Altruism in Individual and Joint-Giving Decisions
What’s Gender Got to Do With It?

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Abstract

This paper uses dictator experiments to examine gender differences in altruism when decisions are made individually and jointly. In anonymous individual giving to charity, women give substantially more than men, and in paired settings, mixed-sex groups give the most while all male pairs give the least. Evidence supports social information and negotiation effects as participants change giving toward that of their partners. Social image effects are found only in mixed-sex groups, indicating a gender-based component to the value of the social signal sent. Although men and women appear to have similar influence, the positive social image effect pushes giving in mixed sex pairs above the sum of the members’ individual gifts because the less altruistic partners (usually men) adjust their giving upward more than the more altruistic partners (usually women) reduce giving. Therefore, increasing participation of women in traditionally male spheres of decision-making may result in more altruistic economic behavior.

Keywords: altruism, gender, experimental economics

JEL Classification: D64, A13, J16, C91, C92
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I. Introduction

As women play an ever-increasing role in economic decision-making, whether men and women behave differently in economic situations and the way they influence each other in making economic decisions have become issues of primary importance. One area where gender differences may arise is in the degree to which economic behavior is motivated by self-interest or other-regarding behavior. This paper explores whether gender affects the degree to which self-interest or other-regarding motivations affect economic behavior by investigating male and female giving in both anonymous and social settings. Defining altruistic behavior as the act of giving up something of value to improve the wellbeing of another, we utilize laboratory experiments to obtain evidence on three gender-related issues: First, are women more altruistic than men when making decisions anonymously? Second, when people make giving decisions with a partner, do they act more altruistically when someone else is aware of how much they donate and to what degree are they influenced by their partner? Third, does an individual’s giving depend on the sex of his or her partner and does the influence of the partner differ according to gender? While some of these questions have been addressed by others, no definitive answers have been obtained; some studies find gender differences while others do not. As we discuss below, the lack of consensus on the importance of gender may be due to differences in the types of experiments utilized and the way in which they are formulated. In this paper, we carefully design and carry out experiments that can accurately measure gender

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differences in other-regarding behavior and the influence of partners when decisions are made jointly.

We begin by measuring benchmark altruism using an anonymous dictator game in which individuals have the opportunity to give money to charity. Then we randomly pair individuals together to determine how social image considerations, social information, and bargaining within pairs affect giving to the same charity when giving decisions are made jointly. In these experiments, we find significant gender differences in altruistic behavior. Women give significantly more than men as anonymous individuals. Pairs consisting of one man and one woman give more than same-sex pairs, and all-male pairs give the least. We find strong evidence that negotiation and/or social information leads each member to move his giving within the team away from his own giving as an individual and toward his partner’s giving as an individual. This move towards a compromise gift is stronger when the pair negotiates a common gift (both members give and keep the same amount) than when each gives a different amount and negotiations are not required, implying that social information plays a role independent of a negotiation effect. While we also find social image considerations to be important, these are evident only in pairs when partners are the opposite sex, indicating that the social image effect is gender-based. Therefore mixed-sex teams give more than the sum of their individual gifts because the combined effects of social information, negotiation, and social image in team giving lead the less altruistic partners (usually men) to increase giving more than the more altruistic partners (usually women) decrease giving.

Information from this type of experiment on gender differences in individual and joint decision-making may be useful in predicting changes in economic outcomes resulting from changes in the status of women in the workplace and in the amount of wealth that they control.
For example, if men and women have different levels of altruism, then, as women become more economically self-sufficient, the amount and distribution of contributions to charitable organizations may increase. Similarly, if men and women have different preferences for implementing public goods policies in the workplace, the increasing number of women in the workplace may change its very nature. However, all these predictions need to be tempered by the understanding that men and women often must make economic decisions jointly. The effect of joint decision-making on levels of altruistic actions and the degree to which women influence male decision-making or men influence female decision-making then become important.

II. Gauging Gender Differences in Economic Decision-Making

There is no consensus in the experimental literature on whether there are significant gender differences in altruistic behavior, with some studies finding women to be more generous and others concluding there are no significant gender differences.\textsuperscript{1} The diversity of results may be largely the result of conducting different experiments (ultimatum, public good, investment/trust, or dictator experiments), experimental design or context (including the motivation for giving embodied in the experiment), the framing of the experiment, the degree of anonymity, the subject population, and the manner in which the participants are chosen.

Ultimatum, public goods, and investment/trust games conflate altruistic motivations with self-seeking behavior and other motivations so that truly altruistic actions cannot be adequately measured. For example, experiments reveal that individuals make larger offers in ultimatum games than in dictator games (Forsythe et al. 1994), but the motivations behind the offers cannot

be identified. In addition, men and women may respond differently to the risk and strategic interaction of these games, further confounding the measurement of differences in altruistic behavior.²

Anonymous dictator games more accurately identify truly altruistic actions that are not motivated by any form of self-interest. In dictator games, the decision-maker has total control over the division of the money and the recipient passively receives it, eliminating both risk and strategic giving in order to increase one’s own return. However, empirical studies using dictator experiments to measure gender differences in other-regarding behavior still produce conflicting results,³ possibly because gender differences depend on context.⁴

In economic experiments that measure altruistic giving, the identity and “deservedness” of the recipient of the giving is important in motivating the act of giving.⁵ Eckel and Grossman (1996) argue: “By imposing double anonymity, Hoffman et al. (1994) have removed virtually all motivation for donating money to one’s partner.” Their experimental results show that giving increases when the recipient changes from an anonymous person to a charity (1996). Another issue in measuring altruistic or other-regarding behavior is the manner in which the experiment is framed. Identifying the experiment as a “game” may reduce altruist giving by inducing

² Eckel and Grossman (2000a) and Croson and Gneezy (2004) survey the literature on gender differences in economic decision-making. Eckel and Grossman find that in experiments where women are exposed to risk (e.g. monetary loss or feeling cheated in ultimatum games or public goods games), they behave more like men, while in games without risk, such as dictator games, women act more altruistically than men. Croson and Gneezy conclude that differences in experimental findings may result from the fact that women are more sensitive to the social conditions of an experiment.
⁴ Some studies conclude that the more generous sex depends on the context: Andreoni and Vesterlund (2001) find that women are more generous than men when the price of giving is high while men give more when the price is low, and Cox and Deck (2006) conclude that the more generous sex depends on the size of the stakes, degree of anonymity and possibility of reciprocity.
⁵ A number of studies have compared giving when the dictator has information about the recipient, including gender. See Bohnet and Frey (1999), Scharlemann et al. (2001) Saad and Gill (2001a, 2001b), Ben-Ner,Kong and Putterman (2004), Charness and Gneezy (2000), Dufwenberg and Muren (2006b), and Burnham (2003).
perceptions of winning/losing and competitiveness,⁶ and experimental research has shown that women, more than men, tend to shy away from competitive situations.⁷ Similarly, referring to the dictator experiment in market terms tends to orient decision-making away from thoughts of altruism or fairness (Hoffman et al., 1994 and Frolich and Oppenheimer, 2000).

