THREE ESSAYS ON PRO-SOCIAL BEHAVIOR

A Dissertation

by

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ABSTRACT

In this dissertation, I study individuals' prosocial behaviors. I focus on the topics of charitable giving, measuring altruism, and trust.

The first essay studies the effectiveness of fundraising campaigns with volunteer leaders in charitable giving. We ask: 1) Does having volunteer leaders increase contributions from potential donors?, and 2) What factors increase or decrease the impact of volunteer leaders on charitable giving? We find that the effectiveness of leadership depends on the specific context. Volunteers are generally more effective in increasing follower donations, but themselves give less than randomly-selected leaders. Social distance of the leader has little effect on fundraising.

The second essay is directly related to altruism, the altruistic motivation for charitable giving. Altruism has been measured in the lab using dictator games, where some scholars use only one decision and others use multiple decisions. The latter has gained remarkable popularity in identifying heterogeneous distributional preferences among populations and found the prevailing existence of preferences for efficiency relative to preferences for equality. We examine the effect of playing both roles in the dictator games with multiple decisions. We ask: 1) Does playing both roles change behavior?, and 2) If so, should we rethink the measure of distributional preferences? We find that dual role procedure distorts revealed preferences. Dual role procedure leads to greater price sensitivity, and overestimates preferences for efficiency and underestimates preferences for equality. We also find evidences that only single role measurement predicts real life giving.

In the third essay we ask: 1) Does altruism explain individual trust and trustworthy behavior?, and 2) Are trust and trustworthiness norms? We find that altruism predicts trust, while both fairness and trust predict trustworthiness. Trust and trustworthiness could

be explained by following norms. Our results suggest the presence of norms that elicit trusting and trustworthy behavior.

DEDICATION

To my parents and my husband

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My advisor, Catherine Eckel, has been incredibly important in shaping this dissertation as well as my career as an economist; I am incredibly grateful for her advice and direction. I also appreciate the financial support she provided throughout my graduate career. Catherine, thank you for being such an excellent role model, as well as for your guidance, motivation, and insight.

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Contributors

This work was supported by a dissertation committee consisting of Professor Catherine Eckel (Chair), Timothy Gronberg and Jonathan Meer of the Department of Economics and Professor Marco Palma of the Department of Agricultural Economics.

The analyses depicted in Chapter I and III were conducted in part by Catherine Eckel. The analyses in Chapter II were conducted in part by Catherine Eckel and Phillip Grossman.

All other work conducted for the dissertation was completed by the student independently.

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1. INTRODUCTION

Traditional economic models assume individuals are self-interested utility maximizers. However, both our day-to-day experiences and a significant body of research suggest that concerns about others also play an important role in shaping individuals' decisions across different situations. Individuals appear to be willing to sacrifice their own benefit for the well-being of others. Understanding people's preferences for tradeoffs between self and others has important applications for not just economists, but also for practitioners and policy makers. This dissertation employs laboratory experiments to study individuals' prosocial behavior. One chapter examines the impact of volunteer leaders on donor's giving. One chapter examines the measure of altruism. The other chapter studies trust, trustworthiness and how are they shaped by norms.

In Chapter II, titled "The Impact of Volunteer Leaders in Charitable Giving", Catherine and I examine the impact of volunteer leaders on donors' giving. Charities often engage in fundraising campaigns that utilize volunteer leaders. Examples include the American Heart Association's annual "Dear Neighbor Campaign" and the Leukemia Lymphoma Society's "Team in Training." While these fundraising techniques are commonly used, there is little research assessing their effectiveness or exploring the mechanisms underlying their impact. I received a grant from Science of Philanthropy Initiative to study this question. We designed a "real-donation" laboratory experiment to study the role of leadership in fundraising. In our study, subjects are randomly assigned to groups that then have the opportunity to donate any part of their endowment to three alternative projects. We compare volunteer and randomly-selected leaders, and vary whether the leader's donations are observed by followers. A third factor varies whether the preferences of the leader over the projects coincide with those of the follower. Our analysis focuses on these

three dimensions: 1) the status of the leader; 2) information about donations; and 3) social distance. We find that the effectiveness of leadership depends on the specific context. Volunteers are generally more effective in increasing follower donations, but themselves give less than randomly-selected leaders. Social distance of the leader has little effect on fundraising.

In Chapter III, titled "Does How We Measure Altruism Matter?: Playing Both Roles in Dictator Games", Catherine, Phil and I take a step back from charitable giving, to examine altruism, an important underlying motive for charitable giving. Altruism has been measured in the lab with dictator games, with some scholars using experiments that reward subjects based on only one decision while others pay subjects based on multiple decisions. The latter approach has gained remarkable popularity for identifying heterogeneity in distributional preferences among the population. One of its most notable findings is the prevalence of preferences for efficiency relative to preferences for equality. Our concern was that paying subjects for more than one decision may have distorted the assessment of such preferences. We designed an experiment to directly test the impact of the payment method on revealed preferences. Participants in our experiment play a series of dictator games, where one player determines the distribution of a fixed amount of money between herself and another player. We vary endowments and relative prices for giving to recipients. In the single role treatment (SR), subjects are assigned as either dictators or recipients, and paid for one decision in one role; in the dual role treatment (DR) all subjects make decisions in the dictator role, and are matched twice and paid for two decisions, once in the role of dictator, and once as a recipient. While in both treatments the preferences for giving are typically rational, in the sense of being consistent with the Generalized Axiom of Revealed Preference (GARP), we find that subjects in DR display greater sensitivity to the price of giving compared to subjects in SR, who are more likely to divide earnings equally regardless of the price. When estimating a CES utility function to recover the underlying

individual preferences for giving, we find that the distributions of preferences are quite different across the two treatments: Subjects in DR are substantially more efficiency-focused and more likely to be selfish than the SR subjects. Because individual donation decisions are rarely "reciprocated" in this way, we believe the SR protocol is likely to be a more accurate measure of altruistic preferences. An additional study shows that the observed differences in preferences across treatments are not due to the differences in total payoffs between the two treatments. Our results shed light on a better design for measurement of altruism.

Prosocial behavior could be shaped by individual preferences, but could also be influenced by social norms. In Chapter VI, titled "Trust, Altruism and Social Norms", Catherine and I replicate a study of the trust game [Cox, 2004], which was designed to deconstruct the motives for "trust" behavior in the game. His design makes it possible to discriminate between transfers resulting from trust or reciprocity and transfers resulting from altruism. We augment his design by adding coordination games to elicit social norms directly for the three component games of his "triadic" design. We combine the norms data with separately measured decisions to better understand patterns of behavior across the three games. We find that altruism predicts trust. Both fairness and trust predict trustworthiness. Both trust and trustworthiness could be explained by following norms. Our results suggest the presence of norms that elicit trusting and trustworthy behavior.

2. THE IMPACT OF VOLUNTEER LEADERS ON CHARITABLE GIVING

2.1 Introduction

In fundraising campaigns, instead of making a direct appeal to potential donors, charities and non-profits often utilize volunteer leaders recruited specifically to make the appeal on their behalf. Examples include: neighborhood campaigns (e.g, the "Dear Neighbor Campaign" by the American Heart Association), and athletic event fundraisers (e.g, "Team in Training" by the Leukemia & Lymphoma Society). Although this fundraising approach is frequently adopted, there is little research on whether and under what conditions this mechanism should be successful. Our study is designed to experimentally investigate the impact of volunteer leaders on potential donors' contribution behaviors.

We are interested in answering the following research questions. First, we examine whether having volunteer leaders gives rise to higher contributions from potential donors. Second, if it does, what factors increase or decrease the impact of volunteer leaders. This will allow us to identify circumstances under which this fundraising strategy is likely to be effective and gauge its impact on fundraising in the short run and the long run.

There may be many different reasons that fundraising campaigns with volunteer leaders would be successful. Previous research suggests that the volunteer leaders may play an informative role; that is, by making an appeal to potential donors on behalf of the charity, volunteer leaders may send a signal about the quality of the charity [Vesterlund, 2003, Potters et al., 2007]. Existing research also finds that concerns for status may affect donors' charitable giving [Eckel et al., 2010]. In this paper, we also examine whether social distance may be one factor explaining the observed success of volunteer leader campaigns, since it plays an important role in many related settings [Chen and Li, 2009]. A commonly held belief among practitioners is that potential donors respond more favorably to appeals

made by persons to whom they are closely related socially or even spatially. By inserting a volunteer leader who is known to the donor into the appeal process, the decrease in social distance may affect potential donors' contribution behavior.

We design a "real donation" laboratory experiment to study the role of volunteer leaders. In our experiment, participants are assigned to groups of four and then have the opportunity to donate some of their endowments to the online charity DonorsChoose.org. We manipulate the selection procedure for leaders, the information content of their messages, and the way donation groups are formed. With a between-subject design, we compare volunteer and randomly-selected leaders, and vary whether the leader's donations are observed by followers. A third factor varies whether the preferences of the leader over the projects coincide with those of the followers. Our analysis focuses on these three dimensions: 1) the status of the leader; 2) information about donations; and 3) social distance. We find that the effectiveness of leadership depends on the specific context. Volunteers are generally more effective in increasing follower donations, but themselves give less than randomly-selected leaders. Social distance of the leader has little effect on fundraising.

By investigating a number of factors that may influence donors' response toward volunteer leaders, our research increases our understanding of the motives that underlie individual's giving behavior, as well as advances our understanding of how individuals react to different fundraising strategies. The behavioral regularities we identify could be used to develop more accurate theories of fundraising, and ultimately more effective, targeted fundraising campaigns that utilize volunteer leaders.

The remainder of the chapter proceeds as follows. Section 2.2 offers a conceptual framework of leadership in charitable giving. Section 2.3 describes the experimental design. In Section 2.4, we discuss the results. Section 2.5 concludes.

2.2 Conceptual Framework

We build our hypotheses on the basis of the following three literature streams in charitable giving.

2.2.1 Sequential Donations and Social Status

We begin with previous research that has investigated the interdependencies among individual contributors. Our research is related to the literature studying fundraising mechanisms that account for this interdependence, such as sequential fundraising and leadership giving. The theoretical work on sequential fundraising begins with [Varian, 1994], who builds a simple theoretical model to compare contributions with and without announcements. The model predicts that fundraisers should prefer not to announce past contributions to potential donors. His argument is that the initial donors will choose to make a small contribution and leave it to subsequent donors to donate to the charity. But this result is in sharp contrast to established practices of charitable organizations, which often begin their campaigns by soliciting wealthy, respected individuals in a community, and prominently announcing their contributions. [Romano and Yildirim, 2001] extend Varian's model to a general class of preferences, and show that, relative to simultaneous giving, sequential giving increases contributions to a public good when followers respond positively to increases in leader giving. This increase is sufficient to compensate leaders' cost of contributing. Experimental research tends to support fundraising practice; both laboratory and field studies have found evidence that, when the announced initial contribution is large, individuals contribute more [List and Lucking-Reiley, 2002, Shang and Croson, 2003].

One explanation for the positive correlation between the initial giving and subsequent giving is the information value of the initial gift. [Vesterlund, 2003] and [Andreoni, 2006] explore theoretically the case where the leader's gift can be a signal of the quality of the charitable good. That is, a sufficiently large initial contribution informs future donors

that the charity is of high quality; inferring the higher quality, the follower will make a larger contribution as well. [Vesterlund, 2003] examines an environment where charities have hidden qualities, either high or low, and donors can learn the true quality at a cost. She finds that in this situation, both high and low quality charities will reveal the past contributions; a positive contribution by leaders will signal that the charitable good is of high quality to subsequent donors. [Potters et al., 2007] use experimental methods to examine contributions in an environment where there is uncertainty about the quality of a public good. They show that sequential giving results in larger overall contributions, and that their results are consistent with the signaling hypothesis.

Concerns for social status have also been shown to influence donations. Following [Ball et al., 2001],[Kumru and Vesterlund, 2010] induce high and low status based on participants' score on a trivia quiz. They find that, in a sequential-contribution public good experiment, high status first-movers are more likely to be mimicked by second-movers. Overall contributions double when high status members move first. The social status of a leader has been shown to serve a useful purpose in public goods provision. [Eckel et al., 2010] study the impact of the social status of a central player in a star network on public goods provision within the network. The network has a central player who can observe the set of all players, however the players themselves can only observe the central player. High or low status is granted based on trivia quiz results, and announced to the other members of the network. They find that high status central players are more likely to be followed, and higher contributions can result, but only when the central players are high contributors.

In contrast to earlier studies, our paper addresses volunteer leadership. In this fundraising mechanism, volunteer leaders act as active solicitors of other potential donors on behalf of the charity. Despite the popularity of fundraisers with volunteer leaders, there is little research explaining whether and why they are successful. While there are clearly many

reasons that we might see fundraising using volunteer leaders, previous research suggests two likely explanations: uncertainty about the charity quality, and the potential positive effect of a high-status exemplar. We ask what role these two factors play in fundraising with volunteer leaders. We anticipate that potential donors will respond more favorably (i.e., with greater incidence of donation, or higher contribution amount) to fundraising appeals made by volunteer leaders versus appeals made directly from the non-profit organization.

On the basis of previous research and practice, we hypothesize that both information and concerns for status will influence charitable giving behavior.

Hypothesis 1: A volunteer leader elicits higher contributions from potential donors.

2.2.2 Communication

Previous research has empirically shown that leaders can directly influence group members via one-way communication [Koukoumelis et al., 2012]. Their experimental context is public good provision with one-way communication. One member in the group can send a free-text message to his fellow group members. They find that the introduction of one-way communication substantially increases contributions and decreases their variation. [Arbak and Villeval, 2011] study the emergence of leadership in the laboratory setting. In one treatment they have participants volunteer to be leaders where leading the group means contributing first and making this contribution visible. In a second treatment leaders are randomly selected. They find that a large proportion of subjects volunteer to lead even though it is costly. Voluntary leaders improve efficiency in their team but they are not necessarily more influential than randomly imposed leaders.

[Croson, 2007] reports a strong correlation between others' contributions and one's own. In experiments that elicited participants' beliefs about how much they think others will contribute, she finds that contributions are positively correlated with beliefs because subjects want to match or reciprocate giving by others. We aim to test the hypothesis that

potential donors' contributions are correlated with observed volunteer leaders' contributions.

Hypothesis 2: Information about the leader's own contribution positively affects donations: the more the leader gives, the more other donors give.

2.2.3 Social Distance and Leadership

Another purpose of this paper is to examine whether social distance can be the explanation for the frequently observed volunteer leader approach. Many recent studies illustrate the impact of social distance on social influence in decision making. We discuss the most relevant of these.

Social distance - the closeness between individuals and groups - has been acknowledged to have a profound influence on charitable giving. [Hoffman et al., 1996] suggest that the decrease in social distance between the experimenter and subjects, and between the donor and recipient, increases donations in dictator games. [Andreoni et al., 2003] find that revealing subjects' photographs to other participants has a positive effect on contributions, an even greater impact than revealing the distribution of group contributions. [Leider et al., 2009] conduct online experiments in large real-world social networks to decompose giving into: baseline altruism toward strangers, directed altruism that favors friends, and the prospect of future interaction. They find that generosity decreases with social distance. [DellaVigna et al., 2012] incorporate social pressure into charitable giving decisions. They conduct a field experiment in which potential donors have the opportunity to avoid contact with solicitors. Their findings suggest that social pressure is an important determinant of giving.

The fact that social distance can affect giving suggests that it also may be influential in our specific fundraising environment. By inserting volunteer leaders into the appeal process, the decrease in social distance may affect potential donors' contribution behavior.

We wish to determine whether and how social distance may help explain the success of fundraising with volunteer leaders.

A common way of manipulating social distance in psychological experiments, as well as in economical experiments, is through the creation of artificial groups [Chen and Li, 2009]. We will manipulate the group cohesion to test the social distance hypothesis.

Hypothesis 3: Potential donors respond more favorably to a solicitation with decreasing social distance of the leader.

Finally, there is recent empirical research that examines how the social interaction affects charitable giving. [Meer, 2011] focuses on peer effects in solicitation. He examines whether alumni are more likely to give if the solicitation comes from someone they know. He finds that social ties affect both the decision to donate and the gift size. [Carman, 2003] studies peer effects in charitable giving among workplace teams. She finds that the individuals respond positively to higher levels of mean giving within their group. Interestingly, and in line with the references above, she also suggests that the team captain plays a role in the team's contribution.

