Altruism through experience – Framework and Experiment

This study was conducted as a Master Thesis of a Double Degree Economics student of

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ABSTRACT

The aim of this study is to investigate whether past experience affects ones altruism. Does having been poor makes a person more altruistic when rich, does her concept of fairness change as it gets richer? An adaption of the classic Public Goods Game with heterogeneous endowments was used for the purpose.

Keywords: Experience; Altruism; Heterogeneous Public Goods Game.

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Introduction

This paper was written with the objective of understanding the relation between a rich persons past experience with their current donations, using a modified version of the Public Goods Game in order to create a social experiment in which some of the participants may start out as the poorest at the table, and become the richest, having to donate tokens to the public pot during the two phases. Investigation will be made by comparing the behavior of players with fixed roles to those with varying roles. A more detailed explanation on the framework will later follow. While applying this experiment, further analysis can be made concerning the impact of enrichment or impoverishment of the participants in their donations, with comparison to other participants with constant endowment.

Behavioral Game Theory has demonstrated to be an efficient approach in showing these concerns, by analyzing strategic choices using simple games. One of those games is the Public Goods Game.

In its most basic form, everyone starts out with the same number of tokens, and each player secretly chooses how many tokens to donate to a public pot. This pot is then multiplied by a factor (greater than one and lower than the number of players) and evenly divided between every player, regardless of their donations. Each player also keeps the tokens they did not contribute.

Although quite interesting, a game where every player begins with the same endowment is not reflective of our society where, due to countless factors, people have different amounts of wealth. It is quite common for the wealthier members of the society to donate to the

meager ones and, if we exclude the "self interested donators", we can testify the presence of altruism and care for the greater well being of society. In some cases, these donators are people who have somehow experienced a life much different than the one they live now, and there are multiple cases of self made people donating huge amounts of money to people living the same struggles they have once lived.

Evidence indicates that a large proportion of people act not only on their self interest, but also with concern for the well being of others. Concerns for fairness, reciprocity and the overall well being of others are quite common, and have been proven to have important economic consequences [Fehr and Schmidt (2006)]. Having gone through another's situation, is a person affected by such concepts more easily?

Background and Literature Review

The Public Goods game is amongst the best known experiments in economics. It is meant to mimic everyday behaviors in multiple situations. Economists such as Ledyard (1995) or Ostrom (2000) have studied its intricacies and limitations, and current social economists use it as a tool to measure social norms and preferences [Camerer and Fehr (2003); Bayer et al. (2010)].

Rational choice theory states that, in an environment with voluntary provision of a public good, people will free ride. There is indeed a dominant strategy of every player donating zero tokens to the pot, making it a Nash Equilibrium. However, this outcome has rarely been seen in experiments, as most people do not free ride, making positive contributions [Ledyard (1995); Ostrom (2000)].

Different theories have been put forward regarding this behavior, whether related to the concepts of fairness and reciprocity [Rabin (1993); Bolton and Ockenfels (2000); Fehr and Gachter (2000)]; or to the possibility that such behavior occurs from self interest [Baik et al. (1999); Hoffman et al. (1994); Forsythe et al. (1994)].

Regarding heterogeneous endowments in linear public goods game, there are a number of studies that have found contradictory results.

 Hofmeyr et al. (2007) find no impact of endowment heterogeneity on the overall contributions level, nor on each players contribution as a proportion of their endowment ("fair share rule"). Likewise, Sadrieh and Verbon (2006) also observe a lack of influence of the skew of inequality on the contributions level in prolonged Public Goods games (where

endowments are dynamic, as players are given their earnings every round). In contrast, Cherry et al. (2005) performed the classic linear Public Goods game, with only one round, where subjects' endowments were retrieved by their performance on a GMAT like quiz, thus creating heterogeneity. Results were then compared with similar experiments on homogeneous groups. In heterogeneous groups, subjects contributed significantly less to the public good than those in groups with homogeneous endowments, being reciprocity one of the main reasons, since a subject with high endowment does not contribute a higher than average amount, as she knows that the others, having smaller endowments, won't reciprocate.

