player's decision can be affected by the first player's choice. The second player can ignore the first player's choice, but insofar as he or she takes notice of the first player's choice, his or her decision can be affected by that knowledge.

It is more than a logical possibility that the first player can affect the second player's choice. This has been demonstrated empirically in the experiments by Hayashi et al. (1999) and Watabe et al. (1996) in which the second player's behavior in the sequential

game was affected dramatically by the first player's behavior. When the first player defected, all of the American participants and 88 percent of the Japanese participants defected. In contrast, when the first player cooperated, the majority (61 percent of the American participants and 75 percent of the Japanese participants) cooperated. These findings not only show clearly that the first player can affect the decision of the second player in the sequential game, but also indicate that the first player understands that he or she can affect the second player's decision. The first players in the sequential game cooperated at a higher level than the simultaneous players (56 percent versus 36 percent among Americans; 83 percent versus 56 percent among Japanese); the first players cooperated because they expected reciprocal cooperation from the second players, and the second players in fact reciprocated the first players' choice. The first player in the sequential game thus can reasonably expect to induce the second player to practice mutual cooperation. In contrast, the player in the simultaneous game had no such source of expectation of the partner's cooperation.

In the experiment described below, we compared the effect of group membership on the players of the simultaneous game and on the first players of the sequential game. All participants in the sequential game were assigned the role of first player; there were no second players, though the participants believed that they existed. The PD game uses the "give-some" format in which the player decided how much of the endowment of 300 yen to give to the partner. The amount decided on by the player was doubled by the experimenter before it was given to the partner. We describe the game in greater detail in the "procedure" section.

### *Prediction*

We expect that group membership will affect the player's level of cooperation (i.e., how much he or she gives to the partner) in the simultaneous game but not in the sequential game. This prediction of the differential effect of social category is based on the difference in the source of expectations

<sup>2</sup> In other words, it is an expectation that in-group members have transformed the original PD incentive structure into that of an Assurance Game. See Yamagishi et al. (1999) for a discussion of the relationship between these concepts.

for the partner's cooperation. In the sequential game, the first player, at least potentially, can affect the second player's behavior: the first player can expect directly reciprocal behavior from the partner. That is, the main source of the expectation of the second player's cooperation lies in the first player's ability to induce the second player to practice mutual cooperation.

In contrast, the player of the simultaneous game cannot expect reciprocation from the partner. According to the in-group reciprocity approach to in-group favoritism, people treat in-group members more favorably than out-group members because they expect favorable treatment from in-group members. In the sequential game, this expectation of in-group reciprocity would be overridden by the much stronger expectation based on direct reciprocity. Hence we predict that the differential effect of group membership on cooperation will emerge in the simultaneous game but not in the sequential game.

## PROCEDURE

### *Design and Participants*

We used a game (simultaneous versus sequential)  $\times$  group (in-group versus out-group) design in which the former was a between-subjects factor and the latter a within-subjects factor. Each participant played the same type of PD game (either simultaneous or sequential) twice, once with an in-group member and once with an out-group member. We counterbalanced the order of types of partner (in-group and out-group).

The participants were 91 students (53 male and 38 female) recruited from the subject pool for social psychology at a major national university in Japan. The subject pool of about 1,300 was created at the beginning of the semester by soliciting volunteers at introductory classes in various departments throughout the university. We emphasized monetary incentives when recruiting potential participants. Six to 16 participants were scheduled for a single experimental session. When an odd number of participants appeared, a confederate was brought in to give the appearance of an even-numbered

group. Those 6 to 16 participants were assigned randomly to the two game conditions. Because the game condition was manipulated through individualized instructions, participants were led to believe that the other participants were in the same condition as themselves.

### *Manipulation of Categories*

As participants arrived at the laboratory (a classroom), each was handed an ID card on which three letters were written. They were asked to identify themselves by these ID letters so that their personal identity would be completely unknown to the experimenter. They were reminded not to show their ID letters to the other participants, nor to the experimenter.

After the initial introductions, participants sat in the classroom facing the front. They were told that the experiment required two groups of people; thus they would be divided into two groups based on their "picture preferences." The participants then indicated their preferences for one of two pictures projected on a screen, one by Klee and the other by Kandinski. This task was repeated nine times, each with a new pair of pictures. The sheet reporting the participants' preferences for Klee's or Kandinski's pictures, although participants were not told the painters' names, was then collected and handed to another experimenter who waited outside the classroom.