The subject population of the experiments may also affect the outcomes. A number of studies have found that students in economics/business classes behave more in accordance with the self-interest model than do students in other majors.⁸ The differences in results on gender differences in altruism may be partially due to the fact that many of the previous experiments have utilized participants primarily from economics/business classes, potentially obscuring gender differences in altruistic giving and making comparisons among studies difficult. In addition, recruiting subjects by promising a monetary reward for participation may attract students who are more interested in monetary returns than the population in general, thus biasing the estimate of altruism downwards. Eckel and Grossman (2000b) find that recruited students give significantly less than students in experiments held in classrooms, even though both groups are voluntarily participating.

Our experiments are designed to measure pure altruism in individual giving in the first round of the experiments. To allow for a broad set of motivations, we use a dictator game where the recipient is a general interest charity, the American Red Cross.⁹ We do not characterize the experiment as a “game” with players, nor do we utilize language that invokes a market context, and we do not state that subjects can earn more money by the type of decisions made. Rather

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⁶ Frohlich, Oppenheimer, and Moore (2001) report that dictators who stated that they viewed the experiment as a game that they were trying to win gave less to recipients than dictators who did not view the experiment as a game.
⁷ See, for example, Gneezy, Niederle, and Rustichini, (2003).
⁸ See Marwell and Ames (1981), Carter and Irons (1991), and Frank et al. (1993). In addition, Fehr, Naf, and Schmidt (2006) find that economics/business majors more often choose allocations of payoffs based on efficiency motives while other majors tend to prefer allocations that reduce inequality among the recipients.
⁹ The American Red Cross was also used by Eckel and Grossman (1996).
than recruiting participants with a pecuniary incentive, our experiments are conducted in classes with students from a wide diversity of majors, not just economics or business students. Finally, the individual experiments are designed to preserve anonymity both from fellow students and from experimenters.

III. Joint-Giving Decisions

When individuals make giving decisions as a member of a pair, several factors may influence the decision on how much to give. People may change the amount they donate due to the necessity of coming to an agreement with the other person on the appropriate amount to give and to keep (negotiation). In addition, people may change giving because the information they acquire on what the other person gives is an indication of the social norm (social information) or they may increase giving in order to look good in the eyes of others (social image). The former effect results from learning what others are donating while the latter occurs because others are aware of what one donates.

When pairs of people commit to a common gift where each person gives (and keeps) the same amount, negotiations will occur. Assuming that each person prefers his or her gift to be the same in the individual and the team setting, the members’ gifts in the individual round become the upper and lower bounds in the negotiations. In negotiations where each member wields equal power, we expect that the team gift will move to the Nash equilibrium or twice the average of the two team members’ gifts in the first round.  

10 Assume a simple utility function such that an individual’s utility is highest when his or her donation is what was chosen in the individual round and drops off in a linear one to one fashion as the donation deviates from that initial level in a positive or negative direction. For person one who gave $D_1$ in the individual round and gives $D_t$ in the team round, utility in the team setting would be $|D_1 - |D_1 - D_t||$. Also assume that each individual’s threat point, the donation they will give if they fail at bargaining, is their partner’s donation. In the situation where two individuals gave different amounts in the individual setting and must agree on a common gift, $D_t$, the Nash equilibrium is the $D_t$ that maximizes the product of the excess of person one’s utility of $D_t$ above his utility of the threat point and the excess of person two’s utility of $D_t$ above his utility of the threat point. The $D_t$ that maximizes this product is
The social information effect occurs because in discussing with a partner the amount to
give, each person learns the partner’s views on giving and/or the specific amount the partner
gave in round one. This provides information (one data point) on the amount that is socially
acceptable to give or the social norm.\footnote{Social information may influence giving because it acts as a reference point or because the person wants to conform to social norms (Shang and Croson (2005)), so that obtaining such information may affect giving even when others are not aware of how much a person gives, that is, in situations where anonymity is preserved. The influence of social information has been examined by: Cason and Mui (1998), Bohnet and Zeckhauser (2004), Frey and Meier (2004), Shang and Croson (2005), and Meier (2006, 2007).} In cases where the partner’s gift is different than one’s own gift, the individual may move his or her second round gift closer to the partner’s gift, suggesting that those who gave less than their partner as individuals would increase giving within a pair while those who gave more than their partner would decrease giving. If the social information affects the two people equally and both members have equal influence in negotiations, the team gift moves to the sum of the members’ individual gifts. Therefore, it becomes difficult to disentangle the negotiation and social information effects. However, in cases where the two people give different amounts in the paired giving we can identify the social information effect because there is no negotiation effect.

Because generosity is seen as a positive trait, an individual who cares about social image may increase giving once the gift is known by someone else (this has also been called an “observer effect”).\footnote{The possibility that social image or non-anonymity may affect decisions has been studied by Hoffman et al. (1996), Bolton and Zwick (1995), Roth (1995), Bolton et al. (1998), and Dufwenberg and Muren (2006b).} The social image effect should increase gifts for everyone in joint-giving decisions compared to individual giving. Mean giving as a pair would then exceed the average of the two individual gifts.

It is possible, and even likely, that the gender of one’s partner may influence giving in joint-giving decisions; in particular, people may behave differently when paired with someone of
the opposite sex.\textsuperscript{13} The negotiation effect may differ in same sex and different sex groups if males or females have more power in influencing a person of the opposite sex.\textsuperscript{14} The gender of one’s partner may also influence how social information affects giving if the social information obtained is considered more (or less) important when the partner is the opposite sex. Similarly an individual may value social image more when it is displayed to someone of the opposite sex than to someone of the same sex, resulting in a stronger positive social image effect in mixed-sex than same-sex groups.

These three effects on paired giving decisions can be summarized in the following numerical expression:

\[ g_2 = g_1 + s + i(p_1 - g_1) + n(p_1 - g_1) \]  

where \( g_1 \) is the amount the person gave in the first round individual giving decision, \( g_2 \) is the person’s giving in the second round decision made with a partner, \( p_1 \) is the amount the partner gave as an individual in the first round, \( s \) is the social image effect, \( i \) is the social information effect, and \( n \) is the negotiation effect. Giving as a member of a group is the amount the person gave as an individual \( g_1 \) plus a positive social image effect \( s \) plus the partner’s relative influence through the social information effect \( i \) and the negotiation effect \( n \).

For estimation purposes, equation (1) can be rewritten as:

\[ g_2 - g_1 = s + (i + n) (p_1 - g_1) \]  

\textsuperscript{13} This paper focuses on measuring gender differences in altruism. An in-depth explanation of the causes of differences in such behavior is beyond the scope of the present work. Behavior may be influenced by biological, social, psychological, or spiritual considerations. For example, as pointed out by a reviewer, evolutionists might argue that increased generosity of males when paired with females is a type of sexual signaling behavior. On the other hand, women may have been socialized to be more giving than men, and women’s identification as mothers or caregivers may lead to altruistic acts. Finally, spiritual or religious values usually foster care or compassion for others.