2.3 Experimental Design

In order to study the impact of volunteer leaders on charitable giving, we design a "real charity" laboratory experiment in which participants are given endowments from which they have the opportunity to donate to three alternative projects selected from DonorsChoose.org, an online charitable organization that allows individuals to donate directly to specific projects at public schools across the country.

All sessions were conducted at the Economics Science Lab at Texas AM University, using students recruited through ORSEE [Greiner, 2015]. In each session, subjects were seated at computer terminals upon arrival. The experiments were programed in zTree [Fischbacher, 2007]. The experiment began with participants reading instructions on a

computer screen. We made it clear that all subjects were identified only by subject IDs and that all of their decisions were anonymous. We explained that the experiment would consist of a "ranking task", during which they would be asked to rank three projects according to the order in which they would like to see them funded, and an "allocation task", during which they would be asked to allocate their endowments between themselves and each of the three projects. One of these decisions would be randomly selected by the monitor for payment at the end of the session. A monitor was selected randomly for each session in order to ensure that all the money donated in the session would be sent online to the chosen project at DonorsChoose.org.

Currently there are approximately 20,000 projects seeking funding on DonorsChoose.org. These project requests are posted by teachers from public schools across the country. Projects cover a wide range of subject areas, including music and arts, literacy and language, math and science, history and civics, health and sports, etc. The types of resources requested vary from books and classroom supplies to field trips and class visitors. The organization accepts projects from classrooms from pre-kindergarden through second grades, and ninth through twelfth grades. Since the projects vary across several dimensions, we fix the classroom grade to Pre-K-2, grades with the most project requests, and we choose the first four projects with different subject areas from the "most urgent" list (the list of projects from high poverty schools and closest to the finish line). We provide each subject with a Project Description Handout sheet including a total of three projects. The project description has basic information on each project including the project title, subject, resource requested, and a short project objective written by the requesting teacher. An example of a project description is provided in Figure 2.1.

In the "ranking task", subjects were asked to rank all three projects according to the order in which they would like to see them funded. After completing the ranking task, participants were given a $20 endowment, in addition to their $5 show-up fee. They were

Project A			
Project Title:	"It's Time for Kids"	**Project ID:**	799008
Level:	Grades PreK-2	**Economic Designation:**	Highest Poverty
Subject:	Social Sciences (in History & Civics), ESL		
Resource:	Books		
Materials Needed: 30 copies, a class set, of time for kids magazine so they can learn about the importance of current events from around the world			
Project Objective: Second graders are eager to learn about events that are taking place around them. The subscription to Time for Kids magazine will enable students to learn about current events from around the world. These resources have proved to be very useful in learning about current events. Time for kids also has great activities within their weekly subscriptions. In the classroom we will work on these activities in small groups for a better understanding.			

Figure 2.1: Project Description Example

then divided into groups of four (details of treatments are described below). After groups were formed, a leader was selected for each group, either randomly, or through a process whereby group members have the opportunity to volunteer to be a leader. Once leaders were selected, they receive a message on their computer screen identifying them as the leader of their groups. The leaders were then shown an appeal message, the message of solicitation on behalf of DonorsChoose.org. As leader, they were tasked with forwarding the appeal message to the members of their groups. Leaders made allocation decisions after sending out the appeal message. After receiving the message, other group members made their allocation decisions. The prescribed message is provided as follows:

> *"Dear Participant:*
>
> *DonorsChoose.org is an online charity connecting individual donors to public school classrooms in need. Its mission is to engage the public in public education by giving individuals a simple, accountable, and personal way to fund educational projects in public schools across the country.*

On behalf of DonorsChoose.org I am asking all of the members of group Green to please consider making a donation to help implement projects that augment learning experiences in public school classrooms. On the following screen you will be able to allocate a donation to any or all of the projects described below. Thank you for your consideration of our request.

Sincerely,

Leader of Group Green"

There are six treatments in total in our experiment. No information random grouping with a random leader is the baseline treatment (Treatment 1). In the baseline, after finishing the ranking task, all participants are randomly assigned into groups of four. A group member will be selected randomly as leader. Leaders send the appeal message (shown above) on behalf of the charity to other group members before the allocation task begins. The leader's contribution will not be observed by other group members. The remaining treatments vary in leader selection (random or volunteer leaders), leader contribution information (whether leaders' contribution could be observed by the followers or not), or group cohesiveness (random groups or groups that share similar project preferences). Table 2.1 presents the list of treatments and the number of subjects who participated in each treatment. All in all, we have 240 participants in six treatments.

Treatment	# of Observations
1. Random Group, Random Leader, No Information	36
2. Random Group, Random Leader, Information	40
3. Random Group, Volunteer Leader, No Information	36
4. Random Group, Volunteer Leader, Information	40
5. Preference Group, Random Leader, No Information	44
6. Preference Group, Volunteer Leader, No information	44

Table 2.1: Treatments

2.4 Results

Table 2.2 presents mean donations by treatment. When pool the random leader treatments and volunteer leader treatments, we find average percentage contributions of 26.97% for the random leader treatment and 32.34% for the volunteer leader treatments.

Treatment	Mean Giving (%)	# of Observations
1. Random Group, Random Leader, No Information	22.85	36
2. Random Group, Random Leader, Information	26.42	40
3. Random Group, Volunteer Leader, No Information	32.40	36
4. Random Group, Volunteer Leader, Information	30.65	40
5. Preference Group, Random Leader, No Information	31.65	44
6. Preference Group, Volunteer Leader, No Information	33.98	44
Total Random Leader (Treatment 1 + 2 + 5)	26.97	120
Total Volunteer Leader (Treatment 3 + 4 + 6)	32.34	120

Table 2.2: Mean Giving by Treatment

Hypothesis 1. A volunteer leader elicits higher contributions from potential donors.

Results: We find that overall giving is higher with volunteer leaders relative to with random leaders.

Support: To determine how does having volunteer leaders affect subjects' giving behaviour, we conduct regression analysis with the giving (percentage of endowment allocated to the charity) as dependent variable. Table 2.3 reports the results of a random effects model with standard errors clustered at group level. We find that having a volunteer leader increases the average giving significantly by 9.546. The results hold after we control for demographics.

Hypothesis 2: Information about the leader's own contribution positively affects donations: the more the leader gives, the more other donors give.

Results: Regarding the effect of observing leaders' contribution, we find mixed re-

Dependent Variable: Giving	(1)	(2)	(3)
Observed	0.908	3.565	3.690
	(3.262)	(4.086)	(4.072)
Volunteer	6.750**	9.546**	9.507**
	(3.257)	(4.699)	(4.751)
Observed x Volunteer		-5.313	-5.379
		(6.471)	(6.548)
Rank			-13.20***
			(1.089)
Female			0.0322
			(3.321)
Age			-0.289
			(0.721)
Constant	24.25***	22.85***	55.33***
	(2.620)	(2.839)	(16.13)
Observations	456	456	456
R^2 (Overall)	0.018	0.020	0.197

Random Effects Model (GLS) with clustered standard errors at the group level
Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.3: Effect of Volunteer Leaders

sults. Followers respond to the information of the leaders' contribution differently depending on whether they are random leaders or volunteer leaders.

Support: Table 2.4 reports separate regression results for treatment 3 and 4, the two treatments where leaders' contributions could be observed by the followers. When the leader is randomly selected, followers' contributions are not correlated with the amount the leader sent. But when volunteer leaders are allowed, followers respond to volunteer leaders' contributions positively, the more the leader gives, the more other donors give.

Hypothesis 3: Potential donors respond more favorably to a solicitation with decreasing social distance of the leader.

Results: We find social distance of the leader has effect on fundraising only when the leader is randomly chosen.

Dependent Variable	Giving by Followers Random Leader	Giving by Followers Volunteer Leader
Giving by Leaders	0.0388	0.125**
	(0.0825)	(0.0629)
Project rank	-10.60***	-12.54***
	(1.716)	(1.611)
Female	-0.0661	-8.236
	(7.889)	(7.714)
Age	-1.183	0.947
	(1.538)	(1.408)
Constant	67.97*	38.35
	(34.72)	(29.71)
Observations	90	90
R^2 (Overall)	0.153	0.217

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.4: Effect of Observing Leaders' Giving

Support: We compare potential donors' contributions in the baseline treatment to potential donors' contributions in the preference based group treatment (treatment 5). In treatment 5 participants are grouped according to the results of their ranking task. Participants with similar preferences are grouped together. With the data from treatment 1 and 5 we can compare contribution behavior between random groups and groups that are formed based on preferences. This comparison allows us to investigate whether the responding contribution behavior differs depending on social distance. The comparison between treatment 2 and 6 helps us to study the interaction of social distance with volunteer leaders. We find decreasing social distance of the leader results in more than 30% increase in total giving when the leader is randomly chosen. We find no significant effect with volunteer leaders.

In order to study leaders' behavior, we conduct regression analysis for leaders only again with giving as the dependent variable. Table 2.5 reports the results of a random

effects model of leaders' giving behavior. We find that both volunteering and observability increase leader giving. We also find evidence that leaders treat volunteering and giving as substitutes.

	(1) Giving by leaders	(2) Giving by leaders
Observed	12.94**	29.61***
	(5.881)	(7.560)
Volunteer	4.877	22.32***
	(5.873)	(7.913)
Observed x Volunteer		-33.38***
		(10.69)
Project rank	-13.70***	-13.59***
	(1.889)	(1.939)
Constant	43.18***	35.56***
	(6.411)	(7.954)
Observations	114	114
R^2 (Overall)	0.265	0.373

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.5: The Effect of Observability on Leaders

2.5 Conclusion

There are several reasons that fundraising campaigns with volunteer leaders may be successful. In order to provide the needed insight into when this mechanism is likely effective, this paper examines three factors that may affect the impact of volunteer leaders derived from the existing literature: the status of the leader, information about donations, and social distance of the leader.

We design a "real donation" laboratory experiment to study the impact of volunteer leaders on charitable giving. We find that the effectiveness of leadership depends on the

specific context. Volunteers are generally more effective in increasing follower donations, but themselves give less than randomly-selected leaders. Social distance of the leader has little effect on fundraising. Further research (and replication) is necessary before we draw strong conclusions.

3. DOES HOW WE MEASURE ALTRUISM MATTER?: PLAYING BOTH ROLES IN DICTATOR GAMES

3.1 Introduction

Distributional preferences shape individual opinions concerning economic inequality and redistribution. Although most economists assume individuals are self-interested utility maximizers, both day-to-day experiences and a significant body of research suggest that concerns about social welfare also play an important role in shaping individuals' decisions across a wide variety of situations. Understanding the tradeoffs between fairness and selfishness, equality and efficiency thus has important applications for designing optimal public policies.

In recent research regarding distributional preferences, the modified dictator games devised by [Andreoni and Miller, 2002] (AM in the following) have gained remarkable popularity in identifying heterogeneous distributional preferences in the population. Subjects in AM play a series of dictator games allocating tokens between self and other that vary both the relative price of giving and the available budget. This design captures both subjects' selfishness (weight on payoff of self) and efficiency-equity tradeoffs (concerns for increasing total payoffs versus concerns for reducing differences in payoffs). Distributional preferences measured using the AM design are used to explain important issues such as political participation [Dawes et al., 2011] and intergenerational sharing [Porter and Adams, 2015], and to predict career choices [Fisman et al., 2015b], among other applications. Surprisingly, studies implementing the AM design present significant evidence of preferences for efficiency over preferences for equality, in contrast to the persistent findings of fairness preferences in the literature using standard dictator games. One noticeable difference between the AM design and a standard dictator game lies in the pay-

ment method. In a standard dictator game [Forsythe et al., 1994], a single role procedure is carried out, where a subject in the dictator role decides how much of the endowment to allocate between herself and a partner, who is in the recipient role. In the modified dictator games as in AM, subjects play in both roles, in the sense that they are paid once as a dictator, and once as a recipient of someone else's dictator decision. The existing literature in dictator games shows that subjects are sensitive to the description and the procedural details of the game [Eckel and Grossman, 1996, Hoffman et al., 1994, Engel, 2011]. It has also been shown in other experimental games that playing both roles affect subjects' pro-social behaviour [Burks et al., 2003, Güth et al., 1982].

Playing both roles may influence subjects in dictator games in a number of ways. First, playing both roles may prompt subjects to empathize with their matched recipients. If this were the case, we would expect playing both roles to increase giving. On the other hand, implementing decisions for both roles may cause subjects to feel less responsibility for their partners, resulting in less overall giving. Studying the effect of playing both roles may help us to understand the relative absence of preferences for fairness in studies using the AM design as compared to studies using a standard dictator game. We are not aware of any experiments that directly examine the effects of single-role and dual-role procedures in dictator games, even though both procedures are commonly used in literature.

In this paper, we aim to compare individual distributional preferences in modified dictator games with subjects playing both roles with those where subjects playing a single role. Participants in our experiment play a series of dictator games similar to AM. Our dual role treatment (DR) replicates the procedure in AM where subjects are paid for both roles, as dictators and as recipients. In the single role treatment (SR), subjects are assigned either as dictators or recipients and paid for only one role.

We find that the dual-role design overstates preferences for efficiency and understates concerns for equality compared to the single-role design. Subjects in DR sessions give

less (22 percent) of their endowment, on average, than in SR sessions (35 percent). In both treatments the preferences for giving are typically rational in the sense of being consistent with GARP. However, there is a striking difference between the two treatments in the preference for efficiency over equality: Subjects in DR display greater sensitivity to the price of giving compared to subjects in SR. We estimate the distribution of social preferences by estimating individual CES utility functions, recovering underlying preferences for giving. The distributions of preferences differ dramatically across the two treatments: while 19% of subjects in DR display selfish preferences, only 5% subjects in SR are selfish; 53% of subjects in SR present a preference for equality , but only 19% in DR. In addition, having subjects play both roles increases the proportion of subjects with a preference for efficiency by 47.6% (42% in SR vs. 62% in DR).

In an additional study, we implement an additional treatment to test whether the difference between dual-role procedure and single-role procedure are due to the reduced responsibility in dual-role procedure as we discussed above or due to the differences in final payoffs (subjects in DR are paid twice thus on average earn more than subjects in SR). We find the effect of playing both roles on distributional preferences is preserved even after controlling for the differences in final earnings. When using the estimated altruism parameters from both DR and SR protocols to predict real life giving, we find that only the measures derived from the SR data are correlated with subjects' past giving behaviour. This leads us to believe that the SR protocol is likely to be a more accurate measure of altruistic preferences.

3.2 Modified dictator games and playing both roles

AM originally designed their modified dictator games to address the question of whether or not other-regarding behaviour is consistent with rational choice theory. In their experiments, subjects made a series of modified dictator game decisions that varied both

the available budget and the relative price of giving, allowing the authors to test whether choices are consistent with the generalized axiom of revealed preference (GARP). They find that the majority of their subjects' choices are consistent with maximization of a quasi-concave utility function. AM also find a great deal of heterogeneity across subjects, with a large numbers of subjects having selfish preferences and others having other-regarding preferences. Many subjects showed a strong preference for efficiency over equality in their allocation decisions. Finally they estimate a CES utility function with two parameters, a selfishness parameter and an efficiency parameter, which are used in the subsequent literature as measurements of distributional preferences.

[Fisman et al., 2007] extend the AM design by implementing a graphic computer interface and increasing the number of decisions from the eight or eleven used in AM to fifty. They also expand AM's analysis to estimate individual preference parameters. Consistent with AM, they also find evidence in favour of preferences for efficiency as well as considerable heterogeneity among subjects.

Both AM and extensions of their design have been used in a number of papers to measure distributional preferences. [Dawes et al., 2011] explored the influence of different types of social preferences measured by the AM design on political participation. They found that subjects who exhibit higher preferences for efficiency are more likely to participate in politics than those who are concerned with equalizing resources among individuals. [Fisman et al., 2015a] find that the Great Recession increased selfishness. [Porter and Adams, 2015] compare the preferences for giving to strangers and parents and find that giving to parents is more sensitive to price as compared to giving to strangers.

Using an extended AM design, [Fisman et al., 2015b] measure the distributional preferences of a highly elite group of students (students at Yale Law School), an intermediate elite group of students (students at the University of California, Berkley), and a representative sample of Americans (a sample drawn from the American Life Panel). They find

that the elite sample is significantly more focused on efficiency relative to equality than is the U.S. public.[1]

AM implement a different payout method compared to a standard dictator game. In a standard dictator game, subjects are assigned specific roles as either a dictator or a recipient. Dictators then allocate a certain amount of money (endowment) between themselves and the recipient whom they are randomly paired with. Notice recipients don't make any decisions despite being paid. In AM all subjects make allocation decisions. They are paid twice, once as a dictator and once as a recipient. In other words, subjects play both roles. Following AM, most of the papers using the modified dictator games also adopt the dual-role procedure.

