

Intergroup Discrimination in the Minimal Group Paradigm: Categorization, Reciprocation, or Fear?

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H. Tajfel's (1970) minimal group paradigm (MGP) research suggests that social categorization is a sufficient antecedent of ingroup-favoring discrimination. Two experiments examined whether discrimination in the MGP arises from categorization or processes of outcome dependence, that is, ingroup reciprocity and outgroup fear. Experiment 1 unconfounded categorization from outcome dependence. Categorized men discriminated only when dependent on others. Categorized women discriminated regardless of the structure of dependence. Experiment 2 examined dependence on the ingroup versus the outgroup as the locus of male-initiated discrimination. Consistently with an ingroup reciprocity effect, men discriminated when dependent on ingroup, but not outgroup, members. Sex differences are discussed in regard to women's heightened ingroup dependence produced by biological or environmental constraints.

Can the very act of social categorization, as far as it can be identified and isolated from other variables, lead—under certain conditions—to intergroup behavior which discriminates against the outgroup and favors the ingroup? (Tajfel, Billig, Bundy, & Flament, 1971, p. 151)

The initial minimal group paradigm (MGP) experiments (Billig & Tajfel, 1973; Tajfel & Billig, 1974; Tajfel et al., 1971) revealed the potency of social categorization as an antecedent of intergroup discrimination. Participants assigned to relatively novel and mutually exclusive social categories (e.g., persons preferring the art of Klee versus the art of Kandinsky) allocated more money to anonymous ingroup than outgroup members. The nature of this discrimination was such that category members maximized the relative difference between the earnings of the ingroup and outgroup rather than maximizing the ingroup's absolute earning. The results of numerous such experiments have been interpreted as indicating that

the mere perception of belonging to two distinct groups—that is, social categorization per se—is sufficient to trigger intergroup discrimination favoring the ingroup. In other words, the mere awareness

of the presence of an outgroup is sufficient to provoke intergroup competitive or discriminatory responses on the part of the ingroup. (Tajfel & Turner, 1979, p. 38)

Social identity theory (SIT; Tajfel & Turner, 1979) was developed to account for the effect of social categorization on intergroup discrimination. SIT suggests that group membership (e.g., nationality, ethnicity) is internalized as a social identity and that this identity is enhanced by distinguishing positively the ingroup from the outgroup. SIT's focus on identity enhancement was derived, in part, from category members' preference for maximizing the ingroup's relative rather than absolute gain. With regard to the MGP experiments, SIT suggests that

subjects define and evaluate themselves in terms of the imposed social categories, compare ingroup with outgroup in terms of the only available value dimensions (money, 'points,' evaluative scales) and seek positive distinctiveness for their own group by awarding it more money. (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987, p. 30)

Is social categorization alone a sufficient antecedent of intergroup discrimination? Do category members discriminate in the MGP to maintain a positively distinct social identity? Subsequent research and theory locate the source of discrimination that arises in the MGP in processes of outcome dependence rather than mere categorization. In the current research, we explore these outcome dependence perspectives and examine whether social categorization is sufficient for discrimination.

Outcome Dependence Perspectives

The assumption that the intergroup allocation task lacks instrumental or utilitarian value to the person making the allocation (Bourhis, Turner, & Gagnon, 1997; Tajfel et al., 1971; Tajfel & Turner, 1979) is critical to both an argument for the sufficiency of categorization as an antecedent of discrimination and the application of SIT to the results of the MGP. Rabbie and colleagues (Rabbie & Lodewijckx, 1994; Rabbie, Schot, & Visser, 1989)

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argued that this assumption is not satisfied in the MGP. In particular, participants allocate money to and receive money from other ingroup and outgroup members. Consequently, social categorization in the MGP is confounded with outcome dependence. Two outcome dependence hypotheses have been proposed to account for intergroup discrimination in the MGP: ingroup reciprocity and outgroup fear.

Ingroup Reciprocity

The ingroup reciprocity hypothesis (Rabbie et al., 1989; Yamagishi, Jin, & Kiyonari, 1999) suggests that discrimination in the MGP represents utilitarian behavior aimed at maximizing economic self-interest. In particular, category members follow a norm of reciprocity and exchange favorable allocations with ingroup members. Indeed, research is consistent with the reciprocity hypothesis. Categorized participants expect other ingroup members to make ingroup-favoring allocations (Jetten, Spears, & Manstead, 1996) and are more discriminatory when on a previous trial other ingroup members allocated more resources than fewer resources to the ingroup (Jetten et al., 1996; Locksley, Ortiz, & Hepburn, 1980). Intergroup discrimination occurs with the allocation of positively valenced resources but not with the allocation of negatively valenced resources (Mummendey et al., 1992). Perhaps most consistent with an outcome maximization position and least consistent with a social categorization or identity enhancement argument is evidence of outgroup favoritism. When category members are solely dependent upon the outgroup, they favor outgroup members (Rabbie et al., 1989).

Outgroup Fear

The outgroup fear hypothesis (Ng, 1981) proposes that discrimination reflects a concern for maintaining intergroup equity. That is, category members expect outgroup members to discriminate in favor of their own group and preempt the expected discrimination by favoring ingroup members (e.g., "If you favor your group and I favor my group, we will all come out equal"). Empirical support for the fear hypothesis, however, is equivocal. Mixed support comes from research on (a) expectations about the outgroup's behavior, (b) behavioral responses to feedback about the outgroup's behavior, and (c) allocation behavior in situations of unilateral versus mutual control of the outcomes of others.

Consistent with the fear hypothesis, Jetten et al. (1996) reported that categorized participants expect outgroup members to favor the outgroup. However, Diehl (1989; Experiment 2) reported that category members expect outgroup members to equally distribute the resources. Jetten et al.'s participants indicated expectations for the allocation behavior of both ingroup and outgroup members, whereas Diehl's participants indicated their expectations for only outgroup members. Perhaps, outgroup fear becomes salient in the MGP after ingroup members reflect on a norm of ingroup reciprocity.

Locksley et al. (1980) reported that category members are responsive to the prior allocations of outgroup members; namely, they are more discriminatory when outgroup members previously allocated more resources to the outgroup. On the other hand, neither Diehl (1989; Experiment 2) nor Jetten et al. (1996; Experiment 1) replicated this pattern. The three experiments, however, differ in two potentially important aspects. First, Diehl provided

feedback about outgroup members' intentions rather than their actual actions. Second, Locksley et al. informed participants about how they personally were treated. Diehl and Jetten et al. informed participants about how other unidentified ingroup members were treated. Perhaps in the MGP, the outgroup's behavior has more impact when it is targeted directly at the self rather than at other ingroup members.

A more direct test of the fear hypothesis suggests that category members are more discriminatory when they and an outgroup member have joint control over the outcomes of other ingroup and outgroup members than when category members have unilateral control (Ng, 1981). That is, participants discriminate less when they do not have to consider how recipients of their allocations will be treated by outgroup members. On the other hand, Platow, McClintock, & Liebrand (1990) did not replicate this pattern. Neither experiment, however, controlled completely for the effect of outgroup fear. Participants in the unilateral control condition of both experiments solely determined the earnings of particular ingroup and outgroup members, whereas outgroup members solely determined the earnings of other ingroup and outgroup members. Consequently, the total earnings of the ingroup and outgroup were not under the unilateral control of the participant, and fear of the outgroup may have influenced the allocations.

In summary, alternative theoretical perspectives raise questions about whether social categorization alone is sufficient for intergroup discrimination. In the current research, we address empirically the issues raised in the work discussed above and further test whether social categorization alone is sufficient for intergroup discrimination. Experiment 1 unconfounded social categorization and outcome dependence in the MGP. Experiment 2 examined the outcome dependence hypotheses of reciprocity and fear and explored further distinctions within each perspective.

Measurement Issues

Experiments 1 and 2 assessed intergroup discrimination with the Multiple Alternative Matrices (MAMs; Bornstein et al., 1983a). This section summarizes briefly three issues relevant to the MAMs: interpretation, detection of discrimination, and alternation.

Interpretation

The MAMs were developed to avoid the following problems associated with the typical MGP measure of intergroup discrimination (i.e., the Tajfel matrices; Tajfel et al., 1971): (a) confounding the strategies of maximum differentiation and maximum ingroup profit (Brewer, 1979), (b) failing to simultaneously provide participants with the full range of allocation strategies and therefore forcing participants to select a less than optimal preference (Bornstein et al., 1983a), and (c) providing an ambiguous measurement of the fairness strategy (Bornstein et al., 1983b). The MAMs present simultaneously seven unconfounded options for distributing resources between ingroup and outgroup members (see Table 1). Each option represents a distinct social orientation (Kelley & Thibaut, 1978) or allocation strategy (Tajfel & Turner, 1979). Three of the orientations favor the ingroup: (a) *Max Rel Own* represents a concern for maximizing the ingroup's relative gain over the outgroup, (b) *Max Own* represents a concern for maximizing the ingroup's absolute gain, and (c) *Max Joint Own* represents a concern for maximizing the joint earnings of both

Table 1
Ingroup and Outgroup Outcomes as a Function of the Multiple Alternative Matrices

Recipient	Allocation strategy						
	Max Rel Own	Max Own	Max Joint Own	Min Dif	Max Joint Other	Max Other	Max Rel Other
Ingroup	42	47	44	34	36	30	22
Outgroup	22	30	36	34	44	47	42

Note. The seven allocation strategies distribute outcomes (e.g., money) to the ingroup and outgroup and constitute one set of Multiple Alternative Matrices (MAMs). Participants were instructed to select the single distribution that reflects their allocation preference. In the versions of the MAMs presented to participants, the allocation strategies were not labeled and each value was multiplied by five. For a mathematical derivation of possible outcome values, see Bornstein et al. (1983a). Max Rel Own = allocation strategy that represents a concern for maximizing the ingroup's relative gain over the outgroup; Max Own = allocation strategy that represents a concern for maximizing the ingroup's absolute gain; Max Joint Own = allocation strategy that represents a concern for maximizing the joint earnings of both groups while providing an advantage to the ingroup; Min Dif = allocation strategy that represents a concern for minimizing the differences between groups; Max Joint Other, Max Other, and Max Rel Other = allocation strategies that favor the outgroup in a manner symmetrical to Max Rel Own, Max Own, and Max Joint Own.

groups while providing an advantage to the ingroup. One orientation, *Min Dif*, represents a concern for minimizing the differences between groups. The remaining three orientations (*Max Rel Other*, *Max Other*, and *Max Joint Other*) favor the outgroup in a manner symmetrical to the ingroup-favoring orientations. Participants select the single orientation that best reflects how they would like the resources to be allocated (for a criticism, see Turner, 1983; for responses, see Bornstein et al., 1983b and Insko & Schopler, 1987).¹

Detection of Discrimination

Prior research with the MAMs did not replicate consistently the findings of the initial MPG studies (Bornstein et al., 1983a, 1983b) and, consequently, implied that discrimination does not arise in the MGP. In particular, college-age females tended to minimize intergroup differences (i.e., *Min Dif*), and college-age males tended to maximize the joint profits of the ingroup and outgroup (i.e., *Max Joint Own*; Bornstein, 1983a).² However, the lack of discrimination detected in the MGP with the MAMs can be attributed to a methodological artifact. Participants were instructed to think of the MAM values as "payment." The use of the term payment in the context of an array of clearly differentiated response alternatives (i.e., the MAMs) constrained participants from expressing discriminatory inclinations. Indeed, category members in the MGP selected discriminatory orientations (e.g., *Max Rel* and *Max Own*) more frequently when the MAM values were described as "bonus money" (i.e., an award) or an indication of one's "feelings toward others" than when described as "payment" (Gaertner & Insko, in press.)³ The MAM values in the current research were described to participants as "bonus money."