\textsuperscript{14} Babcock and Laschever (2003) have shown that women are less likely to negotiate and less effective at negotiating starting salaries.
The constant then measures the social image effect, and the coefficient on the difference between own and partner’s gift in round one provides an estimate of the sum of the social information and negotiation effects. As mentioned earlier, it is difficult to disentangle the social information effect and negotiation effect when people agree to give the same amount in the paired giving decision. However, a small number of our sample gave different amounts when making the paired-giving decision. For these participants, we can conclude that there was no negotiation, or \( n = 0 \), so we can identify the social information effect for these pairs.

There has been some experimental work on joint-giving decisions. Cason and Mui (1997) compare dictator offers as individuals and as partners in a two-person team. They test two competing theories. First, Persuasive Argument Theory predicts that group giving will polarize teams as a result of discussions that provide additional arguments supporting group members’ initial positions. Therefore, groups that give more generously as individuals will give even more as a group and vice-versa. Alternatively, Social Comparison Theory predicts that group giving will be higher than individual giving after exposure to new information that influences people to try to present themselves in a socially favorable manner. The authors conclude that their experiments tend to favor the Social Comparison Theory in that there are more groups that shift toward being more generous than shift to being more self-interested. They also find that the more altruistic person in individual giving has a greater influence on the joint-giving decision. While Cason and Mui do not focus on gender per se, they do find that women have a larger impact on the decision in mixed-sex pairs.

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Equation 2 imposes the constraint that the coefficient on \( g_1 \) in equation 1 is one and allows the constant to represent the sole social image effect. If in estimating equation 1, the coefficient on \( g_1 \) were greater than one, for example, the social image effect would be incorporated into the coefficient on \( g_1 \) as well as in the constant. The initial estimate of giving before any influence by one’s partner would be greater than one’s initial gift by some percentage and that percentage would be a part of the social image effect. In the empirical section we test whether this constraint is justified.
This paper differs from the Cason and Mui work in that we study the influence of gender more carefully and examine social image, social information, and negotiation effects on giving. In addition, our experiments are designed to identify altruistic giving more precisely by making the recipient a charity rather than framing the experiment as a market with buyers and sellers, which may diminish the motivation to be generous. Also, we utilize a population of participants from various fields, not just economics classes, and we preserve anonymity by allowing the participants to take the dollar bills they want to keep and place the money they choose to donate in unmarked envelopes rather than mailing them the money they decide to keep. Finally, in our analysis, we consider within-person changes in giving from individual to joint decisions rather than comparing individual and group means so that we can identify changes in giving behavior for each individual.

Dufwenberg and Muren (2006) examine how the gender of group members affects giving decisions. Groups of three people are asked to decide how to split up a pot of money among the three of them and an anonymous fourth person. The authors find that groups with two women and one man are the most generous and the most likely to make an equal split of the pot among all four people. While Dufwenberg and Muren find that gender matters for group giving decisions, they do not measure individual giving and, therefore, cannot investigate changes in giving or partner influence through the channels we have identified above.

IV. Experimental Design

The experiments were performed at Skidmore College in seven undergraduate classes in various disciplines with a total of 164 students. In the first round of the experiment, the students were given ten one-dollar bills in an envelope and told that this money was their payment for
participating in the experiment. They were then offered the opportunity to donate some, none, or all of the money to the American Red Cross and to keep any money not donated. The experimenter explained that the student’s decision to donate or not would be completely anonymous. The experimenter instructed the students to leave the room with their envelope and a pen and to walk as far away as they needed to in order to feel that no one could see what they were doing. They were to decide how much, if any, of the money they wanted to donate and return that to the envelope. The rest of the money was theirs to keep. They were given a short questionnaire to fill out that asked them to choose a code word that would be used to link them with the amount they donated. While the researchers knew that the person with the code word donated the amount in the envelope, no one knew which student used that particular code word so their decisions were totally anonymous. They were instructed to put the questionnaire back into the envelope with any money they may have decided to donate, seal the envelope without writing anything on the outside of the envelope, return to class and drop the envelope in a box near the door.

The students were not aware of the second round until after the initial round was completed. Then they were randomly paired, and each pair was given an envelope with twenty one-dollar bills. They were told that this cash was their payment for participating in the second round of the experiment, and they could donate some, none, or all of the money to the American Red Cross. The students were asked to leave the room together and walk far enough away so that they felt comfortable that no one could overhear their deliberations or see what they chose to do. Again, students were asked to fill out individual questionnaires, recording the same code word used in the first round of the experiment and explaining why they made the decision to give (or not to

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16Because we wanted anonymous individual giving to serve as a benchmark with which to compare the joint-giving decisions, we did not reverse the order of the allocation decisions because then the individual decisions would be affected by the previous discussion with the partner. Cason and Mui (1996) ran their experiments with both orders, individual first then team and team first then individual. They did not find changes in giving between the two orders to be significantly different.
give). They were instructed to place any money they chose to donate in the envelope along with the two partners’ questionnaires, seal the envelope without writing on the outside, return to class, and drop the envelope in the box by the door.

At the end of the two rounds, all students were asked to fill out an anonymous survey that collected information on giving decisions (including how much each person and his or her partner gave in the second round if they did not give the same amount) and on background characteristics such as family income, religion (practicing or non-practicing), major, and how well they knew their partners. They were asked to provide their code words so that the surveys could be linked to the giving decisions in the two rounds.

V. Evidence of Pure Altruism - Anonymous Individual Giving

Table 1 provides the means and distribution of individual giving in the first round of the experiment for the total group and for men and women. Students are categorized as perfectly altruistic if they donated the entire ten dollars to the Red Cross and perfectly selfish if they kept all the money.

The results indicate that pure altruism is quite substantial, as more than 60 percent of the total money was donated to the charity and the mean gift was $6.03. Moreover, 40.1% of the students acted as perfect altruists giving all of the money to the Red Cross. Only 8.6% acted perfectly selfishly, choosing to keep all the money. The amounts given were substantially higher than in most dictator experiments, which is most likely due to the fact that the recipient was a charity rather than an anonymous fellow student and that participants were not recruited by pecuniary offers.17

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17 Eckel and Grossman (1996) report that subjects gave 30.1% of the money to the American Red Cross compared to the 10.6% given to anonymous recipients. Their participants were recruited from economics, accounting, finance and psychology courses, which may partly explain the smaller giving than found here, where students come from a
We find large differences in giving between men and women. Mean giving for men was $4.91 and for women was $7.07 (a difference of 44%), and these means are significantly different from one another at the 1% significance level. This implies that women behave far more altruistically than men. Furthermore, only 28.2% of men acted as perfect altruists, while 50.6% of women did so. At the same time, 15.4% of the men and only 2.4% of the women were perfectly selfish. A chi-squared test of the null hypothesis that men and women have the same distribution among altruistic types is rejected at the 1% significance level. We conclude that there are important gender differences in charitable giving and levels of altruism.\footnote{Eckel and Grossman (1998) find that women donate twice as much as men ($1.60 compared to $0.82 out of $10) and men are more likely to keep all the money (60.0% of men and 46.7% of women).}

Table 2 provides the means of giving by gender for different personal characteristics: different religions, practicing or not practicing a religion, college major and income levels. Women gave more than men in every category, with the exception of the lowest income (less than $60,000) students. The difference in mean giving between the highest and lowest income groups is statistically significant. However, there is not much of a pattern in giving for males according to income, while female giving rises (though not smoothly) with income. High-income women gave 73% more than high-income men ($9.50 compared to $5.50), though the number of students in each category is low (10 and 2). It is interesting to note that the differences between genders is the smallest for Jews (Jewish females gave only 1% more than Jewish males), and Jewish males were the most generous of all the categories of males, giving $7.11.