In a study with similar motivation to our own, [Iriberri and Rey-Biel, 2011] compare discrete dictator games, where subjects make a series of choices among three options (a selfish action, an efficiency-enhancing altruistic act, and an efficiency-reducing spiteful act) with and without "role uncertainty" in dictator games. With role certainty, subjects are assigned a role ahead of time and make a decision and are paid only for that decision. With role uncertainty all subjects play as dictators, and then half are assigned to be recipients. Their design allowed them to classify subjects as selfish, social welfare maximizers (preferring efficiency), inequality averse or competitive. Their results show that with role certainty, selfish and inequality averse types dominate (with 44% and 25% respectively). However, role uncertainty substantially increases the proportion of social welfare maximizers (from 21% to 74%) and decreases the proportion of selfish (to 21%) and inequality averse (to 4%).

Playing both roles has been shown to impact behavior in other experimental games. In trust games, [Burks et al., 2003] find that playing both roles increases selfish behavior, re-

[1]However, it is worth noting that they used different procedures for the two samples. We revisit their findings in the conclusion below.

ducing both the degree of trust and the degree of reciprocity. Playing both roles has mixed effects in ultimatum games: [Carter and Irons, 1991] found that proposer demands were greater if subjects play both roles compared to the standard single-role ultimatum game, but [Güth and Tietz, 1990] found that proposers who play both roles are more likely to select 50/50 splits than those who do not. The various results suggest that an examination of the effects of the dual-role and single-role procedure for dictator games is warranted.

3.3 Experimental Design and Procedures

To test the effect of a dual-role procedure on subjects' behaviour in the AM modified dictator games, we adopt a between-subject design with two treatments. Subjects in both treatments played a series of dictator games that includes the eleven decisions in AM and two additional decisions. Each of the decision problems differed by the number of tokens to be divided and by the relative price of giving, expressed as the number of points a token is worth to each subject. Tokens were worth 1, 2, 3 or 4 points each. The total number of tokens varied between 40 and 100. Table 3.3 provides the details of the thirteen budgets offered to subjects.

Subjects were told that at the end of the experiment, one of the thirteen decisions would be chosen at random for payment and each point was worth \$0.10 in payoff. In the SR treatment, as in a standard dictator game, subjects were assigned either the dictator role or the recipient role before dictators made allocation decisions. Our DR treatment replicated the procedure in AM, where each subject was both a dictator and a recipient.

From November to December 2015, we recruited a total of 114 undergraduate students to participate in six sessions: 42 in DR and 72 in SR. The experiments were conducted in the Economic Research Lab at Texas AM University. Subjects were recruited using ORSEE [Greiner, 2015] The experiments were computerized using zTree [Fischbacher, 2007]. Each session lasts on average 45 minutes. The average earnings was \$12.13. Subjects earn

Budget	Token Endowment	Hold Value	Pass Value	Relative Price of Giving
1	40	1	4	0.25
2	40	1	3	0.33
3	40	3	1	3
4	40	4	1	4
5	60	1	3	0.33
6	60	1	2	0.5
7	60	1	1	1
8	60	2	1	2
9	60	3	1	3
10	75	1	2	0.5
11	75	2	1	2
12	80	1	1	1
13	100	1	1	1

Table 3.1: Allocation Choices

on average $10.50 in SR, and $15.75 in DR. A $5 participation fee was paid to all participants. Upon arrival, participants were randomly seated at computer terminals. A random payment ID was given to each participant. The instructions were read aloud by the experimenter. A quiz was included at the end of the instructions to ensure subjects understand nature of the game and the payoffs. We ensure anonymity throughout the experiment. All subjects in DR sessions, but only the designated dictators in the SR sessions, made decisions that determined the payoffs for both dictators and recipients. In the SR treatment, recipients were asked to fill in a questionnaire that had no influence on their payoffs while dictators were making decisions. Subjects then filled out an exit survey before being paid privately by an assistant not involved with the experiment in a separate room.

3.4 Results

We begin by examining whether the data in our study is similar to other dictator game studies. For those budgets with a relative price of giving equal to one (as in standard dictator games), our subjects passed 28 percent of the endowment on average, which is

similar to the pass rates reported in the literature [Camerer, 2003, Engel, 2011]. Our results in the DR treatment replicated those reported by AM, with subjects giving 22.45 percent of tokens endowed, quite similar to the 23 percent average giving reported in theirs. We were unable to find significant differences between the average tokens passed for any of the thirteen choices.

Next we check whether our subjects in both DR and SR behave rationally in the sense that their choices are consistent with GARP. Following AM, we use Afriat's (1972) Critical Cost Efficiency Index (CCEI) to measure the severity of violations. CCEI shows the largest value by which the endowments must be multiplied to avoid violations. The closer the CCEI is to one, the less we would have to shrink any budgets to avoid violations. Following Varian (1991), we choose a threshold of 0.95 as a cutoff to establish that subjects are rational. Our subjects exhibit a high degree of rationality in all three treatments. Of the 114 dictators in our experiment, 6 had violations CCEI indices of less than .95 (12 percent). Over 90 percent of subjects made choices that are consistent with utility maximization, 89 percent in SR (32/36), and 95 percent in DR (40/42). The 95 percent in DR is close to the 98 percent rationality reported in AM.

We now turn to the effect of having subjects playing both roles in the game, beginning with the effect on amount passed. Table 3.4 details the average amount our subjects chose to share for each of the budgets in both DR and SR treatments. The final column contains the p-values for tests comparing SR with DR giving.

Subjects in our DR decisions passed 22 percent of their endowments compared to 35 percent in the SR decisions. The Wilcoxon rank-sum test yields a p-value of 0.0034, indicating a significant difference in giving. When we compare decisions played for each of the budgets in SR and DR, we find that subjects in DR are more sensitive to relative price of giving. Subjects in DR passed significantly less than those in SR when the relative price of giving is greater or equal to one.

Budget	Token Endowment	Relative Price of Giving	Tokens Passed in SR	Tokens Passed in DR	P-value
1	40	0.25	12.94	14.10	0.847
2	40	0.33	11.94	14.02	0.747
5	60	0.33	20.42	20.24	0.488
6	60	0.5	20.53	17.95	0.528
10	75	0.5	27.69	23.5	0.269
7	60	1	22.78	11.36	0.000
12	80	1	30.83	16.31	0.000
13	100	1	35.83	19.64	0.001
8	60	2	20.56	8.21	0.001
11	75	2	25.97	11.1	0.002
3	40	3	14.58	5.79	0.001
9	60	3	22.36	7.5	0.000
4	40	4	15	4.88	0.001

Table 3.2: Total Contribution

To determine how playing both roles affects subjects' behaviour in the modified dictator games, we conduct regression analysis with the tokens passed as dependent variable. Table 3.4 reports the results of a random effects model with standard errors clustered at individual level. We find that subjects in single role sessions on average give more. While subjects in both treatments give more when endowment increases, only subjects in dual role sessions are sensitive to the price of giving. The sensitivity to price for dual role subjects stays significant after controlled for subjects' demographics and self-reported past giving and volunteering.

Finally we examine how preferences for giving differ across treatments. Given that the majority of our subjects' behavior is rational, we can estimate a structural model of utility that represents their preferences. With thirteen observations per subjects, we can estimate the preference for giving at the individual level.

We denote person self and other as s and o, respectively. Consider the choices of person s have consequences for his own payoff, π_s, and the payoff of the other person, π_o. For

Dependent Variable: Tokens Passed	(1)	(2)	(3)	(4)
Dual Role	-8.219***	-8.219***	-3.835	-4.511
	(-3.37)	(-3.37)	(-1.17)	(-1.25)
Endowment		0.244***	0.244***	0.244***
		(7.12)	(7.12)	(7.09)
Price		-1.693**	-0.0710	-0.071
		(-2.13)	(-0.06)	(-0.06)
Price*Dual Role			-3.013**	-3.013**
			(-2.09)	(-2.08)
Constant	21.65***	9.280***	6.919**	8.688
	(12.34)	(3.35)	(2.26)	(0.92)
Control Variables				Yes
Observations	1014	1014	1014	1014
R-squared	0.0571	0.1487	0.1595	0.1788

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

- Random effects model with standard errors clustered at individual level.

- Model 4 controls for demographics and self reported past giving.

Table 3.3: Effect of Dual Role Procedure (Regression Results)

each individual we estimate the utility function with a Constant Elasticity of Substitution (CES) functional form:

$$U_s = (\alpha\pi_s^\rho + (1-\alpha)\pi_s^\rho)^{1/\rho}$$

where α represents the relative weight on the payoff for self ($\alpha = 1$ when perfectly selfish); ρ captures the curvature of the indifference curves, with $\sigma = 1/(\rho - 1)$ the elasticity of substitution between one's own payoff and that of the other. As $\rho \to 1$ preferences are perfect substitutes. When $\rho \to -\infty$ preferences are Leontief. As $\rho \to 0$, the indifference curves approach those of a Cobb-Douglas function, which implies that the expenditures on tokens kept and given are equal to fractions α and $1 - \alpha$ of the endowment m. Thus $\rho > 0$ indicates that distributional preferences are weighted towards increasing total payoffs, whereas $\rho < 0$ indicates distributional preferences are weighted towards reducing differences in payoffs.

With the normalized budgets $\pi_s + (p_o/p_s)\pi_o = m/p_s$, or $\pi_s + p\pi_o = m'$, the demand function for the CES utility function is written as:

$$\begin{aligned}\pi_s(p, m') &= \frac{[\alpha/(1-\alpha)]^{\rho/(1-\rho)}}{p^{-\rho/(1-\rho)} + [\alpha/(1-\alpha)]^{\rho/(1-\rho)}} m' \\ &= \frac{A}{p^r + A} m',\end{aligned}$$

where $r = -\rho/(1-\rho)$, and $A = [\alpha/(1-\alpha)]^{\rho/(1-\rho)}$.

We estimate A and r using two-limit Tobit maximum likelihood, reflecting the restriction that subjects' choices are censored at both ends of the budget constraint, or $0 < \pi_s/m' < 1$. The estimated demand function is

$$\frac{\pi_s(p, m')}{m'} = \frac{A}{p^r + A} + \epsilon,$$

where $\epsilon \sim N(0, \sigma^2)$. AM categorize subjects into groups and estimate the utility function for each group of subjects. We estimate unique utility function for each individual subject.

The estimates of the two relevant parameters α and ρ reflect individual preferences for giving. Figure 3.1 shows a scatterplot of $\hat{\alpha}$ and $\hat{\rho}$, and compares the estimates across the two treatments. Not surprisingly, most of our subjects are self-interested ($\hat{\alpha} > 1/2$ for almost all subjects in our experiment). Notice that in both treatments there is a great deal of heterogeneity in preferences across subjects. Though we do see higher fraction of subjects in DR procedure with positive, indicating the preferences for efficiency. Notice that the perfectly selfish subjects ($\hat{\alpha} = 1$) are almost all in the dual role treatment (turquoise dots at the top of the figure), while most of the subjects with $\hat{\rho} < -.5$ are in the single-role treatment (orange dots to the left).

With estimates from the structural analysis, we classify subjects into the following categories: purely selfish ($\hat{\alpha} = 1$ and $\hat{\rho} = 0$), efficiency focused ($\hat{\rho} > 0$), and equality

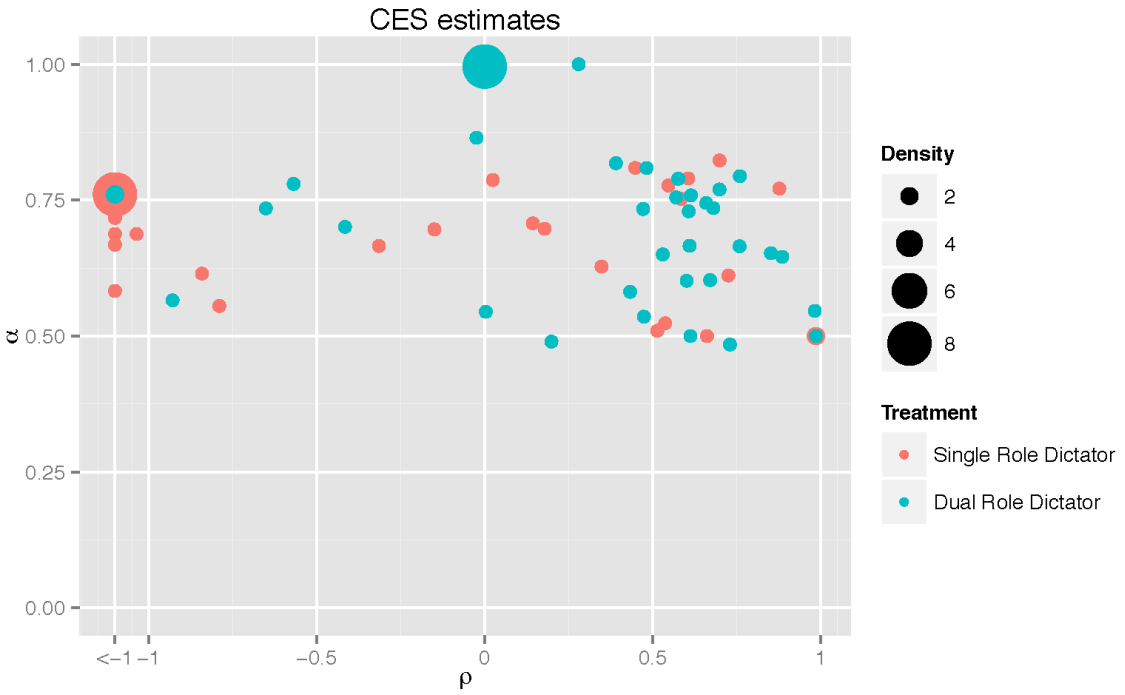

Figure 3.1: CES Estimates

focused ($\hat{\rho} < 0$). We find that the distribution of preferences is significantly affected by whether a single-role procedure or a dual-role procedure is implemented (see Figure 3.2). In SR, the majority of subjects are equality focused (53%), indicating a strong preference for equal-payoffs. On the other hand, in DR, preferences for equality are frequent (19%). The majority of dual role dictators have preferences for efficiency (62%). The selfish preference is more frequent in DR than in SR (19% vs. 5%).

Given the large differences in the distribution of types in the two treatments, the question naturally arises as to why the results are so different. Recall that in the introduction we posited two possible factors that might affect the outcome. First, subjects might feel greater empathy for their counterparts in the dual role setting, because they would be more likely to consider themselves in the recipient role. We posited that this would make

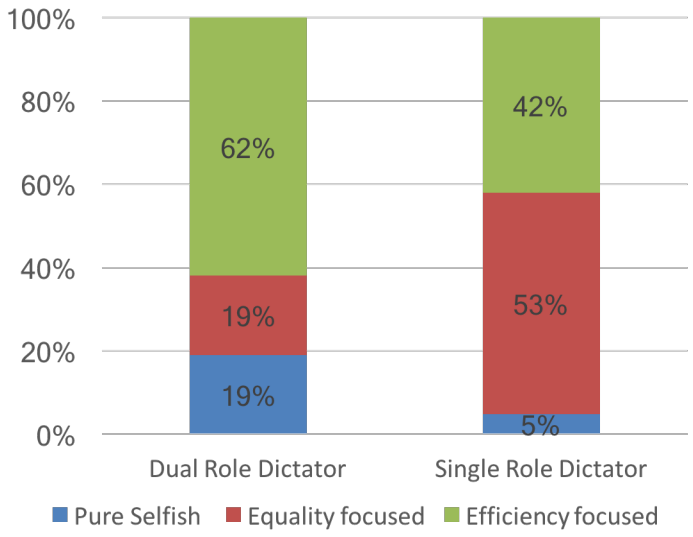

Figure 3.2: Distribution of Preference

subjects more generous in the dual role treatment. However our data provide no support for this conjecture. Second we argued that subjects in the dual role treatment might feel less responsible for their counterpart's earnings, since one of the counterpart's own decisions would also be implemented. This would tend to decrease giving. Our data generally support that conjecture. To further explore the mechanism underlying the results, we conducted an additional study described below, where each subject has another source of earnings.

