Groups Work for Women: Gender and Group Identity in Social Dilemmas

Rachel Croson, Melanie Marks, and Jessica Snyder

Behavior in social-dilemma (mixed-motive) situations has been of great interest to economists, psychologists, and negotiation scholars. In this study, we used a threshold social-dilemma game to examine factors that have not yet been investigated and that may have an impact on behavior in these settings: gender and group identity. We found that, for women, interacting with members of a naturally occurring group increased coordination and efficiency, while for men, interacting with members of a naturally occurring group decreased coordination and efficiency. Psychological literature on gender differences and group interdependence explains these differences. We conclude by discussing the implications of these results for gender differences in negotiation behavior.

Key words: negotiation, social dilemma, identity, gender.

Rachel Croson is director of the Negotiation Center and professor in the department of economics and in the School of Management at the University of Texas at Dallas. Her e-mail address is crosonr@utdallas.edu.

Melanie Marks is a professor in the College of Business and Economics at Longwood University in Farmville, Virginia. Her e-mail address is marksmb@longwood.edu.

Jessica Snyder graduated from the College of Business and Economics at Longwood University in Farmville, Virginia.

10.1111/j.1571-9979.2008.00195.x

Introduction

Settings in which individual interests conflict with the interests of the group are common in many domains and have been studied by researchers in multiple disciplines. For example, each country and its fishing industry may have incentives to overfish international waters, but the planet as a whole and the future fishing industry is better off if each limits its own consumption. While the correct number of fish to harvest is generally not zero, sustainable harvests are lower than what countries would reap by following their own self-interest but higher than taking no fish.

Researchers have modeled this type of setting using a *threshold* social dilemma (for a review see Dawes 1980).[1] This dilemma has the familiar features: there is tension between free-riding and increasing one's own earnings (in our example, by overfishing), and contributing and improving the earnings of the group as a whole (in our example, by exercising restraint through catch-limit regulations and other fisheries policies). Because there is an optimum level of fish to be caught (greater than zero but less than whatever you can catch), this game is not only about the conflict between competition and cooperation but also about *coordination*. In our example, individual countries need to decide among themselves who will get how much fish in order to achieve the optimal amount of harvesting. This article compares the impact of gender and group identification on cooperation and coordination in a threshold social-dilemma setting.

This particular mechanism has two types of predicted outcomes or equilibria. In the first, participants acting only in their own self-interest fully "free-ride" (defect), and no social benefit is created. In the second, the group contributes, but the amount of contribution from each member of the group can differ. Each individual would prefer that *others* contribute while he or she free-rides.

Only one other article (Cadsby and Maynes 1998b) has explored the impact of gender in this setting. Our article builds on this stream of research. In particular, we are interested in determining if more cooperation occurs within some groups of individuals than within others.

We continued this line of research by considering the interaction of gender and group identity when individuals of established groups such as sororities, fraternities, and service organizations make decisions with others in their group. We compared the decisions made in these groups with those made in groups of the same gender composition (all male, both genders, all female) who are strangers. The design allows us to determine if the existence of a cohesive group identity matters and, if so, if the impact is similar for male groups, female groups, and mixed-gender groups.

Previous Literature

Researchers have undertaken many studies of the role of gender in social dilemmas, although with one exception, the paradigms used have been slightly different than ours.

Experimental Economics Studies on Gender

Although a large literature on gender differences in psychology exists, relatively, experimental economists have only recently discovered that gender can be an important driver of behavior in many situations. (See Eckel, de Oliveira, and Grossman 2008 in this issue for an excellent review of this literature.)

For example, a series of articles in experimental bargaining finds that men and women make different decisions in dictator games (for an alternative view, see Bolton and Katok 1995; Eckel and Grossman 1996 and 1998). James Andreoni and Lise Vesterlund (2001) found that these gender differences are sensitive to both the relative costs of contributing money and to the benefits of receiving it. Eckel and Grossman (2001) and Sara Solnick (2001) identified gender differences in ultimatum game bargaining. Rachel Croson and Nancy Buchan (1999) found that, in experimental trust games, women were more trustworthy than men.

A number of previous experiments have explored gender differences in *linear* social dilemma games in which the optimal thing to do for the group is to contribute everything (or, in our previous example, to take no fish). For example, Jamie Brown-Kruse and David Hummels (1993) found that males contributed significantly more than females. Their result was replicated by Bram Cadsby and Elizabeth Maynes (1998b).

Jane Sell, W. I. Griffith, and Rick Wilson (1993) extended this research by comparing both gender and the gender composition of the group. In experiments with monetary payoffs, the authors found that neither gender nor composition had an impact on contributions. Women who interacted exclusively or almost exclusively with other women gave somewhat less than men who interacted primarily with other men, but the result was not statistically significant. When payoffs were changed from money to "time with an expert," however, men contributed significantly more than women, although no group composition effects were found.