Buckley and Croson (2006), in their linear public good experiment with heterogeneous endowments, observe that the poorest players donate the same absolute amount, meaning a bigger proportion than the richer players.

Van Dijk and Wilke (1994) have performed a single round public good experiment with heterogeneous endowments, and found that the more endowment a player has, the more she will contribute ("noblesse oblige"). However, and unlike Cherry et al. (2005), who had found no impact of wealth origin on donations, they detected that contributions are influenced by whether endowments have been randomly distributed or allocated through some process which may differ players' capacities or abilities in certain tasks, or that require unequal amounts of time. In this case, the difference between poor and rich players' donations is significantly larger. Van Dijk and Wilke's experiment is similar to the one this paper proposes, and their conclusions are remarkable, as having your endowment being dependent on performance brings up a different approach on fairness, where merit and reward play an important role.

A different, yet quite interesting approach was used in Georgantzís (2011) research, as subjects were questioned on their belief of their relative financial position (Rich, Poor, neither), and also their parents income (subjects were all students), and then randomly allocating either a small or a big endowment, in order to form groups with two poor and two rich subjects. Georgantzís, unlike previous studies, concluded that heterogeneity has a positive effect on both absolute and relative contributions. Georgantzis also found that, by retrieving subjects' beliefs on each other, it is expected that players on the opposite type, regardless of each, will contribute more.

Reuben (2012) focuses on the enforcement of contribution norms in public goods games, and his approach is guided towards punishment based games, which deviates from the topic of this paper. However, this study has found no influence of endowment heterogeneity in any contribution norm, other than the expected tendency to free riding as more rounds are played.

Keser et al. (2014) perform a linear public goods game of 25 rounds, with the exception that players do not know each other's endowments. Results show that, as asymmetry in endowments strengthens, contributions decrease significantly, so that, when there is a super rich player in the table, she is not interested in achieving the social optimum.

Evidence, although somewhat contradictory, does seem to support the tendency for games with heterogeneous endowments having worse social outcomes [Ledyard (1995)], as every player donates less. Experimental research has shown that it is often the richest player who is primarily responsible for the lack of contributions.

These studies however, to the extent of my knowledge, have been purely focused on the analysis of constantly rich/poor players. In contrast, this thesis is concerned with the creation of a game where players go through different endowments, where the previously poorest player can now play the game whilst being the richest, providing the basis for an evaluation of whether he follows the norm of donating proportionally less, or, due to his previous rounds as the poor player, becomes a more altruistic rich player. Similarly, it provides an opportunity to investigate if a previously rich player, when becoming poor, will keep donating proportionally less as when he was rich, or will he understand the social benefit of having everyone donating bigger proportions of their endowments, and thus contribute for a more socially desirable outcome.

Experimental Design

Subjects shall be divided into groups of 4, and then, in each group, players will be randomly assigned 3 possible roles, and their respective endowments, forming the following set: 1 Rich (25 tokens), 1 Poor (5 tokens), and 2 average (15 tokens). Subjects shall not talk to each other before or during the experiment, as to avoid emotional bias, but they can see each others' role and endowment.

A one shot linear public good game is then performed, where each player donates an amount of their endowment to the public pot, which will be doubled and then evenly shared between all 4 players, whether they have donated or not. Donations shall be made public, as to avoid contradictory or mixed beliefs. However, making donations public does allow for impure altruism effect [Andreoni (1990)].

Now in order to restructure groups there are two main solutions. One is to sit each player with three different people, and again randomize their roles. This method would be very costly, as many samples would be needed in order to gather a sufficient number of players who had been poor and then rich, and vice versa. It would however allow for interesting follow up research, since all possible role transactions would occur and be motivating to study upon.

A less costly solution would be to have the poor and rich players from the first stage swap roles with each other, sit in different tables, and get 3 new randomly assigned subjects to perform another one shot game. This group restructuring may however encourage retaliatory actions, since the previously poor now rich player could form the correct belief

that the poor player sitting at his table had been rich before, and hadn't donated enough tokens in the first stage.