Alternation

Typically, participants complete several sets of MAMs, and the proportion or frequency of selection for each orientation is exam-

ined. Participants, however, occasionally alternate between selection of ingroup- and outgroup-favoring allocations to simultaneously maximize the joint earnings of both groups while minimizing intergroup differences (Bornstein et al., 1983a; Gaertner & Insko, in press). For example, a selection of *Max Joint Own* in conjunction with a selection of *Max Joint Other* provides more money to the ingroup and outgroup than do two selections of *Min Dif* and simultaneously minimizes intergroup differences. In the current research, we used procedures that minimized the difficulties of interpretation posed by alternation. Participants selected only one orientation (i.e., allocation strategy) in Experiment 1 and rated their preference for each orientation in Experiment 2.

Experiment 1

The current experiment independently varied the presence of the dependence structure and social categorization. Previous research has varied aspects of the dependence structure by examining (a) the intergroup reward structure, (b) individual and group control over the allocation task, and (c) personal dependence. These previous studies, however, were not necessarily designed to unconfound categorization and dependence and, therefore, contained methodological problems specific to differentiating social categorization and outcome dependence explanations.

Intergroup Reward Structure

Brewer and Silver (1978) varied the intergroup reward structure such that the participant and the outgroup were either competitively interdependent (i.e., participants could win a prize if they received more points from the ingroup than the outgroup), cooperatively interdependent (i.e., participants could win a prize if the total points they were awarded jointly by the ingroup and outgroup exceeded a criterion), or independent (i.e., participants could win a prize if the total points they were awarded by the ingroup exceeded a criterion). Allocations did not differ between the competitive and independent conditions. However, there were more

¹ Contrary to Turner's (1983) argument, both open-ended and closed-ended responses indicated that choices of *Max Joint Own* and *Max Own* were not attempts to obtain relative differences less than the maximal extent possible (Insko & Schopler, 1987).

² Platow, McClintock, and Liebrand (1990) reported evidence of relative ingroup gain as assessed by the MAMs. However, participants allocated points rather than money. Unlike money, points do not have an absolute value. That is, points are meaningful only in relation to the amount of points possessed by another person or group. Consequently, allocating points may foster relativistic concerns.

³ The cover story used by Bornstein et al. (1983a) informed participants that the purpose of the experiment was to test procedures that would be used in an alleged larger study of artistic preferences. In particular, participants were informed that persons in the larger study would complete numerous questions related to their artistic preferences. To maintain their attention, Bornstein et al. would pay the persons in the larger study, and, furthermore, participants would determine exactly how much payment other persons would receive. The cover story informed participants that they would test the allocation procedure to be used in the larger study by allocating payment to other participants (who happened to be ingroup and outgroup members). Gaertner & Insko (in press) used a similar procedure for testing the effect of the term payment versus bonus money, and a similar procedure was used in the current research.

ingroup-favoring allocations in both the competitive and independent conditions than in the cooperative condition.

These results suggest that a competitive intergroup reward structure is unnecessary for discrimination. On the other hand, these results do not demonstrate that discrimination arises as a simple function of social categorization. Participants were positively interdependent with ingroup members, and in the cooperative condition, they were also positively interdependent with outgroup members. The discrimination may reflect a motive for outcome maximization such that participants reciprocated favorable allocations with persons with whom they were positively interdependent.

Individual and Group Control

Research has varied whether participants had unilateral or joint control over the outcomes of other ingroup members (Ng, 1981; Platow et al., 1990). As detailed above, however, participants did not have unilateral control over the total earnings of the ingroup and outgroup. Furthermore, participants' own outcomes were determined by other ingroup and outgroup members. As in Brewer and Silver's (1978) research and in the standard MGP experiments, participants' allocations occurred in the context of categorization and a dependence structure.

Sachdev and Bourhis (1985) varied the intergroup power differential, with power defined as the ingroup's relative control over the intergroup allocations. Relative to the outgroup, the ingroup had zero control, equal control, or complete control over the allocation task. Only members of groups that had complete or equal control favored the ingroup over the outgroup. A replication of this experiment that coded for gender indicated that the zero-control condition eliminated ingroup favoritism among males but not females (Bourhis, 1994). These results are consistent with an ingroup reciprocity hypothesis in that members favored the ingroup only when other ingroup members could reciprocate the favoritism. Bourhis and colleagues (Sachdev & Bourhis, 1985; Bourhis, 1994), however, suggested that male members of the zero-control group did not discriminate because they did not have usable power to achieve a positive social identity. Because power (i.e., control) was removed simultaneously from the participant and fellow ingroup members, these experiments cannot distinguish between a dependence-based reciprocity hypothesis and a categorization-based identity enhancement hypothesis. The participant could not affect the consequences of intergroup comparisons nor could the ingroup reciprocate favorable allocations.

The sex effect documented by Bourhis indicates that a reciprocity or identity enhancement through power effect may be restricted primarily to males. The report of sex differences in this literature suggests that males and females may differ in their responses to categorization to the possibility of reciprocation, or to both. As elaborated below, this sex difference can be approached from an evolutionary or social structure perspective.

Personal Dependence

Gagnon and Bourhis (1996) examined whether intergroup allocations are influenced by whether participants' own outcomes are dependent upon the allocations of others. Gagnon and Bourhis reported that although their manipulation of the dependence structure had no effect on allocation behavior, category members who identified strongly with the ingroup were more discriminatory than

category members who identified less strongly with the ingroup. These results are consistent with an argument for the sufficiency of categorization as an antecedent of discrimination and for a social identity perspective (i.e., identity enhancement). However, methodological issues jeopardize the validity of these findings.

First, group identification was measured after the completion of the allocation task, rather than being manipulated. The correlational nature of the relation between identification and allocation behavior compromises assumptions of causality. Indeed, longitudinal analyses of the relationship between ethnic identification and prejudice indicate causal paths from prejudice to identification, rather than the reverse (Duckitt & Mphuthing, 1998).

Second, the presence of ingroup reciprocity and outgroup fear in both conditions of the dependence structure manipulation may account for the null effect. In particular, participants were informed that the outcome values in the Tajfel matrices represented extra credit points to be added to their course grade. Participants making allocations in the presence of the dependence structure were informed that the amount of credit they would receive would be determined by the allocations made by other persons. Participants making allocations in the absence of the dependence structure were informed that they alone would receive the maximum amount of credit regardless of the amount of credit the others allocated to them. Despite these latter instructions, a manipulation check indicated that participants felt somewhat dependent upon the allocations of other ingroup and outgroup members—although it is true that they felt less dependent than participants who were in the presence of the dependence structure, perceptions of dependence were nonetheless present. Additionally, outgroup fear was plausible in both conditions. The outcomes of other ingroup members were determined, in part, by the allocations of outgroup members. The possibility of ingroup reciprocity and outgroup fear in both dependence conditions may account for the null effect of the dependence manipulation.

The Current Research

The current experiment used a different procedure for manipulating the presence of the dependence structure and, consequently, avoided the methodological problems present in the previous research. In the presence of the dependence structure, participants received the standard MGP instructions and were informed that they would allocate bonus money to and receive bonus money from others. In the absence of the dependence structure, each participant was informed that he or she was the only person performing the allocation task and that the other participants were working on different tasks. Thus, participants' own outcomes did not depend on the allocations of others, and they had unilateral control over the total earnings of the ingroup and outgroup. Reciprocity and fear were removed simultaneously in the absence of the dependence structure.

Additionally, the dependence manipulation was crossed with a manipulation of social categorization. One third of the participants were not categorized, and the remaining two thirds were categorized on either a random basis (i.e., by coin flip) or a more meaningful basis (i.e., by their painting preference). Prior research indicates that categorization based upon a random criterion produces effects similar to categorization based on a more meaningful criterion (Brewer & Silver, 1978). However, categorization was confounded with outcome dependence. The current experi-

ment examined both modes of categorization in the presence and absence of dependence. Furthermore, the addition of a no-categorization condition provides a crucial comparison for assessing the effect of categorization. Do categorized persons select more frequently than noncategorized persons allocation strategies that differentially award recipients (i.e., ingroup- or outgroup-favoring options)? That is, do categorized persons behave differently than noncategorized persons?

A categorization-based hypothesis (e.g., SIT) predicts only a main effect for categorization. That is, if categorization is alone sufficient for discrimination, categorized participants will select ingroup-favoring allocations more frequently than noncategorized participants, regardless of the dependence structure. A dependence-based hypothesis (e.g., ingroup reciprocity or outgroup fear), however, predicts an interaction. Categorized participants will select ingroup-favoring allocations more frequently than noncategorized participants in the presence of the dependence structure. On the other hand, in the absence of the dependence structure, categorized participants will select ingroup-favoring allocations as infrequently as noncategorized participants. Given the sex differences on intergroup allocations reported in previous research (Bornstein, 1983a, 1983b; Bourhis, 1994; Gaertner & Insko, *in press*, Experiment 1), we included a sex factor in the current research.

Method

Participants

Five hundred and fifty-eight students (270 males and 288 females) enrolled in an introductory psychology course at the University of North Carolina at Chapel Hill participated for partial course credit. Participants were tested in 6-person, same-sex groups.⁴

Design

The design was a 2 (dependence structure: present, absent) \times 3 (categorization: none, random, meaningful) between-subjects factorial. The presence of the dependence structure was manipulated by varying whether participants expected others to participate in the allocation task. For conditions in which the dependence structure was present, participants received the standard MGP instructions. Participants were informed that they would both allocate bonus money to and receive bonus money from other participants. For conditions in which the dependence structure was absent, each participant was informed that he or she was the only person allocating bonus money. The other 5 participants were working allegedly on alternative tasks and, therefore, would not allocate bonus money. Thus, expectations regarding the allocation behavior of other ingroup and outgroup members were inconsequential to the participants' own allocation decision.

Categorization was manipulated by either not categorizing participants or categorizing them on a random or meaningful basis. Participants in the no-categorization condition were not categorized into mutually exclusive groupings; they were identified on the basis of an identification number (each participant received the identification number 53). Participants in the random categorization condition were categorized allegedly on the basis of a coin flip into Group X or Group Y (each participant was informed that he or she was Member 53 of Group X). Participants in the meaningful categorization condition were categorized allegedly on the basis of their painting preference into either the Klee group or the Kandinsky group (each participant was informed that he or she was Member 53 of the Klee group).

Procedure

Participants sat in a main experimental room facing a large projection screen and were informed that the session was a small part of a larger project investigating artistic preferences. Participants completed the Klee-Kandinsky painting preference task. The experimenter projected onto the screen five pairs of paintings and mentioned that each pair contained work by the artists Klee and Kandinsky. Participants recorded privately their preferred painting from each pair, handed their painting preferences to the experimenter, and relocated to individual cubicles.

After ostensibly scoring the artistic preferences, the experimenter distributed identification slips containing an individual identification number and, depending upon condition, additional categorization information. Participants in the meaningful categorization condition were informed that in the population of college students, half prefer the style of Klee and half prefer the style of Kandinsky and that a similar proportion of Klees and Kandinskys were present in the current session. Participants in the random categorization condition were informed that for administrative purposes they were divided into two 3-person groups on the basis of a coin flip.

The experimenter explained that the purpose of the session was to address six questions pertinent to the larger project investigating artistic preferences. The experimenter read a brief description of each question. The description of the allocation task was similar to that used by Bornstein et al. (1983a). However, the MAM values were described as bonus money (i.e., an award) rather than as payment. The description indicated that participants would distribute bonus money to other participants present in the current session to test an allocation procedure designed for the larger project and that the recipients would keep the bonus money. Participants also heard descriptions of five other questions: (a) "Does color influence picture preference?," (b) "Do shape and line angle influence picture preference?," (c) "Are the questions in the personality measure comprehensible?," (d) "Does the personality measure assess a unique aspect of personality?," and (e) "What types of images are produced by the various paintings?" In conditions in which the dependence structure was present, the experimenter indicated that all participants would work on the allocation task question. In conditions in which the dependence structure was absent, the experimenter indicated that each participant would work on a different question. To assign participants to a question, each participant privately drew a numbered slip of paper from a bag. The slips were rigged so each participant was assigned anonymously to the allocation task question.