In the study that is closest to ours, Cadsby and Maynes (1998b) investigated the effect of gender in threshold social dilemmas for all-male or all-female groups. In these settings, the optimal thing to do for the benefit of the group is to contribute some intermediate amount (or, in the fisheries example, to take some intermediate amount of fish). The decision then must be made as to how much each person should give (or take). The researchers found that women contributed marginally more than men in the initial rounds of the game. In the last five rounds, women displayed more cooperative behavior than did men, but contribution levels and rates

of meeting or exceeding the threshold did not significantly differ by gender. In our study, we extended this research to look at the effect of group identity, as discussed later, as well as gender.

Experimental Economics Studies on Group Identity

The second dimension we varied in our experiment is group identity. The creation of group identity and its impact on behavior has been studied by psychologists, primarily in prisoners' dilemma games with more than two players (e.g., Dawes, van de Kragt, and Orbell 1988; Brewer and Brown 1998). These scholars have suggested that group identification may cause people to place a group's interests above their own. Our project examined whether such group identity effects are gender specific.

Researchers have conducted experiments in linear social dilemmas designed to measure group identity and have used these measures as an explanation for behavior. Brown-Kruse and Hummels (1993) used a pregame questionnaire wherein information was shared in a public manner to create a "sense of membership" among individuals in a group. The authors concluded that the questionnaire did not enhance contribution levels and found no difference between men and women in their response to this manipulation. Cadsby and Maynes (1998b) used the same pregame questionnaire, administered to a larger group. They also found that the questionnaire had no impact on the outcomes of the experiment. When looking at the first round only, however, they found that using the questionnaire seemed to diminish the contribution differential between women and men (with women contributing more) than researchers had previously found (Cadsby and Maynes 1998b, discussed earlier). We conclude from this research that these manipulations were insufficient to generate the group identification that psychologists (as discussed earlier) have suggested would be effective.

John Solow and Nicole Kirkwood (2002) took a more naturalistic tack by comparing three mixed-gender conditions or scenarios: the strangers condition, in which individuals knew nothing about the other members of their group; the questionnaires condition, which was similar to those described earlier; and the groups scenario, which involved members of an already-existing and established group, the Iowa Marching Band. As in previous research, they used a linear social dilemma. They reported significantly higher contributions when social identity was high (the marching band). The authors also found some gender differences, but all groups were of mixed gender.

In our study, we used this strategy of identifying naturally occurring groups and inviting members from those groups to the lab in order to compare the impact of group identity on decisions in a social-dilemma setting. But because we also sought to examine the interaction of group identity and gender, we compared all-male, all-female, and mixed-gender groups.

Experimental Design and Procedures

Theoretical Model

The model employed in this design is based on one introduced by Mark Bagnoli and Bart Lipman (1989). In this model, each group comprises five people, and each individual begins the game with an allotment of fifty-five tokens. Individuals are asked to contribute some portion of their endowment to the group account. If the sum of the contributions exceeds 125 tokens, then each person in the group will receive a bonus of fifty cents, regardless of whether or not they contributed themselves. If not, all contributions are refunded. Tokens kept earn one cent per token for the individual only.

Note that any contributions over the threshold of 125 disappear. Thus, if the threshold is met (with or without excess funds), each player receives the benefits from the tokens they keep, and their value is fifty cents. If the threshold is not met, contributions are returned.

We choose parameters such that the social benefits outweigh the social costs. For a five-person group, if each individual contributed twenty-five tokens, the threshold of 125 would be exactly met, and everyone would earn their value for the public good of fifty cents. It would cost each individual only twenty-five cents (the twenty-five tokens they could have consumed privately) and all parties are better off with a total of eighty cents than they would be if nobody contributed (earning fifty-five cents each). Each individual, however, might prefer a slightly different outcome. For example, I would rather give only twenty-four tokens, and have someone else in the group give twenty-six to make up for my shortfall. More generally, I would rather that I give less and that others give more, as long as it means I can still collect my bonus for the public good. These outcomes are distinct from one another only in the rule used to divide the costs of meeting the threshold among the group members. We will examine those rules in the results section on equity.

Note that if group contributions are below 125, the group earns less than it could have; everyone will be better off if the public good is provided. If group contributions are above 125, this outcome is also inefficient; it costs individuals tokens (which they could have kept and used to earn money) but does not create any additional benefits for the group.

Experimental Design

The experiment entailed a 3×2 design, incorporating three gender conditions (all males, all females, mixed groups) and two group-identity conditions (high group identity, low group identity). Each of the six conditions involved five experimental sessions of one group of five participants each. In each session, participants played twenty-five rounds of the social-dilemma game repeatedly with the same group of participants, with the

length of each session announced to all participants. Participants were not permitted to communicate in any way with their counterparts in their group or with others in the session. Thus, this experiment is designed to capture settings like the international fishing situation *before* explicit negotiation or agreements have been introduced. Each individual independently decides how much to contribute in each round. After each round, each individual sees the contributions of the others in their group, and decides on his or her subsequent round's contribution. All sessions of the experiment were performed in a noncomputerized laboratory at Longwood University.

