Altruism, Fairness and Social Intelligence: Are Economists Different?\(^1\)

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ABSTRACT

This thesis employs “The Ultimatum Game” followed by “The Dictator Game” to examine different conceptions of altruism, fairness and social intelligence held by economics versus non-economics majors at Stanford University. Moreover, the study separates students within each group by amount of economics courses in order to discern between hypotheses of selection and of learning.

\(^1\) I would like to thank URO for the $1500 grant that funded this research. I also wish to thank Geoffrey Rothwell for his guidance and above all, my advisor, Antonio Rangel, for his extended time and efforts, without which this thesis would not have been possible.
1. Introduction

Economics distinguishes itself from other social sciences in generally assuming that individuals possess somewhat stable, well-defined preferences from which they base rational choices. In addition, many economic models are built on the belief that individuals are solely motivated by self-interest. Indeed, the relatively small role of fairness considerations in standard economic theory remains one of the most striking contrasts between economics and other social science disciplines.

Why do such fundamentally different views of human nature exist between disciplines? One potential explanation is that academic economists themselves are different in the sense that they behave differently in situations involving social cooperation. If this can be shown to be the case, a natural follow-up question is whether this distinction is due to self-selection or to training.

This paper employs a novel experimental design to study these two questions, testing differences between economists and non-economists in the Ultimatum and Dictator Games. Having subjects play both games is the key innovation of this design, allowing one to separate altruism and fairness from strategy.

2. Related Literature

This is not the first paper to study these questions. Studies by Marwell and Ames (1981) found economists more prone to free-ride, less inclined to donate to charities and general public funds, and more likely to defect in prisoner’s dilemma experiments. Their first experiment called for private contributions to public goods. Subjects were given equal initial endowments of money, which they then allocated into “private” and “public” accounts. Money deposited in the private account was returned to the subject dollar-for-dollar, while money deposited in the public account was pooled, multiplied by a factor greater than one, and distributed equally among all subjects. In this design, the socially optimal allocation is for all subjects to put their entire endowments in the public account, while the individually optimal allocation is to put everything into one’s private account. On average, economics students contributed 20% to the public account, while all other subjects contributed substantially more at 49%. The second experiment of Marwell and Ames (1981) consisted of a one-shot prisoner’s dilemma game and similarly revealed
economists to be more self-interested. Out of a total of 267 games (534 choices between cooperation and defection), the defection rate was 60.4% for economics majors versus 38.8% for non-economics majors.

While the majority of experiments find economists to be more self-interested, not all do. Results from the Ultimatum Game run at Hendrix College by Stanley and Tran (1998) indicated that economics majors are actually less motivated by self-interest than are other students. In their lost-envelope experiment, Yezer, Goldfarb and Poppen (1996) found cash-filled envelopes marginally more likely to be returned when left in economics (v. non-economics) classrooms.

Aside from the question of whether economists are different, few studies have invested why, differentiating between selection and learning. One exception is Carter and Irons (1991). In their study of behavior in the Ultimatum Game, the authors first examined differences between economists and non-economists and then discriminated between selection and learning hypotheses. The authors recruited students from four general groups: 1) freshman non-economists, 2) freshman economists, 3) senior non- economics majors, and 4) senior economics majors. Overall, economists offered on average $3.85, versus $4.66 for non-economists. Economists also demonstrated a lesser concern for fairness than non-economics students: on average accepting $1.70, versus $2.44 for non-economists. Carter and Irons then employed regression analysis\(^2\) first to confirm the found difference between economists and non-economists was significant and second, to distinguish between selection and learning hypotheses. The authors used the coefficient on the economist dummy variable to reflect the effect of self-selection and the coefficient on the senior economist dummy variable to reflect the effect of learning. Carter and Irons found their data failed to support the learning hypothesis, summarizing that economists are different, but are already so when they begin their area of study and that economic study does not augment this initial difference.

Overall, while this is not the first paper to address the question of whether economists are different, it contributes to related literature via its novel experimental design, thereby differentiating between fairness and strategy and furthermore, utilizing

\(^2\) Regression analysis was not employed in this paper because the assumption of linearity was not appropriate for generated data.
results to comment upon the social intelligence and rationality of economics versus non-economics majors.

3. Experimental Design

170 Stanford students participated in the study. Subjects were randomly assigned into pairs, each consisting of a Player 1 and Player 2. Students were connected to their pairs by number (written beforehand on each subject’s form). In all cases, pairings were anonymous, so that each subject never knew the identity of the other player in the pair. Each individual played a one-shot Ultimatum Game, followed by a one-shot Dictator Game with the same anonymous partner. Decisions were made by filling out an experimental form included in the appendix.