Participants then completed one set of MAMs. This single allocation distributed bonus money between two sets of 2 persons. Participants in the meaningful condition allocated bonus money to 2 members of the Klee group and 2 members of the Kandinsky group. Participants in the random condition allocated bonus money to 2 members of Group X and 2 members of Group Y. Participants in the no-categorization condition allocated bonus money to Persons 52 and 55 and Persons 51 and 56. Aside from the specific category label (i.e., Klee or Kandinsky, Group X or Group Y, or no category label), the MAMs were identical across conditions.

Following the MAMs, participants completed a packet of supplementary dependent variables (see the *Dependent Variables* section below). The experimenter then debriefed and thanked the participants. Participants in the presence of the dependence structure received one dollar to reduce deception.

Dependent Variables

Intergroup discrimination. Participants completed only one set of the MAMs. That is, participants selected one of the seven allocation strategies (i.e., orientations). Counterbalancing was used to prevent position effects.

⁴ On six occasions, only 5 participants arrived for the study. To maintain the guise of equivalent ingroup and outgroup size, a confederate played the role of the 6th participant.

The ingroup's payoffs occurred in either the top or bottom of the matrices. The ingroup-favoring orientations either preceded or followed the outgroup-favoring orientations. The Min Dif orientation was positioned either between the ingroup- and outgroup-favoring orientations, in front of the ingroup- and outgroup-favoring orientations, or behind the ingroup- and outgroup-favoring orientations.

The MAM values that provide the greatest distinction (i.e., least confounding) between each orientation were selected: Min Dif = 34/34; Max Rel Own = 42/22; Max Rel Other = 22/42; Max Own = 47/30; Max Other = 30/47; Max Joint Own = 44/36; and Max Joint Other = 36/44 (for details, see Bornstein et al., 1983a, p. 329, Figure 1). Each value was multiplied by five to increase the value of the single allocation.

Correct understanding of the dependence manipulation. To assess whether participants understood correctly the instructions of the dependence structure manipulation, we had participants indicate whether they thought that other participants had also completed the bonus money allocation task. Participants chose one of three responses: (a) "Yes, while I was working on the bonus procedure, I was certain that other participants were also doing the bonus procedure"; (b) "No, while I was working on the bonus procedure, I thought that I was the only person doing the bonus procedure"; or (c) "I did not think about this issue."

Category meaningfulness. To check whether artistic preference was perceived to be a more meaningful basis for categorization than a coin flip, categorized participants responded to five questions: (a) "How much does being a member of your group indicate something about who you are?," (b) "How arbitrary is the basis for membership in your group?," (c) "How significant is your membership in your group to you?," (d) "How much do you identify with your group?," and (e) "How meaningful is it to you to be a member of your group?" Participants responded to each item on a 7-point scale, on which 1 indicated *not at all* and 7 indicated *very much*. Responses to the "arbitrary" item were reverse-scored.

Expected allocation from others. Participants in the dependence-present condition indicated how they thought other ingroup and outgroup members allocated the bonus money to them. Participants selected one of three responses: (a) "the Klee's (Xs; Persons 51 and 56) awarded me more," (b) "the Klee's (Xs; Persons 51 and 56) and Kandinsky's (Ys; Persons 52 and 55) awarded me the same amount," or (c) "the Kandinsky's (Ys; Persons 52 and 55) awarded me more."

Prior knowledge of Klee and Kandinsky. Participants in the meaningful categorization condition indicated (yes or no) whether they could, prior to the experiment, distinguish between the artistic styles of Klee and Kandinsky and whether they were assigned to the wrong preference group.

Results

The responses of 3 participants who believed they were categorized in the wrong artistic preference group were excluded from analysis. The cell sizes for the no-categorization, meaningful, and random conditions for females in the dependence-present condition were 48, 48, and 48, respectively; for males in the dependence-present condition were 47, 42, and 42, respectively; for females in the dependence-absent condition were 48, 45, and 48, respectively; and for males in the dependence-absent condition were 47, 46, and 46, respectively.

Correct Understanding of the Dependence Manipulation

Approximately 10% of the participants did not understand correctly the instructions for the dependence structure manipulation (i.e., indicated that other participants were also performing the allocation task in the dependence-absent condition [$n = 51$] or that other participants were not performing the allocation task in the dependence-present condition [$n = 5$]). Exclusion of these 56 persons, however, does not alter the pattern of significant and

nonsignificant results for the allocation behavior, and, therefore, the following analyses contain the responses of all participants.

Intergroup Discrimination

Each participant selected from the set of seven orientations the single orientation that best reflected his or her allocation preference. Thus, the dependent variable can be conceptualized as a single variable with seven response options or as seven variables each having two response options (i.e., selected or not selected). The scaling of these frequency data is not necessarily amenable to an analysis of variance (ANOVA).⁵

Conceptualizing the MAMs as a single variable with seven response options produces a 2 (sex) \times 2 (dependence) \times 3 (categorization) \times 7 (MAMs) multiple contingency table. Likewise, conceptualizing the MAMs as 7 two-level variables produces a 2 (sex) \times 2 (dependence) \times 3 (categorization) \times 2 (selected: yes, no) multiple contingency table for each of the seven orientations. Frequency data from contingency tables are amenable to a chi-square analysis. To avoid problems posed by small, expected frequencies, the $2 \times 2 \times 3 \times 7$ table was collapsed into separate $2 \times 2 \times 3 \times 2$ tables for each orientation.

Sutcliffe's (1957) analysis strategy for partitioning the multiple contingency table's total chi-square value and associated degrees of freedom into additive components was used.⁶ This analysis strategy sets to zero the effect of parameters that are fixed and estimates the effect of parameters that are free to vary. In terms of the current experiment, the marginal effects of sex, categorization, dependence, and their interactions are set to zero because the distribution of participants among the Sex \times Dependence \times Categorization contingency table was controlled by the experimenter. However, the effects associated with the interactions among the independent variables (i.e., sex, dependence, categorization) and the response variables (i.e., the MAM orientations) were estimated because the distribution of participants among these contingency tables was free to vary.

Fisher's exact probability tests were conducted to corroborate the results of the Sutcliffe (1957) analyses. Indeed, the results of Fisher's exact tests were analogous to those of the Sutcliffe analyses presented below. The proportion of selection of each orientation as a function of sex, dependence, and categorization is displayed in Table 2. Max Own was the only orientation affected by the manipulation of dependence and categorization. Selections of Max Joint Own, Min Dif, and Max Joint Other were affected only by sex. The remaining orientations (Max Rel Own, Max Other, and Max Rel Other) were selected relatively infrequently.

Selection of Max Own. For Max Own, the Dependence \times Categorization \times Selection of Max Own (yes, no) effect predicted by the dependence hypothesis was qualified by a significant four-

⁵ Although these data are not necessarily amenable to an ANOVA, the frequency of selection of each orientation was nonetheless entered into 2 (sex) \times 2 (dependence) \times 3 (categorization) ANOVAs. The results of the ANOVAs were analogous to the results of the analyses described in the text. Both analysis techniques produced the same conclusions.

⁶ The large number of cell frequencies equal to zero prevented estimation of the model parameters with a log-linear analysis. The Sutcliffe (1957) analysis is conceptually similar to the log-linear analysis in that both analysis strategies partition multiple contingency tables into main effects and interactions.

Table 2

Proportion of Orientation Selection as a Function of Sex, Dependence, and Categorization

Orientation	Males						Females					
	Dependence structure						Dependence structure					
	Present			Absent			Present			Absent		
	R	M	N	R	M	N	R	M	N	R	M	N
Max Rel Own	.00	.00	.02	.00	.00	.00	.02	.02	.04	.04	.02	.00
Max Own	.00	.17	.28	.02	.04	.09	.04	.04	.12	.00	.04	.13
Max Joint Own	.30	.17	.19	.21	.26	.20	.12	.25	.19	.13	.14	.09
Min Dif	.49	.51	.50	.57	.59	.65	.73	.62	.60	.77	.77	.73
Max Joint Other	.08	.15	.00	.15	.02	.04	.04	.02	.02	.04	.02	.02
Max Other	.08	.00	.00	.04	.02	.00	.04	.02	.02	.02	.00	.02
Max Rel Other	.04	.00	.00	.00	.06	.02	.00	.02	.00	.00	.00	.00
Marginal frequency	47	41	42	47	46	46	48	48	48	47	48	45

Note. N = no categorization; R = random categorization; M = meaningful categorization. Max Rel Own = allocation strategy that represents a concern for maximizing the ingroup's relative gain over the outgroup; Max Own = allocation strategy that represents a concern for maximizing the ingroup's absolute gain; Max Joint Own = allocation strategy that represents a concern for maximizing the joint earnings of both groups while providing an advantage to the ingroup; Min Dif = allocation strategy that represents a concern for minimizing the differences between groups; Max Joint Other, Max Other, and Max Rel Other = allocation strategies that favor the outgroup in a manner symmetrical to Max Rel Own, Max Own, and Max Joint Own.

way interaction involving sex, $\chi^2(2, N = 553) = 6.69, p < .05$. To explain the four-way interaction, the Dependence \times Categorization \times Selection effect was examined for each sex. The mean proportion of selection of Max Own as a function of sex, dependence, and categorization is in the second row of Table 2.

For males, the pattern of selection of Max Own is consistent with the dependence hypothesis. The effect of categorization on selection of Max Own was qualified by the presence of the dependence structure. Categorized males favored the ingroup (i.e., maximized its absolute profit) in the presence, but not the absence, of the dependence structure. In particular, the Dependence \times Categorization \times Selection of Max Own effect was significant, $\chi^2(2, N = 269) = 7.02, p < .05$. When the dependence structure was present, categorization had a significant effect on selection of Max Own, $\chi^2(2, N = 130) = 14.80, p < .001$. When we collapsed across the random and meaningful conditions, a larger proportion of categorized males were shown to have selected Max Own ($M = 0.23$) than did noncategorized males ($M = 0.00$), $\chi^2(1, N = 130) = 12.60, p < .05$. The randomly ($M = 0.17$) and meaningfully ($M = 0.28$) categorized males did not differ, $\chi^2(1, N = 83) = 1.55, p > .05$. When the dependence structure was absent, however, categorization did not affect selection of Max Own, $\chi^2(2, N = 139) = 2.16, p > .05$. Categorized males selected Max Own as infrequently ($M = 0.06$) as did noncategorized males ($M = 0.02$), $\chi^2(1, N = 139) = 1.26, p > .05$. Likewise, the randomly ($M = 0.04$) and meaningfully ($M = 0.09$) categorized males did not differ, $\chi^2(1, N = 92) = 0.71, p > .05$.⁷

For females, however, the effect of categorization on selection of Max Own was not qualified by the presence of the dependence structure. Categorized females favored the ingroup regardless of the dependence structure. In particular, only the Categorization \times Selection of Max Own effect was significant, $\chi^2(2, N = 284) = 10.38, p < .05$. When we collapsed across the random and meaningful conditions, a larger proportion of categorized females were shown to have selected Max Own ($M = 0.08$) than did noncategorized females ($M = 0.02$), $\chi^2(1, N = 284) = 4.31, p <$

.05. However, the meaningfully categorized females ($M = 0.13$) selected Max Own more frequently than did the randomly categorized females ($M = 0.04$), $\chi^2(1, N = 189) = 4.65, p < .05$. As displayed in Table 2, it appears that it is primarily the meaningfully categorized females who selected Max Own.