All experimental instructions were written so that they conform to language developed by Mark Isaac, David Walker, and James Thomas (1984). All language that referred to "investments" or "contributions" was intentionally avoided and replaced by neutral words such as "allocation" of tokens, in order to avoid priming the participants with any particular objective. (Our instructions are available upon request.) To ensure uniformity and common knowledge, we both read instructions out loud and projected them using an overhead projector. We also administered a postinstruction questionnaire to ensure that all participants understood the instructions and were able to calculate their earnings. After each decision period, the total contribution was announced verbally and was displayed on a dry-marker board.

Participants

All participants were undergraduate students at Longwood University. Low-group-identity participants were recruited from classrooms. Recruiters were careful to avoid scheduling individuals who had been sitting near each other in class for the same experimental sessions. We recruited high-group-identity participants by contacting well-established organizations whose members we believed would share a group identity. The groups we recruited from included fraternities (all-male condition), sororities (all-female condition), a service fraternity (both-gender condition), and a business fraternity (both-gender condition).

Participants arrived at the lab, were given instructions, made their decisions (with feedback as described previously), were paid privately, and were dismissed. An experiment generally lasted for one hour and forty-five minutes, with each round lasting between five minutes and one minute (earlier rounds took somewhat longer, while later rounds were significantly shorter). Participant payoffs ranged from $15 to $18.

Results

We were interested in a number of dependent variables, including:

- the number of tokens contributed,
- the likelihood of meeting the threshold,

- the distance between the group's contribution and the threshold contribution of 125, and
- the variance of contributions made by individual members of the group.

The first set of variables reflects the social benefit created by the group. We designed the experiment such that meeting the threshold of 125 tokens is good for the group, but the distance between the group's contribution and 125 is also a measure of efficiency, because contributions above or below 125 represent losses.

In contrast, the variance of contributions *within* a group is a measure of equity. If everyone gave twenty-five tokens (the equal-cost-sharing outcome), we would see zero within-group variance of individual contributions. We have used the observed variance of contributions within a group as a measure of the equity (or fairness) exhibited by the group.

Descriptive Statistics

Figure One through Figure Six graph the group contributions in our six treatments. Note that all the figures are on the same scale, and that group contributions "hover" around the predicted outcome of 125. These data are similar to those generated from previous experiments (see, e.g., Marks and Croson 1998).

A comparison of Figures One and Two with Figures Five and Six illustrates some of our results. In Figures One and Two, which show contributions by all-female groups, the variance of group contributions was noticeably greater in the low-identity groups than in the high-identity groups. Figures Five and Six, which show contributions by all-male groups, indicate more variance in high-identity than in low-identity groups. Interactions between gender composition and group identity will be demonstrated statistically later in the discussion.

Table One provides some summary statistics for our experiments. Boldface denotes the average contribution made for each condition.

Efficiency

In this section of the article, we analyze our measures of the efficiency of the players' behavior. As might be intuited from the figures and table, we found that neither gender nor group identity had significant effects on the amount allocated to the group account, with the following average contributions: female high identity, 124.85; female low identity, 123.17; both genders high identity, 122.50; both genders low identity, 123.18; male high identity, 124.50; and male low identity, 124.93. (Regressions are available from the authors.)

The second measure of efficiency we examined is the proportion of times that each group met the threshold. As with contributions, we found gender and group identity had no significant effects: female high identity, 54 percent; female low identity, 50 percent; both genders