Now, it is important to mention the decay that repetition has on donations (see Fischbacher and Gachter (2010) for an updated and extended reference list of articles where an increase in free riding over time is reported), which may distort the outcome of the experiment. In order to control for this effect, base groups where people do not change roles (but do change partners) will form the relevant comparison groups. Base groups would only need to be created if the cheapest group restructuring solution was applied (since in the costliest solution it would be possible to find data within the sample where subjects were constantly rich/poor), but it would still increase the costs of the experiment.

It is also worth mentioning how income effects may play a role in the players' behavior in the second round. It is possible that players may alter their behavior not resulting from changes in their endowments, but from their initial income positions.

Discussion

For the purpose of controlling for player's beliefs and consequent punishing actions, we shall assume that group restructuring for the second stage was made with randomly assigned roles.

The main focus of this experiment is the decision making process of the first stage poor/ second stage rich player (and, in extension, both of the remaining enrichment possibilities: 1st stage poor, 2nd stage average; 1st average, 2nd rich). Observing whether she becomes more altruistic than the constantly rich player, benefiting the social wellbeing; or whether she becomes selfish once rich, and punishes society for the potential lack of altruism shown towards her in the 1st stage. However, it is also quite interesting to analyze the other players' actions. Observing how the players who have suffered an endowment lost - especially the ones who went from richest to poorest - react and feel towards the group social wellbeing can prove to be a very interesting way to study the behavior of individuals who suddenly lose a great amount of wealth and now have to experience a different approach when facing society.

These are the hypotheses that can be tested in this experiment:

1. A player who has enriched is more altruistic than 1st stage rich player, donating more thus providing for social wellbeing, or does he donate less. This is the main research question of this thesis, and what should be prioritized when analyzing the results of the experiment. If a great number of 2nd staged enriched players donate more (decay effects aside for simplicity) than a constantly rich player, and if this

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past experience is shown to be significant for the player's future donations, then we are closer to demonstrating the importance of enriched donators to society.

On the other hand, if the enriched player shows no increase in donations in comparison to the constantly rich, future research can be made concerning how endowment affects a player's view on equality and altruism, as it is possible that a player, even when poor, doesn't believe that the richer players should help him.

2. A player who has been impoverished continues to donate a small proportion of his endowment or does he increase his social awareness and consequently his donations. Now it is important to check wheter the impoverished player, wasn't simply altruistic in the first stage, when he was richer. Having that established, observing if an impoverished player changes his attitude towards the game and social wellbeing is quite interesting, but it is possible that impure altruism is shown in order to increase the player's revenue. On the other hand, and considering the main focus of this thesis, it is also possible that an impoverished player who has donated few tokens in the first stage, regrets doing so after experiencing what it is like to be the poorest player.

3. How do constantly average players behave, do they contribute or do they expect the rich player to do so. This hypothesis can be restated as the players' opinion on whose task is it of looking out for the poorer players: the richest or everyone's. Whether constantly average players are more altruistic or not can be analyzed as the average altruism of the population, since there is no past experience with different endowments or with the participants at the table.

Considering the uniqueness of the research question of this paper, the consequential lack of literature regarding experience and altruism, and the fact that this design was unable to be tested in an ideal setting, it is a rather complicated task to predict the player's behavior. However, in an almost "Lockesque" manner, I believe that knowledge comes from experience, and having been trough poverty makes one more understanding of the social benefits of the richer players donations, and, having the opportunity of being that richer player, a larger sense of altruism will arise, providing for a better outcome for the whole group.

Results

In order to collect data, I have created an online survey (using Qualtrics) where I thoroughly explained the rules of the public goods game and the heterogeneous endowments' adaptation described in this thesis (see appendix 2 for the instructions given). Participants were then randomly allocated either 5€ or 25€ (Since a small number of participants was expected, the 15€ endowment was removed but the participants were not aware of this removal, as to continue assuming there were two average players in their "table"). Two rounds were made.