Selection of Max Joint Own, Min Dif, and Max Joint Other. Consistent with prior research (Bornstein, 1983a; Gaertner & Insko, in press), males and females differed in selection of Max Joint Own, Min Dif, and Max Joint Other. Regardless of categorization or dependence, males were more concerned with maximizing the joint earnings of the ingroup and outgroup and less concerned with minimizing intergroup differences than were females. In particular, significant Sex \times Selection effects indicate that relative to females, males made more selections of Max Joint Own ($M_{\text{men}} = 0.22$ and $M_{\text{women}} = 0.15$), $\chi^2(1, N = 553) = 4.20, p < .05$, and Max Joint Other ($M_{\text{men}} = 0.07$ and $M_{\text{women}} = 0.03$), $\chi^2(1, N = 553) = 6.13, p < .05$, and fewer selections of Min Dif ($M_{\text{men}} = 0.55$ and $M_{\text{women}} = 0.70$), $\chi^2(1, N = 553) = 13.41, p < .05$.

Expected Allocation From Others

Participants indicated whether they expected to receive (a) more money from other ingroup members (or Persons 51 and 56 for noncategorized participants), (b) more money from outgroup members (or Persons 52 and 55 for noncategorized participants), or (c) an equivalent amount of money from the other allocators. To examine if categorized participants expected to receive favorable allocations from other ingroup members, we examined expected allocations in a 2 (sex) \times 2 (categorization) \times 3 (expected allo-

⁷ Although additional tests are unnecessary, the reader may be interested to know that in the absence of the dependence structure, a direct comparison of the meaningfully categorized and the noncategorized participants was not significant, $\chi^2(1, N = 93) = 1.97, p > .05$ (Fisher's exact test, $p > .05$).

cation) contingency table. The dependence variable was excluded from this analysis because other persons allocated bonus money only in the dependence-present condition, and, therefore, participants responded to the expectation question only in the dependence-present condition. As can be seen in Table 3, very few categorized participants expected to receive more money from the outgroup. To avoid estimation problems, we combined the frequencies for the equal-allocation and outgroup-more cells. As in the previous analyses, Sutcliffe's (1957) analysis strategy was used.

Analysis of the 2 (sex) \times 2 (categorization) \times 2 (expected allocation: ingroup more, equal + outgroup more) contingency table revealed only a Categorization \times Expected Allocation effect, $\chi^2(2, N = 272) = 61.94, p < .05$. Consistent with an ingroup reciprocity account of a dependence-based effect, categorized participants expected to receive more favorable allocations from the ingroup than did noncategorized participants. In particular, a larger proportion of categorized participants expected ingroup members to allocate more money to them ($M = 0.51$) than did noncategorized participants, ($M = 0.04$), $\chi^2(1, N = 272) = 59.45, p < .05$ (Fisher's exact probability test, $p < .05$). The expectations of randomly ($M = 0.46$) and meaningfully categorized ($M = 0.57$) participants did not differ, $\chi^2(1, N = 178) = 2.26, p > .05$ (Fisher's exact probability test, $p > .05$).

Category Meaningfulness

Categorized participants responded to five items measuring the perceived meaningfulness of the categorization dimension. The arbitrary item correlated weakly with the other four items (i.e., correlations ranged from .08 to .17). Each of the other four items correlated strongly with one another (i.e., correlations ranged from .58 to .78). Consistent with the pattern of correlations, several participants indicated that they were not familiar with the word *arbitrary*. Hence, the arbitrary item was excluded from further analysis.

Responses to the four items were averaged to form an index of perceived category meaningfulness ($\alpha = .88$). The index was entered into a 2 (sex) \times 2 (dependence) \times 2 (categorization: random, meaningful) ANOVA. A significant categorization effect, $F(1, 356) = 61.04, p < .0001$, indicates that, as expected, artistic preference was perceived to be a more meaningful basis of categorization ($M = 2.62$) than the random toss of a coin ($M = 1.71$). No other effects were significant.⁸

Table 3

Proportion of Expected Allocation From Others as a Function of Sex and Categorization

Expectation	Males			Females		
	N	R	M	N	R	M
Ingroup more	.04	.55	.63	.04	.38	.51
Equivalent	.87	.43	.36	.78	.56	.49
Outgroup more	.08	.02	.00	.17	.06	.00
Marginal frequency	47	42	41	47	48	47

Note. N = no categorization; R = random categorization; M = meaningful categorization.

Discussion

This experiment independently manipulated categorization and the dependence structure to unconfound categorization and dependence-based explanations of discrimination. The results indicate that the discriminatory behavior of males (i.e., selection of Max Own) in the MGP arises from processes of outcome dependence (i.e., ingroup reciprocity or outgroup fear). In the presence of the dependence structure, in which other ingroup and outgroup members had partial control over the distribution of resources, categorized males were more discriminatory than noncategorized males. However, in the absence of the dependence structure, when participants believed they alone controlled the distribution of resources, categorized males discriminated as infrequently as noncategorized males.

Clearly, males in the MGP do not favor the ingroup as a means of achieving a positive social identity (Tajfel & Turner, 1979)—if this were the case, they should have discriminated in both the absence and presence of the dependence structure. Rather, males discriminate either in response to fear of the outgroup or as a means of maximizing individual economic welfare through reciprocity with the ingroup. In Experiment 2, these latter two processes were examined.

In contrast to the males, the discriminatory behavior of females (i.e., Max Own) was not affected by the dependence structure. Categorized females (i.e., primarily persons categorized on a meaningful basis) discriminated more than noncategorized females in both the presence and absence of the dependence structure. These results are similar to the sex difference reported by Bourhis (1994): Females but not males favored the ingroup when neither the participant nor other ingroup members had control over the intergroup allocations. This sex difference is discussed in this article, following an examination of the effects of reciprocity and fear on the allocation preferences of males.

Finally, the nonsignificant main and interactive effects of the dependence manipulation on the perceived meaningfulness of the social category are particularly noteworthy. The category meaningfulness measure can be construed as an assessment of group identification, given the items of which it is composed (e.g., "How much do you identify with your group?", "How much does being a member of your group indicate something about who you are?"). Group identification (i.e., category meaningfulness) was affected only by the manipulation of category meaningfulness. Thus, the dependence manipulation affected intergroup discrimination without affecting group identification.

Experiment 2

The results of Experiment 1 indicated that in the MGP categorized males discriminated as a function of the dependence structure; that is, categorized males favored the ingroup only when other ingroup and outgroup members had partial control over the intergroup allocations. Because the ingroup's and outgroup's control varied concurrently, it was not clear whether discrimination arose from dependence upon the ingroup, the outgroup, or both.

⁸ The analysis of an index containing all five items ($\alpha = .75$) produced results analogous to the results of the analysis of the index that excludes the arbitrary item. Likewise, analogous results were obtained when each item was analyzed separately.

Therefore, the current experiment used a 2 (other allocator: ingroup member, outgroup member) \times 2 (self-recipient: yes, no) between-subjects factorial. By varying independently whether (a) the other allocator was a member of the ingroup or outgroup and (b) the participant would or would not receive resources from the other allocator, the current experiment unconfounded processes of ingroup reciprocity from outgroup fear and captured further distinctions within each process. In particular, each process can be divided into two subhypotheses.

Reciprocity Hypotheses: Bounded or Unbounded Reciprocation?

The reciprocity hypothesis (Rabbie & Lodewijckx, 1994; Rabbie et al., 1989; Yamagishi et al., 1999) suggests that discrimination in the MGP reflects economic self-interest. The bounded version of the reciprocity hypothesis suggests that reciprocity is bounded by categorization. That is, category members reciprocate favorable outcomes only with ingroup members. The unbounded version of the reciprocity hypothesis, however, suggests that reciprocity is not bounded by categorization. That is, category members reciprocate with any person—ingroup or outgroup member—with whom they can maximize economic self-interest.

In the traditional MGP, category members are dependent upon both ingroup and outgroup members and, according to Rabbie and colleagues, maximize economic self-interest by balancing ingroup favoritism with intergroup equality. Thus, in the typical MGP, allocations support the bounded version of the reciprocity hypothesis in that allocations favor only the ingroup. However, in variants of the traditional MGP, evidence, as assessed by the Tajfel matrices, exists for the unbounded version of the hypothesis. Rabbie et al. (1989) demonstrated that participants favored the ingroup and outgroup when their outcomes depended solely upon either ingroup or outgroup members, respectively.

In situations of mutual dependence (i.e., the traditional MGP), participants may use group membership as a cue to determine with whom to reciprocate—ingroup members may be perceived to be more trustworthy than outgroup members. However, when persons are dependent solely upon the outgroup (i.e., outgroup but not ingroup members are involved in the allocation of resources) and favoring the outgroup poses no additional costs to the welfare of the individual, persons may enter reciprocal relations with outgroup members.

Outgroup Fear Hypotheses: Fear for Self or Group?

Although the unbounded version of the reciprocity hypothesis suggests that persons enter reciprocal relations with outgroup members, the fear hypothesis implies that outgroup members are perceived as untrustworthy and are expected to discriminate. Subsequently, the fear hypothesis suggests that when the outgroup has partial control over the allocation of resources, category members favor their own group to preempt expected discrimination by the outgroup.

An important distinction in the fear hypothesis, however, has not been examined. In particular, for whose welfare do persons fear? The participant's own earnings and the earnings of other ingroup members are simultaneously under the partial control of outgroup members in the traditional MGP. If discrimination arises from outgroup fear, it is not clear whether discrimination arises

from fear for one's personal welfare or for the welfare of the ingroup.

Evidence suggests that persons fear primarily for their own welfare, rather than for their group's welfare. In general, persons react more severely to a threat to their personal identity than their social identity (Gaertner, Sedikides, & Graetz, 1999). As described earlier, research in the MGP has examined whether category members are responsive to the prior behavior of outgroup members. In one study, category members were informed about how they were treated personally by the outgroup (Locksley et al., 1980). In other studies, category members were informed about how other unidentified ingroup members were treated by the outgroup (Diehl, 1989, Experiment 2; Jetten et al., 1996, Experiment 1). Category members reciprocated the outgroup's discriminatory behavior only when they were informed about their own personal maltreatment.

Although category members are responsive to their prior treatment by the outgroup, it is not clear if fear of the outgroup causes discrimination in the MGP. To provide a more direct test of the fear-for-self and fear-for-group hypotheses, the current experiment manipulated whether the other allocator controlled the participant's personal outcomes or his group's outcomes.

Predictions

In regard to the current 2 (allocator) \times 2 (self-recipient) design, the bounded version of the reciprocity hypothesis (i.e., ingroup reciprocity) predicts an interaction for preferences involving ingroup-favoring allocations. When the other allocator is an ingroup member, participants should have stronger preferences for the ingroup-favoring allocations when they are recipients than when they are not recipients of the ingroup allocator. However, when the other allocator is an outgroup member, the participant's status as a recipient should not influence preferences for the allocation strategies. Participants should prefer the ingroup-favoring strategies only when they can reciprocate favorable allocations with an ingroup member.

The unbounded version of the reciprocity hypothesis predicts interactions for preferences of both the ingroup- and outgroup-favoring allocations. For preference involving the ingroup-favoring allocations, the same pattern should occur as described for the bounded version of the reciprocity hypothesis. For preferences involving the outgroup-favoring allocations, participants should have stronger preferences for the outgroup-favoring allocations when they are recipients of an outgroup allocator than when they are not recipients of an outgroup allocator. When the other allocator is an ingroup member, however, the participant's status as a recipient should not influence preferences for the outgroup-favoring strategies. Participants should prefer ingroup- and outgroup-favoring strategies when they can reciprocate favorable allocations with ingroup and outgroup members, respectively.