Figure One
Female, High-Identity Group

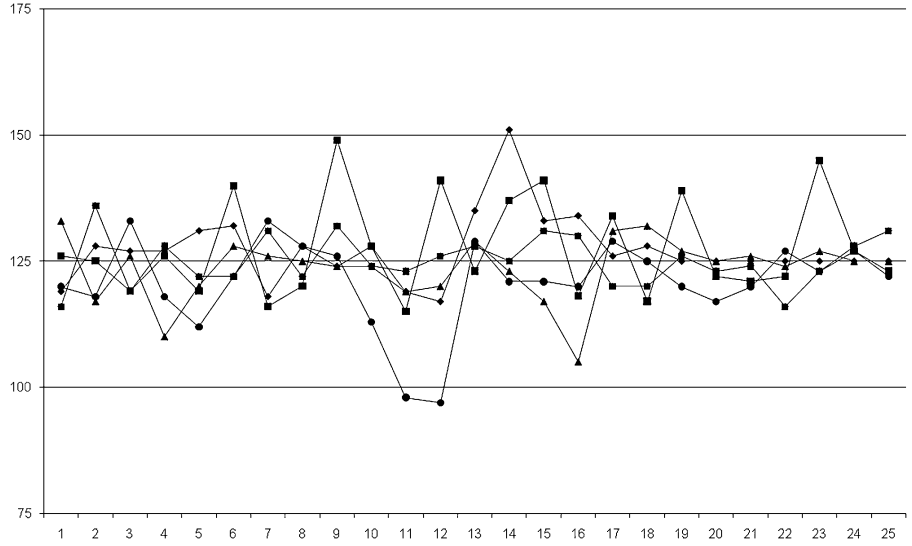


Figure Two
Female, Low-Identity Group

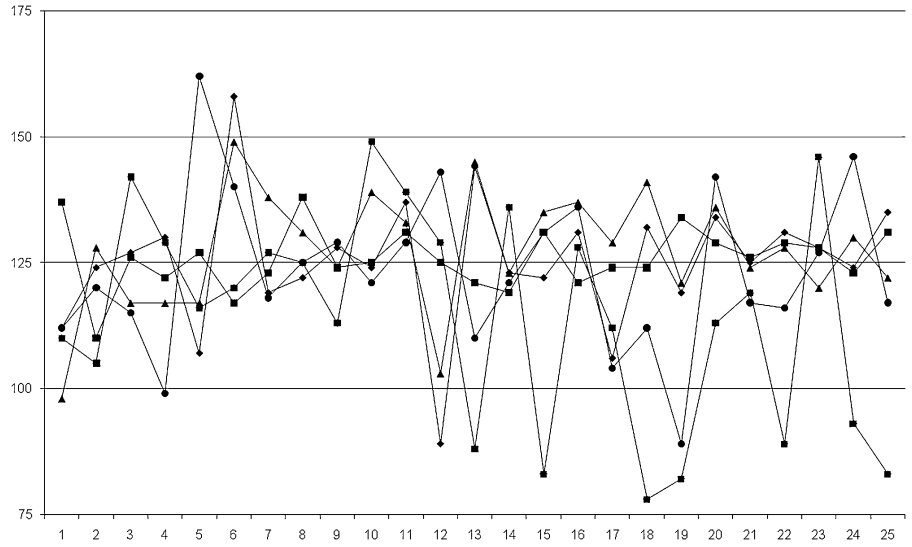


Figure Three
Both Genders, High-Identity Group

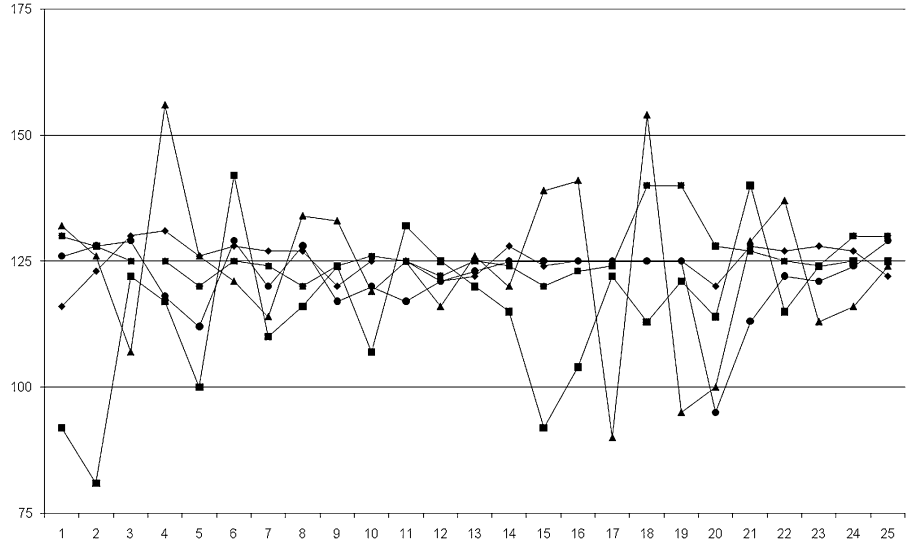


Figure Four
Both Genders, Low-Identity Group

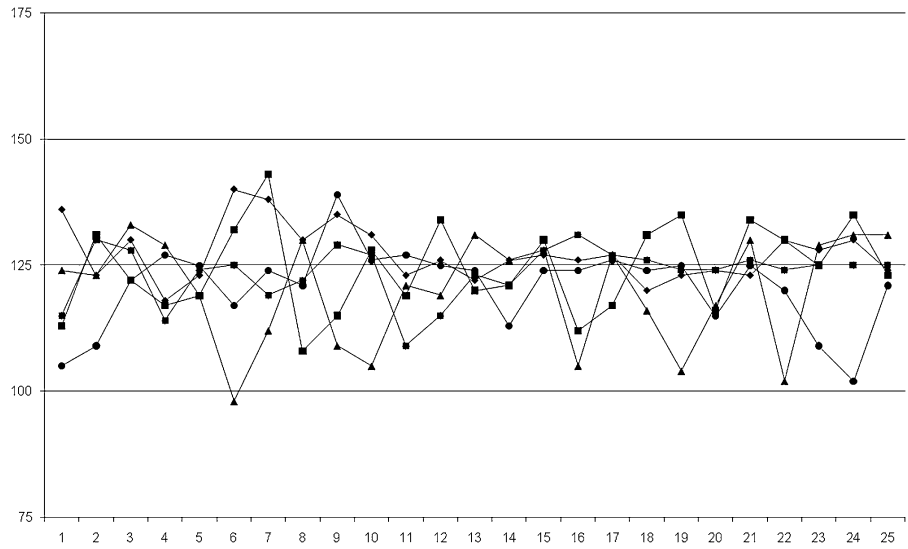


Figure Five
Male, High-Identity Group

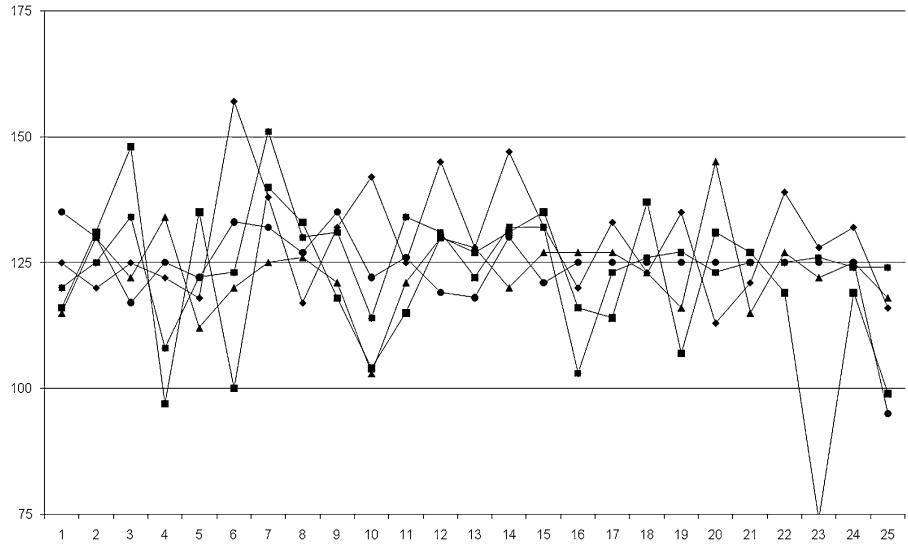


Figure Six
Male, Low-Identity Group

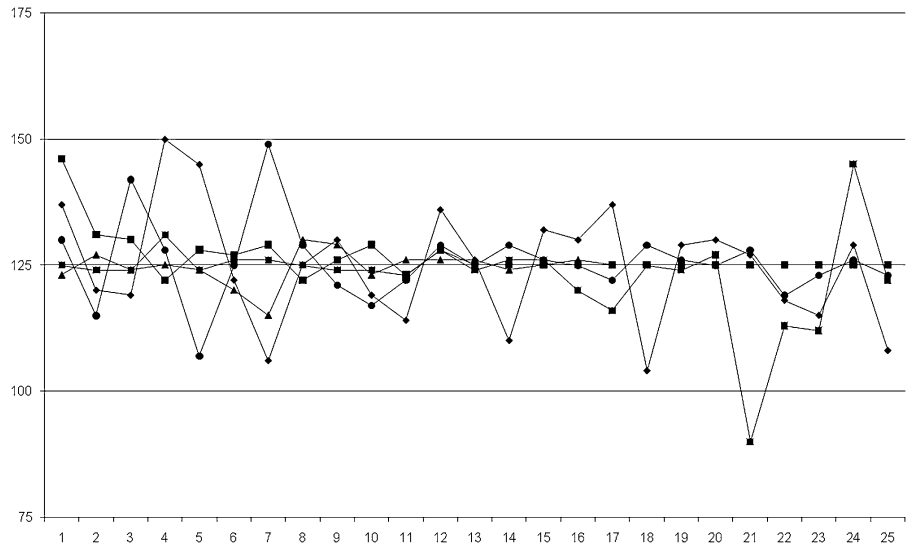


Table One
Summary Statistics

Treatment	Average Contribution	Proportion Success	Average Abs Dist 125	Average Within-Group Variance
Female high identity	124.85	0.54	5.51	31.36
Group 1	127.72	0.52	7.92	24.02
Group 2	123.68	0.60	4.36	21.61
Group 3	125.04	0.48	4.12	42.27
Group 4	120.76	0.36	6.80	53.88
Group 5	127.04	0.76	4.36	15.01
Female low identity	123.17	0.50	10.89	83.24
Group 1	125.24	0.52	8.96	35.70
Group 2	125.80	0.56	4.56	31.57
Group 3	123.24	0.44	12.56	76.14
Group 4	127.40	0.56	9.52	90.74
Group 5	114.16	0.40	18.84	182.04
Both high identity	122.50	0.50	6.94	54.46