### *Instructions*

In a few minutes, an assistant experimenter knocked on the door and handed a bundle of envelopes to the experimenter in the room. An ID card was clipped on each envelope. The experimenter placed the envelopes side by side on tables in the first row, in such a way that he could not see the ID letters. Then he announced that the experiment was starting and asked the participants to come forward, find the envelope with their own ID letters attached, and take it.

Each envelope contained a booklet of the instructions. The first page informed the participant that he or she belonged to the "Klee group" (the people who preferred



Klee to Kandinski) or to the “Kandinski group.” The assignment was based on the participant’s actual preferences in the “picture preference” task.

After the assignment to either the Klee or the Kandinski group, participants were informed that they would conduct several rounds of transactions, each time with a different partner drawn from a different group. They were told the following: “In each transaction round, it will first be determined from which group your transaction partner<sup>3</sup> is drawn. In some rounds your partner will be a member of your, Klee (or Kandinski) group, and in other rounds your partner will be a member of the other, Kandinski (or Klee) group. We will inform you from which group your partner is drawn each round, but not which particular person from that group is your partner.” From the participant’s viewpoint, the transaction rounds constituted repeated one-shot PD games, not iterated PD games. They did not expect to deal exclusively with members of one group.

Then the nature of the transaction—the PD game—was explained, and the participants were asked four questions testing their understanding of the instructions. They were asked to wait until the experimenter came to check their answers. The experimenter then checked the participants’ answers to the questions, and gave further explanations when errors were found. After all the errors were corrected and further explanations were provided when necessary, the participants were asked to turn to the last page of the instruction booklet. We explain what followed after describing the PD game.

### *Prisoner's Dilemma*

Participants were told that they would engage in several rounds of transactions, but the exact number of transactions was not specified. In each transaction they received 300 yen (about \$3) as an endowment. The transaction would take place between two participants. The task of each participant was to decide how much of the 300 yen (any amount between 0 and 300) to give to the

partner. The money provided by the participant was doubled by the experimenter; thus the partner received twice the amount actually provided. This situation was symmetrical: the participant also received twice the money provided by the partner.<sup>4</sup> Although the partner’s group identity was revealed to the participant in each transaction and the participant knew that his or her own group identity would be revealed to the partner, their personal identities were kept anonymous.

*Simultaneous versus sequential game.* In the simultaneous game condition, the two players made the decision simultaneously, each without knowing the other’s decision. In the sequential game condition, one player made the decision first, and the second player made the decision after being informed of how much the first player gave him or her. As mentioned earlier, participants in this condition were first players; the second players did not actually exist.

*Flow of the games.* On the last page of the instruction booklet, the participant was informed of the group identity of the partner in the first round of transaction. As the participants finished reading this page, the experimenter asked them to pull the “decision sheet” from the envelope and write down how much they would give to the partner. The participant’s group identity was indicated again on the decision sheet, together with the participant’s own group. Participants then put the filled-out decision sheet back in the envelope together with the ID card originally clipped to the envelope. The experimenter collected the envelopes and handed them to an assistant waiting outside the room. This procedure assured the anonymity of the participants’ decisions to the experimenter. The experimenter had no access to participants’ decisions and did not

<sup>3</sup> A more neutral term, which translates as “the other,” was used to refer to the “partner.”

<sup>4</sup> This should not be confused with the reward allocation game used in the original MGE, in which the allocator-subject had no right to the allocated money. In the current game, each participant earned 300 yen if neither gave any, 600 yen if each gave the full amount of 300 yen to the partner, nothing if one participant gave 300 yen and the partner gave nothing, and 900 yen if one participant gave nothing and the partner gave 300 yen. These figures constitute a PD matrix.

know their ID letters. The assistant had access to their decisions but could identify them only by ID letters, not by appearance or name.

After a brief waiting period, the assistant knocked on the door and handed the experimenter a second bundle of envelopes; the experimenter placed these side by side on the front table in the same way as before. Participants came to pick up a set of two envelopes with their ID letter card attached. The envelopes were placed on top of the ID cards so that only the participants could see the ID letter by privately turning the cards up. The second envelope contained a questionnaire asking how much the participant thought the partner had given (i.e., the expectation of the partner's cooperation level) and other post-decision questions. Participants filled out the questionnaire and put it back in the envelope, together with the attached ID card. The experimenter collected the envelopes and handed them to the assistant waiting outside the room. Participants in the sequential game thought that the second players were making their decisions while they were answering the questions.