The fear-for-group version of the outgroup fear hypothesis predicts a main effect for allocator on preferences involving the ingroup-favoring strategies. Participants should have stronger preferences for the ingroup-favoring strategies when the other allocator is an outgroup rather than an ingroup member. This pattern should occur regardless of whether the participant is a recipient of the allocation. Participants should prefer the ingroup-favoring strategies when an outgroup member can influence the welfare of the ingroup.

The fear-for-self version of the outgroup fear hypothesis, however, predicts an interaction for preferences involving the ingroup-favoring allocations. When the other allocator is an outgroup member, participants should have stronger preferences for the ingroup-favoring strategies when they are a recipient than when they are not a recipient of the outgroup allocator. However, when the other allocator is an ingroup member, the participants' status as a recipient should not influence preferences for the allocation strategies. Participants should prefer the ingroup-favoring strategies only when their own welfare can be influenced by an outgroup member.

Methodological Change

The methodology of Experiment 1 resolved the issue of alternation (i.e., selecting ingroup- and outgroup-favoring orientations) by having participants select a single allocation strategy. This methodology produced a categorical dependent variable that required a large sample size to test the hypotheses. The current experiment used a different methodology to handle the problems posed by alternation and a dichotomous dependent variable. After completing one set of MAMs, participants rated on 7-point scales their preference for each orientation. Consequently, the current methodology enabled the problem of alternation to be examined and resolved statistically (i.e., the relative rating of each orientation could be compared) and provided a continuous, rather than categorical, dependent variable.

Method

Participants

Ninety male students enrolled in an introductory psychology course at the University of North Carolina at Chapel Hill participated for partial course credit. Participants were tested in 6-person groups.

Design and Procedure

A 2 (other allocator: ingroup member, outgroup member) \times 2 (self recipient: yes, no) between-subjects design was used. Participants were told that they and one other person would allocate bonus money. The other person allocating bonus money was either a member of the ingroup or outgroup. Likewise, participants were told explicitly that they either would or would not be allocated bonus money from the other allocator; so in the no-self-recipient condition, the participant was informed that other ingroup members, aside from himself, would be allocated bonus money.

Participants completed the Klee-Kandinsky painting-preference task. The experimenter distributed identification slips that informed each participant that he was Member Number 1 of the Klee group. The experimenter explained that the purpose of the experiment was to address five questions pertinent to a larger ongoing project investigating artistic preferences. The experimenter described briefly each of the questions used in Experiment 1 with the exception of Question C. The experimenter explained that 2 persons would work on the bonus money allocation question and the other 4 persons would each work on one of the other questions. Participants drew a numbered slip of paper from a bag to determine their question assignment. As in Experiment 1, the slips were rigged so that all participants were assigned to the allocation task.

Participants completed one set of MAMs in which they allocated bonus money to an ingroup and outgroup member and then rated their preference for each allocation strategy. Written instructions accompanying the MAMs indicated whether the other allocator was an ingroup or outgroup member and whether participants would receive money from the other allocator. In

conditions in which the participant would receive allocations from the other allocator, the other allocator was also a recipient of the participant's allocation.

Following the MAMs, participants completed a packet of supplementary dependent variables (see the *Dependent Variables* section below). The experimenter then debriefed and thanked the participants. The experimenter gave one dollar to participants in the condition in which they were recipients to minimize deception.

Dependent Variables

Intergroup discrimination. Participants completed one set of MAMs to allocate bonus money to one ingroup and one outgroup member. The counterbalancing procedure from Experiment 1 was used to guard against possible position effects. After participants selected their most preferred orientation, they rated each orientation in terms of how much they would like to select it as the bonus distribution. Participants responded on 7-point scales, on which 1 represented *not at all* and 7 represented *very much*.

Manipulation checks. To check the manipulation of the perceived group membership of the other allocator, participants indicated to which group the other allocator belonged. Participants selected one of three responses: (a) "Klee group," (b) "Kandinsky group," and (c) "I don't remember." To check the self-recipient manipulation, participants indicated whether they were allocated bonus money from the other allocator. Participants selected one of three responses: (a) "Yes," (b) "No," and (c) "I don't remember."

Expectation for the other allocator's behavior. Participants indicated their expectation for how the other allocator distributed the bonus money between the ingroup and outgroup members. Participants responded on a 7-point scale, on which 1 indicated *the other person awarded a lot more money to the Klee group*, 4 indicated *the other person awarded the money equally*, and 7 indicated *the other person awarded a lot more money to the Kandinsky group*.

Prior knowledge of Klee and Kandinsky. As in Experiment 1, participants indicated (yes or no) whether they could distinguish between the artistic styles of Klee and Kandinsky prior to the experiment and whether they were assigned to the wrong preference group.

Results

The responses of 3 participants were excluded from analysis. Two participants were identical twins who participated in the no-self-recipient-outgroup allocator condition. During debriefing each twin indicated that he assumed that his brother was a fellow ingroup member and thought his brother would share his earnings. Despite the instructions, each twin assumed that he would indeed receive money (i.e., half of the money allocated to his brother). The third participant believed he was categorized in the wrong preference group. The cell sizes for the ingroup and outgroup allocator conditions for the yes-self-recipient condition were 17 and 24, respectively, and for the no-self-recipient condition were 24 and 22, respectively.

Manipulation Checks

Ninety-three percent of the participants indicated correctly whether they would receive bonus money from the other allocator; 87% of the participants identified correctly the group membership of the other allocator. Furthermore, 84% of participants responded correctly to both manipulation-check questions. Exclusion of the 14 participants who did not respond correctly to both manipulation-check questions did not alter the results of the analysis of the participants' preferences for the allocation strategies.

Therefore, the following analyses contain the responses of all 87 participants.⁹

Allocation Preferences

Participants first selected one of the seven MAM allocation strategies and then rated their preference for each allocation strategy. As discussed above, the choice data create a dichotomous dependent variable that requires large sample sizes to test hypotheses. Therefore, the primary dependent variable is the preference rating for each allocation strategy. For descriptive purposes, the choice data are presented in Table 4. The preference ratings aligned well with the choice behavior. Only 4% of the participants rated their selected allocation strategy as being less preferred than any of the remaining allocation strategies, and the preference ratings evidenced strong to moderate correlations with the choice data (see Table 5).

Separate analyses of each allocation strategy. The preference ratings for each allocation strategy were entered into separate 2 (allocator) \times 2 (self-recipient) ANOVAs. Table 6 contains the

Table 4
Proportion of Orientation Selection as a Function of Allocator and Self-Recipient for All 87 Participants and the 73 Participants Who Responded Correctly to Both Manipulation-Check Questions

Orientation	Allocator			
	Ingroup self-recipient		Outgroup self-recipient	
	Yes	No	Yes	No
All participants				
Max Rel Own	.00	.00	.00	.00
Max Own	.12	.00	.00	.09
Max Joint Own	.35	.21	.29	.09
Min Dif	.53	.67	.50	.77
Max Joint Other	.00	.04	.17	.04
Max Other	.00	.00	.04	.00
Max Rel Other	.00	.08	.00	.00
Participants who responded correctly to both manipulation checks				
Max Rel Own	.00	.00	.00	.00
Max Own	.14	.00	.00	.05
Max Joint Own	.29	.20	.26	.10
Min Dif	.57	.65	.53	.80
Max Joint Other	.00	.05	.16	.05
Max Other	.00	.00	.05	.00
Max Rel Other	.00	.10	.00	.00

Note. The cell sizes for participants who responded correctly to both manipulation checks in the ingroup and outgroup allocator conditions for the yes-self-recipient condition were 14 and 19, respectively, and for the no-self-recipient condition were 20 and 20, respectively. Max Rel Own = allocation strategy that represents a concern for maximizing the ingroup's relative gain over the outgroup; Max Own = allocation strategy that represents a concern for maximizing the ingroup's absolute gain; Max Joint Own = allocation strategy that represents a concern for maximizing the joint earnings of both groups while providing an advantage to the ingroup; Min Dif = allocation strategy that represents a concern for minimizing the differences between groups; Max Joint Other, Max Other, and Max Rel Other = allocation strategies that favor the outgroup in a manner symmetrical to Max Rel Own, Max Own, and Max Joint Own.

mean preference rating of each allocation strategy as a function of allocator and self-recipient.

There were significant main effects of self-recipient for preference of Max Rel Own, $F(1, 82) = 4.94, p < .03$, Max Own, $F(1, 82) = 6.47, p < .02$, and Max Joint Own, $F(1, 83) = 7.44, p < .008$. Consistent with the ingroup reciprocity and fear-for-self hypotheses, participants had stronger preferences for the ingroup-favoring allocations (i.e., Max Rel Own, Max Own, and Max Joint Own) when they were recipients than when they were not recipients of the other allocator. That is, the ingroup-favoring strategies were most preferable when participants could be personally favored by the ingroup allocator or discriminated against by the outgroup allocator.

There were significant Allocator \times Self-Recipient interactions for preference for Max Other, $F(1, 83) = 4.41, p < .04$, and Max Joint Other, $F(1, 83) = 4.00, p < .05$. Consistent with the unbounded version of the reciprocity hypothesis, participants most strongly preferred the outgroup-favoring orientations when they were a recipient of the outgroup allocator. When the other allocator was an outgroup member, participants preferred both Max Other and Max Joint Other more when they were recipients than when they were not recipients, $F_{\text{Max Other}}(1, 83) = 7.68, p < .007$, and $F_{\text{Max Joint Other}}(1, 83) = 7.34, p < .009$. However, when the other allocator was an ingroup member, the participant's status as a recipient did not affect preference for Max Other, $F(1, 83) = 0.08, p = .77$, or Max Joint Other, $F(1, 83) = 0.04, p = .83$. That is, the outgroup-favoring strategies were most preferable when participants could reciprocate only with the outgroup.

Rationale for a difference score approach. Although the previous analyses are consistent with the unbounded version of the reciprocity hypothesis and the fear-for-self hypothesis, each allocation strategy should not necessarily be examined in isolation. Prior research indicates that participants alternate between (or pair) selections of ingroup- and outgroup-favoring strategies. To examine whether participants expressed a similar tendency with the preference ratings, we counted the number of participants who rated each ingroup- and outgroup-favoring counterpart (e.g., Max Own and Max Other) as being equally preferable on the 7-point rating scale (i.e., rated the counterparts with the same scale value). The proportion of participants who equated their preferences for Max Joint Own and Max Joint Other, Max Own and Max Other, and Max Rel Own and Max Rel Other were 56%, 58%, and 67%, respectively. The tendency to equate preferences for the ingroup- and outgroup-favoring counterparts was pronounced and did not vary systematically across conditions. Indeed, the preference ratings occurred in the context of balancing preferences for the ingroup- and outgroup-favoring strategies. For that reason, a difference score analysis is the more appropriate analysis strategy.

Difference score analysis. To control for the participants' tendency to balance preferences for ingroup- and outgroup-favoring allocations, we examined in our analyses preferences for the ingroup-favoring strategies relative to preferences for the outgroup-favoring counterparts. In particular, three difference scores were formed. The participant's preference rating for each outgroup-favoring orientation was subtracted from his preference rating for each ingroup-favoring counterpart (i.e., $\text{MRdif} = \text{Max Rel Own} - \text{Max Rel Other}$; $\text{MODif} = \text{Max Own} - \text{Max Other}$;

⁹ Degrees of freedom fluctuate across analyses because of missing data.