For both sexes, business majors were among the lowest givers and the difference is more diverse set of courses and were not recruited. Since we are primarily interested in differences in giving among participants and changes in giving from individual to joint-giving, the absolute amount of average giving in the population of participants should not affect our findings.
statistically significant.\textsuperscript{19} While female business majors gave less than females in other majors ($6.33 compared to $7.16), they were still more generous than every category of male, except Jewish men, who gave $7.11. Overall, every category of female students gave more than any category of male student, with the exception of female business majors and the lowest income women compared to Jewish men.

Turning to the multivariate analysis, because giving decisions in dictator games are limited to a minimum of zero and a maximum of ten dollars, we model the taste for altruism and the resulting charitable gift as a two limit tobit model. Assume that the taste for giving is represented by a latent variable $y_i^* = \beta x_i + u_i$ and follows a normal distribution. While we do not always observe the latent variable we do observe $y_i$, the charitable gift:

\[
y_i = 0 \quad \text{if} \quad y_i^* \leq LL
\]
\[
y_i = \beta x_i + u_i \quad \text{if} \quad LL > y_i^* < UL
\]
\[
y_i = 10 \quad \text{if} \quad y_i^* \geq UL
\]

where $\beta$ is a 1 x k vector of parameters, $x_i$ is a k x 1 vector of observable individual characteristics, LL is the lower bound, and UL is the upper bound. The $u_i$ are residuals that are independently and normally distributed, with mean zero and variance $\sigma^2$.

We use maximum likelihood estimation to estimate determinants of giving in time period one using the two limit tobit model. The vector of x characteristics includes a dummy variable for female, a dummy variable equal to one if the individual practices a religion, a dummy
variable equal to one for business majors, and a set of dummy variables representing family income categories.

Table 3 presents the tobit estimates of individual giving for the full sample. The female dummy is significantly different from zero at the 1% significance level, confirming that in anonymous individual giving, women donate significantly more than men. Holding other characteristics constant, women gave on average $2.95 more of the $10 allocation to charity than men. Business major and practicing religion have the expected signs but are not significantly different from zero. Giving rises with income, but the only significant coefficient is that of income exceeding $500,000.

VI. Evidence on Social Image, Social Information, and Negotiation

In the second round of the experiment, pairs of students decided together on the amount to be donated; these decisions are provided in Table 4. The average amount given by the pairs is $11.52. However, the donations differ substantially depending on the gender composition of the pairs: mean giving for pairs with two men, two women, and a man and a woman are $8.17, $12.77, and $13.03 respectively.20 The mean gift of all male pairs is significantly smaller (at the 0.01 level) than the mean gift of all female and mixed-sex pairs. Mixed-sex pairs (40.6%) are significantly more likely (at the 0.01 level) to be perfect altruists than female only pairs (20.7%) and mixed gender pairs (16.7%). Similarly, 20.6% of male-only pairs are perfectly selfish, significantly more than the 7.7% of female-only and 6.3% of mixed-gender pairs who keep all of the money. From this evidence, it appears that men acting with men continue to behave more selfishly than women. However, when paired with women, men are willing to give more.

In order to understand more completely the social influences on an individual’s giving, we next

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20 These results are consistent with those of Dufwenberg and Muren (2006) who also find that mixed-sex groups are the most generous.
examine each individual’s giving as a member of the team and compare that to his or her anonymous giving in the first round of the experiment. Table 4 (rows 5, 6, and 7) provides the means and distributions of individual giving as a member of a pair. While women continue to be more generous than men, the mean of individual giving declines from $6.03 in the anonymous situation to $5.83 in the paired setting and average female giving falls from $7.07 to $6.59. The decline in female giving is not unexpected since the social information and negotiation effects will reduce giving by women in mixed-sex groups since men give on average less than women and these effects may swamp the social image effect. On the other hand, mean giving by men increases from $4.91 in the initial round to $5.01 in the second round, and the percentage of men acting as perfect altruists increases slightly. Men are expected to increase giving, especially in mixed-sex groups, since their female partner was probably more generous in the first round. Therefore, on average, the negotiation, the social information, and the social image effects all work to increase giving for men.

Table 5 gives evidence on the social image, social information, and negotiation effects. Looking at only those individuals whose partner gave a different amount in the first round individual giving, we calculate the percentage of less altruistic partners and more altruistic partners who increase, do not change, or decrease giving. For the total sample, the difference in behavior is striking; while 62.3% of the less altruistic partners increase giving, only 3.3% of the more altruistic people increase giving (row 1, columns 1 and 4). On the other hand, only 8.2% of the less altruistic decrease giving while 45.9% of the more altruistic decrease giving (row 1 columns 3 and 6). The changes in giving are similar for male and female sub-samples, although slightly more women than men who are less altruistic as individuals increase giving (65.4% compared to 60.0%) and slightly more men than women who are more altruistic decrease giving
These results are consistent with both social information and negotiation effects that move partners’ giving toward one another.

The social image effect would cause all participants to increase giving. For those initially more altruistic, we find only 3.3% increasing giving, suggesting that if there is a social image effect, it is dominated by the other two effects on giving for the more altruistic partner. For the less altruistic person, all three effects work to increase giving. The fact that many more of the less altruistic participants increase giving (62.3%) than the number of more altruistic that decrease giving (45.9%) provides evidence supporting the existence of a social image effect. In addition, the more altruistic participants are more likely to refuse to change giving (51%) than the less altruistic (29.5%). This evidence supports either greater influence of the more altruistic partner or the existence of a social image effect which counters the negotiation/social information effects for more altruistic partners.

Splitting up the sample according to the gender composition of the pairs provides further insight. Men in men-only groups (row 4) and women in women-only groups (row 5) are about equally likely to increase giving if less altruistic (column 1, 53 to 56%) and decrease giving if more altruistic (column 6, 53 to 61%). This movement toward one’s partner’s gift suggests there is little or no social image effect in same-sex pairs. However, in the mixed-sex groups, 73.1% of less altruistic members increase giving (row 6, column 1,) and only 30.8% of the more altruistic members decrease giving (row 6, column 6,). It appears that the social image effect is especially large in mixed-sex groups, where a large percentage of less altruistic partners increase giving while a low percentage of more altruistic partners decrease giving, thus causing average gifts to increase. These results imply that the social information and the bargaining effects together strongly influence partners with disparate gifts to move giving closer together, but the social image effect is primarily
found for mixed-sex pairs.