The form for Player 1s described that they were given $10 to split between themselves and an anonymous (but already selected) other, explaining that if the other accepted the offer, Player 1 kept the remainder, but if the offer was rejected, neither received any money. The survey then asked Player 1s how much of the $10 he/she would offer and then listed amounts from which to choose, with figures increasing from $0 to $10 in one dollar increments. Part Two of the questionnaire for Player 1 expressed that he/she was again given $10 to split between himself/herself and the same anonymous Player 2, but that this time, the opponent no longer possessed the opportunity to accept/reject. Player 1s were asked how much of the $10 he/she would give this person in this second scenario. After playing both the Ultimatum and Dictator Games, Player 1s were asked to see the reverse side of the questionnaire for a few follow-up questions, including how/why he/she made both his/her first and second decisions, why the offers were different/same, if he/she had taken a course in economics (and if so, to circle all the courses taken out of a comprehensive list of Stanford economics classes), if he/she was an economics majors, and lastly, his/her class.

The questionnaire for Player 2s explained the opposite side of the scenario – that an anonymous other was given $10 to split between himself/herself and him/her and if he/she accepted the amount offered, the other kept the remainder, while if he/she rejected, neither received any money. After these basic rules were explained, the survey then asked Player 2s to circle the least amount of money he/she would accept, (with amounts ranging
from $0 to $10 in increasing dollar increments). As with Player 1s, after completing the Ultimatum Game, Player 2s were then asked to see the flip side of the survey for the same follow-up questions. Player 2s were not informed of the Dictator Game, but received the money, so as to make the game an actual and not simply an experimental one.

At the conclusion of the experiment (of five sessions, each of approximately 30 individuals), subjects submitted their surveys and payments were distributed according to their decisions. Throughout the game, no discussion was permitted between students.

In recruiting subjects for my experiment, I sought out locales, such as dining or lecture halls, which contained a large and varied sample of students and then asked individuals if they would participate in an experimental economic study. Without exception, all 170 Stanford students agreed to partake. Within each of these subgroups both gender and class balance were maintained by keeping a running tally of males and females and persons of each year within each group and at times seeking out one gender or year to participate if the other began to significantly lead in count. Due to all’s acceptance to participate and the similar age and gender distribution of the two groups, there is no reason to believe selection differed for economics versus non-economics pools.

Having subjects play both the Dictator and Ultimatum Games allows us to identify different motives of Player 1s. Suppose Player 1 offers half in the Ultimatum Game, is it due to fear of rejection or to fairness? (If due to strategy, the offer ought fall in the subsequent Dictator Game, but if caused by altruism, the allocation should remain relatively unchanged.)

4. Results

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3 I know this may sound surprising, but it was indeed the case.
4 For both Dictator and Ultimatum Games, results are shown by dividing data by 1) economics v. non-economics majors, 2) students with an economics class v. without, and 3) individual s with varying numbers of economics classes. As shown, these three different cuts in the data lead to similar results, emphasizing the robustness of data. Furthermore, economics and non-economics pools are then separated and within each group individuals are then divided by number of economics courses taken. This second set of graphs permits commentary on selection v. training hypotheses.
4a. Offers in DG, Figure 1

**Behavior in Dictator Game: Econ v. Non-Econ**

- **Fractions of Offers** vs **Offer Amount**
- **Econ (N=24)**
- **Non-Econ (N=61)**

**Behavior in Dictator Game: Class v. No Class**

- **Fractions of Offers** vs **Offer Amount**
- **Econ Class (N=46)**
- **No Econ Class (N=39)**

**Behavior in DG: by # of Classes**

- **Fractions of Offers** vs **Offer Amount**
- **1 Class (N=17)**
- **2-6 Classes (N=16)**
- **7+ Classes (N=13)**
4a. Offers in DG, Figure 2

As figure 1 (4a) reveals, students without economics are far more likely to be fair and split the money equally, while those with an economics background remain much more likely to offer nothing. Figure 2 (4a) demonstrates that for economics majors, training causes offers to become less fair, with individuals with more classes, more likely to offer nothing and less likely to offer half. (The effect of training remains less clear for non-economics majors.)
4b. Rejection in UG, Figure 1

**Rejection in UG: Econ v. Non-Econ**

<table>
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<th>Non-Econ (N=65)</th>
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**Rejection in UG: Class v. No Class**

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<th>Fraction of Offers</th>
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<th>No Econ Class (N=43)</th>
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**Rejection in UG: by # of Classes**

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<th>Offer Amount</th>
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<th>2-6 Classes (N=13)</th>
<th>7+ Classes (N=14)</th>
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As figure 1 (4b) demonstrates, students with economics have lower rejection rates than those without. As depicted in figure 2 (4b) training causes the rejection rates of economics majors to fall further. (The effect of training for non-economics majors remains less explicit.)
4c. Spite v. Fairness, Figure 1

Figure 1 (4c) portrays the distribution of offers in the Dictator Game (a measure of fairness) and the distribution of rejection rates in the Ultimatum Game (a measure of spite) for both economics and non-economics majors. These graphs first demonstrate that the two groups have different perceptions of fairness. Secondly, they show that some degree of spite is involved, as in the Ultimatum Game both groups on average ask for more than they are willing to give in the Dictator Game, (with pink curves lying slightly to the right and above blue ones).
4d. Sender’s Behavior in UG, Figure 1