Table 5
Overall and Within Condition Correlations Between Selection Frequency and Rating of Each Orientation for All 87 Participants and the 73 Participants Who Responded Correctly to Both Manipulation-Check Questions

Condition		Orientation						
Allocator	Self-recipient	Max Rel Own	Max Own	Max Joint Own	Min Dif	Max Joint Other	Max Other	Max Rel Other
All participants								
In	Yes	—	.70	.69	.77	—	—	—
In	No	—	—	.47	.77	.23	—	.55
Out	Yes	—	—	.68	.61	.37	.43	—
Out	No	—	.72	.39	.49	.30	—	—
Overall		—	.51	.57	.63	.30	.31	.36
Participants who responded correctly to both manipulation checks								
In	Yes	—	.73	.62	.79	—	—	—
In	No	—	—	.44	.73	.25	—	.54
Out	Yes	—	—	.72	.74	.32	.48	—
Out	No	—	.62	.43	.41	.32	—	—
Overall		—	.49	.55	.64	.29	.34	.41

Note. Participants selected one of the seven orientations and rated their preference for each orientation. Consequently, dashes reflect selection frequencies of zero. Max Rel Own = allocation strategy that represents a concern for maximizing the ingroup's relative gain over the outgroup; Max Own = allocation strategy that represents a concern for maximizing the ingroup's absolute gain; Max Joint Own = allocation strategy that represents a concern for maximizing the joint earnings of both groups while providing an advantage to the ingroup; Min Dif = allocation strategy that represents a concern for minimizing the differences between groups; Max Joint Other, Max Other, and Max Rel Other = allocation strategies that favor the outgroup in a manner symmetrical to Max Rel Own, Max Own, and Max Joint Own.

Table 6
Preference Rating of Each Orientation as a Function of Allocator and Self-Recipient

Orientation	Allocator			
	Ingroup self-recipient		Outgroup self-recipient	
	Yes	No	Yes	No
Max Rel Own	2.88	2.13	2.63	2.00
Max Own	4.18	3.13	3.63	3.00
Max Joint Own	5.47	4.58	5.13	3.95
Min Dif	5.59	6.25	5.29	5.82
Max Joint Other	4.18	4.29	4.87	3.50
Max Other	2.71	2.83	3.58	2.45
Max Rel Other	1.76	1.92	2.33	1.48

Note. Ratings range from 1 to 7. Larger numbers indicate a stronger preference for the particular orientation. Max Rel Own = allocation strategy that represents a concern for maximizing the ingroup's relative gain over the outgroup; Max Own = allocation strategy that represents a concern for maximizing the ingroup's absolute gain; Max Joint Own = allocation strategy that represents a concern for maximizing the joint earnings of both groups while providing an advantage to the ingroup; Min Dif = allocation strategy that represents a concern for minimizing the differences between groups; Max Joint Other, Max Other, and Max Rel Other = allocation strategies that favor the outgroup in a manner symmetrical to Max Rel Own, Max Own, and Max Joint Own.

MJdif = Max Joint Own - Max Joint Other). A positive difference score reflects a stronger preference for the ingroup- than outgroup-favoring orientation (i.e., ingroup favoritism). A negative difference score reflects a stronger preference for the outgroup- than ingroup-favoring orientation (i.e., outgroup favoritism). A score of zero reflects an equivalent preference for the ingroup and outgroup-favoring orientations (i.e., no bias). Each difference score was entered into a 2 (allocator) \times 2 (self-recipient) ANOVA. Table 7 contains the mean difference scores as a function of allocator and self-recipient.

The results are consistent with the bounded version of the reciprocity hypothesis (i.e., ingroup reciprocation). Category members preferred the ingroup-favoring over the outgroup-favoring orientations only when the favoritism could be reciprocated by fellow ingroup members. In particular, there were significant Allocator \times Self-Recipient interactions for MODif, $F(1, 82) = 5.60, p < .03$, and MJdif, $F(1, 83) = 4.87, p < .04$, and the interaction was marginal for MRdif, $F(1, 81) = 2.95, p < .09$. These interactions indicate that when the other allocator was an ingroup member, preference for each ingroup-favoring allocation relative to its outgroup-favoring counterpart was stronger when participants were recipients than when they were not recipients of the ingroup allocator, $F_{\text{MODif}}(1, 82) = 5.06, p < .03$, $F_{\text{MJdif}}(1, 83) = 6.37, p < .02$, and $F_{\text{MRdif}}(1, 81) = 4.22, p < .05$. When the other allocator was an outgroup member, however, the participants' status as recipients did not affect preference for the ingroup-

Table 7
Difference Between Ingroup- and Outgroup-Favoring Orientation as a Function of Allocator and Self-Recipient

Orientation	Allocator			
	Ingroup self-recipient		Outgroup self-recipient	
	Yes	No	Yes	No
MRdif	1.12	0.17	0.29	0.43
MOdif	1.47	0.30	0.04	0.54
MJdif	1.29	0.29	0.25	0.45

Note. Each difference score ranges from -6 to 6. Positive values indicate a stronger preference for the ingroup-favoring strategy relative to its outgroup-favoring counterpart. Negative values indicate a stronger preference for the outgroup-favoring strategy relative to its ingroup-favoring counterpart. MRdif = difference between Max Rel Own and Max Rel Other. MOdif = difference between Max Own and Max Other. MJdif = difference between Max Joint Own and Max Joint Other. Max Rel Own = allocation strategy that represents a concern for maximizing the ingroup's relative gain over the outgroup; Max Own = allocation strategy that represents a concern for maximizing the ingroup's absolute gain; Max Joint Own = allocation strategy that represents a concern for maximizing the joint earnings of both groups while providing an advantage to the ingroup; Max Joint Other, Max Other, and Max Rel Other = allocation strategies that favor the outgroup in a manner symmetrical to Max Rel Own, Max Own, and Max Joint Own.

favoring strategies relative to the outgroup-favoring counterparts, $F_{\text{MOdif}}(1, 82) = 1.11, p < .30$; $F_{\text{MJdif}}(1, 83) = 0.30, p < .58$; and $F_{\text{MRdif}}(1, 81) = 0.10, p < .76$. Alternatively, when participants were recipients of the other allocator's allocation, preference for each ingroup-favoring allocation relative to its outgroup-favoring counterpart was stronger when the other allocator was an ingroup rather than an outgroup member, $F_{\text{MOdif}}(1, 82) = 7.73, p < .007$; $F_{\text{MJdif}}(1, 83) = 6.80, p < .02$; and $F_{\text{MRdif}}(1, 81) = 3.29, p < .08$. When the participant was not a recipient of the other allocator, however, the group membership of the other allocator did not affect preference for the ingroup-favoring strategies relative to the outgroup-favoring counterparts, $F_{\text{MOdif}}(1, 82) = 0.25, p < .62$; $F_{\text{MJdif}}(1, 83) = 0.19, p < .67$; and $F_{\text{MRdif}}(1, 81) = 0.34, p < .56$.¹⁰

Furthermore, each difference score was tested against zero—the score that reflects an equivalent preference for the ingroup- and outgroup-favoring counterparts. In other words, each difference score was examined for whether the preference rating for the ingroup-favoring strategy was significantly different from the preference rating for the outgroup-favoring counterpart. The difference scores differed significantly from zero only in the condition in which participants were recipients of the ingroup allocator, $F_{\text{MRdif}}(1, 81) = 10.29, p < .002$; $F_{\text{MOdif}}(1, 82) = 13.99, p < .0001$; and $F_{\text{MJdif}}(1, 83) = 17.84, p < .0001$. That is, the ingroup-favoring strategies were preferred over the outgroup-favoring counterparts only when category members were recipients of the ingroup allocator. In the remaining conditions, preferences for the ingroup-favoring orientations did not differ from preferences for the outgroup-favoring counterparts.

Unlike the separate analysis of each allocation strategy, the difference score analysis controlled for the participants' tendency to balance preferences for the ingroup- and outgroup-favoring strategies. When the tendency to balance preferences was controlled, compelling support was found for the bounded version of

the reciprocity hypothesis. Participants preferred strategies that favored the ingroup over strategies that favored the outgroup only when favorable allocations could be reciprocated with ingroup members.

Expectation for the Other Allocator's Behavior

Participants rated on a scale ranging from *more money to the ingroup* to *more money to the outgroup* how they expected the other allocator to distribute the money. To examine if category members expect ingroup and outgroup members to favor their own groups, we entered the expectation rating into a 2 (allocator) \times 2 (self-recipient) ANOVA. The only significant effect was a main effect for allocator, $F(1, 83) = 13.63, p < .0004$. Consistent with the ingroup reciprocity hypothesis, participants expected the other allocator to be more favorable to the ingroup when the other allocator was an ingroup member ($M = 3.51$) than an outgroup member ($M = 4.33$).

Furthermore, the expectation ratings for the ingroup and outgroup allocator were tested against the scale midpoint (midpoint = 4) that corresponds to an equivalent intergroup allocation. Both expectations deviated significantly from the scale midpoint, $F_{\text{ingroup}}(1, 83) = 9.20, p < .004$ and $F_{\text{outgroup}}(1, 83) = 4.61, p < .04$. These deviations from the midpoint indicate that participants expected the ingroup member to favor the ingroup and the outgroup member to favor the outgroup. Consistent with the ingroup reciprocity and outgroup fear hypotheses, these analyses suggest that participants expect other ingroup members and outgroup members to favor fellow group members.

Discussion

The design of the current experiment unconfounded the fear and reciprocity hypotheses and enabled tests of further distinctions within each hypothesis. The results are consistent with the bounded version of the reciprocity hypothesis: Group members reciprocate favorable allocations only with ingroup members. When controlling for participants' tendency to equate preferences for the ingroup- and outgroup-favoring strategies, we found that category members evidenced a preference for the ingroup-favoring strategies over the outgroup-favoring strategies only when they were dependent upon an ingroup member. That is, category members preferred the ingroup-favoring strategies only when an ingroup member could reciprocate their allocation. Participants did not show a preference for the ingroup-versus outgroup-favoring strategies when the other allocator was an outgroup member or an ingroup member who did not have control over the participants' outcomes.

Category members' expectations for the allocation behavior of other ingroup members provides further support for the ingroup reciprocity hypothesis. In particular, other ingroup allocators were

¹⁰ An alternative method for describing the interactions is to test for a one versus three pattern among the means of the 2 \times 2. Consistent with the bounded version of the ingroup reciprocity hypothesis, preference for the ingroup-favoring allocations relative to the outgroup-favoring counterparts were stronger in the condition in which participants were recipients of an ingroup allocator than in the mean of the remaining three conditions, $F_{\text{MOdif}}(1, 82) = 7.14, p < .01$; $F_{\text{MJdif}}(1, 83) = 7.93, p < .007$; and $F_{\text{MRdif}}(1, 81) = 4.42, p < .04$.

expected to favor the ingroup. Although expectations were measured after the allocation task and may therefore reflect a rationalization process, Jetten et al. (1996) assessed expectations prior to the allocations and found an identical pattern. Consistent with the ingroup reciprocity hypothesis, category members favored the ingroup only when they were dependent upon other ingroup members and they anticipated that the ingroup members would return the favoritism.

Although expectations regarding the allocation behavior of other outgroup members were consistent with the outgroup fear hypotheses, allocation preferences were inconsistent with these hypotheses. That is, category members expected members of the outgroup to discriminate in favor of the outgroup. However, when the tendency to equate preferences for the ingroup-favoring with outgroup-favoring allocations was controlled, there was no evidence for an outgroup fear effect. When outgroup members could influence the welfare of the participant or his group, category members did not prefer the ingroup- over outgroup-favoring strategies.