Then the participants were asked to open a third envelope and to remove the instructions and the decision sheet for the second transaction. These instructions indicated new partner's group membership. Participants wrote the amount to give to the partner on the decision sheet, and put the second set of instructions and the filled-out decision sheet back into the same envelope. The experimenter collected these and handed them to the assistant waiting outside the room. After a brief waiting period, the assistant knocked on the door again and handed the experimenter another bundle of envelopes.

The experimenter placed Envelopes 4 and 5 with ID cards attached face down in the same way as before, and the participants came forward and took their sets. Envelope 4 contained the same post-decision questionnaire as Envelope 2. Participants filled out the questionnaire and put it back in the same envelope. Again, the experimenter collected the envelopes and handed them to the assistant waiting outside the room. Then the

experimenter declared that the experiment was over, and asked the participants to open the fifth envelope and answer the post-experimental questionnaire while the assistant was calculating the results of the transactions.

In a few minutes, the assistant knocked on the door and handed the experimenter a bundle of small envelopes. Each envelope contained the payment to the participant whose ID letters were indicated on one side. The experimenter placed the envelopes side by side on the table with the ID letters facing down. Because no second player existed in the sequential game condition, everyone was paid on the assumption that the partner had given the same amount as he or she. On average, participants received 868 yen; the minimum was 600 yen, and the maximum was 1,200. The participants brought the last envelope with the filled-out post-experimental questionnaire to the experimenter, took the envelopes with their ID letters, and left the room. The whole process took about 1 1/2 hours.

## RESULTS

### *The Effect of the Partner's Group Membership on Cooperation*

Because the manipulation of the partner's membership was the same in the simultaneous and the sequential game conditions, there is no reason to predict a differential effect of the partner's membership (in-group versus out-group) on the level of cooperation from the viewpoint of social identity theory. From the viewpoint of in-group reciprocity, we predicted that the partner's membership would affect cooperation only in the simultaneous game but not in the sequential game because the two games involved different sources of expectation: in-group reciprocity in the simultaneous game, and direct reciprocity in the sequential game.

The results clearly supported the latter prediction and disproved the former. Table 1 shows the average amounts that participants gave to the partners from their endowment of 300 yen. They gave more to in-group members (120.02 yen) than to out-group members (90.45 yen) only in the

Table 1. Average Amount of Money Given to Game Partners (Yen)

Partner's Membership	Game Condition	
	Simultaneous ( $n = 44$ )	Sequential ( $n = 47$ )
In-group	120.02 (sd = 61.71)	153.83 (sd = 84.04)
Out-group	90.45 (sd = 62.95)	168.30 (sd = 91.35)

simultaneous game. This effect of the partner's membership did not exist in the sequential game (in which participants in fact gave more to out-group members than to in-group members, though the difference was not statistically significant). The ANOVA of the amount given to the partner indicates the significant main effect of the game,  $F(1, 89) = 22.11, p < .0001$ , and the game  $\times$  partner's membership interaction effect,  $F(1, 89) = 8.17, p < .01$ , but not the main effect of the partner's membership,  $F(1, 89) = .96, ns$ .

The strong main effect of the game type further confirms the reciprocity explanation of in-group favoritism. Our prediction of no group membership effect in the sequential game was based on the premise that the expectation of direct reciprocity would be strong enough in the sequential game to eliminate the membership effect indirectly derived from expectations of in-group reciprocity. This argument implies that expectation of reciprocity from the partner is stronger in the sequential game than in the simultaneous game; thus the player would be more willing to cooperate in the former than in the latter situation.

The results show clearly that the cooperation rate is much higher in the sequential game than in the simultaneous game. Furthermore, analysis of a post-decision questionnaire item asking how much the participant thought the partner would give to him or her indicates that participants expected cooperation from the partner more strongly in the sequential game than in the simultaneous game, and particularly in the out-group condition, in which no

expectation of in-group reciprocity was expected (see Table 2). The main effect of the game was marginally significant,  $F(1, 89) = 3.87, p < .06$ , and the interaction effect was significant,  $F(1, 89) = 4.69, p < .05$ , but the main effect of group identity was not,  $F(1, 89) = .00, ns$ .