Splitting up the sample according to whether or not the members gave the same amount in the paired giving separates those influenced solely by the social information effect (those individuals who do not give the same amount in the paired giving) and those influenced by both the social information effect and the negotiation effect. In groups where a common gift is not given, 50.0% of the less altruistic partners (row 7, column 1) increase giving, and 22.2% of the more altruistic partners (row 7, column 6) decrease giving. Because the less altruistic individuals increase giving more often than the more altruistic decrease giving, some combination of the social image and social information effects are on display. However, in pairs that decide on a common gift so that negotiation effects are included, a much larger percentage of individuals move their gift towards their partner’s with 67.4% of less altruistic partners increasing giving (row 8, column 1) and 55.8% of more altruistic partners decreasing giving (row 8, column 6). These results reveal that negotiation effects are important since a larger percentage of people adjust giving toward their partners when a common gift is agreed upon. Bargaining is particularly effective in causing the more altruistic person to reduce giving, as 55.8% reduce giving when negotiation is included compared to 22.2% for social information only.

Table 6 examines team decisions in a way that incorporates both the percentages that adjust giving and the dollar amount of the change by categorizing individuals as to whether his or her joint gift was below, at, or above the Nash equilibrium, where the Nash equilibrium is the average of the individual and his or her partner’s first round gift. The individual’s team gift would be above the Nash equilibrium if there is a social image effect, if social information is more salient to those who gave less as an individual (“shame”), or if the more altruistic person has the greater influence in bargaining. Because the averages of the first round gifts are not all integers, we identify a match
with the Nash equilibrium if the individual’s gift is within $0.50 of the Nash equilibrium. In the total sample 14.8% give at the Nash equilibrium, and the remaining individuals are equally likely to give above (42.6%) as below (42.6%) the Nash equilibrium. This distribution suggests that social image does not play a large role in paired decision-making for the participants as a whole nor does the more altruistic partner have greater influence.

The results are quite different if we separate pairs by gender composition. Individuals in single sex groups are much more likely to give below the Nash equilibrium (47% for both men and women; rows 2 and 3, column 3) than above the Nash equilibrium (38.2% for men and 27.8% for women; rows 2 and 3, column 1), while individuals in mixed-sex groups have the highest probability of giving above the Nash (55.8%; row 4, column 1) and the lowest probability of giving below (36.5%; row 4, column 3). These results suggest that the social image effect is stronger and/or the more altruistic person has more influence in mixed-sex groups than in same-sex pairs.21

In order to determine whether males or females have more influence in these mixed-sex groups, we next compare the probability of men moving toward women’s gifts to the probability of women moving towards men’s gifts. According to Table 7, 57.7% of the men change giving toward women’s gifts and 52.9% of the women change giving towards their male partners (row 1). The average change for men is an increase of $1.78 and the average change for women is a reduction of $0.39. Row 2 reveals that the group gift is more likely to move towards the female gift (53.8%) than to the male gift (38.5%). Since women are more likely as individuals to give higher gifts than men, this effect can be the result of either greater female influence in social information/bargaining or a positive social image effect in mixed sex groups.

Continuing to investigate the gender impact on bargaining, we run a team giving equation

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21 Cason and Mui (1997) find that more pairs increased giving above the mean of individual giving than reduced giving below the mean, concluding this was evidence supporting the Social Comparison Theory. However, they do not separate groups by gender, so their result may have been driven by mixed-sex groups.
with team gift as the dependent variable and male first round gift and female first round gift as the explanatory variables. The sample is constrained to mixed-sex pairs whose members give different amounts in the first round, and we estimate the equation with OLS and then with tobits to address the truncation issues. The results are included in rows 3 and 4 of Table 7. For both the OLS and the tobit estimates, the coefficients on the effect of the male and female first round gifts are highly significant and very similar. In neither equation can we reject the hypothesis that the coefficients are equal (F=0.01 for the OLS equation and F=0.00 for the tobit equation). Therefore, we find no evidence that there is a gender bias in influence.\(^{22}\)

In Section III of the paper we derived a specification for individual giving in the team that allows estimation of the social image effect and the sum of the social information and bargaining effects.

\[
(g_2 - g_1) = s + (i + n)(p_1 - g_1) \quad (2)
\]

Therefore we can estimate the following equation:

\[
(g_2 - g_1)_i = a + b(p_1 - g_i)_i + e_i \quad (3)
\]

where the constant is the social image effect and the coefficient on the difference between individual giving decisions between the two partners is the sum of the social information and negotiation effects.

In testing the implicit constraint that the coefficient on \(g_1\) is equal to one (as represented in equation 1), we cannot reject the null at the 0.01 level (F=0.034) so we proceed to estimate

---

\(^{22}\) This result, which conflicts with that of Cason and Mui (1997) who found women to have greater influence, might seem strange since Tables 6 and 7 show that mixed-sex group giving does tend to move towards the more altruistic partner, which is often the woman. However the social image effect in these groups may be pushing team giving above the Nash equilibrium.
equation (3). Results from estimation on the full sample are presented in Table 8. The coefficient representing the sum of the social information and the bargaining effect is significant and positive at 0.302 (row 2, column 1), and there is a significant negative constant (row 1, column 1) implying a negative social image effect. This negative constant may be the result of other factors that offset any social image effect, such as an “already gave” effect which might reduce giving in the second round. Or it may be the result of pooling disparate groups.

Therefore, we separate the sample into three groups. The first group includes members of same-sex teams in which there is agreement on the final gift. Because the members agree on the final gift, we can only use half the sample since the second member of the group gives data that are a mirror of the data for the first. Therefore, we estimate the equation for the more altruistic members of each group. The coefficient on the difference between partner’s gift and own gift is the influence the less altruistic partner has on the more altruistic partner’s final gift. By construction, if we were to re-estimate the same equation for the less altruistic members, the coefficient on the difference between partner’s and own gift would be the influence of the more altruistic partner on the less altruistic partner’s gift. Since the final gift is the same, these coefficients add to one. Similarly, the constants for the social image effects will be equal for the two samples. Therefore we only present estimates for the sample of more altruistic members. Then we re-estimate the same equation for the more altruistic members of mixed-sex groups who agree on the final gift. Finally we estimate the equation for members of groups who do not agree

---

23 The sample is not really the full sample since in groups where members give the same team gift, the data from the two individuals are mirror images and cannot both be used. The full sample includes one member from each group where the group members give the same amount (the more altruistic member when initial giving is different) and both members from each group where members give different team gifts.
on the final gift. F-tests reveal that we can reject the hypothesis that the coefficients are equal across the three samples at the 0.01 level ($F = 24.6$). The results are presented in Table 8.

Row 1 of Table 8 presents the constants in the estimated equations for these three samples. The constant is negative, although not significant, in the same-sex groups (column 2) and in groups where there is no agreement on giving (column 3), implying that if there is a social image effect, it is not large enough to overcome some other pressure pushing second round giving down. In only the mixed-sex group (column 3) is the constant positive and significant. When an individual is paired with someone of the opposite sex, the social image is strong, with a point estimate of 1.24—more than a dollar.$^{24}$

According to row 2 of Table 8, in same-sex groups the less altruistic partner has a significant positive influence on the more altruistic member and the point estimate is 0.456 (column 2). However, we cannot reject the hypothesis that this point estimate is 0.5, implying equal influence for the more and less altruistic members of the group. This estimate of influence increases to 0.74 for mixed-sex groups (column 3), and we can reject the hypothesis that the coefficient is 0.5 at the 0.1 level (F-statistic equal to 2.9). Therefore for mixed-sex groups, the influence of the less altruistic individual is greater than the influence of the more altruistic individual. However, the positive social effect appears to dominate the social information/negotiation effects for mixed-sex pairs, causing overall team gifts to increase.