These data provide clarification of Sachdev and Bourhis's (1985) analysis of intergroup power in the MGP. In Sachdev and Bourhis's research, ingroup members had, relative to outgroup members, zero control, equal control, or total control over the intergroup allocations. Category members did not discriminate when the ingroup did not have power (i.e., control) over the allocations. Arguing from a social identity framework, Sachdev and Bourhis concluded that power is essential in intergroup relations because without usable power, group members can not achieve a positive social identity. In Experiments 1 and 2 of the current research, however, participants always had power over the intergroup allocations, but they did not always discriminate. Participants discriminated only when other ingroup members had the power to reciprocate the favoritism. These results suggest that Sachdev and Bourhis's findings are better interpreted with an ingroup reciprocity explanation than an identity-enhancement-through-power (i.e., SIT) explanation.

Although discrimination in the MGP appears to arise from economic self-interest, there was little evidence for the unbounded version of the reciprocity hypothesis. The analyses that examined each allocation strategy separately were, in part, consistent with Rabbie et al.'s (1989) finding that category members who were dependent only on the outgroup favored the outgroup. That is, in the current research, participants who were recipients of an outgroup allocator had the highest preference ratings for the outgroup-favoring strategies (i.e., Max Other and Max Joint Other). However, when the tendency to equate preferences for the ingroup- and outgroup-favoring counterparts was controlled, there was no evidence of outgroup favoritism. Perhaps different measurement systems account for the discrepancy between the current research and that of Rabbie et al. The current research used the MAMs, whereas Rabbie et al. used the Tajfel matrices.

General Discussion

This research examined the question that was explored almost 30 years ago by Tajfel et al. (1971): Is social categorization, when isolated from other variables, a sufficient antecedent of intergroup discrimination? Although the results of the initial MGP experiments and the subsequent SIT interpretation suggest that the latter question be answered in the affirmative, the traditional MGP

does not isolate social categorization from outcome dependence. The current research indicates that although social categorization is a powerful antecedent of discrimination, categorization alone is not a sufficient antecedent.

Experiment 1 independently manipulated social categorization and outcome dependence. Categorized males discriminated in favor of the ingroup only when they were dependent upon the allocations of others. Experiment 2 unconfounded ingroup and outgroup dependence and revealed that categorized males preferred ingroup- over outgroup-favoring allocations only when they were dependent upon other ingroup members.

These data indicate that a categorization-based social identity process does not account for the behavior of males in the MGP. If category members were concerned with positively distinguishing the ingroup from the outgroup, they would have discriminated in favor of the ingroup regardless of the structure of dependence. Instead, these data support a bounded ingroup reciprocity process: Category members reciprocate favorable allocations with ingroup members to maximize self-interest.

A sex effect found in Experiment 1, however, suggests that sex moderates the effect of dependence. Unlike males, females categorized on a meaningful dimension discriminated in favor of the ingroup both in the presence and absence of the dependence structure. Although the tendency for females to favor the ingroup in a situation in which they should not expect immediate reciprocation is consistent with a social identity position, it is not obvious why a social identity process would be limited to females who are categorized on a meaningful dimension.

Adaptation as the Origin of a Dependence-Based Category Preference Among Females

A dependence-based account of the moderating role of sex is available from the perspectives of evolutionary social psychology and social structure theory. Although these perspectives provide disparate accounts of the origin of sex differences, they both suggest that (owing to either biological or environmental constraints) females are more dependent than are males on social groups and, consequently, more likely to favor the group in situations in which immediate rewards are unexpected. These perspectives are examined in turn.

Evolutionary psychology posits that sex differences arose, in part, to the extent to which ancestral males and females faced different challenges to genetic survival (for reviews, see Buss, 1997; Buss & Kenrick, 1998). In particular, ancestral females could reproduce once per year and they had to invest a minimum of 9 months of resources to produce a viable offspring. Ancestral males, however, could reproduce potentially with each new sexual partner and they had to invest only sperm. Ancestral females lower reproductive potential and greater parental investment may have made them more dependent on the social group than were ancestral males. The social group may have offered a reproductive advantage to females owing to the availability of shared resources, information, protection, and cooperative child rearing (Buss & Kenrick, 1998; for a more general perspective on the role of the social group in evolution, see Brewer & Caporael, 1990; Caporael, 1997; Caporael & Brewer, 1991). If ancestral females were more dependent upon the group than were ancestral males, there may have been selection for female descendants who were more con-

cerned than were male descendants with maintaining the long-term welfare of their group.¹¹

Social structure theory (Eagly & Wood, 1999), on the other hand, locates the origin of sex differences in the differential distribution of men and women in social roles. Relative to men, women tend to occupy positions of lower power and control fewer resources. Men and women adapt to these positions (in part by internalizing stereotypes associated with their roles and acquiring role-related skills) to maximize outcomes within the constraints of the social structure. Eagly and Wood (1999) suggest that the roles occupied by women promote "a pattern of interpersonally facilitative and friendly behaviors that can be termed communal" (p. 413), whereas the roles occupied by men promote "a pattern of assertive and independent behaviors that can be termed agentic" (p. 413).

Both perspectives account for a category preference among females. Both males and females should maximize self-interest by favoring the ingroup when direct rewards are expected. Females however, should be more likely than males to favor the ingroup when direct or immediate rewards are not expected. Evolutionary psychology would attribute this sex difference to a social strategy that promoted the genetic survival of ancestral females whereas social structure theory would attribute this sex difference to a social strategy that promoted females' outcomes, given their chronic placement in low power or dependence-promoting positions. Note that these arguments relate most obviously to a female preference for meaningful categories, and the data indicate that females discriminated only in favor of meaningful categories.

Although the application of these perspectives to the current research is post hoc and requires further testing, it provides parsimonious and dependence-based accounts of the moderating role of sex. Furthermore, research is consistent with the application of these perspectives. Consistent with arguments attesting to females greater dependence on social groupings (fostered by biological constraints or social structures) is research indicating that exclusion from laboratory work groups arouses more negative feelings for females than males (Leary, Tambor, Terdal, & Downs, 1995). Furthermore, Baumeister and Leary (1995) propose that sex moderates the expression of the need to belong. In particular, "men may be more oriented toward forming relationships, whereas women may be more oriented toward maintaining them" (Baumeister & Leary, 1995, p. 499).¹² In the current research, males appeared oriented toward forming relationships. When reciprocal relations were possible, categorized males favored the in-group regardless of the categorization dimension (i.e., either random or meaningful). Females, however, appeared more concerned with maintaining than forming relations. Females favored the in-group regardless of whether they expected immediate reciprocity; however, this occurred primarily for females who were categorized on a meaningful dimension.

Orientation Selection as Further Evidence of Ingroup Reciprocity

The allocation strategies selected by participants provide further support for the bounded ingroup reciprocity hypothesis. Max Rel Own, the allocation strategy that maximizes the ingroup's relative gain (i.e., Maximize Different on the Tajfel matrices), is the cornerstone of SIT. Selection of Max Rel Own reflects a concern for distinguishing positively the ingroup from the outgroup. Selection of Max Own, on the other hand, reflects a concern for

maximizing the ingroup's absolute welfare and, when reciprocity is viable, maximizing one's own absolute welfare.

The results of Experiment 1 indicate that relatively few persons were concerned with positively distinguishing the ingroup from the outgroup. The proportion of participants who selected Max Rel Own ranged from 0% to 4%, and the variation in selection was not related systematically to categorization or dependence (see Table 2). However, a sizable proportion of participants were concerned with maximizing the ingroup's absolute worth. The proportion of participants who selected Max Own ranged from 0% to 28%, and the variation in selection was related systematically to categorization and dependence (see Table 2). Likewise, comparable descriptive patterns occurred in the choice data of Experiment 2 (see Table 4). These selection patterns are consistent with the bounded ingroup reciprocity hypothesis and inconsistent with an SIT account of discrimination in the MGP.

Alternative Accounts

At least three alternative explanations might be proposed to account for the current findings: (a) salience of categorization, (b) dependence effects through social identity, and (c) equity. The salience explanation suggests that category members discriminate only when social categorization is strong or salient. According to this account, the elimination of the dependence structure in Experiment 1 minimized the salience of categorization and, subsequently, minimized discrimination. The dependence through social identity explanation is similar to the salience explanation and suggests that discrimination varies with ingroup identification. According to this account, the elimination of the dependence structure minimized identification with the ingroup and, consequently, minimized discrimination. The equity explanation suggests that the elimination of the dependence structure increased feelings of inequity, which in turn decreased discrimination. In particular, the participant (and one other anonymous outgroup member) was precluded from receiving bonus money in the absence of the dependence structure, whereas the remaining ingroup and outgroup members were recipients of bonus money. Participants may have minimized the amount of money they allocated to the other ingroup and outgroup members to restore equity (e.g., "If I can't receive a bonus, no one will!").

The measure of perceived category meaningfulness from Experiment 1—which, as described previously, can be construed as a measure of ingroup identification—refutes directly the salience and identification explanations. If the salience or identification explanations were viable alternatives, perceived category meaningfulness (i.e., identification) would have varied with the manipulation of the dependence structure. That is, the ingroup would

¹¹ Indeed, a similar argument has been developed to explain sex differences in mate selection (Buss, 1989). Because of ancestral sex differences in parental investment and reproductive potential, ancestral females may have maximized their genetic potential by procuring a stable mate, whereas ancestral males may have maximized their genetic potential by amassing multiple sexual partners. Consequently, female descendants are attracted to resource potential (e.g., power and status), whereas male descendants are attracted to fertility (e.g., youth).

¹² Although Baumeister and Leary (1995) approach this sex difference from the perspective of evolutionary psychology, social structure theory could also account for the difference.

have been perceived as less meaningful (a weaker source of identification) in the absence than in the presence of the dependence structure. This necessary pattern, however, was not evidenced in these data. The perceived meaningfulness of the category was affected only by the categorization manipulation. Neither the dependence main effect nor the Dependence \times Categorization interaction was significant.

A similar rationale indirectly refutes the equity explanation. The equity account might suggest that isolating the participant as the only ingroup member ineligible for a bonus magnified perceptions of intragroup differences that, consequently, minimized ingroup identification and discrimination (e.g., metacontrast principle of self-categorization theory; Turner et al., 1987). Alternatively, the equity account could generate the counterintuitive prediction of more ingroup favoritism in the absence than in the presence of the dependence structure. In particular, inequity in the absence of the dependence structure may have threatened the participant's personal welfare, which according to research on self-definition, would have been buffered by increasing identification with the ingroup and, consequently, increasing discrimination (Cialdini et al., 1976; Gaertner et al., 1999). The fact that identification was not affected by the dependence manipulation provides indirect evidence that feelings of inequity were not heightened in the absence of the dependence structure. It should be noted, however, that these versions of an equity account that link inequity to group identification are not necessarily the only or the best versions of an equity account.

The selection behavior of the noncategorized participants in Experiment 1 and the results of Experiment 2 bear more directly on an equity account. The equity explanation should also apply to the behavior of noncategorized participants. Clearly, noncategorized participants would not select the Max Rel Own–Other nor the Max Own–Other selections. They might, however, select the strategies that maximize the joint earnings of other persons (Max Joint Own and Max Joint Other) and the strategy that minimizes differences among the earnings of others (Min Dif). Selection of this latter strategy would be particularly pronounced in the absence than in the presence of the dependence structure if the restoration of equity were a motive. Sutcliffe (1957) analyses examining the main and interactive effects of dependence and sex on the noncategorized participants' selection of Min Dif, Max Joint Own, and Max Joint Other revealed no significant effects involving the dependence manipulation.¹³

Finally, if category members discriminated less frequently in the absence than in the presence of the dependence structure to restore equity, a similar pattern would have occurred in Experiment 2. In particular, category members would have discriminated less frequently when they were not recipients than when they were recipients of the other allocator. Although this pattern occurred when the preference rating for each allocation strategy was examined separately, the expected pattern did not occur with the more appropriate difference score approach. Analyses that controlled for the tendency to equate preferences for the ingroup- and outgroup-favoring strategies revealed discrimination only when category members were recipients of other ingroup members. In the three remaining conditions, there were no differential preferences for the ingroup- versus the outgroup-favoring strategies, a pattern consistent with the bounded reciprocity hypothesis. Although these analyses are inconsistent with an equity account, the equity position could be tested more directly with a design that removes depen-

dence on other ingroup and outgroup members and varies whether the participant receives bonus money (ostensibly from the experimenter).