#### Group Identity

The following four items were included in the post-experimental questionnaire to measure the degree of participants' identification with in-group and out-group: "How strongly did you feel belongingness to the (Klee or Kandinski) group?" (belongingness); "How much commonality did you think you shared with the members of the (Klee or Kandinski) group?" (commonality); "How close did you feel toward the members of the (Klee or Kandinski) group?" (closeness); and "How favorably did you feel toward the members of the (Klee or Kandinski) group?" (liking). Average responses to these questions (Seven-point scale ranging from 1 to 7) are shown in Table 3. All of the group differences in the responses to those items were significant except liking in the sequential game. These results demonstrate the success of the manipulation of categories: participants felt a stronger sense of belongingness to the in-group than to the out-group and felt closer to the in-group than to the out-group. Thus, the lack of partner's membership effect on cooperation in the sequential game cannot be attributed to failure in invoking group identity in the sequential game condition.

Table 2. Participants' Average Expectation of Partners' Cooperation (Yen)

Partner's Membership	Game Condition	
	Simultaneous ( $n = 44$ )	Sequential ( $n = 47$ )
In-group	107.73 (sd = 45.79)	113.40 (sd = 72.60)
Out-group	91.25 (sd = 39.81)	130.85 (sd = 91.22)

Table 3. Average Responses to the Post-Experimental Questionnaire Items for Group Identity

	Simultaneous Game		Sequential Game	
	With In-Group	With Out-Group	With In-Group	With Out-Group
Belongingness	3.15 (1.71)	2.57 (1.30)	2.70 (1.91)	2.38 (1.75)
Commonality	3.50 (1.65)	2.77 (1.01)	3.43 (1.53)	2.83 (1.20)
Closeness	3.32 (1.68)	2.50 (1.11)	2.83 (1.65)	2.47 (1.30)
Liking	3.43 (1.65)	2.64 (1.20)	2.60 (1.66)	2.40 (1.44)

Note: Standard deviations shown in parentheses.

#### *Analysis with Those Who Identified More Strongly with the In-Group Than with the Out-Group*

On average, participants identified more strongly with the in-group than with the out-group, but a few did not. Thus we excluded from the analysis those who did not identify differentially with the two groups ( $n = 29$ ), and examined whether this made any difference. As in the original analysis, participants gave more to in-group members (126.76) than to out-group members (87.94) in the simultaneous game ( $n = 34$ ) but not in the sequential game ( $n = 28$ ; 134.64 to in-group members and 151.07 to out-group members). The main effect of the game type,  $F(1, 60) = 5.04, p < .05$ , and the game  $\times$  partner's membership interaction,  $F(1, 60) = 11.06, p < .01$ , was significant, but the main effect of the partner's membership was not,  $F(1, 60) = 1.82, ns$ .

#### *In-Group Favoritism, Group Identification, and Expectation*

Was the participant's group identity related to cooperation? To answer this question, we created a variable called "in-group favoritism" by subtracting the amount the participant gave to the out-group from the amount given to the in-group. In a similar manner, we created four "in-group identification" variables by subtracting the participant's responses to the above four post-questionnaire items about the out-group from those about the in-group. Table 4 reports the correlation coefficients between in-group favoritism and each of the four in-group identification measures. All of the in-group identification measures are correlated with in-group favoritism in the simultaneous game, whereas none of the in-group identification measures are correlated with in-group

favoritism in the sequential game. This finding suggests that the in-group favoritism that emerged in the simultaneous game may have been caused by in-group identification.

Yet, this interpretation of the positive correlation between in-group favoritism and in-group identification as an indication of the effect of the latter on the former fails to explain the lack of in-group favoritism in the sequential game, in which in-group identification was present (see Table 3); in-group identification existed in the sequential game but did not affect in-group favoritism. Thus the pattern is consistent only with the expectation explanation, not with the social identification explanation.