3.5 Additional Study

The single role lottery treatment (SR+L) adds an additional source of earnings - described to the subjects as a lottery - for both players. This treatment only differs from SR in that each subject had an opportunity to earn extra money through playing this lottery. The lottery was played as follows. Subjects were asked to draw one card from a deck of 20 cards, each with a number representing the point value of the card. The number of points

on the card drawn was converted to dollars (1 point = $0.10) and added to the payoffs of subjects at the end of the experiment. Dictators and recipients were presented with different decks, and therefore the expected payoffs from the lottery are different across roles. The distribution of payoffs in the two lotteries matches the distribution of earnings in the DR treatment from the other player's decision. That is, for those in the dictator role in SR+L, the points on the cards have a distribution equivalent to the distribution of points received by the recipients in DR. In contrast, those in the recipient role SR+L played the lottery where the points on the cards have a similar distribution to the points dictators in DR decided to keep to themselves. Thus these payoffs mirror what a subject might expect to receive from their second-role payoff. By doing this, we replace the payoffs of the second role with a lottery with same distribution of payoffs in DR. Figure 3.3 provide the details of the lottery. (Recall that the distributions will not be symmetric because of the differences in relative price of giving across decisions).

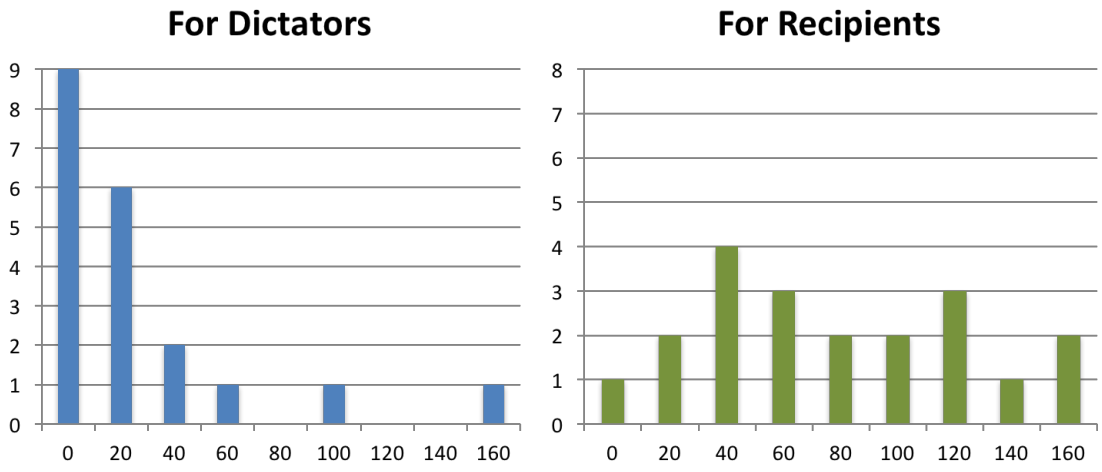

Figure 3.3: Payoff Distribution of Lottery

Four sessions of SR+L were conducted in March 2016. In total 72 subjects participated. All procedures in SR+L are the same as in SR except that subjects played a lottery after the dictator game but before payment. Subjects in SR+L earn on average \$16.89 including the \$5 showup fee. Adding the extra source of payoffs reduced the percentage of tokens passed from 35% in SR to 25.5% in SR+L ($p = 0.0164$). Figure 3.4 reports the average percentages of tokens passed across all three treatments. The average level of giving in SR+L is well below that in SR, and is now similar to that for the DR treatment. Thus a simple examination of the average giving would lead us to believe that the reduced responsibility argument is correct.

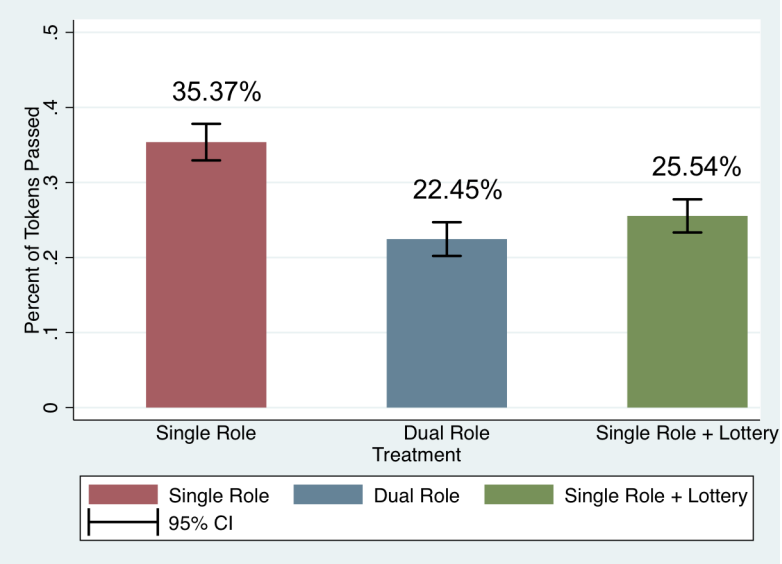

Figure 3.4: Mean Giving for Three Treatments

However, the SR+L results retain a key feature of the SR data: The insensitivity to price of giving in Single Role sessions remained with the extra source of payoffs. Thus reduced responsibility alone cannot fully account for the difference in treatments. To

further explore the differences across treatments, Table 3.5 reports separate regression results for each of the three treatments. Subjects passed more tokens to others when they received higher endowment in all treatments, no matter whether they play both roles or only the single role. But price has a strong effect on giving only in Dual Role sessions.

Dependent Variable: Tokens Passed	(1) Single Role	(2) Dual Role	(3) Single Role Lottery
Endowment	0.391***	0.118***	0.289***
	(9.02)	(2.68)	(6.35)
Price	0.484	-3.559***	0.453
	(0.37)	(-3.94)	(0.52)
Constant	7.294	-5.555	15.23
	(0.58)	(-0.30)	(0.57)
Control Variables	Yes	Yes	Yes
Observations	468	546	468
R^2	0.19	0.16	0.22

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

- Random effects model with standard errors clustered at individual level.

Table 3.4: Effect of Dual Role Procedure (Separate Regression Results)

Similarly to subjects in SR+L and DR, majority of our subjects in SR+L passed the consistency test. 78 percent of subjects in SR+L has CCEI index greater than 0.95. We then proceed to the analysis of our estimates of the individual CES utility parameters. The distributions of types were determined as in the previous study, by classifying subjects based on their estimated parameters. As shown in Figure 3.5, we see that subjects in the DR sessions were substantially more efficiency-focused than subjects in the two single role sessions: 62% of DR subjects are efficiency-focused ($\hat{\rho} > 0$) versus only 42% and 39% of the SR and SR+L treatments. In addition, the DR subjects are less likely to be classified as equality-focused and more likely to be selfish than are SR subjects: 19% of

DR subjects are classified as equality-focused, as compared to 53% and 50% of singles role subjects; conversely, 19% of DR subjects, 5% and 10% of SR and SR+L subjects, respectively, are selfish.

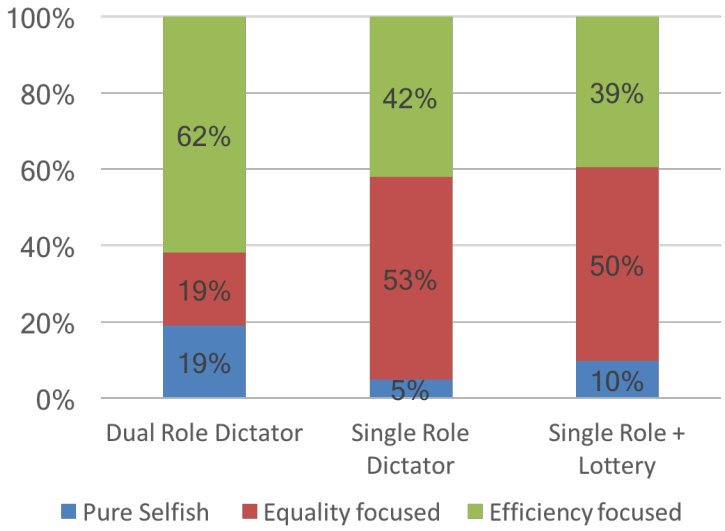

Figure 3.5: Distribution of Preferences for Three Treatments

The additional results provide evidence that, while the reduced responsibility in DR causes subjects to give less on average, it cannot explain why only the DR subjects are responsive to the relative prices of giving but not the SR or SR+L subjects. We conclude that playing both roles leads to different individual behaviour when compared to behavior using the single role protocol. Furthermore, this difference is not due to the fact that there is an additional source of payoffs total payoffs in the dual role protocols. The additional treatment where we mimic the payoffs of dual role treatment in the single role case shows similar classification of types.

3.6 Does measure of altruism predict real life giving?

We have shown that playing both roles alters the measured revealed preferences for giving relative to the single role protocol. Since giving generally occurs in an environment where the donor is not at the same time a recipient of someone else's generosity, we suspect that the single-role measure is a more accurate representation of preferences.

There are a small number of papers examining the external validity of dictator game results. This literature directly links the evidence from the lab to the field to study whether the dictator game results are correlated with people's real life altruistic behavior.

[Barr et al., 2010] and [Franzen and Pointner, 2013] used standard dictator game with single role protocol and found evidence that pro-social behavior in the lab is correlated with behavior in the field. In [Barr et al., 2010], the time teachers in Uganda spent lecturing was positively correlated with their giving behavior in a dictator game.

[Franzen and Pointner, 2013] correlated behavior in a standard dictator game with real choices made many weeks (4 to 5 weeks or 2 years) later and found pro-social behavior in the lab and in the field were significantly correlated. Several papers that used simple dictator game with single role protocol but replaced the recipient with real charities also found dictator game results predict real life pro-social behavior [Benz and Meier, 2008, Carpenter et al., 2008, Carpenter and Myers, 2010]. [Benz and Meier, 2008] compared students' giving behavior in a classroom dictator game with their decisions in a natural occurring decision setting. They found that the dictator game results were correlated with students' charitable giving up to two years before and after the experiment. The correlation ranged between 0.25 and 0.4. [Carpenter et al., 2008] found evidence that giving in dictator games are positively correlated with altruism measured by responses to survey questions among both students and random member of the community.

[Carpenter and Myers, 2010] found that altruism as measured by the dictator game is a

key predictor of the real-life decision to volunteer, and that it is also positively correlated with the time the volunteer firefighters dedicated to training with their co-volunteers. [Galizzi and Navarro Martinez, 2015] found no correlation when compared dictator game results with several behavior elicited in the field and with the self-reported past giving behavior. But their subjects played the dictator game twice, once as dictator, and once as recipient.

Current literature that examines correlation between dictator game results and real-life giving behavior provides evidence consistent with our conjecture that the single-role measure is more accurate. In order to test this conjecture, we conduct additional analysis, comparing elicited preferences with altruistic behavior. We ask which measure better predicts self-reported charitable activity.

Self-reported giving is derived from answers to the post-experiment survey. Subjects in all treatments filled out a survey in which we collected basic demographic information: age, sex, ethnicity, family income, religion, and political ideology. We also asked questions about their past giving behaviour.

In the analysis in Table 3.5, we compare the predictive power of the altruism measure between the dual role protocol and the single role protocol. We estimate $\hat{\alpha}$, the relative weight on self-payoffs, for each participant. $\hat{\alpha}$ takes the value between 0 and 1. The closer the value of $\hat{\alpha}$ to 1, the more selfish the person is. We expect $\hat{\alpha}$ to be negatively correlated with real giving behaviour. We report the results of ordered logit regressions of past year's giving on $\hat{\alpha}$ for DR, SR, and SR+L separately in column 1, 2, and 3 in Table 3.6.

The dependent variable is the reported total amount given to any charitable organizations in the past year.[2] All three columns include the demographic variables as control.

[2]In the post-experiment survey, subjects responded to the question: "How much money have you donated to charitable organizations in the past year?" Subjects choose one of the following options: \$0, \$1-\$10, \$11-\$25, \$26-\$50, \$50-\$100, \$101-\$250, \$251-\$500, and >\$500. 14% of our subjects chose \$0; 19% chose \$1-\$10; 24% chose \$11-\$25, 18%, 12%, 7%, 4% and 1% chose the rest of options, respectively. There is no significant difference across three treatments.

	(1) Dual Role	(2) Single Role	(3) Single Role+Lottery
α	-2.737	-6.497**	-4.830*
	(-1.37)	(-2.55)	(-1.95)
Control Variables	Yes	Yes	Yes
Observations	42	36	42
Pseudo R-squared	0.09	0.10	0.13

Ordered log-odds(logit) regression coefficients are reported
t statistics in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Control variables include: age, gender, race, family income,
religion, weekly spending, and political ideology

Table 3.5: Predict Real Life Giving (Ordered Logit Regression Results)

The negative correlation of and past giving is consistent with our hypothesis. Though the sign of the coefficient is similar between the dual role protocol and the single role protocol, the single-role magnitude is larger, and only the measure from the single role protocol is significantly correlated with past giving behaviour.

3.7 Conclusion

We find that playing both roles in dictator games appears to reduce altruistic behavior and increase the sensitivity to the relative price of giving. Moreover, this method leads to a higher estimate of the proportion of subjects with preferences for efficiency over equality, as well as a higher proportion of subjects exhibiting selfish preferences.

An additional treatment with a single role protocol, but in which subjects earn similar payoffs as in the dual role protocol, shows that it is not the differences in total payoffs that drives the differences. We then conduct additional analysis comparing the estimated altruism parameters with self-reported charitable giving, and find that only the single-role estimates are significantly related to giving. We see this as an indication that the single-role measure is a more accurate representation of preferences.

Our study provides evidence that the dual role protocol distorts the measure of elicited

preferences, and suggests that we may want to rethink the way in which preferences are elicited in the lab. It is tempting to use the strategy method in lab experiments, as this gives the researcher a great deal more data than a single decision would provide. There is increasing evidence that using the strategy method has an impact on behavior. Use of the strategy method may be legitimate when this involves only contingent choices within a single role, as when a trustee in the trust game is asked to specify the amount he wishes to return for every possible amount sent. The evidence of the impact of this type of strategy method usage is mixed [Brandts and Charness, 2011]. But our results suggest that using the strategy method across roles may substantially distort subjects' elicited altruistic preferences.

4. TRUST, ALTRUISM AND SOCIAL NORMS

4.1 Introduction

Matters of trust and trustworthiness practically occupy every aspect of our daily lives. Our society and all of the activities we do together depend on trust. Economists also care a great deal about trust. Trust has been shown to increases efficiency [Frank, 1988]. Higher trust is associated with economic growth, lower corruption, more efficient judicial systems, and higher quality government bureaucracies [Knack and Keefer, 1997, Guiso et al., 2004, La Porta et al., 1997].

In recent years, economists have increasingly used laboratory experiments to measure trust and trustworthiness. The trust game designed by [Berg et al., 1995] has become a popular and well-replicated measure of trust and trustworthiness in the field. In a standard trust game, each of two players is endowed with $10. During stage one, the first mover decides to pass none, some, or all of her endowment to the second mover. The experimenter triples the amount before it is passed on to the second mover. The second mover then has the opportunity to return some or all of the tripled amount back to the first mover. The amount the first mover decides to pass in the trust game represents trust, while the amount returned by the second mover captures trustworthiness.

A large body of literature assumes that trust is motivated by expectations of reciprocity. Trustworthiness, in turn, is typically assumed to be motivated only by reciprocity. However, the prosocial preferences literature suggests that altruism, or unconditional kindness could induce people to trust or to be trustworthy. [Cox, 2004] designs a triadic trust game to study this issue. He argues that the amount sent by the first mover in the trust game confounds trust with altruism. Similarly, the second mover may be motivated by altruism, inequality aversion, or reciprocity when passing positive amounts back. His design con-

sists of three games. Game A is a standard trust game, and Game B is a dictator game intended to capture altruism. Game B only differs from Game A in that the second mover doesn't make return decisions. Game C is a modified dictator game that captures fairness, where the first mover does not make decisions. The results from Cox indicate that a portion of the amount passed in trust game could be explained by not only trust or trustworthiness, but also prosocial preferences such as altruism and fairness. However, since Cox employs a between-subject design, we can not make inferences regarding how altruism and fairness may predict individual trust and trustworthiness behavior. In this paper, we use a within-subject design where the subjects participate in all three games in the triadic design. We then examine whether individuals' altruism and fairness are correlated with their trust and trustworthiness behavior.