Self-Esteem and Reciprocity

Two hypotheses regarding the relationship between self-esteem and intergroup discrimination have been developed from SIT's identity enhancement perspective (for a review, see Rubin & Hewstone, 1998). The first hypothesis suggests that discrimination increases self-esteem because discrimination promotes a positively valued social identity. The second hypothesis suggests that low self-esteem promotes intergroup discrimination because discrimination is motivated by a need for identity enhancement. As Rubin and Hewstone's review suggests, the first hypothesis has received more empirical support than the second hypothesis. The current research, however, refutes SIT's explanation for discrimination in the MGP in favor of a bounded ingroup reciprocity process. Indeed, this ingroup reciprocity framework can account for the first self-esteem hypothesis.

The sociometer model of self-esteem (Leary, Haupt, Strausser, & Chokel, 1998; Leary et al., 1995) suggests that self-esteem is responsive to the real or imagined reactions of others and functions to maintain inclusion in social relationships. Why might ingroup favoritism increase self-esteem? If a reciprocity process governs ingroup favoritism, participation in the reciprocal transaction should maintain inclusion in the group and, therefore, increase esteem. Alternatively, defaulting on the reciprocal transaction (i.e., not reciprocating favoritism) may prompt exclusion from the group and decrease esteem. The ingroup reciprocity hypothesis can account for subsidiary hypotheses generated by SIT.¹⁴

Relations Among More-Than-Minimal Groups

Although social identity and outgroup fear process were not detected in the MGP, research indicates that these processes impact members of more-than-minimal groups. Comparison of interacting groups (i.e., contact within and between groups) with interacting individuals in a mixed-motive situation (i.e., a situation defined by a prisoner's dilemma game) indicate that groups make more behavioral choices that maximize the ingroup's absolute and relative welfare than do individuals (Insko et al., 1992). Analyses of the behavioral choices across interaction trials suggest that groups compete initially to maximize their absolute welfare,

¹³ Noncategorized participants motivated to restore equity might show a heightened preference for Max Rel Own or Other because these strategies minimize the recipients' joint earnings. Inconsistent with an equity account, however, these strategies were avoided.

¹⁴ Rubin and Hewstone (1998) suggest that the confusion regarding the relation between discrimination and self-esteem is due, in part, to variation in the measurement of self-esteem. A SIT interpretation suggests that discrimination will increase state-social self-esteem (i.e., immediate or situation-based esteem derived from one's social group) but not state-personal self-esteem (i.e., immediate or situation-based esteem related to being an individual). An ingroup reciprocity interpretation, however, suggests that discrimination will increase both social and personal self-esteem because the discrimination simultaneously maintains the social group and prevents the individual's exclusion from the group. Indeed, both social- and personal-state self-esteem fluctuates with discrimination (see Rubin & Hewstone, 1998, Table 2, Corollary 1).

whereas concern for the ingroup's relative welfare (i.e., the motive indicative of social comparison and social identity concerns) emerges after trials of competitive relations. These data indicate that social identity concerns influence members of more-than-minimal groups and that the identity enhancement process emerges from intergroup conflict.

Likewise, comparisons of interacting groups with interacting individuals in a mixed-motive situation provide support for an outgroup fear effect. The greater distrust engendered by an opposing group than an opposing individual accounts, in part, for the greater competitiveness of interacting groups than interacting individuals (Insko, Schopler, Hoyle, Dardis, & Gaetz, 1990; Schopler et al., 1993).

In conclusion, social categorization is a potent, but not sufficient, antecedent of intergroup discrimination. Categorization elicits discrimination when it is paired with ingroup dependence. Although these data are inconsistent with an SIT account of the MGP, we do not call for the abandonment of SIT. Indeed, social identity concerns function in more-than-minimal groups. In minimal groups, however, behavior is influenced by self-interest and corresponding principles of reciprocity.

References

- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497-529.
- Billig, M., & Tajfel, H. (1973). Social categorization and similarity in intergroup behavior. *European Journal of Social Psychology*, 3, 27-51.
- Bornstein, G., Crum, L., Wittenbraker, J., Harring, K., Insko, C. A., & Thibaut, J. (1983a). On the measurement of social orientations in the minimal group paradigm. *European Journal of Social Psychology*, 13, 321-350.
- Bornstein, G., Crum, L., Wittenbraker, J., Harring, K., Insko, C. A., & Thibaut, J. (1983b). Reply to Turner's comments. *European Journal of Social Psychology*, 13, 369-381.
- Bourhis, R. Y. (1994). Power, gender, and intergroup discrimination: Some minimal group experiments. In M. P. Zanna & J. M. Olson (Eds.), *The psychology of prejudice: The Ontario symposium* (pp. 171-208). Hillsdale, NJ: Earlbaum.
- Bourhis, R. Y., Turner, J. C., & Gagnon, A. (1997). Interdependence, social identity and discrimination. In R. Spears, P. J. Oakes, N. Ellemers, & S. A. Haslam (Eds.), *The social psychology of stereotyping and group life* (pp. 273-295). Cambridge, MA: Blackwell.
- Brewer, M. B. (1979). In-group bias in the minimal intergroup situation: A cognitive-motivational analysis. *Psychological Bulletin*, 86, 307-324.
- Brewer, M. B., & Caporael, L. R. (1990). Selfish genes vs. selfish people: Sociobiology as origin myth. *Motivation and Emotion*, 14, 237-243.
- Brewer, M. B., & Silver, M. (1978). Ingroup bias as a function of task characteristics. *European Journal of Social Psychology*, 8, 393-400.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1-49.
- Buss, D. M. (1997). The evolutionary psychology of human social strategies. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 3-38). New York: Guilford Press.
- Buss, D. M., & Kenrick, D. T. (1998). Evolutionary social psychology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, 4th ed., pp. 982-1026). Boston: McGraw-Hill.
- Caporael, L. R. (1997). The evolution of truly social cognition: The core configurations model. *Personality and Social Psychology Review*, 1, 276-298.
- Caporael, L. R., & Brewer, M. B. (1991). Reviving evolutionary psychology: Biology meets society. *Journal of Social Issues*, 47, 187-195.
- Cialdini, R. B., Borden, R. J., Thorne, A., Walker, M. R., Freeman, S., & Sloan, L. R. (1976). Basking in reflected glory: Three (football) field studies. *Journal of Personality and Social Psychology*, 34, 366-375.
- Diehl, M. (1989). Justice and discrimination between minimal groups: The limits of equity. *British Journal of Social Psychology*, 28, 227-238.
- Duckitt, J., & Mphuthing, T. (1998). Group identification and intergroup attitudes: A longitudinal analysis in South Africa. *Journal of Personality and Social Psychology*, 74, 80-85.
- Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, 54, 408-423.
- Gaertner, L., & Insko, C. A. (in press). On the measurement of social orientations in the minimal group paradigm: Norms as moderators of the expression of intergroup bias. *European Journal of Social Psychology*.
- Gaertner, L., Sedikides, C., & Gaetz, K. (1999). In search of self-definition: Motivational primacy of the individual self, motivational primacy of the collective self, or contextual primacy? *Journal of Personality and Social Psychology*, 76, 5-18.
- Gagnon, A., & Bourhis, R. Y. (1996). Discrimination in the minimal group paradigm: Social identity or self-interest? *Personality and Social Psychology Bulletin*, 22, 1289-1301.
- Insko, C. A., & Schopler, J. (1987). Categorization, competition, and collectivity. In C. Hendrick (Ed.), *Review of personality and social psychology* (pp. 213-251). New York: Sage.
- Insko, C. A., Schopler, J., Hoyle, R. H., Dardis, G. J., & Gaetz, K. A. (1990). Individual-group discontinuity as a function of fear and greed. *Journal of Personality and Social Psychology*, 58, 68-79.
- Insko, C. A., Schopler, J., Kennedy, J. F., Dahl, K. R., Gaetz, K. A., & Drigotas, S. M. (1992). Individual-group discontinuity from the differing perspectives of Campbell's realistic group conflict theory and Tajfel and Turner's social identity theory. *Social Psychology Quarterly*, 55, 272-291.
- Jetten, J., Spears, R., & Manstead, A. S. R. (1996). Intergroup norms and intergroup discrimination: Distinctive self-categorization and social identity effects. *Journal of Personality and Social Psychology*, 71, 1222-1233.
- Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. New York: Wiley Interscience.
- Leary, M. R., Haupt, K. S., Strausser, K. S., & Chokel, J. T. (1998). Calibrating the sociometer: The relationship between interpersonal appraisals and state self-esteem. *Journal of Personality and Social Psychology*, 74, 1290-1299.
- Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, 68, 518-530.
- Locksley, A., Ortiz, V., & Hepburn, C. (1980). Social categorization and discriminatory behavior: Extinguishing the minimal intergroup discrimination effect. *Journal of Personality and Social Psychology*, 39, 773-783.
- Mummendey, A., Simon, B., Dietze, C., Gruenert, M., Haeger, G., Kessler, S., Lettgen, S., & Schaferhoff, S. (1992). Categorization is not enough: Intergroup discrimination in negative outcome allocation. *Journal of Experimental Social Psychology*, 28, 125-144.
- Ng, S. H. (1981). Equity theory and the allocation of rewards between groups. *European Journal of Social Psychology*, 11, 439-444.
- Platow, M. J., McClintock, C. G., & Liebrand, W. B. G. (1990). Predicting intergroup fairness and ingroup bias in the minimal group paradigm. *European Journal of Social Psychology*, 20, 221-239.
- Rabbie, J. M., & Lodewijkx, H. (1994). Conflict and aggression: An individual-group continuum. *Advances in Group Processes*, 2, 139-174.
- Rabbie, J. M., Schot, J. C., & Visser, L. (1989). Social identity theory: A conceptual and empirical critique from the perspective of a behavioral interaction model. *European Journal of Social Psychology*, 19, 171-202.
- Rubin, M., & Hewstone, M. (1998). Social identity theory's self-esteem

- hypothesis: A review and some suggestions for clarification. *Personality and Social Psychology Review*, 2, 40-62.
- Sachdev, I., & Bourhis, R. Y. (1985). Status differentials and intergroup behavior. *European Journal of Social Psychology*, 15, 415-434.
- Schopler, J., Insko, C. A., Graetz, K. A., Drigotas, S., Smith, V. A., & Dahl, K. (1993). Individual-group discontinuity: Further evidence for mediation by fear and greed. *Personality and Social Psychology Bulletin*, 19, 419-431.
- Sutcliffe, J. P. (1957). A general method of analysis of frequency data for multiple classification designs. *Psychological Bulletin*, 54, 134-137.
- Tajfel, H. (1970). Experiments in intergroup discrimination. *Scientific American*, 223, 96-102.
- Tajfel, H., & Billig, M. (1974). Familiarity and categorization in intergroup behavior. *Journal of Experimental Social Psychology*, 10, 159-170.
- Tajfel, H., Billig, M., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, 1, 149-178.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole.
- Turner, J. C. (1983). Some comments on . . . "the measurement of social orientations in the minimal group paradigm." *European Journal of Social Psychology*, 13, 351-367.
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford and New York: Basil Blackwell.
- Yamagishi, T., Jin, N., & Kiyonari, T. (1999). Bounded generalized reciprocity: Ingroup boasting and ingroup favoritism. *Advances in Group Processes*, 16, 161-197.

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