Results from the following series of multiple regression analyses further confirm this conclusion. First, we examined how much the standardized regression coefficient for each identification measure on in-group favoritism would be reduced by controlling for differential expectations. The analysis involved only the simultaneous game because it was the only condition in which in-group favoritism emerged. Each of the four measures of in-group identification was tested separately. The standardized regression coefficient of the belongingness mea-

Table 4. Correlations of the In-Group Favoritism Measure with Each of the Four In-Group Identification Measures and the Difference in the Expected Amount from In-Group and Out-Group Partners

	Simultaneous Game	Sequential Game
Belongingness	.37*	.09
Commonality	.34*	.04
Closeness	.39**	-.02
Liking	.32*	-.09
Differential Expectation	.56***	.56***

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .0001$

sure of in-group identification was reduced from .37 ( $p < .05$ ) to .13 (ns); similar reductions in the standardized regression coefficient were .34 ( $p < .05$ ) to .20 (ns) for commonality, .39 ( $p < .01$ ) to .20 (ns) for closeness, and .32 ( $p < .05$ ) to .17 (ns) for liking. The effect of a compound measure of in-group identification (i.e., the average of the four measures) was also reduced from .43 ( $p < .01$ ) to .22 (ns). In contrast, the effect of differential expectation on in-group favoritism was not strongly affected, even when all four measures of in-group identification were controlled at once; the standardized regression coefficient was reduced from .56 ( $p < .0001$ ) to .49 ( $p < .01$ ).

The conclusion of these analyses is unequivocal: the effect of in-group identification disappears when the effect of expectation is controlled, while the effect of expectation remains largely unchanged when in-group identification measures are controlled. Thus it should be concluded that the relationship between in-group identification and in-group favoritism either is mediated by expectations or is spurious. (We discuss these possibilities below.)

#### *Gender Effect*

Gender did not have a significant effect (either a main effect or an interaction effect) either on the total level of cooperation (the amount participants gave to in-group and out-group members) or on the size of in-group favoritism. Similarly, gender did not have an effect on any of the four measures of in-group identification, nor on the compound measure.

### DISCUSSION

The results of the experiment described above consistently support the critical role of in-group reciprocity in the production of in-group favoritism in the one-shot Prisoner's Dilemma. The most important finding is that players gave more money to an in-group member than to an out-group member in the simultaneous game, but not in the sequential game. Furthermore, players expected a higher level of cooperation from the partner and cooperated at a higher level

in the sequential game than in the simultaneous game; this finding suggests the power of direct reciprocity. It was also demonstrated that statistically controlling for the effect of expectation greatly reduces the effect of group identity on cooperation. Because categorization manipulation did not differ in the two game conditions, the differential effect of the partner's membership on cooperation cannot be attributed to the differential salience of group identity in the two games.

These results indicate that in-group favoritism in the minimal group situation occurs only when expectations of in-group reciprocity, but not of direct reciprocity, are operating. When this conclusion is taken together with the findings from the previous experiments, showing that in-group favoritism does not occur when participants cannot or do not expect favorable treatments from in-group members, a clear picture emerges. Identification with social categories per se is insufficient to induce players to practice in-group favoritism; social categories do not affect people's behavior in the minimal group situation unless they come with expectations that in-group members will exhibit in-group favoritism toward the player. Thus we have added evidence to the argument that in-group favoritism in the minimal group situation is not a matter of identification with the social category per se. Social categories come to play a role in the minimal group situation only as the demarcation for the group in which in-group reciprocity is assumed to operate. In-group-favoring behavior is produced by expectations of in-group reciprocity or depersonalized trust (Brewer forthcoming), while the salient social category directs people's attention to the expectations that in-group members can be trusted to treat them favorably.

In this sense, the social category is the container of the expectations of in-group reciprocity. The previous works by Yamagishi and his colleagues, together with those by Rabbie and his colleagues, discussed earlier, showed that the empty container itself can play no role in producing in-group favoritism in the minimal group situation unless it is filled with expectations of in-group reciprocity. These researchers demonstrated that participants do not exhibit in-group-favoring

behavior unless they expect favorable behavior from other in-group members. In the current experiment we have shown that people do not need to look to the container for such expectations when a more readily available source of expectations exists in the form of direct reciprocity.