However, since it is an online survey and not the actual experiment, there are some pitfalls with this kind of data gathering:

    a) The absence of real monetary outcomes, which will inevitably allow for a much greater sense of altruism, since players will more often act on what they assume to be the correct thing to do, since there are no real costs in doing so.

    b) Although explained, participants did not get to know their outcomes in the end of each round, since they were not actually playing the game with each other, but merely asked on how much would they donate/keep considering the endowment allocated to them. The lack of a real grasp on the game might distort the answers given.

In total there were 91 responses. I imported the answers to Stata and organized the data into the following variables:

- contribution1 (proportion of endowment donated in the first round)
- contribution2 (proportion of endowment donated in the second round)
- constpoor (dummy variable, 1 if player had 5€ in both rounds, 0 otherwise)
- constrich (dummy variable, 1 if player had 25€ in both rounds, 0 otherwise)

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- enriched (dummy variable, 1 if player had 5€ and 25€ in the first and second, respectively, and 0 otherwise)
- impoverished (dummy variable, 1 if player had 25€ and 5€ in the first and second, respectively, and 0 otherwise)

As shown below in figure I, a linear regression was then performed using contribution2 as the independent variable which brought up interesting results. From the survey responses, it seems that enriched people actually donate proportionately less in the second round that constantly rich players donate in both rounds. Moreover, being enriched leads to a statistically significant 24 percentage point decrease in contributions relative to being constantly poor. Not so surprisingly, but also significant, players who have donated a higher proportion of their endowment in the first round will also donate higher proportions in the second round.

```
Linear regression                                    Number of obs =        91
                                                     F(  4,    86) =     21.87
                                                     Prob > F      =    0.0000
                                                     R-squared     =    0.4579
                                                     Root MSE      =    .28353
```

contribution2	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
contribution1	.6690368	.0982884	6.81	0.000	.473646	.8644276
enriched	-.2413658	.0840214	-2.87	0.005	-.4083948	-.0743367
impoverished	-.0574499	.1103729	-0.52	0.604	-.2768641	.1619642
constrich	-.099164	.07849	-1.26	0.210	-.255197	.0568691
_cons	.2595508	.1061393	2.45	0.017	.0485529	.4705486

Figure I - Linear Regression of survey data

These conclusions seem to go against my original prediction, which, survey flaws aside, may have some interesting interpretation to it. Perhaps being accustomed to having larger endowments makes one more altruistic, as opposed to someone who suddenly earns a lot of

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money and therefore is more tempted to keep it than to donate it. This last sentence brings me to another issue that both the survey and the actual experiment may have. It seems reasonable that enriched people may not become highly altruistic at the moment they become richer, meaning that it is possible that they will, as predicted, be more altruistic than constantly rich people, but not immediately after becoming rich, and especially not after having earned their endowment on a random basis (and in the survey case, without even having palpable outcomes). Evidently, these are the main limitation of a social experiment when in comparison with real life, where enriched people often struggle when poor and work hard to become rich, and do so gradually, implying a greater acknowledgement of the experience lived, which can translate into a more altruistic rich person.

Conclusion

The mechanism design provided in this paper is expected to be able to better understand the impact of experiencing poverty in a player's altruism. Studying several papers referring to Public Goods games, particularly ones with heterogeneous endowments, and referring to its conclusions, it was possible to formulate all the possible outcomes this mechanism design may lead to, and the consequences of such outcomes. A personal prediction of the outcome of the experiment was then added.

Focusing on the enriched player, the possibility of her being more altruist than a constantly rich player allows for a wider analysis on how society and wealth distribution work nowadays. However, data gathered through a survey seemed to point otherwise, as enriched participants donated proportionately less than the constantly rich ones. Limitations of both the survey and the experiment were also covered in this paper.

Interestingly, according to the Oxford Committee for Famine Relief reports, the annual incomes of the wealthiest 100 people in the world could end global poverty four times over. Maybe if those people had gone through scarcity themselves they would be more understanding and helpful towards the end of extreme poverty.