Within teams where partners do not agree, one’s partner has a significant but relatively small level of influence on one’s giving within a pair. This point estimate of 0.17 (column 4) represents the social information effect (since there is no negotiation effect for these

$^{24}$ Econometric tests (adding a dummy variable for sex to the equation 3 specification) reject the hypothesis that the social image effect differs for men and women. We also estimate the equation for the mixed-sex groups who agree on team giving but use only the males as our observations. In this specification the coefficient on the difference between partner and own gift is 0.52 implying a larger impact of women than men, but not significantly so. In this specification, the constant is positive although not significantly different from zero.
participants), and it is the same for the more altruistic and less altruistic partners. This point estimate reveals less partner influence than in any of the teams where negotiation is also present.25

Examination of giving in joint decision-making reveals that partner influence does impact giving in the team. Partner influence is largest in groups which agree to give the same amount in the team and much smaller in the groups where members do not agree, most likely because there is no negotiation effect. Negotiation within same-sex pairs results in close to equal influence of the two members while the less altruistic partner has more influence in the mixed-sex groups. Social image effects, if present, are masked by other forces in groups that do not agree and in same-sex groups. However in mixed-sex groups, the social image effect is significant, implying that both men and women value the signal of generosity more if it is sent to someone of the opposite sex than if it is sent to someone of the same sex.

VII. Conclusion

The dictator experiments provide evidence that women behave more altruistically than men in anonymous giving situations. Women gave an average of $7.07 (out of a possible $10.00) while men gave $4.91, a difference of 44%. In addition, women were significantly more likely than men to give all the money away and less likely to keep all of the money. The tobit analysis, which corrects for the truncation of the giving distribution and controls for major, religious practice, and income, estimates that women gave on average $2.95 more than men gave. Gender continues to be important in the second round when each individual is asked to donate as part of a two-person team.

25 In the teams that agree on a common gift, by construction the influence of the two partners sums to one. In same sex teams, each partner’s influence is roughly equal while in mixed sex teams the less altruistic partner has about three times the influence (0.74) of the more altruistic partner (0.26.) In the teams where a common gift is not agreed upon there is a big gap between team members’ giving as each member only moves about 17 percent of the way toward his or her partner’s gift.
Male-only pairs acted the most selfishly, giving $8.17, while women-only pairs donated $12.77, and mixed gender pairs gave $13.03.

Further evidence on altruistic behavior in social situations is provided by comparing an individual’s giving when paired with a partner to his or her anonymous giving. We identify three types of influence on giving when decisions are made with a partner: a social image effect, a social information effect, and a negotiation effect. The tendency for people to adjust their giving towards their partner’s giving reveals strong evidence of social information and/or negotiation; 62% of those who were less altruistic in individual giving increased giving and 46% of those who were more altruistic as individuals gave less in the team setting. Econometric estimates reveal that partner influence is higher in teams which agree on the final gift than in teams which do not. Furthermore this small but significant effect of partner influence in groups where there is no successful negotiations towards a common gift supports the existence of a social information effect.

Examining male and female influence on joint-giving decisions, we find that slightly more men change giving toward the woman’s gift (58%) than women change toward the man’s gift (53%) and giving by the pairs is closer to the woman’s gift in 54% of the groups and closer to the male gift in 39% of the groups. However, the econometric results fail to reject the hypothesis that men and women have equal influence on determining the paired gift.

The social image effect appears to be important only in mixed-sex pairs, where 73% of the less altruistic partners increased giving while 31% of the more altruistic partners decreased giving. For same sex pairs the percentage of less altruistic members and more altruistic members who adjust giving towards their partners is much more symmetric. In addition, mixed-sex pairs more often give above the Nash equilibrium while this does not occur for same-sex pairs. Econometric estimates also reveal a social image effect only for mixed-sex pairs, and the
magnitude of the effect on the final gift, which does not differ for men and women, is more than a dollar. Therefore mixed-sex groups tend to give more than the sum of each member’s individual gift. The positive social effect on giving augments the positive effects of negotiation and social information for the less altruistic partner (usually the male) and offsets the reduction in giving by the more altruistic partner (usually the female) in response to negotiation or social information.

As in all laboratory experiments, the conclusions are limited to the population from which the sample is selected. Furthermore, giving behavior may be affected because the participants are allocating money they have been paid rather than using money from their wallets. However, since all participants are in the same situation, we can measure differences in behavior among groups of people and, as such, our results are important building blocks in the growing experimental literature on gender differences in altruistic behavior.

In conclusion, the results of our dictator experiments suggest that women are more altruistic than men when making anonymous donation decisions, and mixed-sex groups are more generous than same-sex groups. While there is strong evidence for both social information and negotiation effects on joint-giving decisions, the social image effect is present only for mixed-sex pairs, suggesting that the value of social signals is greater when one’s partner is the opposite sex. We conclude that men and women act more altruistically when in the presence of someone of the opposite sex suggesting that increased participation of women in economic affairs may lead people to behave more altruistically.
References


Charness, Gary and U. Gneezy (2000). “What’s in a name? Anonymity and Social Distance in Dictator and Ultimatum Games.” Unpublished manuscript, University of California, Santa Barbara and University of Chicago Graduate School of Business.


Croson, Rachel and Uri Gneezy (2004). ‘Gender Differences in Preferences.’ mimeo, University of Pennsylvania


Table 1
Mean and Distribution of Anonymous Individual Giving

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean Gift</th>
<th>Perfect Selfishness (Gave $0)</th>
<th>Perfect Altruist (Gave $10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>162</td>
<td>$6.03</td>
<td>8.6% (n=14)</td>
<td>40.1% (n=65)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>78</td>
<td>$4.91**</td>
<td>15.4%</td>
<td>28.2%</td>
</tr>
<tr>
<td>Women</td>
<td>84</td>
<td>$7.07**</td>
<td>2.4%</td>
<td>50.6%</td>
</tr>
</tbody>
</table>

\(^a\) In Chi-square test with H\(_0\): distribution of altruism types is the same for both groups, H\(_0\) is rejected at 0.01 significance level.