Trust and trustworthiness may be shaped by individuals' prosocial preferences, but they could also be influenced by social norms. The literature on prosocial behavior and social norms shows that prosocial behavior is not only driven by preferences regarding payoff distributions, but also those for following well-established social rules, the norms. The existing literature studying norms in experimental economics primarily focuses on dictator games and altruism. We contribute to the discussion by combining the trust and the norms literature in experimental economics to study the relationship between norms and trust.

We aim to better understand what factors influence an individual' decision to trust. We are specifically interested in answering the following two research questions:1) does altruism explain individual trust and trustworthy behavior, and 2) is trust a norm? What about trustworthiness? The rest of the chapter is organized as follows. In the next section we describe the experimental design and procedures. In Section 4.3 we present our results. Section 4.4 concludes.

4.2 Experimental Design

Our experiment design consists of two parts. Experiment 1 is the triadic trust game where subjects make choices. Experiment 2 describes the choice environment in Experiment 1, then elicits the social norms over behavior in Experiment 1 from an independent group of subjects who never play that triadic trust games.

4.2.1 Experiment 1: Triadic Trust Game

We employ a within-subject design in which subjects in Experiment 1 participate in all three games, Game A, Game B, and Game C. These three games constitute the triadic trust game design as in [Cox, 2004].

Game A: Both the first and second mover are endowed with 10 tokens. In the first stage the first mover can transfer none, some, or all of her endowment (from 0 to 10 tokens) to the second mover. The amount the first mover decides to transfer is tripled by the experimenter before being delivered to the second mover. In the second stage the second mover has the opportunity to return none, some, or all of the amount she receives from the first mover. Differing from [Cox, 2004], we use the strategy method asking the second mover to make choices for every possible amount sent by the first mover.

Game B: Both the first and second mover are endowed with 10 tokens. Game B differs from Game A only in that the second mover in Game B does not make decisions. The game ends after the first stage.

Game C: The "first mover" is endowed with X tokens and the "second mover" is endowed with 10 plus 3x(10-X) tokens. The "second mover" may transfer none, some, or all of her 3x(10-X) tokens to the "first mover". We again use the strategy method.

Our Experiment 1 differs from Cox's design in two ways: 1) we employ a within-subject design where subjects participate in all three games (Game A, Game B, and Game C); 2) we use the strategy method asking the second mover to make choices for each

possible action made by the first mover. The sequence in which subjects participate in Game A, B, and C is randomly varied. Instructions were distributed independently before each game.

4.2.2 Experiment 2: Norms Elicitation

[Krupka and Weber, 2013] (KW) propose using coordination games to measure social norms, studying norm-driven behavior in dictator games. We adopt their coordination game design and adjust it to measure norms in our triadic trust games.

In Experiment 2, subjects have the scenarios in the triadic trust games described to them. They then judge each action taken by the first and second mover in each of the three games as "very socially inappropriate," "somewhat socially inappropriate," "somewhat socially appropriate," or "very socially appropriate." Subjects receive a reward if their evaluation agrees with the majority of other subjects. Subjects therefore have an incentive to reveal what they consider the jointly recognized perceptions of appropriateness of the actions, but not their perceptions of the appropriateness of the actions. One of the actions they evaluate is randomly selected for payment. If a subject's evaluation for the chosen action agrees with that of other subjects then they receive an extra $1 in addition to their $1 base payment.

4.2.3 Amazon's Mechanical Turk

We conducted all experiments during May 2017. Subjects were recruited and paid using Amazon's Mechanical Turk (MTurk). We restricted our subject pool using the following criteria: 1) subjects are located in United States, 2) subjects must have had successfully completed at least 50 prior Mechanical Turk assignments, and 3) subjects must have had more than 90% of their previous assignments approved for payment. All experiments consist of the following six parts: 1) consent form, 2) a bogus item that serves as a deterrent for those who do not pay attention to instructions, 3) instructions for each game,

4) quizzes to make sure subjects understand each game, 5) games, and 6) an exit survey. The experiments were programmed in Qualtrics. Subjects who satisfied the criteria and signed up for the experiment were directed to complete all tasks on Qualtrics.

In total 132 subjects participated in our study: 90 in the triadic trust game, and 42 in the norm elicitation experiment. All subjects received $1 on completing all the tasks, plus an additional payment ranging from $0 to $4 based on decisions made in the experiments.

4.3 Results

We begin our discussion of the results by analyzing the data generated from our triadic trust games. We then combine the norms data with the trust game decisions to predict behavior.

4.3.1 Trust, Trustworthiness, and Altruism

Overview

First, we notice that the average amounts transferred and returned in our triadic trust games are surprisingly close to the standard results from trust and dictator games despite the substantial differences in our design versus earlier studies, as well as using a subject pool different from the standard undergraduate students. Typically dictators send approximately 20 percent while the first movers send approximately 50 percent of their endowment, and the second movers return about the amount that the first movers sent to them [Camerer, 2003]. In our experiment, on average the first mover sends 4.47 tokens (45%), and the second mover returns 3.88 tokens (see Figure 4.1). We find that 12 out of 43 first movers sent all of their 20 token endowments and 17 sent zero tokens. In total more than 60 percent subjects sent a positive amount to their paired second movers.

Although both subjects are endowed with 10 tokens in Game B, we still observe that the first movers transfer some positive amount to the second movers. On average the first movers pass 1.58 tokens, or 16% of their endowment (see Figure 4.2). Consistent with

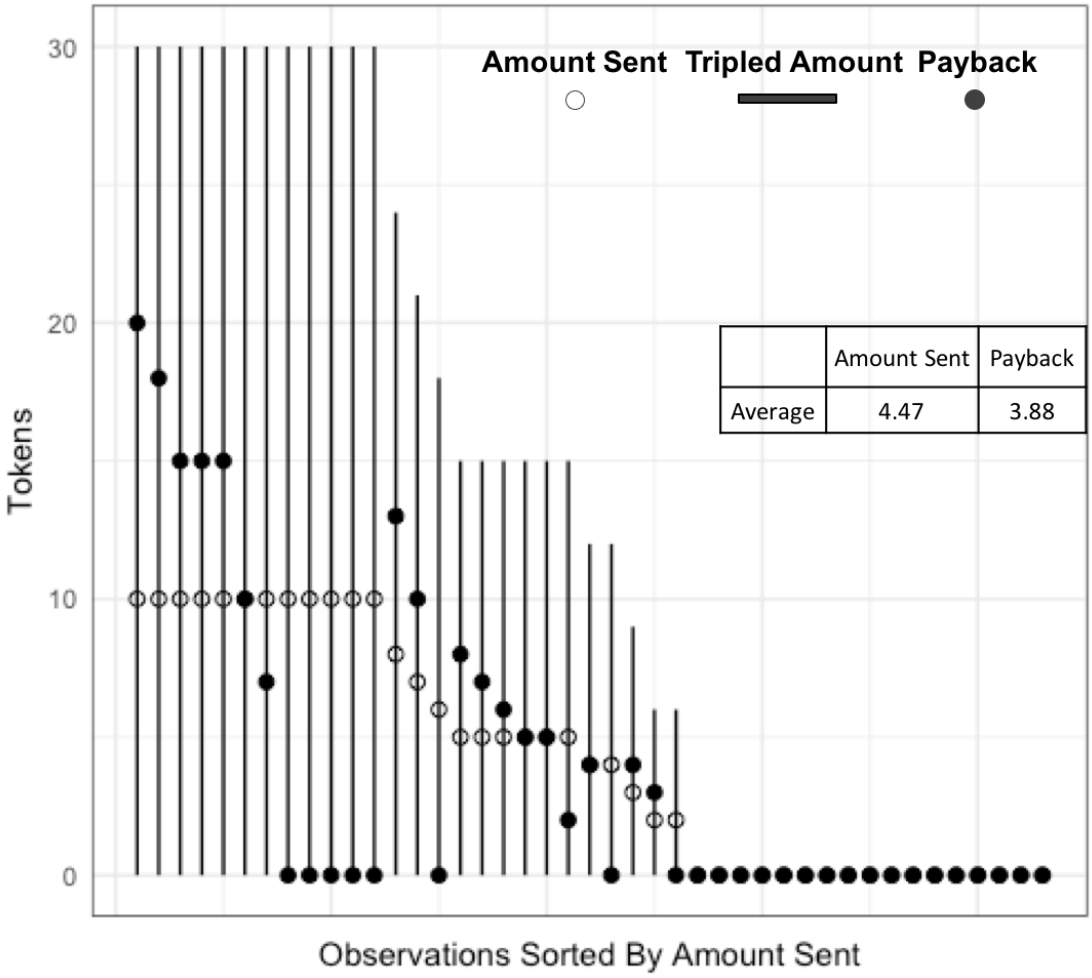

Figure 4.1: Trust and Trustworthiness

Cox's findings, we find that altruism does play a role in the first mover's trust decisions.

Figure 4.3 shows the comparison of the amounts sent in Game A versus Game B. The grey bars represent Game A data and the black solid bars represent Game B data. Although more subjects in Game B sent zero tokens than those in Game A, we still find that 28% of our first movers sent positive amounts to their paired subjects. There is evidence of altruism in the data.

Game C is designed to capture preferences for fairness among the second movers in

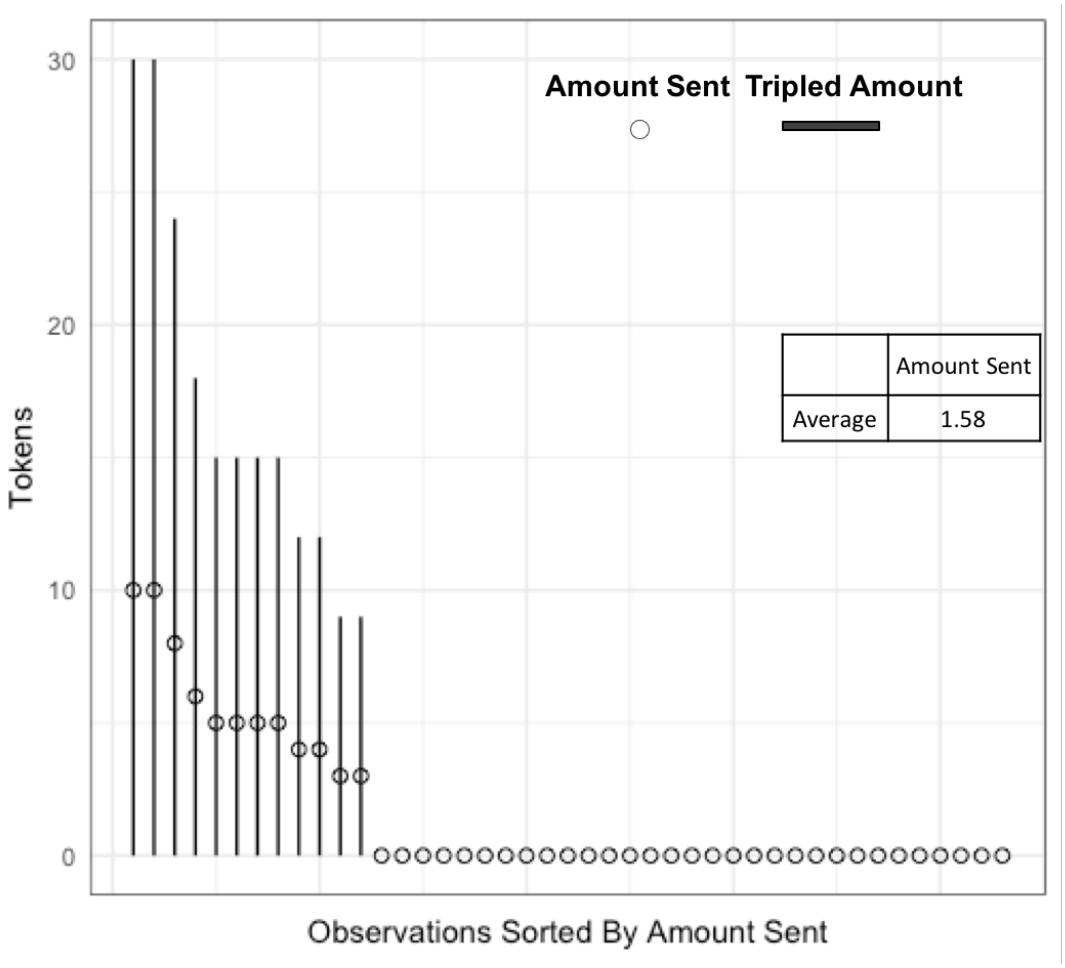

Figure 4.2: Altruism

trust games. On average "the second movers" in Game C "returned" 3.83 tokens to their paired subjects; 42% of them sent positive amounts. We accordingly find strong evidence for fairness in our data (Figure 4.4).

Analysis

Our within-subject design allows us to examine the correlation between altruism and trust, as well as that between fairness and trustworthiness. We also collect survey measures of trust and trustworthiness in the exist survey. We could further examine how well the

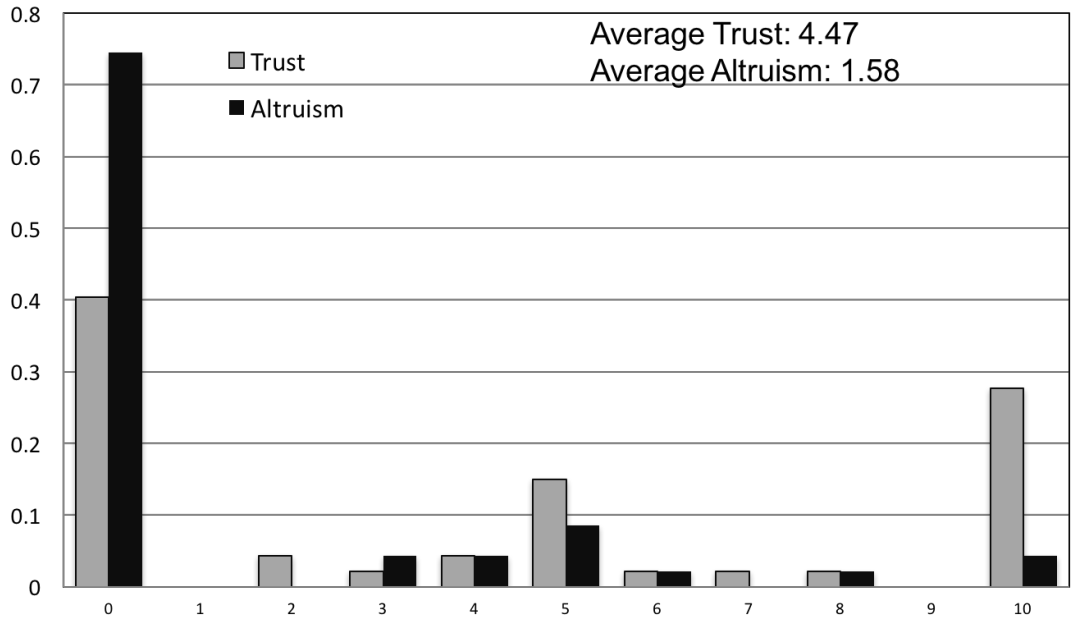

Figure 4.3: Trust and Altruism

survey measures predict subjects' trust and trustworthiness behavior in trust games. We report our results as follows.

Result 1. Altruism predicts trust.

Table 4.1 reports the regression results of trust on altruism. In all three models (Columns 1, 2 and 3) we find that altruism as measured by the amount sent in Game B is significantly correlated with trust as measured by the amount sent in Game A.

Result 1.1. Survey measure of trust predicts trust.