Before closing, we must discuss four issues. The first concerns the generalizability of the findings. It is likely that the results of the current experiment hold true only in the minimal group situation, and cannot be generalized to more realistic groups. The lack of such generalizability, however, does not compromise the significance of this research. After all, the original MGE extended a strong influence because it demonstrated the existence of in-group favoritism even in the minimal group situation. In other words, it is no surprise to find in-group favoritism in realistic groups, and in-group favoritism in realistic groups can be attributed to many causes. By demonstrating in-group favoritism in MGE, Tajfel and his colleagues could provide a convincing argument that such favoritism is due to social identity, not to other causes such as realistic conflict of interest. The current research is significant for its success in demonstrating that expectation of generalized reciprocity, not category-based social identity per se, is responsible for in-group favoritism *even in the minimal group situation*. Whether or not nontrivial, realistic social categories produce in-group favoritism is not an issue here.

The second issue concerns the distinction between in-group evaluation or in-group boasting (Yamagishi et al. 1999), on the one hand, and in-group favoritism, on the other. The former does not involve any tangible rewards; the latter does so. The original MGE had a strong effect because it involved allocation of tangible rewards; this implies that mere categorization produces discriminative *behavior*. Feeling favorably toward people who share one's category is commonly observed, as in the case of basking in other's glory at the Olympic Games. Feeling good about the victory of one's own Olympic team, however, is far from acting discriminatory toward people of other nations. The most important problem awaiting investigation by social psychologists is

how great that distance is and what lies on the route from basking in Olympic team's glory to outright discrimination toward people from another country. Simply equating in-group favoritism with in-group evaluation is no help in this endeavor. The current research suggests that the distance is fairly substantial and that what lies on the way is the expectation of in-group reciprocity.

The third issue concerns the expectation of in-group reciprocity. Such expectation is similar to other concepts such as the generic norm of group behavior (Tajfel et al. 1971) or depersonalized trust (Brewer forthcoming). It is the expectation that members of a group will treat in-group members more favorably than others. Yamagishi et al. (1999) consider it to be based on the intuitive understanding of the group as involving a system of generalized exchanges. In such a system, people receive favors (intangible as well as tangible), but not necessarily from those to whom they provide favors. Thus, in a group where a system of generalized exchanges exists, people expect favorable treatment from any member of the group, provided that they are accepted as members of the system. According to Yamagishi et al. (1999), the expectation of *in-group reciprocity* is the *expectation of favorable treatment from others not as direct but as indirect reciprocation for the favors they give*.

As Yamagishi et al. (1999) point out, a system of generalized exchanges in fact existed in the minimal group experiments described earlier. Participants in those experiments expected to receive more from in-group members, gave more to in-group members, and in fact received more from in-group members. That is, their in-group favoring behavior was reciprocated indirectly by someone in the group. Similarly, participants of the PD experiment gave favorable treatment to the in-group member, and the favor was reciprocated by the in-group partner.<sup>5</sup>

<sup>5</sup> Although receiving is contingent on giving in iterated PD games, how much a player receives from the partner in the simultaneous one-shot PD game is totally independent of how much one gives to the partner. The exchanges involved in the simultaneous one-shot PD are noncontingent exchanges in which one player cannot affect the other player's choice.

When participants were categorized into minimal groups, the category became salient and they expected in-group reciprocity. Also, by acting on this expectation, in fact they generated a system of generalized exchanges in which each participant unilaterally provided resources to in-group members and unilaterally received them. In this sense, the social category plays the role of a container or a vessel for the system of generalized exchanges.<sup>6</sup>

The fourth issue is related to the last two but is theoretically more intricate. The issue is the conceptual relationship between the idea of social categories as a vessel for in-group reciprocity or generalized exchanges, on the one hand, and the concept of group entitativity (Campbell 1958), on the other. Gaertner and Schopler (1998) argue that groups are perceived as an entity (assume group entitativity) to the extent of the group members' interconnection rather than their similarity to each other.<sup>7</sup> If we adopt this "dynamic entity perspective" rather than the "category perspective," viewing in-group entitativity as do Gaertner and Schopler (1998), the notion of group entitativity is very close to our notion of the group as a vessel for in-group reciprocity or generalized exchanges. Both our perspective and that of Gaertner and Schopler claim that the group is closely related to substantial interaction processes within the group and that identifi-

cation with the group plays a role in social and group life because of these implicitly assumed interaction processes. With the support of experimental findings, we argue that the system of generalized exchanges is the core of the implicitly assumed interaction processes.