Group 1	125.00	0.68	2.56	20.19
Group 2	115.92	0.24	12.20	95.48
Group 3	123.72	0.52	11.92	51.94
Group 4	121.68	0.48	4.84	83.12
Group 5	126.16	0.60	3.16	21.55
Both low identity	123.18	0.48	6.14	45.13
Group 1	123.44	0.52	3.72	35.81
Group 2	124.40	0.48	7.64	40.60
Group 3	119.96	0.44	9.04	52.94
Group 4	127.32	0.60	4.48	27.41
Group 5	120.76	0.36	5.84	68.91
Male high identity	124.50	0.58	7.64	54.05
Group 1	129.32	0.64	8.72	29.18
Group 2	120.12	0.48	13.28	137.80
Group 3	123.16	0.48	5.92	12.81
Group 4	124.48	0.72	4.36	56.45
Group 5	125.40	0.56	5.92	33.98
Male low identity	124.93	0.65	4.60	31.88
Group 1	124.72	0.56	9.32	96.60
Group 2	126.64	0.88	2.28	25.49
Group 3	124.72	0.72	1.48	1.70
Group 4	125.60	0.64	5.08	6.73
Group 5	122.96	0.44	4.84	28.90

high identity, 50 percent; both genders low identity, 48 percent; male high identity, 58 percent; and male low identity, 65 percent. Of course, these observations are linked — if one group contributed more than another, it would also (likely) have had a higher rate of success in meeting the threshold.