National surveys such as the General Social Survey (GSS) ask attitudinal questions to measure trust. The general trust question reads "Generally speaking, would you say that most people can be trusted, or that you can never be too careful when dealing with others?" (GSS trust). Together with "Do you think most people would try to take advantage of you if they got the chance, or would they try to be fair?" (GSS fair), and "Would you say

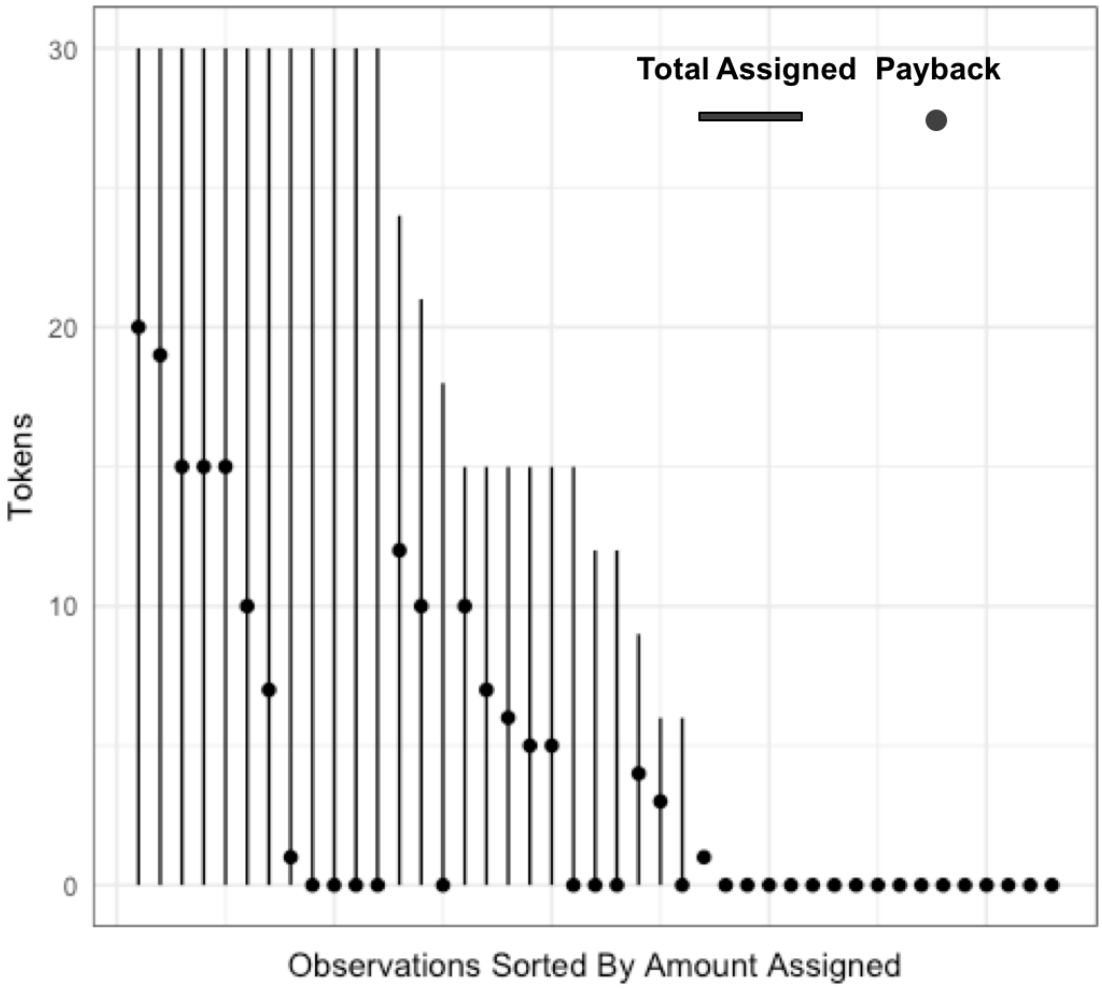

Figure 4.4: Fairness

that most of the time people try to be helpful, or that they are mostly just looking out for themselves?" (GSS help), these survey questions measure individuals' confidence in others. We ask these three questions during the exist survey. We then construct a GSS trust index that equally weighs the answers to these three questions. Columns 2 and 3 in Table 4.1 include both altruism and the GSS trust index as predictors. We find that although altruism is still the strongest predictor of trust, the survey measure also provides

	(1)	(2)	(3)
Altruism	0.714***	0.686 ***	0.602***
	(3.57)	(3.60)	(3.00)
GSS Trust Index		0.469**	0.399*
		(2.41)	(1.89)
Constant	3.243***	3.284 ***	1.4
	(5.24)	(5.58)	(0.58)
Control Variables			Yes
Observations	47	47	47
Pseudo R-squared	0.221	0.311	0.455

Dependent Variable:Trust (Amount Sent in Game A)

t statistics in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.1: Altruism Predicts Trust

explanatory power for subjects' trust behaviors.

Result 2. Both fairness and trust predict trustworthiness. Table 4.3.1 reports the regression results of trustworthiness on fairness. In Column 1, trust, measured by the amount

	(1)	(2)	(3)	(4)
Trust	0.878***	0.305 ***	0.303***	0.308***
	(22.23)	(10.68)	(10.56)	(10.67)
Fairness		0.790 ***	0.792***	0.786***
		(32.09)	(31.64)	(31.20)
GSS Trust Index			-0.049	-0.059
			(-0.45)	(-0.51)
Constant	-0.347	-0.194	-0.194	-3.14
	(-0.58)	(-0.61)	(-0.61)	(-1.32)
Control Variables				Yes
Observations	473	473	473	473
Pseudo R-squared	0.277	0.792	0.793	0.83

Dependent Variable:Trust (Amount Sent in Game A)

t statistics in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.2: Fairness and Trust Predict Trustworthiness

sent in Game A, strongly predicts trustworthiness; the more the first mover trusts, the more the second mover reciprocates. When including fairness in the model (Columns 2, 3, and 4), we find that both trust and fairness are positively correlated with the amount "returned" in Game C. GSS trust index doesn't predict trustworthiness.

4.3.2 Norms

Following KW we implement a decision model where the decision maker cares about both the monetary payoff and the degree to which the action is collectively perceived as socially appropriate:

$$u(\alpha_k) = \beta\pi(\alpha_k) + \gamma N(\alpha_k)$$

where $\pi(\alpha_k)$ is the payoff from the selected action α_k, and $N(\alpha_k)$ is the appropriateness of the chosen action α_k. β captures how much individuals care about the payoffs from their actions. γ represents the degree to which individuals are willing to conform to the norms of their actions.

Hypothesis 1. $\beta > 0$; individuals care about their own monetary payoff when they decide to trust or reciprocate.

Hypothesis 2. $\gamma > 0$; individuals care about following norms when they decide to trust or reciprocate.

Result 3. Trust could be explained by both preferences for monetary payoffs and following norms.

Table 4.3 reports the estimates from our decision model. Column 2 reports the parameter estimates for β and γ. As we expected, our subjects care about the monetary payoffs of their decisions ($\beta = 0.3$). They also strongly conform to the norms of trust ($\gamma = 2.84$). However, we do not find an effect of norms on altruism though (γ not significant in Column 4).

Result 4. Trustworthiness could be explained by following norms. Table 4.4 reports

	Trust	Trust	Altruism	Altruism
	(1)	(2)	(3)	(4)
Monetary Payoff (β)	-0.073	0.300 **	0.515***	0.734*
	(-1.56)	(2.18)	(6.38)	(1.78)
Appropriateness Rating (γ)		2.840***		1.294
		(2.73)		(0.55)
N	517	517	517	517
Log-likelihood	-111.5	-107.3	-77.63	-77.47

t statistics in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.3: Trust, Altruism and Norms

the estimates for our decision model for trustworthiness. Individuals strongly conform to

	Trustworthiness	Trustworthiness	Fairness	Fairness
	(1)	(2)	(3)	(4)
Monetary Payoff (β)	-0.002	0.0.002	0.001	0.001
	(-0.23)	(2.18)	(0.17)	(0.17)
Appropriateness Rating (γ)		1.459***		1.786***
		(9.14)		(11.16)
N	3555	3555	3555	3555
Log-likelihood	-558.4	-513.1	-554.7	-478.6

t statistics in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.4: Trustworthiness, Fairness, and Norms

the norms of being trustworthy ($\gamma = 1.459$); and also follow norms of fairness ($\gamma = 1.786$).

Our results suggest the presence of social norms that elicit both trusting and trustworthy behavior.

4.4 Conclusion

In this paper we combine the trust and norms literature in experimental economics to study the relationship of trust, trustworthiness, altruism, and norms. We aim to better understand what factors influence individuals' decisions to trust. We answer two research

questions in this chapter: 1) does altruism explain individual trust and trustworthy behavior, and 2) is trust a norm? What about trustworthiness?

We find that altruism predicts trust, while both fairness and trust predict trustworthiness. We also find that the survey measure of trust is positively correlated with that measured using trust games. Regarding following norms, we find that both trust and trustworthiness could be explained by following norms. Our results suggest the presence of norms elicit both trusting and trustworthy behavior. Our findings highlight the importance of studying the effect of norms in other-regarding behaviors. Identifying differences in norms of trust and trustworthiness across different cultures could be an important area for future research.

5. SUMMARY

In contrast to the self-interest hypothesis of standard economic theory, in reality individuals are surprisingly generous. For instance, according to the Giving USA 2017 report, charitable giving was estimated to be $390 billions in the United States in 2016, or more than 2% of GDP. This self-interest hypothesis has also been rejected in a large number of laboratory experiments where people have displayed a willingness to simply give away money to other participants even when the decisions are made anonymously. The three essays of this dissertation are focus on studying prosocial behavior.

This dissertation contributes to the literature that asks what motivates prosocial behavior and what factors affect individuals' prosocial behaviors. In the first essay, we study the impact of volunteer leaders on individual's giving. By experimentally examining the impact of three factors including the status of the leader, information, and social distance, we find evidence that allowing volunteer leaders increases charitable giving. The second essay is about measuring altruism, the underlying motive for giving. We find that the dual role protocol distorts the measurement of altruism. Our findings will provide an important input to the future research on the motives of charitable giving. The final essay examines the effect of social norms on prosocial behavior. We combine the trust and norms literature to study how social norms influence trust and trustworthiness behavior. We find that both trust and trustworthiness could be explained by following norms.

