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An experimental test for gender differences in beneficent behavior

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Abstract

We examine data from a laboratory test in which each subject is given the task of dividing a sum of money between him-or-herself and one other. We find no evidence for gender differences in generosity.

Keywords: Experimental economics; Gender; Dictator game

JEL classification: C91

1. Introduction

Do women exhibit more or less concern for others than do men, or is there no difference? Put succinctly, are there gender differences in *beneficent behavior*? We examine relevant evidence gathered from laboratory play of *the dictator game*, in which an individual (the dictator) must decide how to distribute a sum of money between him-or-herself and one other (the recipient). The amount of money allocated to the recipient provides a measure of the dictator's beneficence.[1]

Gender differences have long been of interest to a broad array of social and biological scientists. Beneficent behavior is an aspect of gender study that falls within the economist's domain. Specifically, questions about the nature of beneficent behavior lie at the foundation of

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[1] There is considerable debate as to whether or not seemingly beneficent behavior is a manifestation of self-interest. We do not pursue this issue here. Instead, as with much of the literature on charitable giving and public goods (see, for example, Andreoni, 1990), we conceive of individuals as having preferences over, and distributing their income between, two independent entities: self-interest (one's own consumption) and beneficence (contributions to another's consumption).

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the studies of charitable giving and the provision of public goods (see, for example, Andreoni, 1990).

Our test also contributes to the study of an important issue in laboratory methodology. Few experimental economics studies presently control for gender differences, probably because to date there is little evidence on whether gender matters in the economics laboratory. In contrast, other experimental disciplines (for example, medicine and psychology) have long known of, and consequently control for, gender. It would seem prudent for experimental economists to explore the issue. The beneficence question is a natural place to begin studying because it concerns a feature inherent to virtually all experimental economics designs. Specifically, in the economist's laboratory, subjects typically confront situations in which they are motivated towards self-interested behavior by real economic – usually monetary – incentives, but where satisfying one's self-interest also implies a lesser allocation for other subjects. One can interpret our study as a test of whether, in such a situation, men and women show the same inclination toward self-interested behavior. The dictator game provides a particularly sharp test because the subject in the dictator role unilaterally decides how to allocate the resource between self-interest and beneficence. There are no strategic considerations that might otherwise confound our interpretation of the observed response to the monetary incentive.

To date, there have been only a few experimental economics studies dealing substantially with gender issues,[2] and these have had a somewhat different focus than the present study. Brown-Kruse and Hummels (1993) find that all-male groups play a public goods contribution game more cooperatively than do all-female groups. Eckel and Grossman (1994) find subtle differences in ultimatum game bargaining behavior when subjects know the gender of the person with whom they are bargaining. In addition, there have been several (non-gender-related) studies of the dictator game. These are surveyed in Bolton et al. (forthcoming).

2. Experimental design and method

Our data are drawn from a much larger study of the dictator game, one that had several goals beyond the study of gender differences. The relevant treatments are outlined in Fig. 1. (There were other treatments in the larger study, but they involved modifications of the dictator game that render the resulting data inappropriate for our present study.) The treatment variables were division choices available per game ('2Card' or '6Card') and the number of games played ('10Game' or '1Game'). In the 1Game treatment, each dictator played a single game in which he or she allocated \$10. In the 10Game treatments, each dictator played ten games simultaneously, and allocated \$1 per game. So in all treatments a dictator allocated a total of \$10.

For each session, subjects were assembled in a single room. Written directions described the dictator game as a 'game', concerning 'Player A' and 'Player B', in which Player A chooses a

[2] In contrast, there are a fair number of studies in the experimental psychology literature. Methodological differences, however, impede comparison with studies in experimental economics. Brown-Kruse and Hummels (1993) provide references to, along with a critique of, the relevant psychology literature.

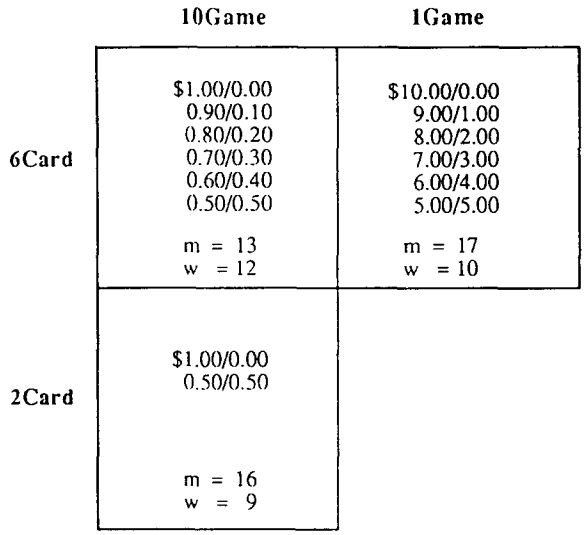

Fig. 1. Player A's choices represented by $\$x/y$ = Player A receives $\$x$ while Player B receives $\$y$; m = number of male dictator subjects, w = number of female dictator subjects.

card indicating how the money is to be divided. Actual card choices depended on the treatment (see Fig. 1). After the monitor read the directions aloud and answered any questions, subjects were randomly divided into equal numbers of Players A and B. Players B were escorted to a second room. Players A then made their choices at private cubicles. Once selections were complete, all players were paid their earnings in cash. Games were anonymous in the sense that matched Player As and Bs did not know one another's identity.