The third measure of efficiency we have examined is the (absolute) deviation from the threshold of 125. When groups contributed less than 125 tokens, their efficiency was diminished because they failed to meet the threshold and thus each individual earned less. When groups contributed more than 125 total tokens, efficiency was reduced because contributions over the minimum were not returned to individuals and were thus wasted. How closely each group came to contributing exactly 125 tokens can thus be construed as a measure of that group's ability to successfully coordinate. Groups that are more successful at coordination would thus have contributions closer to the threshold.

For each group and each round, we calculated the absolute distance between the contributions it produced and the threshold of 125. Figure Seven demonstrates the pattern of the data, which are statistically significant in regression analyses (available from the authors).

As Figure Seven shows, the high-identity all-female group experienced lower deviations from the desired threshold of 125 than did the low-identity female group, which we believe is a result of better coordination among the group's members. (Women who know each other were significantly better able to coordinate than women who did not.) In contrast, we found the exact *opposite* pattern for men: our results indicate that all-male groups with higher group identity had significantly *worse* coordination than those with low identity. We found group identity had no significant effect on the mixed-gender groups.

We saw this pattern again when we analyzed within-group variance of contributions (see later discussion). Together, these two results paint a picture of greater coordination by females when they are in groups with high identity but less coordination by males when they are in groups with high identity.

Equity

Our measure of equity is a within-group measure. We calculated the variance of the contributions across individuals within a group. If group members chose the "fair" solution in which each participant contributed 25 tokens (and received his or her individual fifty-cent bonus), this variance would be zero. If they instead chose an unequal rule, this variance would be high. This variance thus provides a measure of equity within the group. Figure Eight depicts the results, which are statistically significant (regressions available from the authors).

Figure Seven
Absolute Distance between Contributions and Threshold

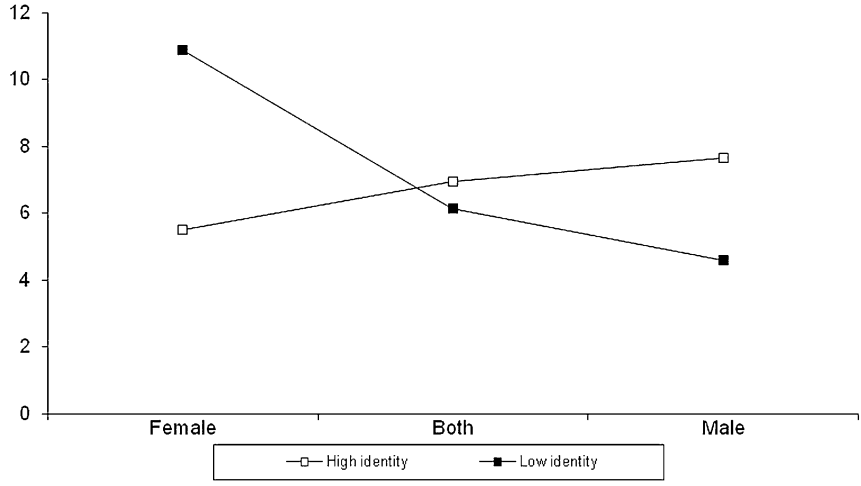
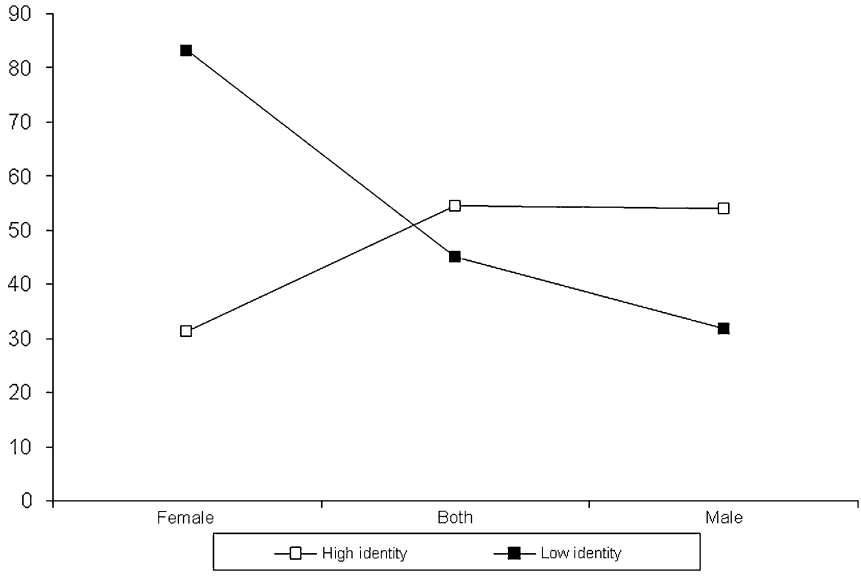


Figure Eight
Equity within the Groups



The pattern in Figure Eight mirrors that in Figure Seven. Women in high-identity groups exhibited significantly more equitable outcomes (less within-group variance) than women in low-identity groups. But this pattern was reversed for males. In our study, males in high-identity groups reached significantly *less* equitable outcomes than did males in low-identity groups.