As seen in the survey results, there is also the risk that the previously poor player, once rich, will donate the same (or even less) as the constantly rich player. This could be interpreted in two ways: it could show the effect money has on a person's mentality towards altruism and social wellbeing; but it could also mean that the population on which the experiment was tested doesn't believe in equity, and doesn't believe that the poorest should be helped by the richest [See Baumard (2013)].

The results of the experiment, if significant, could affect policy making in fund raising. One of the most implemented strategies is to awe people using images, testimonies or reports about extreme poverty. This sort of campaign is often misguided, as constantly rich people may not feel devoted to the cause, since it may be too far and distinct for them to fully acknowledge and care about. Perhaps policy makers in this field should focus on rich people with poorer backgrounds, and instead of stunning people with the most extreme cases of poverty, an approach where possible donators felt closer and more related to would be more effective.

Now, a different strategy shall be used to attract possible donators who have always been wealthy, as they are less likely to donate based on self familiarization with poverty. Perhaps it is possible to implement such policy in where people have to somehow experience a sub optimal living, in order to further relate to the cause, and possibly donate more.

Appendix 1: Instructions page given to the participants in the experiment

(2 pages)

Today you will be playing the Public Goods Game, a standard game in experimental economics. Read and follow the instructions carefully.

You will be seated with 3 different people who have received the same instructions page as you.

You will be randomly assigned with 5, 15 or 25 tokens.

You will then decide how many of your tokens to keep, and how many to donate to the public pot, by writing your allocation on the answer sheet given to you. The sum of the tokens you keep and the ones you donate should be exactly equal to the number of tokens you were assigned with.

You shall be granted the tokens you keep for yourself. The tokens you and the other players at your table have donated are to be added together doubled and then equally shared amongst the four of you.

Under any circumstance shall you speak to other participants in the experiment.

If you have any questions, please ask one of the supervisors.

Answer Sheet

1. a) With how many tokens have you started the first game? (Please circle your answer)

5

15

25

b) Tokens donated: _____

c) Tokens kept: _____

d) Tokens received from the pot: _____

2. a) With how many tokens have you started the second game? (Please circle your answer)

5

15

25

b) Tokens donated: _____

c) Tokens kept: _____

d) Tokens received from the pot: _____

Appendix 2: Survey instructions

Intro: Thank you very much for participating in this survey!

It will be a very short (two questions) questionnaire about money allocation choices in an hypothetical situation, to which I ask you to try and act as if it was your own.

Please read carefully in order to fully understand the scenario, as it makes it much easier and faster to then answer the questions.

Set up: Imagine you are seated it with three other people who you have never met before. You are given a random amount of money out of three possible options, forming the following set: One of you has 5€, two of you have 15€, and the last one has 25€.

Each of you must decide how much money you want to keep, and how much you want to donate into a public pot.

You shall be granted the money you keep for yourself. The money you and the other players at your table have put into the pot are doubled and then equally shared amongst the four of you.

You will be asked to play this game twice.

Here are four examples of how the game works:

Example 1: If everyone puts all their money (5+15+15+25=60€) in the pot, then everyone leaves the table with an amount of 30€ (Pot is doubled so turns into 120€, then divided by four people.)

Example 2: If everyone puts all their money except the first player, which contributes nothing. Pot has 55€, which turn into 110€, giving 27,5€ to each player. This will be the final outcome of the three players who have donated, whilst the person who didnt donate will have his initial 5€ plus the 27,5€ from the pot, ending with 32,5€.

Example 3: If everyone puts all their money except the last player, which contributes nothing. Pot has 35€, which turn into 70, giving 17,5€ to each player. This will be the final outcome of the three players who have donated, whilst the person who didnt donate will have his initial 25€ plus the 17,5€ from the pot, ending with 42,5€.

Example 4: If everyone puts 5€ in the pot and keeps the rest. Pot has 20€, get doubled and turns to 40€, meaning everyone gets 10€, plus what they kept. (10€ for first, 20€ for the second and third, and 30€ for the last one).

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