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APPENDIX A

SECTION 2 INSTRUCTIONS

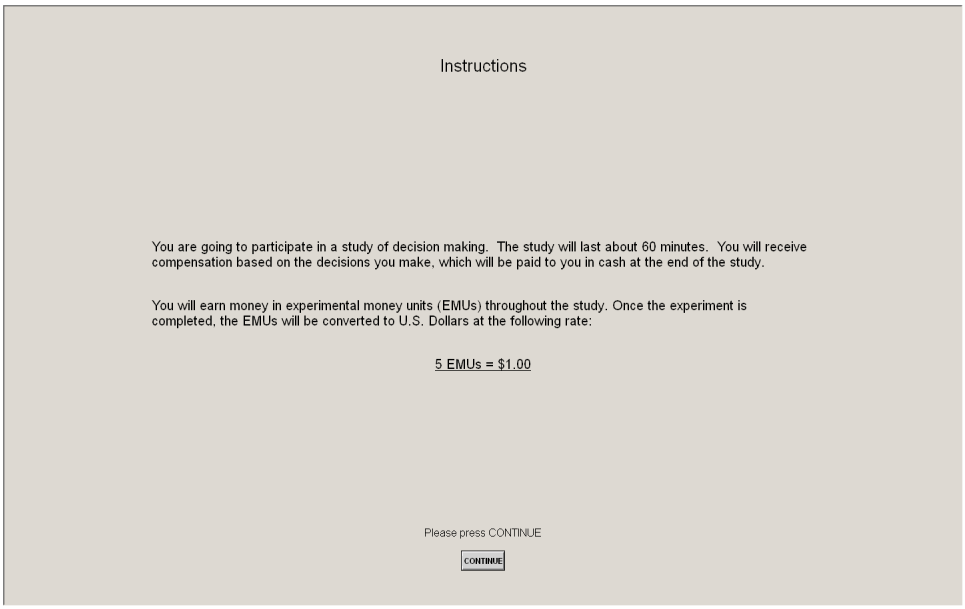

Figure A.1: Instructions Section 2.1

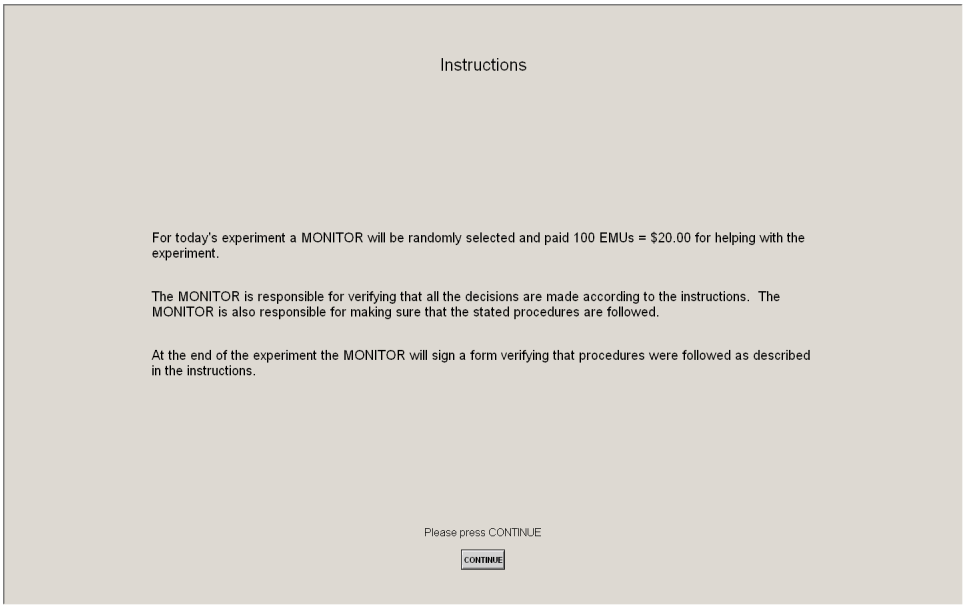

Figure A.2: Instructions Section 2.2

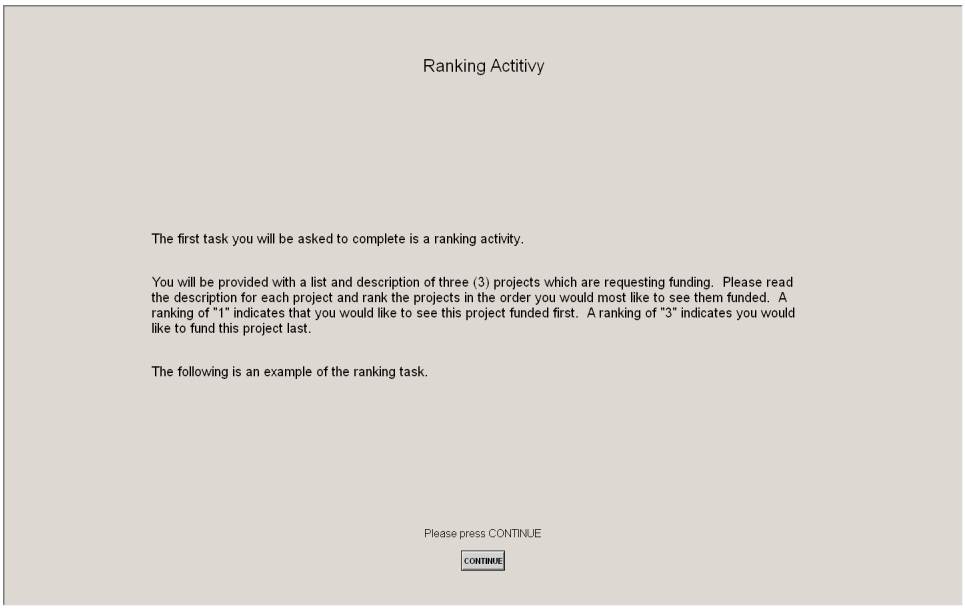

Figure A.3: Instructions Section 2.3

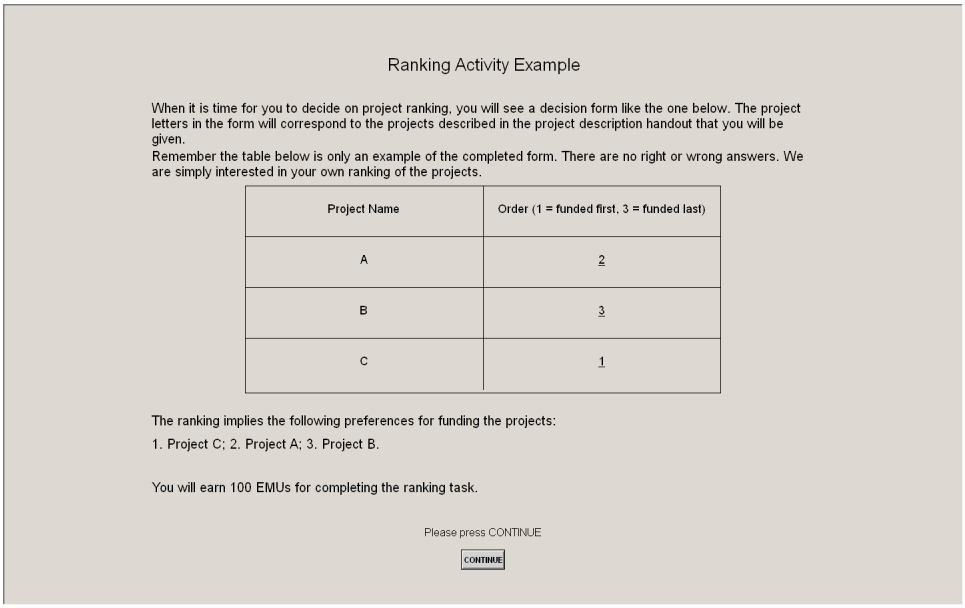

Figure A.4: Instructions Section 2.4

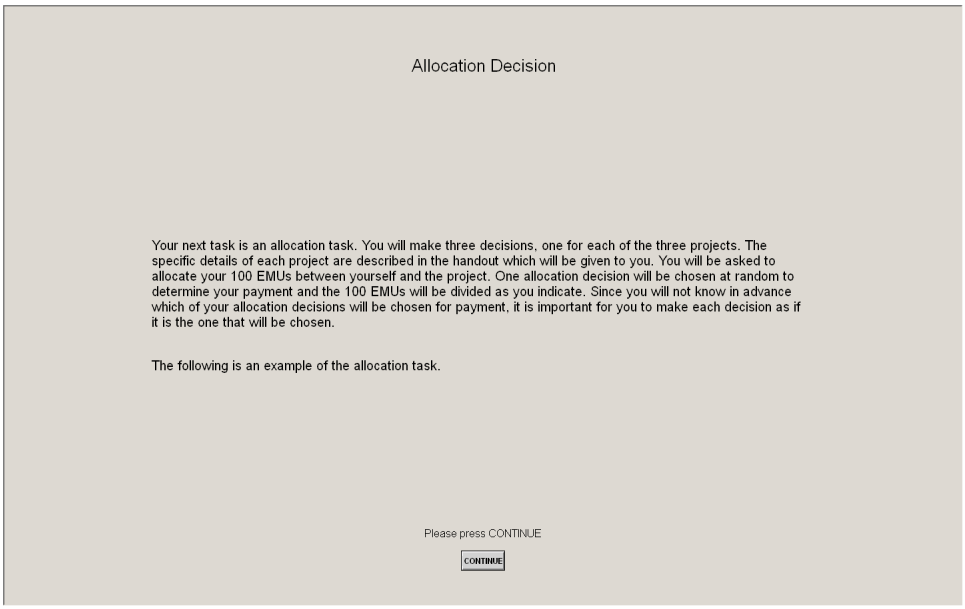

Figure A.5: Instructions Section 2.5

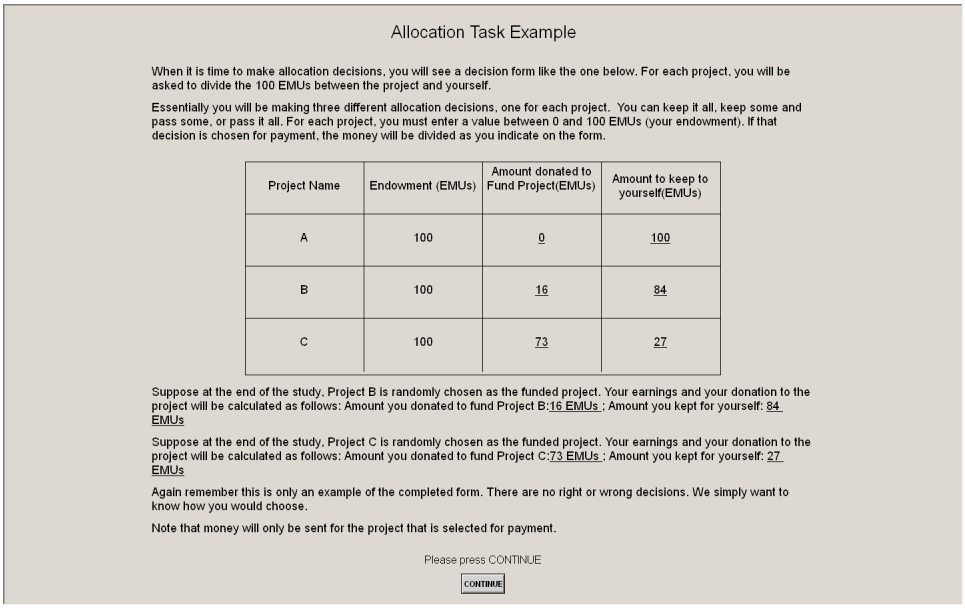

Figure A.6: Instructions Section 2.6

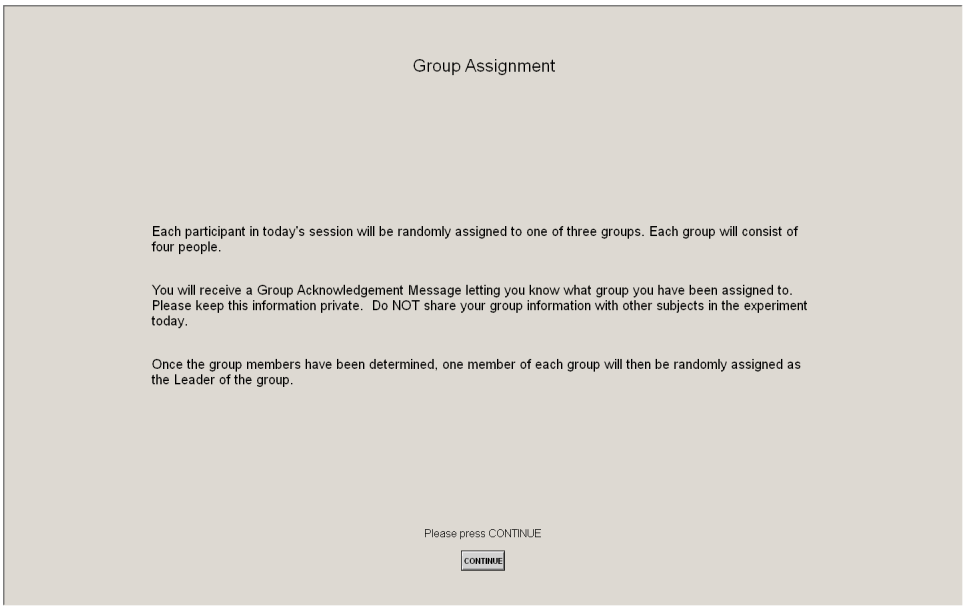

Figure A.7: Instructions Section 2.7

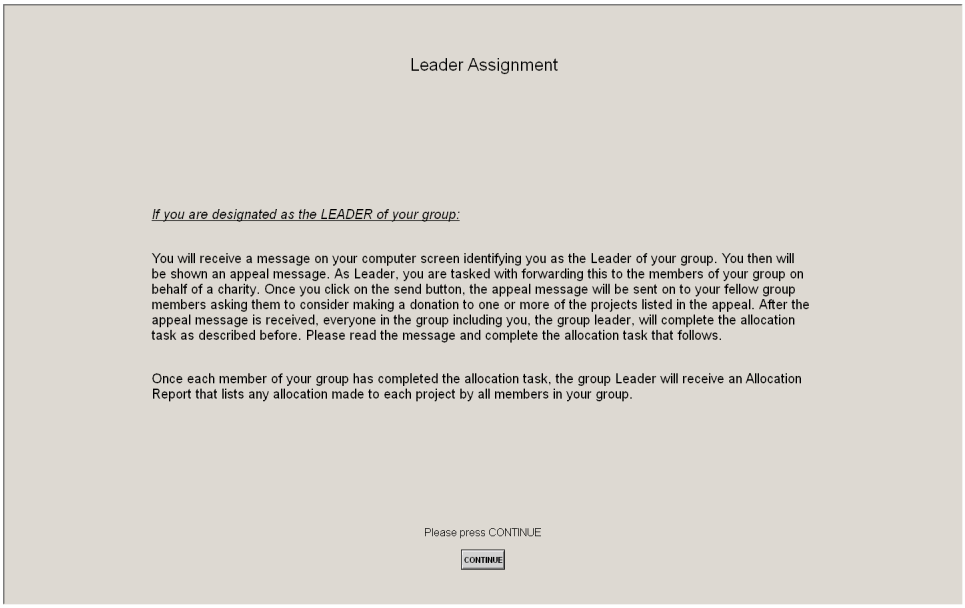

Figure A.8: Instructions Section 2.8

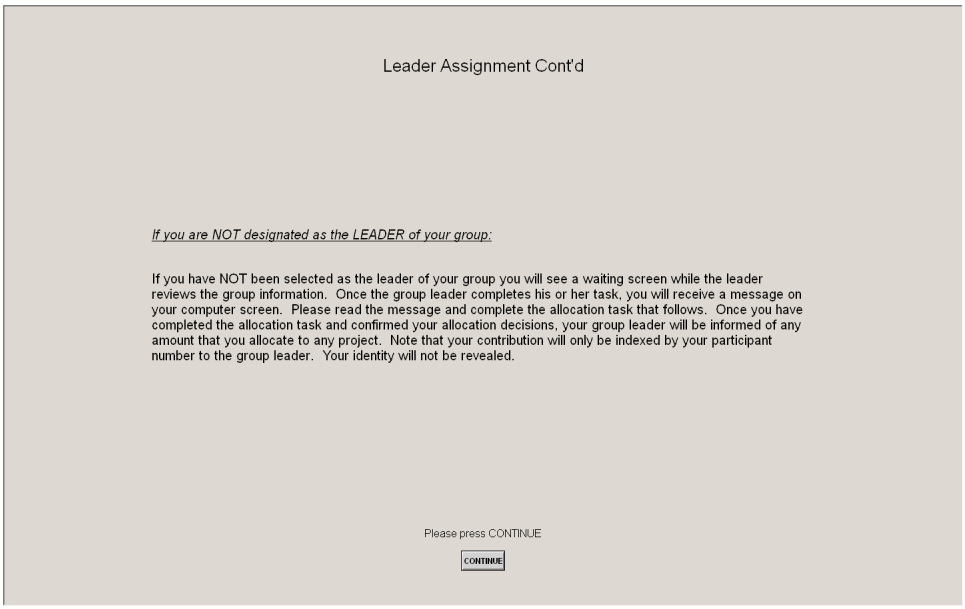

Figure A.9: Instructions Section 2.9

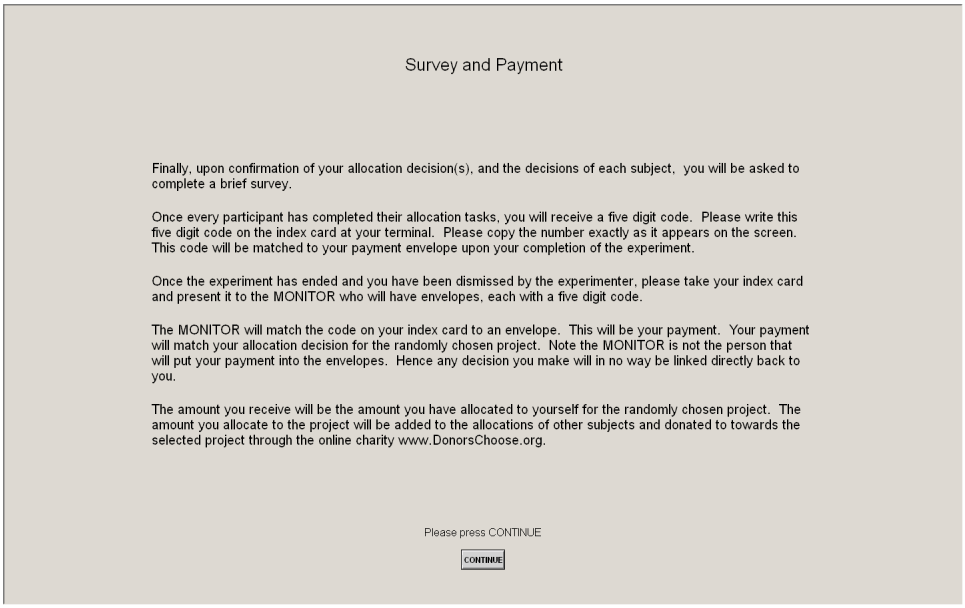