Conclusion and Discussion

This article builds on a growing literature experimentally testing behavior in social-dilemma (mixed-motive) settings. This literature seeks to examine what variables promote increased (and decreased) coordination, efficiency, and equity. In our study, we examined the impact of gender and group identity on contribution levels in a threshold social dilemma. While related work has looked simply at the impact of gender with inconclusive results (Cadsby and Maynes 1998b), we examined the interaction between gender and social identity. We found that, in all-female groups, when participants were part of a larger organization with high social identity, the group's coordination, efficiency, and equity increased. In all-male groups, however, high social identity decreased these measures.

This result is consistent with evidence from other fields. Noted biological anthropologist Lionel Tiger, whose book *Men in Groups* introduced the term "male bonding" to popular discourse, discusses this phenomenon. In particular, his work claims that, as with other primates, male bonds often involve "competition for dominance," crucial to the reproductive survival of the tribe (Tiger 1984). We believe this competition for dominance is activated in all-male groups whose members interact on a frequent basis (who are members of the same tribe, or fraternity). This causes high-identity male groups to do more jockeying for position, which causes greater deviation from the threshold contribution of 125, and to settle on more inequitable cost-sharing allocations, which causes greater within-group variance of contributions.

Research from self-construals (a person's definition of herself or himself based on his or her relationships) in psychology also supports this explanation. Susan Cross and Laura Madson (1996) suggested that women are more likely to exhibit interdependent self-construals, while men are more likely to exhibit independent self-construals. The (female) interdependent self-construal results in a situation in which "the goals and needs of families and close friends are often as important as one's own goals and needs" (Cross and Madson 1996: 7). This explanation is consistent with our results that indicate that groups matter more for women than they matter for men. Similarly, in her studies of children, Elinor Maccoby (1990) found that boys' groups were characterized by demonstrations of dominance, while girls' groups were characterized by cooperation and efforts to maintain social relationships. This research is also consistent with what we

found: men in high-identity groups vied for dominance, which caused lower equity within the group.

When considering negotiation behavior more generally, individuals have both incentives for coordination (to make the pie bigger) and competition (to take more of the larger pie). Our results suggest that for women, negotiating with someone in their group (here, the same sorority) will increase the cooperative drive and decrease the desire for competition, leading to more efficient outcomes relative to negotiating with a female stranger. For men, however, negotiating with others in their group (here, the same fraternity) seems to have engaged the desire for competition, leading to more competition when compared with negotiating with a male stranger. Our results predict no effect of group identity for mixed-gender negotiation.

These predictions suggest interesting and testable hypotheses for future studies. These could include: add the ability to communicate in these settings and then examine the communication for cooperative or competitive statements, undertake more detailed analysis of the individual contributions and how they change in response to others' actions, and identify different types of all-male and all-female groups in order to determine the robustness of the results.

As our title suggests, creating group identity seems to help women, but not men. As this team of (female) authors has found, female bonding using sugar and spice can pay off.

NOTE

1. Our particular setting follows parameters and structures theoretically developed by Bagnoli and Lipman (1989), and previously tested by Marks and Croson (1998), among others. The interested reader should see Isaac, Schmidtz, and Walker (1989); Bagnoli and McKee (1991); Ledyard (1995); Cadsby and Maynes (1998a); Croson and Marks (1998); Cadsby and Maynes (1999); Croson and Marks (1999); Marks and Croson (1999); Marks, Croson, and Schansberg (1999); Rondeau, Schulze, and Poe (1999); Croson and Marks (2000); Croson and Marks (2001); Poe et al. (2002); Rose et al. (2002); and Rondeau, Poe, and Schulze (2003).

REFERENCES

Andreoni, J. and L. Vesterlund. 2001. Which is the fair sex? Gender differences in altruism. *The Quarterly Journal of Economics* 116(1): 293–312.

Bagnoli, M. and B. Lipman. 1989. Provision of public goods: Fully implementing the core through private contributions. *Review of Economic Studies* 56(4): 583–601.

Bagnoli, M. and M. McKee. 1991. Voluntary contribution games: Efficient private provision of public goods. *Economic Inquiry* 29(2): 351–366.

Bolton, G. and E. Katok. 1995. An experimental test for gender differences in beneficent behavior. *Economics Letters* 48(3–4): 287–292.

Brewer, M. and R. Brown. 1998. Intergroup relations. In *The handbook of social psychology*, 2nd edn., edited by S. Fiske, D. Gilbert, and G. Lindzey. Boston, MA: McGraw-Hill.

Brown-Kruse, J. and D. Hummels. 1993. Gender effects in laboratory public goods contribution: Do individuals put their money where their mouth is? *Journal of Economic Behavior and Organization* 22(3): 255–267.