\(^\ast\) Difference between group means statistically significant at 0.01 level
**Table 2**  
Mean and Distribution of Anonymous Individual Giving  
By Gender and other Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Mean Gift (n)</th>
<th>Mean Gift Men (n)</th>
<th>Mean Gift Women (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>$6.03 (162)</td>
<td>$4.91# (78)</td>
<td>$7.07 (84)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practicing</td>
<td>$6.55 (53)</td>
<td>$5.04# (25)</td>
<td>$7.89 (28)</td>
</tr>
<tr>
<td>Not practicing</td>
<td>$5.78 (109)</td>
<td>$4.85# (53)</td>
<td>$6.66 (56)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jewish</td>
<td>$7.16 (25)</td>
<td>$7.11 (9)</td>
<td>$7.19 (16)</td>
</tr>
<tr>
<td>Catholic</td>
<td>$5.93 (40)</td>
<td>$4.74# (19)</td>
<td>$7.00 (21)</td>
</tr>
<tr>
<td>Other Christian</td>
<td>$6.60 (25)</td>
<td>$5.64 (14)</td>
<td>$7.82 (11)</td>
</tr>
<tr>
<td>Other</td>
<td>$5.44 (16)</td>
<td>$4.00 (9)</td>
<td>$7.29 (7)</td>
</tr>
<tr>
<td>None</td>
<td>$5.52 (56)</td>
<td>$4.22# (27)</td>
<td>$6.72 (29)</td>
</tr>
<tr>
<td>Major</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>$4.86* (35)</td>
<td>$4.36 (26)</td>
<td>$6.33 (9)</td>
</tr>
<tr>
<td>Other</td>
<td>$6.35 (127)</td>
<td>$5.19# (52)</td>
<td>$7.16 (75)</td>
</tr>
<tr>
<td>Family Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$60,000</td>
<td>$5.28* (25)</td>
<td>$5.46 (13)</td>
<td>$5.08 (12)</td>
</tr>
<tr>
<td>$60,000 - $150,000</td>
<td>$5.83 (64)</td>
<td>$4.89# (35)</td>
<td>$6.97 (29)</td>
</tr>
<tr>
<td>$150,000 - $500,000</td>
<td>$5.86 (49)</td>
<td>$4.64# (22)</td>
<td>$6.85 (27)</td>
</tr>
<tr>
<td>&gt;$500,000</td>
<td>$8.83 (12)</td>
<td>$5.50# (2)</td>
<td>$9.50 (10)</td>
</tr>
</tbody>
</table>

* Difference between group means is statistically significant at the 0.05 level.  
# Difference between male mean and female mean for individuals with specified characteristic is statistically significant at the 0.05 level.
Table 3
Tobit Estimates of Anonymous Individual Giving
(standard errors in parentheses)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>2.95**</td>
<td>(1.15)</td>
</tr>
<tr>
<td>Business Major</td>
<td>-1.63</td>
<td>(1.39)</td>
</tr>
<tr>
<td>Practice Religion</td>
<td>1.13</td>
<td>(1.21)</td>
</tr>
<tr>
<td>Income $ 60,000-$150,000</td>
<td>1.18</td>
<td>(1.55)</td>
</tr>
<tr>
<td>Income $150,000 - $500,000</td>
<td>0.92</td>
<td>(1.61)</td>
</tr>
<tr>
<td>Income over $500,000</td>
<td>7.70**</td>
<td>(2.89)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.61**</td>
<td>(1.53)</td>
</tr>
<tr>
<td>Sample size</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>22.70</td>
<td></td>
</tr>
<tr>
<td>$p &gt; \chi^2$</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

** Coefficient is significantly different from zero at the 1% level.
Table 4
Mean and Distribution of Giving
When Decisions Were Made by Pairs of Students

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean Gift</th>
<th>Perfect Selfishness (Gave $0)</th>
<th>Perfect Altruist (Gave $10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Team Giving:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. All teams</td>
<td>81</td>
<td>$11.52</td>
<td>11.0%</td>
<td>29.3%</td>
</tr>
<tr>
<td>2. Male Teams</td>
<td>23</td>
<td>$8.17</td>
<td>20.6%</td>
<td>16.7%</td>
</tr>
<tr>
<td>3. Female Teams</td>
<td>26</td>
<td>$12.77</td>
<td>7.7%</td>
<td>20.7%</td>
</tr>
<tr>
<td>4. Female-Male Teams</td>
<td>32</td>
<td>$13.03</td>
<td>6.3%</td>
<td>40.6%</td>
</tr>
<tr>
<td>5. Giving by Each Individual in the Pair</td>
<td>162</td>
<td>$5.83</td>
<td>13.6%</td>
<td>36.4%</td>
</tr>
<tr>
<td>Gender d</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Men</td>
<td>78</td>
<td>$5.01**</td>
<td>18.0%</td>
<td>30.8%</td>
</tr>
<tr>
<td>7. Women</td>
<td>84</td>
<td>$6.59</td>
<td>9.5%</td>
<td>41.7%</td>
</tr>
</tbody>
</table>

a The mean gifts of the male teams are significantly lower than the mean gifts for the female teams and the mixed teams at the 0.01 level.
b The probability of being totally selfish is significantly higher for male teams than for all female teams and for mixed teams at the 0.01 level. However there is no significant difference in the probability of being selfish for the mixed and all female teams.
c The probability of being totally altruistic is significantly higher for mixed teams than for all male teams at the 0.01 level. However there is no significant difference in the probability of being altruistic for the mixed and all female teams and for the all female and all male teams.
d In Chi-square test with H₀: distribution of altruism types is the same for both groups, H₀ is rejected at .01 significance level.
**Difference between male and female means is statistically significant at .01 level.
Table 5
Percentages of Participants Who Increase, Do Not Change, or Decrease Giving in Joint Decisionsa

<table>
<thead>
<tr>
<th>Less Altruistic Person in Individual Giving</th>
<th>More Altruistic Person in Individual Giving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase Giving (1)</td>
<td>No Change (2)</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>1. All Pairs</td>
<td>62.3%</td>
</tr>
<tr>
<td>2. Men</td>
<td>60.0%</td>
</tr>
<tr>
<td>3. Women</td>
<td>65.4%</td>
</tr>
<tr>
<td>4. Male-Male</td>
<td>52.9%</td>
</tr>
<tr>
<td>5. Female-Female</td>
<td>55.5%</td>
</tr>
<tr>
<td>6. Female-Male</td>
<td>73.1%</td>
</tr>
</tbody>
</table>

7. Social Information: Members give different amounts in pairs
| Percentage | 50.0% | 38.9% | 11.1% | 11.1% | 66.7% | 22.2% |

8. Negotiation: Members give same amounts in pairs
| Percentage | 67.4% | 25.6% | 7.0% | 2.33% | 41.9% | 55.8%** |

a Sample includes individuals who gave different first round gifts from their partners.
* Statistic for mixed-sex group is significantly different from statistic for same sex groups at the 0.05 level.
** Statistic for negotiation sample is significantly different from statistic for social information sample at the 0.05 level.

Table 6
Relation of Individual Giving to Nash Equilibrium

<table>
<thead>
<tr>
<th>Percentage of Individuals whose:</th>
<th>Paired Giving is Above Nash (1)</th>
<th>Paired Giving is at Nash (2)</th>
<th>Paired Giving is Below Nash (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All Pairs</td>
<td>42.6%</td>
<td>14.8%</td>
<td>42.6</td>
</tr>
<tr>
<td>2. Male-Male</td>
<td>38.2%</td>
<td>14.7%</td>
<td>47.1</td>
</tr>
<tr>
<td>3. Female-Female</td>
<td>27.8%</td>
<td>25.0%</td>
<td>47.2</td>
</tr>
<tr>
<td>4. Female-Male</td>
<td>55.8%</td>
<td>7.7%</td>
<td>36.5</td>
</tr>
</tbody>
</table>

a Sample includes individuals who gave different first round gifts from their partners.
### Table 7
**Gender Influence on Giving**

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage That Change Giving Toward Woman’s</td>
<td>Average Dollar Change</td>
</tr>
<tr>
<td>1. Female-Male Pairs</td>
<td>57.7%</td>
<td>$1.78</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>% Pairs Closer to Male Individual Gift</th>
<th>% Pairs At Nash</th>
<th>% Pairs Closer to Female Individual Gift</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Female-Male Pairs</td>
<td>38.5%</td>
<td>7.7%</td>
<td>53.8%</td>
</tr>
</tbody>
</table>

Coefficient on male first round gift and female first round gift in team giving equation (Dependent variable is team donation.)