Sender’s Behavior in UG: Econ v. Non-Econ

Sender’s Behavior in UG: Class v. No Class

Sender’s Behavior in UG: by # of Classes
4d. Sender’s Behavior in UG, Figure 2

Figure 1 (4d) shows that students without economics are more likely to offer half in the Ultimatum Game, while those with economics remain more likely to offer $1. Figure 2 (4d) demonstrates that training causes offers to fall for both economics and non-economics majors.
4e. “Rationality”: Economics v. Non-Economics, Figure 1

Expected Return of Offers (for entire sample)

Expected Return of Offers (for Econ only)

Rationality in Econ v. Non-Econ
The first graph in this figure depicts the probability an offer is accepted in the Ultimatum Game along with the expected value of any offer (for the entire sample), with the highest expected value residing at $5 and the second highest found at $1. The second graph displays the same information if only economics majors were to play the game, changing the first best solution to $1 and the second best solution to $5. The third graph portrays the distribution of offers for economics and non-economics majors, revealing that 25% of economics majors offered $5 and another 25% offered $1. For non-economics majors, 72% offered $5 and 8% offered $1. Thus, it can be concluded from graphs 1 and 3 that the non-economics group behaved more “rationally” (or exhibited greater “social intelligence”) than the economics group, being on average more likely to maximize monetary returns. However, if the game were played only by economics majors, the economists would have done a superior job at optimizing than the non-economists.

5. Discussion

One might argue that one limitation of the employed game structure is its one-shot nature, as it unrealistically depicts the real world, in which we involve ourselves in multiple as opposed to single transactions – and oftentimes against the same opposing players. However, cross-societal Ultimatum Games led by Ensminger (2002) found that those more involved in the market economy make more generous offers. One of Ensminger's explanations for the seemingly more generous individuals in market-orientated societies is that of reputation: in a market economy, people have to look beyond making one quick killing and fair-minded behavior becomes simply a means to signal you are a “good guy.” Thus, Ensminger’s conclusion may suggest that the one-shot
nature of the experimental games remains irrelevant as people act as though they were playing in the multi-game atmosphere of the real world.

Aside from the game’s one-shot nature, individuals have also questioned whether even outcomes of Ultimatum Games remain a function of somewhat trivial stakes, typically ranging from $10 to $20. However, Hoffman, McCabe, Shachat, and Smith (1994) explored whether Ultimatum results would change if winnings were raised, investing $5000 in research funds so that 50 pairs could play $100 rounds of the Ultimatum Game. The authors discovered that proportions offered in $10 and $100 games proved insignificantly different, permitting future experimenters to return to more affordable Ultimatum Games, as generated data remained indistinguishable from high-stakes statistics.

In conclusion, this study found students with economics to offer less in both the Dictator and Ultimatum Games and to hold lower rejection rates in the Ultimatum Game. Thus, it may be argued that in offering and accepting less, individuals with economics hold a lesser concern for fairness (or a lower notion of what is fair). Additionally, economics training seems to lower both offers and acceptance thresholds and thus, conceptions of fairness overall. Lastly, as subjects were informed that they were randomly matched to another student, individuals should have assumed that they were most likely not paired with an economics major. It follows that non-economics majors exhibited a greater degree of “social intelligence” or “rationality” in being far more likely to offer half and thus maximize expected value. On the contrary, more often than not, economics students, in generally offering less, played the Ultimatum Game as those they
were playing against themselves, thereby becoming more likely to earn less when paired with an individual from the entire sample.

**Appendix 1**: Questionnaire for Player 1.

**Player 1**

You are given $10 to split between yourself and an anonymous other.

If this person accepts your offer, you keep the remainder.

If he/she rejects your offer, neither of you receive any money.

*How much of the $10 will you offer this person?*

$0  $1  $2  $3  $4  $5  $6  $7  $8  $9  $10

Again, you are given $10 to split between yourself and an anonymous other.

He/she no longer has the opportunity to accept/reject.

*How much of the $10 will you give this person?*

$0  $1  $2  $3  $4  $5  $6  $7  $8  $9  $10

(Please see reverse side for a few follow-up questions)

1. Why/how did you make your first decision? (Briefly explain)
2. Why/how did you make your second decision? (Briefly explain)
3. Why were your offers different/same? (Briefly explain)
4. Have you taken a course in economics?    Y   N
5. If yes, please circle the economics courses you have taken:

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6. Are you an economics major?    Y    N

7. If yes, do you plan to pursue a career in business post-graduation?    Y    N

8. What year in college are you? 1 2 3 4

Thank you for your time.

Appendix 2: Questionnaire for Player 2.

Player 2

An anonymous other is given $10 to split between himself/herself and you.
If you accept the amount that is offered to you, he/she keeps the remainder.
If you reject, neither of you receives any money.

*What is the least amount of money you will accept?*

$0  $1  $2  $3  $4  $5  $6  $7  $8  $9  $10

(Please see reverse side for a few follow-up questions)

1. Why/how did you make your decision? (Briefly explain)

2. Have you taken a course in economics?    Y    N
3. If yes, please circle the economics courses you have taken:

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4. Are you an economics major?  Y  N

5. If yes, do you plan to pursue a career in business post-graduation?  Y  N

6. What year in college are you?  1  2  3  4

Thank you for your time.

References