In this respect, we are especially interested in the finding that the correlation between in-group favoritism and in-group identification was reduced by controlling for differential expectations. It was suggested that this reduction in the correlation might reveal its spuriousness. Perceived in-group entitativity is a strong candidate for the common cause responsible for the spurious correlation. Figure 1 illustrates a possible causal mechanism for the production of in-group favoritism and in-group identification. The perception of in-group entitativity, which is produced by the outward appearance of the container (e.g., homogeneity, closeness, common fate, interactions), gives rise to in-group identification and in-group boasting (i.e., positive evaluation of in-group members). At the same time, it hints at the existence of in-group reciprocity inside the container, which ultimately leads to in-group favoritism.

The mechanism illustrated in Figure 1 is still in a preliminary stage of theoretical development. Whether this basic schema is correct, and (if so) what additional details are needed, are topics for future study. Whatever the exact nature of the mechanism that gives life to the group, we believe that it lies on the path that connects identification with the group and in-group boasting, at one end, with the actual practice of in-group favoritism, at the other. Whatever lies between these two points will be fertile ground for further investigation.

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We consider this noncontingent quality of the exchanges the theoretically most important feature of generalized exchanges, as compared with direct exchanges. For a more elaborate discussion of this issue, see Yamagishi et al. (1999).

<sup>6</sup> Yamagishi et al. (1999) argue that saliency of a social category triggers the "group heuristic" and that the expectation of in-group reciprocity is a part of the heuristic. In addition to engendering this expectation, the group heuristic transforms mixed-motive incentive structures such as PD into an Assurance Game (AG) in which mutual cooperation is regarded as a better choice than unilateral exploitation of the cooperative partner. An alternative explanation of the transformation from PD into AG, based on the pure effect of group identity, has been rejected by the sixth and the seventh experiments reported by Yamagishi et al. (1999).

<sup>7</sup> Similarly, Hamilton, Sherman, and Lickel (1998) argue that groups are perceived as more "groupy" when the structural relations between its parts are clearly evident.

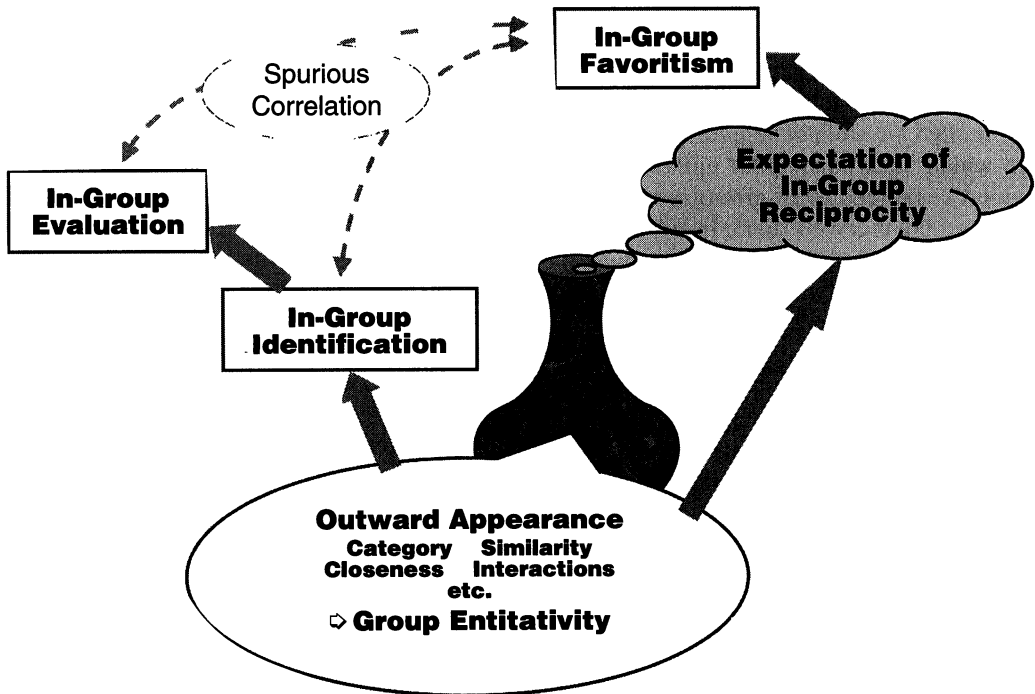


Figure 1. Possible Relations between the group as a container, Group Entitativity as Its Outward Appearance, In-Group Evaluation, In-Group Identification, Expectation of In-group Reciprocity and In-Group Favoritism

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