<table>
<thead>
<tr>
<th></th>
<th>OLS Estimates</th>
<th>Tobit Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Male</td>
<td>1.162***</td>
<td>1.756***</td>
</tr>
<tr>
<td></td>
<td>(0.353)</td>
<td>(0.580)</td>
</tr>
<tr>
<td>4. Female</td>
<td>1.205***</td>
<td>1.759***</td>
</tr>
<tr>
<td></td>
<td>(0.371)</td>
<td>(0.593)</td>
</tr>
</tbody>
</table>

* Sample includes individuals who gave different first round gifts from their partners.
*** Coefficient is significantly different from zero at the 0.01 level.

### Table 8
**OLS Estimations of Change in Giving Equations**

**Dependent variable is Change in Giving from the Individual to the Team Round**

(standard errors in parentheses)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full Sample (1)</th>
<th>Same-sex teams (2)</th>
<th>Mixed-sex teams (2)</th>
<th>All teams (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Constant</td>
<td>-0.671**</td>
<td>-0.431</td>
<td>1.241*</td>
<td>-0.579</td>
</tr>
<tr>
<td></td>
<td>0.282 (0.353)</td>
<td>(0.353)</td>
<td>(0.755)</td>
<td>(0.504)</td>
</tr>
<tr>
<td>2. Partner Gift Minus Own gift</td>
<td>0.302***</td>
<td>0.456***</td>
<td>0.743***</td>
<td>0.170**</td>
</tr>
<tr>
<td></td>
<td>(0.055)</td>
<td>(0.089)</td>
<td>(0.144)</td>
<td>(0.084)</td>
</tr>
<tr>
<td>3. $R^2$</td>
<td>0.236</td>
<td>0.431</td>
<td>0.538</td>
<td>0.077</td>
</tr>
<tr>
<td></td>
<td>(100)</td>
<td>(37)</td>
<td>(25)</td>
<td>(38)</td>
</tr>
</tbody>
</table>

* Coefficient is significant at the 0.10 level.
** Coefficient is significant at the 0.05 level.
*** Coefficient is significant at the 0.01 level.
Appendix A

Experiment Instructions

Hello – I’m Professor _________ and I’ll be leading our experiment today. This is a very simple and quick experiment. It should not take more than 20 minutes. You will be paid for participating, as is usual for most academic research experiments. Your participation is entirely voluntary and you may leave if you do not want to participate.

Round 1: Professor __________ is passing out unmarked envelopes. Each envelope contains a large sheet of paper folded around 10 one-dollar bills. This money is your payment for participating in the experiment. You will have earned it for the time you have spent in the experiment. It now belongs to you. We are going to give you the choice of keeping some or all of this money and donating some or all of this money to the Red Cross. The Red Cross is a non-profit organization that provides disaster relief (such as floods or earthquakes) and other programs. We pledge to send all the money you decide to donate to the Red Cross and will notify your professor of the total amount given.

Your instructions for the experiment are the following: You are to leave the classroom taking your envelope and a pen with you. Walk far enough away to find a spot where you are alone and no one can see what you are doing. Decide how much, if any, of the $10 you want to keep and how much, if any, of the $10 you want to give to the Red Cross. Chose a code word. This can be any word from the English language. Answer the questions on the sheet of paper. Be sure to include your code word. Your choice will be entirely anonymous; no one will have any way of knowing what you decide to do. No one will ask you to reveal your code word. This is solely for purposes of the analysis of the experiment. Wrap any dollars you want to give to the Red Cross in the sheet of paper. Try to do this privately so that others cannot see what you are choosing to do. Place this in the envelope and seal it. Do not write anything on the outside of the envelope – this is to be totally anonymous. You may keep the remaining dollars, if any. Try to do this within three minutes and return to the room. Drop the sealed envelope in the box by the door and return to your seat.

Round two: (Students are randomly assigned a partner by the experimenter.) In this round of the experiment, you will be leaving the room with your partner. Please take a pen with you. As you leave the room, Professor _________ will hand you an unmarked envelope. Each envelope contains two sheets of paper folded around 20 one-dollar bills. This money is your payment for participating in the second round of the experiment. You will have earned it for the time you spend in the experiment. This money now belongs to you and your partner. Leave the room and walk far enough away to find a spot where no one other than your partner can see what you are doing. You and your partner will decide how much, if any, of the $20 you want to keep and how much, if any, of the $20 you want to give to the Red Cross. Your choices will be entirely anonymous. No one other than your partner will have any way of knowing what you decide to do. Each student should individually answer the questions on one of the sheets of paper – please be sure to write down the same code word you used in the first round. No one will ask you to reveal your code word. Wrap any dollars you want to give to the Red Cross in the two sheets of paper.
paper. Try to do this privately so others cannot see what you are choosing to do. Place this in the envelope and seal it. Do not write on the outside of the envelope. You may keep the remaining dollars, if any. You and your partner can decide how to divide any remaining dollars. Return to the room and drop the envelope in the box by the door and return to your seat. Try to do this in three minutes.

Final questionnaire: As you return to your seat, Professor ______ is handing you a questionnaire. When you have completed it, fold it up and drop it in the box. Be sure to include the same code word you used in the previous rounds of the experiment. Thank you for your willingness to participate in this experiment.
Appendix B
Exit Questionnaire

CODE WORD ______________________________

1. Major (declared or planned) _________________________________

2. Gender:
   Male ______
   Female _____
3. Gender of your partner in this game
   Male ______
   Female _____

4. How well did you know your partner before today?

   1  2  3  4  5
   Not at all Slightly Have had Friends Good friends
   Conversations

5. What religion do you consider yourself?

   Religion _________________ None _________________
   Practicing _________________ Non-Practicing _________________

6. Circle your family's annual income:

   1. Under $20,000  6. $100,000 - $150,000
   2. $20,000 - $40,000  7. $150,000 - $200,000
   3. $40,000 - $60,000  8. $200,000 - $500,000
   4. $60,000 - $80,000  9. Over $500,000
   5. $80,000 - $100,000

7. Amount you gave to the Red Cross in the first round _________________

8. Total amount you and your partner gave to Red Cross in the second round ___________

9. How much did you keep in the second round? _________________
   How much did your partner keep in the second round? _________________

10. In deciding on the amount to donate, who had the most influence on the decision?

    1  2  3  4  5
    Partner had Partner had Equal I had a I had a
    a lot more a little more Decision little more lot more influence
    influence influence influence influence