All subjects were students at Penn State University, and were recruited through billboards posted around campus. Participation required appearing at a special time and place. Cash was the only incentive offered. Each subject participated in a single treatment, and was paid a $5 participation fee plus all earnings from games played.

3. Results

Fig. 1 provides a classification of the number of observations by treatment and gender. From each treatment, we obtained distributions over the *total* gift left to recipient(s) by each dictator; one distribution for male dictator subjects, one for female dictator subjects.

We first test for a gender effect within each individual treatment. This is done in two ways. First, we look for a locational difference – location being an evident summary measure of generosity. Rank correlation tests (see Kendall and Gibbons, 1990) yield one tail p-values of 0.467 for 1Game–6Card, 0.269 for 10Game–6Card, and 0.508 for 10Game–2Card.[3] Therefore, there is no evidence for a locational difference between male and female distributions

[3] All p-values reported for both χ^2 and rank correlation tests are the averages of five 20,000 trial samplings of the actual distribution associated with the test statistic. This technique provides a more accurate p-value than could be obtained from table approximations of the statistic's distribution.

within any of the three treatments. Second, in order to determine whether there are any general differences between the distributions, we perform a χ^2 contingency table test. The resulting p-values are 0.643 for 1Game–6Card, 0.747 for 10Game–6Card, and 0.527 for 10Game–2Card. So by either test, there is evidence for a gender effect on dictator-giving within any of the three treatments.

Pooling the data would allow for tests with greater power, and is appropriate if there is no treatment effect. We therefore test the hypothesis that the distribution of male (female) dictator-giving is the same across treatments; that is, for each gender, we test for a treatment effect on total dictator-giving. Note that dictators in the 10Game treatments could give non-whole dollar amounts, whereas dictators in the 1Game treatment were constrained to giving whole dollar amounts. Here we take advantage of a finding reported by Bolton et al. (forthcoming): when confronted with a choice of leaving more or less than they would freely choose, dictators choose less. In accordance, we round non-whole dollar (total) gifts down to the nearest dollar. A χ^2 contingency table test on the resulting distributions finds no evidence for differences across either the male or female distributions at any standard level of significance (p-value of 0.949 for male distributions and 0.200 for female distributions). We therefore pool the male (female) distributions across treatments.[4] The pooled distributions are displayed in Fig. 2.

A rank correlation test on the pooled distributions yields a p-value of 0.399. Larger sample sizes permit a meaningful test for a difference in the average amount of giving – an alternative approach to looking for a locational difference. Average giving for men and women was \$1.13 and \$1.23, respectively. A z-test of the hypothesis that the two averages are equal yields a one tail p-value of 0.363. So neither location test yields evidence for a difference between the two distributions. In addition, a χ^2 contingency table test results in a p-value of 0.896. So even when the data is pooled across treatments, there is no evidence for a gender effect on dictator-giving.

Finally, we reconsider the 10Game–6Card data, this time treating each game played as an

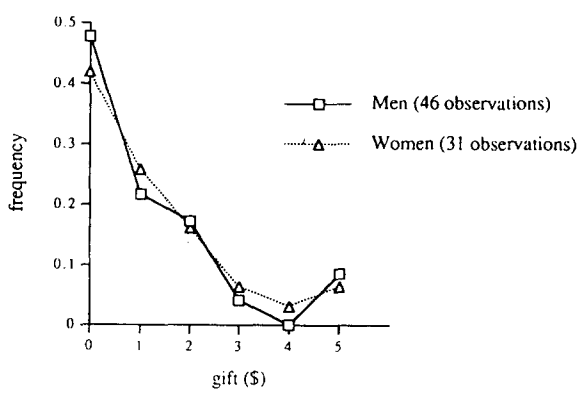

Fig. 2. Dictator-giving by gender: amount left for recipients (pooled data).

[4] Even if we ignore gender and aggregate across all dictators, there is no evidence for a treatment effect (p-value of 0.458).

independent observation. Under this (perhaps heroic) assumption of independence, we have 130 male observations and 120 female observations. We again test for differences in giving distributions, keeping in mind that a null hypothesis rejection may simply indicate a bad independence assumption. A rank correlation test yields a p-value of 0.429. Average giving per game was \$0.125 for men and \$0.138 for women. A z-test of the hypothesis that the two averages are equal yields a one tail p-value of 0.239. A χ^2 contingency table test results in a p-value of 0.488. So again there is no evidence for a gender effect.

4. Discussion

The dictator games we examine were conducted under the player–player anonymity condition typical of many experimental economics studies; that is, players did not know the identity of their playing partners; although, given that subjects for a session were initially all gathered in one room, players could observe the pool from which their partners were drawn. Our results are therefore reassuring (methodologically speaking) in the sense that, under typical experimental conditions, gender does not appear to influence the outcome.

The two experimental economics studies cited in the introduction both report gender effects. We, however, find no effect even though our pooled sample size is somewhat larger than that for either of the other two studies. One possible explanation has to do with the fact that the different studies involved different games. So, for example, men and women might differ in how they bargain, but nevertheless not differ in generosity. Another possible explanation begins with the observation that the other studies report differences when subjects *know* the gender of their playing partners. In contrast, dictators in our study could not know the gender of their recipients because the pool from which the recipients were drawn included both men and women. Perhaps, then, the differing results can be attributed to differences in subject knowledge of the gender of the other players. One potential reason for why this information might make a difference would be that, while the preferences that pertain to these games do not differ across genders, individuals nevertheless think that they do.

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