Figure A.10: Instructions Section 2.10

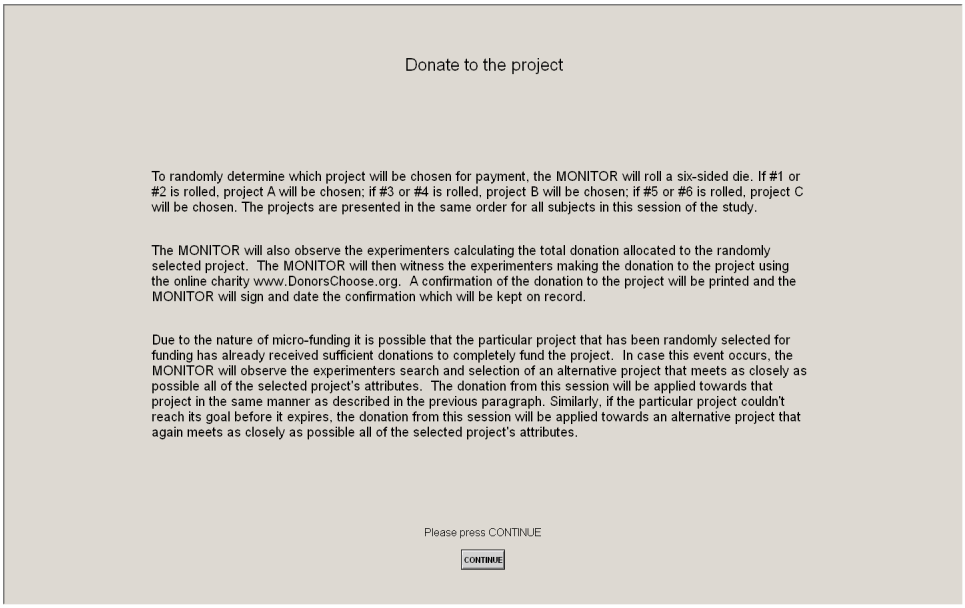

Figure A.11: Instructions Section 2.11

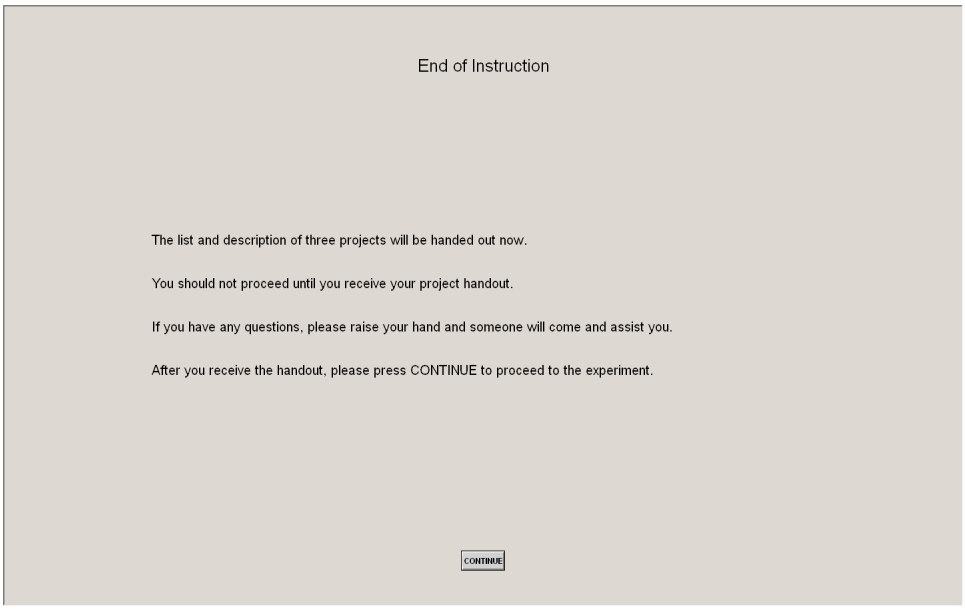

Figure A.12: Instructions Section 2.12

APPENDIX B

SECTION 3 INSTRUCTIONS

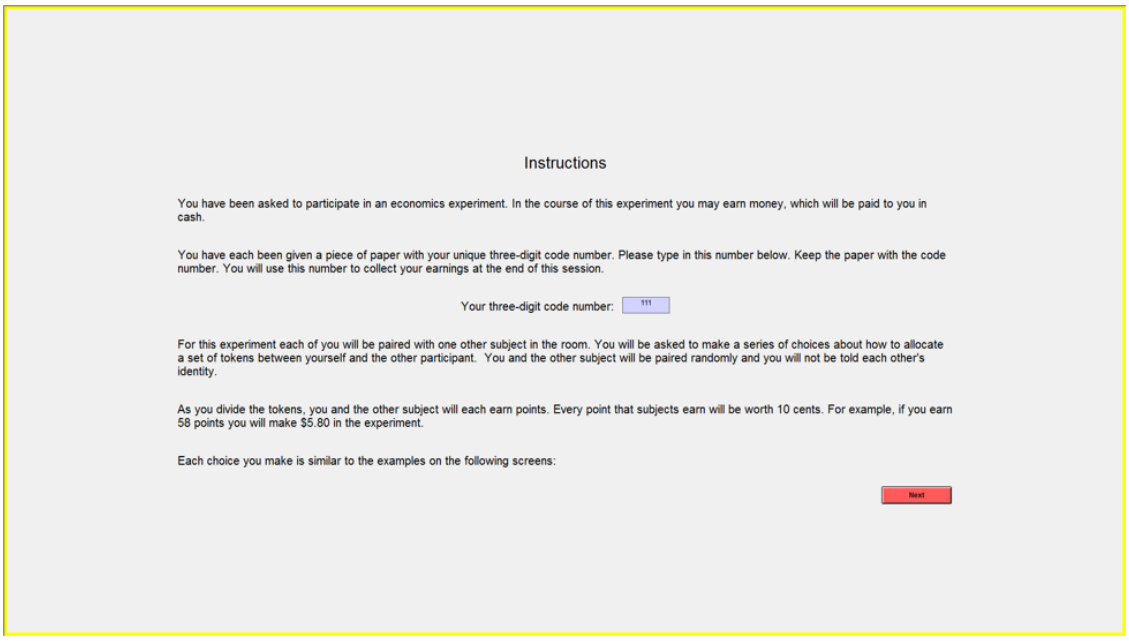

Figure B.1: Instructions Section 3.1

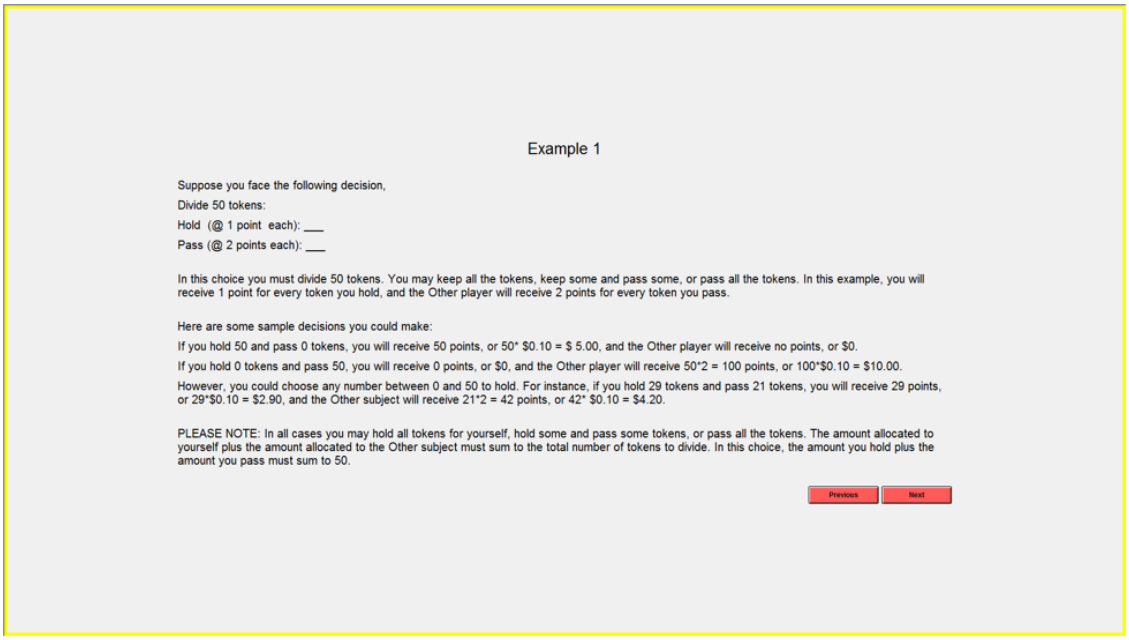

Figure B.2: Instructions Section 3.2

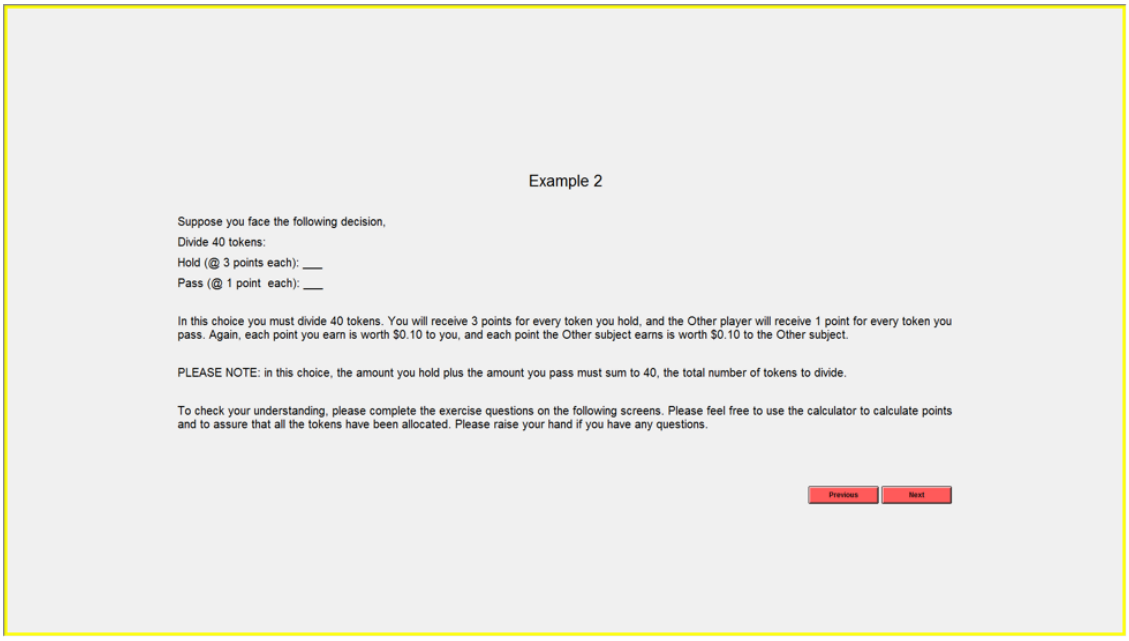

Figure B.3: Instructions Section 3.3

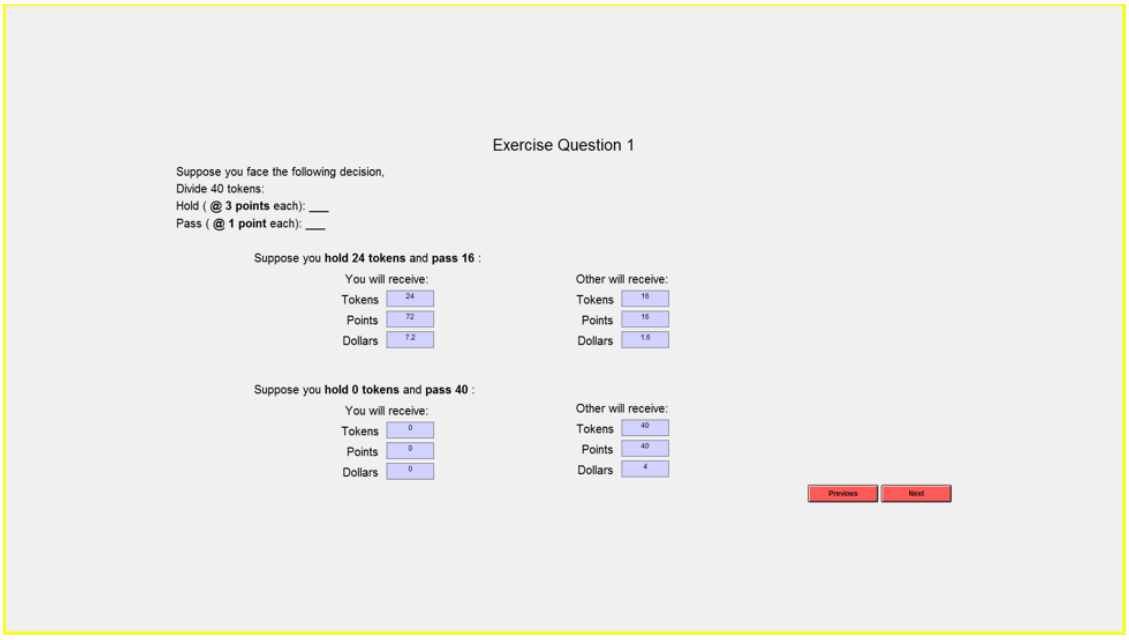

Figure B.4: Instructions Section 3.4

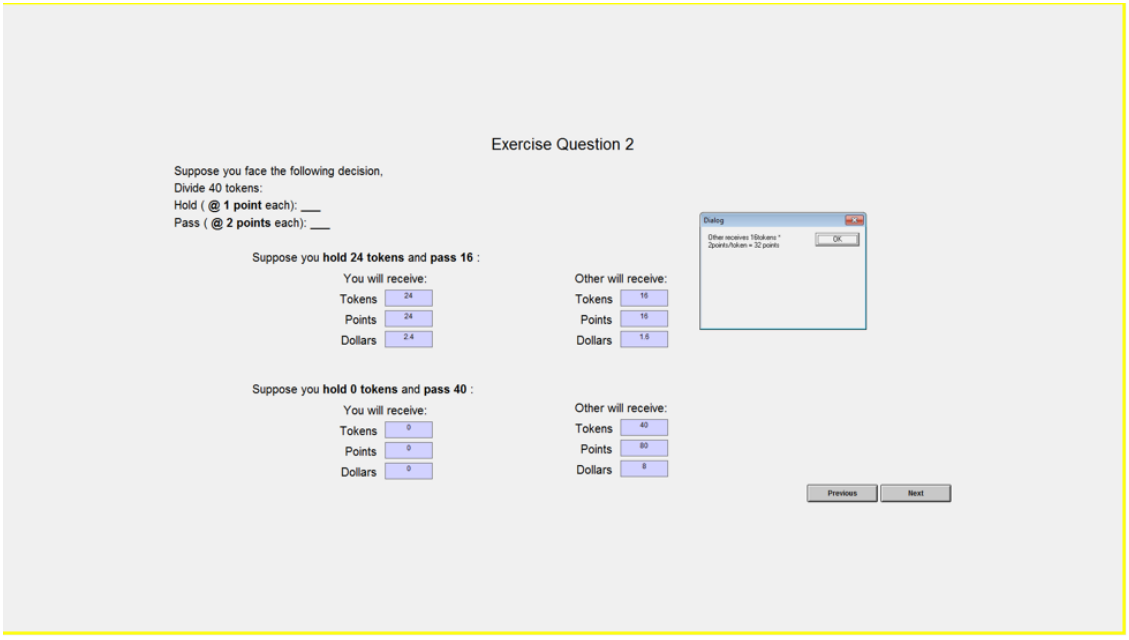

Figure B.5: Instructions Section 3.5

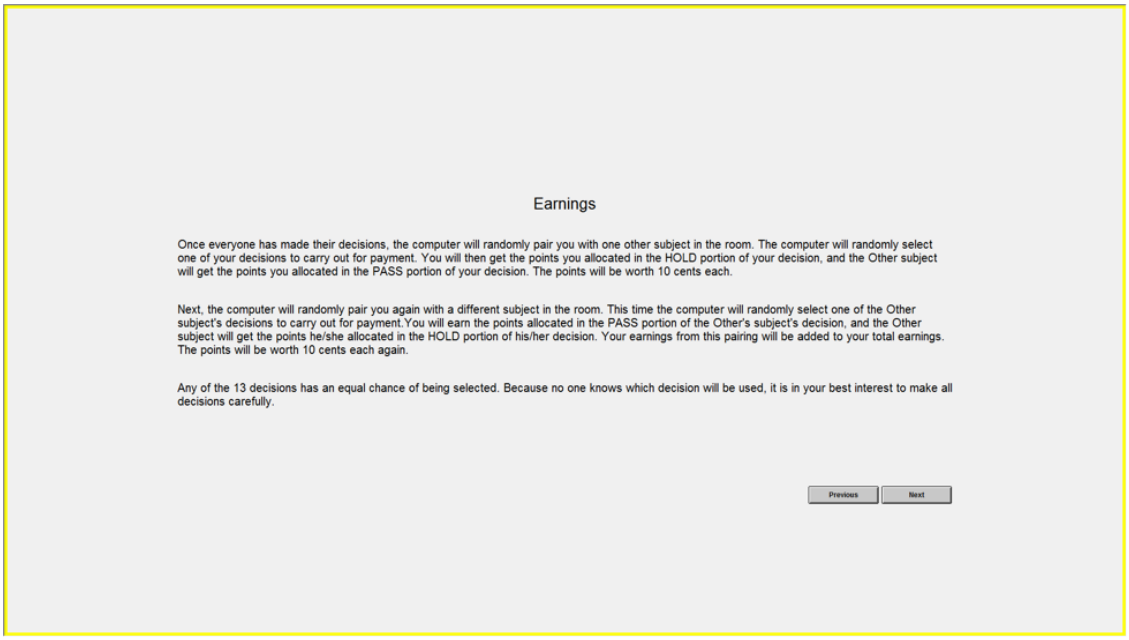

Figure B.6: Instructions Section 3.6

Figure B.7: Instructions Section 3.7

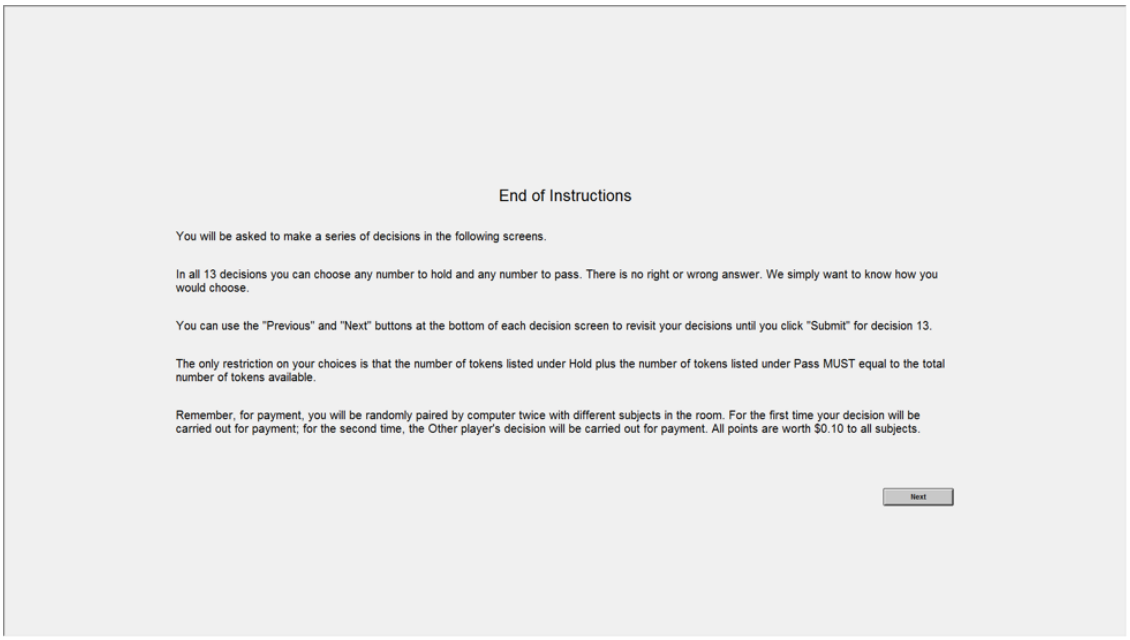

Figure B.8: Instructions Section 3.8