Cadsby, B. and E. Maynes. 1998a. Choosing between a socially efficient and free-riding equilibrium: Nurses versus economics and business students. *Journal of Economic Behavior and Organization* 37(2): 183–192.
— — — and — — —. 1998b. Gender and free riding in a threshold public goods game: Experimental evidence. *Journal of Economic Behavior and Organization* 34(4): 603–620.
— — — and — — —. 1999. Voluntary contribution of threshold public goods with continuous provisions: Experimental evidence. *Journal of Public Economics* 71(1): 53–73.
Croson, R. and M. Marks. 1998. Identifiability of individual contributions in a threshold public goods experiment. *Journal of Mathematical Psychology* 42(2–3): 167–190.
— — — and — — —. 1999. The effect of heterogeneous valuations for threshold public goods: An experimental study. *Risk, Decision and Policy* 4(2): 99–115.
— — — and — — —. 2000. Step returns in threshold public goods: A meta- and experimental analysis. *Experimental Economics* 2(3): 239–259.
— — — and — — —. 2001. The effect of recommended contributions in the voluntary provision of public goods. *Economic Inquiry* 39(2): 238–249.
Croson, R. and N. Buchan. 1999. Gender and culture: International experimental evidence from trust games. *American Economic Review* 89(2): 386–391.
Cross, S. and L. Madson. 1996. Models of the self: Self-construals and gender. *Psychological Bulletin* 122(1): 5–37.
Dawes, R. 1980. Social dilemmas. *Annual Review of Psychology* 31: 169–193.
Dawes, R., A. van de Kragt, and J. Orbell. 1988. Not me or thee but we: The importance of group identity in eliciting cooperation in dilemma situations — experimental manipulations. *Acta Psychologica* 68(1): 83–97.
Eckel, C., A. C. M. de Oliveira, and P. J. Grossman. 2008. Gender and negotiation in the small: Are women (perceived to be) more cooperative than men? *Negotiation Journal* 24(4): 429–445.
Eckel, C. and P. Grossman. 1996. The relative price of fairness: Gender differences in a punishment game. *Journal of Economic Behavior and Organization* 30(2): 143–158.
— — — and — — —. 1998. Are women less selfish than men?: Evidence from dictator experiments. *The Economic Journal* 108(448): 726–735.
— — — and — — —. 2001. Chivalry and solidarity in ultimatum games. *Economic Inquiry* 39(2): 171–188.
Isaac, M., D. Schmidtz, and J. Walker. 1989. The assurance problem in a laboratory market. *Public Choice* 62(3): 217–236.
Isaac, M., J. Walker, and S. Thomas. 1984. Divergent evidence on free-riding: An experimental examination of possible explanations. *Public Choice* 43(2): 113–149.
Ledyard, J. 1995. Public goods: A survey of experimental research. In *Handbook of experimental economics*, edited by J. Kagel and A. Roth. Princeton, NJ: Princeton University Press.
Maccoby, E. 1990. Gender and relationships: A developmental account. *American Psychologist* 45(4): 513–520.
Marks, M. and R. Croson. 1998. The effect of alternative rebate rules in the provision point mechanism of voluntary contributions: An experimental investigation. *Journal of Public Economics* 67(2): 195–220.
— — — and — — —. 1999. The effect of incomplete information and heterogeneity in the provision point mechanism of voluntary contributions: An experimental investigation. *Public Choice* 99(1–2): 103–118.
Marks, M., R. Croson, and E. Schansberg. 1999. Using suggested contributions in fund-raising for public goods: An experimental investigation of the provision point mechanism. *Nonprofit Management and Leadership* 9(4): 369–384.
Poe, G., J. Clark, D. Rondeau, and W. Schulze. 2008. Provision point mechanisms and field validity tests of contingent valuation. *Environmental and Resource Economics* 23(1): 105–131.
Rondeau, D., G. Poe, and W. Schulze. 2003. *VCM or PPM? A comparison of the efficiency properties of two voluntary public goods mechanisms*. Working Paper, Department of Economics, University of Victoria, Canada.
Rondeau, D., W. Schulze, and G. Poe. 1999. Voluntary revelation of the demand for public goods using a provision point mechanism. *Journal of Public Economics* 72(3): 455–470.
Rose, S., J. Clark, G. Poe, D. Rondeau, and W. Schulze. 2002. The private provision of public goods: Test of a provision point mechanism for funding Green Power programs. *Resource and Energy Economics* 24(1–2): 131–155.

Sell, J., W. I. Griffin, and R. Wilson. 1993. Are women more cooperative than men in social dilemmas? *Social Psychology Quarterly* 56(3): 211–222.
Solnick, S. 2001. Gender differences in the ultimatum game. *Economic Inquiry* 39(2): 189–200.
Solow, J. and N. Kirkwood. 2002. Group identity and gender in public goods experiments. *Journal of Economic Behavior and Organization* 48(4): 403–412.
Tiger, L. 1984. *Men in groups*. London: Marion Boyars Publishers Ltd.