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Reciprocity in Dictator Games: An Experimental Study

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Abstract

When decisions are made before roles are assigned, the Dictator Game is strategically equivalent to a linear Public Goods Game. This suggests that, when played between individuals with the same income, the prosocial behavior observed may be attributed at least in part to reciprocal altruism. Dictators transfer money only because they believe Recipients would transfer money as well, if roles were reversed. By contrast, when the game is played between individuals with different background income, the generosity of the rich towards the poor is more easily attributed to pure, non-reciprocal altruism. We test this hypothesis by eliciting conditional preferences for giving in a Dictator Game in two treatments. In the first students are matched with other students, while in the second students are matched with subjects living in a refugee camp in Uganda. We find that our predictions are only partially borne out by the data. Whether giving is directed to a person with similar or lower socioeconomic status, most subjects reveal conditionally altruistic preferences. Unconditional altruism is virtually absent in both treatments. These counter-intuitive results have important implications for the experimental elicitation of social preferences.

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> I am sure, if someone runs an experiment where the receiver is a hungry looking child with begging eyes, the percentage of proposers who give nothing approaches zero. Oechssler (2010)

1 Introduction

One of the main issues in the large literature on social preferences is just how these preferences should be elicited. There is the obvious concern that a typical participant to an experiment may exaggerate any non-selfish preference she may have, be it for fairness, equality or for other people's welfare (Zizzo, 2010; Barmettler et al., 2012). A deeper concern is that in most games used in experimental settings the optimal choice for a player depends not only her own preferences, but also on her beliefs about other players' behavior. In an early review of this literature, Camerer (2011) noted that games like the Prisoner's Dilemma and the Public Goods Game

> are blunt tools for guiding theories of social preferences. These games cannot distinguish between players who are altruistic and players who are self-interested and those who have reciprocal preferences but pessimistically think others will free-ride.(49)

The *Dictator Game* (DG) (Forsythe et al., 1994) was originally thought to be the tool of choice to circumvent this problem. In a Dictator Game, a subject is asked to divide a fixed sum of money between himself and another subject who makes no choices. As Bolton et al. (1998) stated, “Dictator game is a bit of a misnomer. The ‘game’ is actually a one person decision task”. Since there is no apparent strategic interaction, beliefs about other players' choices should play no role and any deviation from self-interest can be attributed to "pure" other-regarding motives like altruism (Andreoni and Miller, 2002; Cox et al., 2007; Fisman et al., 2007) or inequity aversion (Fehr and Schmidt, 1999).[1]

Despite the early success of the Dictator Game (Engel, 2011), the evidence on the DG has always been regarded with some skepticism. There were two main reasons for concern, that we shall label the "wrong beneficiary" and the "weak situation" criticism. First, some authors claimed that the Dictator game overestimates altruism and hence had little external validity (See Galizzi and Navarro-Martinez (2015) for a review). Objections like these are often dismissed with the argument that the Dictator Game involves trivial sums of money that are "windfall". People would be much more selfish in choosing about their own, hard-earned money. Although there is some truth in this argument (Cherry et al., 2002), it is easy to see that it fixes the problem only in part. Skeptics may retort that sharing the endowment in a standard Dictator Game is analogous to donate money to a randomly chosen stranger, and that this makes little sense whether the money is a windfall or not. A student who is willing to donate money to another anonymous student, should also be ready to leave part of the money she may find on a sidewalk for the next stranger to grab. Such a behavior is virtually non-existent both in real life and in experiments that try to reproduce this type of settings (Winking and Mizer, 2013). Notice that the lack of external validity stems not from the fact that too much altruism is

[1]"Since the baseline dictator sessions include neither reciprocity nor status, the analysis spotlights the role of nonreciprocal altruism or benevolence". Cox et al. (2007). "Intentions-based models cannot explain a dictator' s generosity because the receiver is passive. That is, the receiver has done nothing from which the dictator can infer his intentions." Dana et al. (2006), "We deliberately focus on modeling a concern for reciprocity, and disregard other motivations like altruism, equity, envy, [...] it is clear that this omission is not innocuous. [...] in experimental Dictator games individuals often give away lots of money [...] something which cannot be explained by the model we propose in this paper." (Dufwenberg and Kirchsteiger, 2004, 291)

observed in experimental Dictator Games. Rather, the problem is that the students participating to economic experiments would never be the targets of altruistic choices of the same type outside of the lab. The point frequently made that the lab magnify existing pro-social inclinations seems to be incorrect. It would be more apt to say that it makes them out of whole cloth. This is the gist of what we shall call the *wrong beneficiary* criticism.

There was a second reason for concern. Some experiments showed that the preferences subjects reveal in Dictator Games are fragile. Experiments show that the magnitude of transfers can be significantly manipulated by adding a sentence like "he relies on you" at the end of the instructions (Branas-Garza, 2007), asking subjects what they think to be the morally right thing to do (Capraro et al., 2019), and describing the game in terms of taxes to pay rather than donations to make (Chang et al., 2019). A consensus emerged that the Dictator Game is a *weak situation* in the sense that the "average allocations can change dramatically with changes in the experimental design." (Camerer and Fehr, 2004). We shall refer to this argument as the *weak situation* criticism.

The inevitable conclusion seemed to be that "dictator games cannot be treated as a Petri dish where outcome based preferences can be studied in isolation" (Cooper and Kagel, 2011). This prompted a new wave of theoretical models (and fresh evidence in their support) that relied on different sets of motivations, like a concern for social image (Andreoni and Bernheim, 2009), guilt aversion (Battigalli and Dufwenberg, 2007) or norm following (Krupka and Weber, 2009; Kimbrough and Vostroknutov, 2016). All these models offered different solutions both to the wrong beneficiary and to the weak situation criticism.

In this paper, we argue that researchers have been too quick to abandon the explanations based on standard social preferences, in favor of more complex alternatives involving social image or guilt aversion.

In fact, most of the deviations from pure self-interest observed in the Dictator Game can be easily explained in terms of either reciprocal altruism or ex-ante inequity aversion. The reason is simple. Just like the name suggests, the Dictator Game as played in many experimental settings is a game, in the sense that two individuals have to make a choice and their payoffs depend jointly on the choice each of them makes. In fact, the Dictator Game is strategically equivalent to one of the most widely studied social dilemmas: the linear Public Goods Game (PGG).[2]

To get the gist of our argument, consider the familiar setting in which social preferences are elicited with a series of Dictator Games played with the strategy method. *All* subjects choose how to allocate money between themselves and another subject from a linear budget set. At the end of the experiment, half of these decisions are randomly chosen and implemented. Let p be the slope of the budget set, the "price of giving". p indicates how many dollars the receiver obtains for each dollar transferred by the dictator. Consider now a PGG in which one dollar spent on the public good earns $\alpha \leq 1$ dollars for all the members of the group. The two settings are similar in that in both cases all subjects involved make a decision and in both cases each subject can transfer payoffs from herself to others at a fixed rate. As Andreoni and Miller (2002) put it, "linear public goods games are multi-person dictator games with a price $p = \frac{(1-\alpha)}{\alpha}$."[3].

[2]Surprisingly enough, so far the literature has paid scant attention to this issue. An exception is a recent paper, Grech and Nax (2020) that provides a careful theoretical discussion of the Dictator Game as a situation of strategic interaction.

[3]It may seem that the standard Dictator Game in which money is transferred on a one-to-one ratio (with two individuals this requires $p = 1, \alpha = \frac{1}{2}$) lacks a crucial element of the PGG, namely the efficiency enhancing effect of co-operation. This is incorrect insofar as subjects are assumed to be risk-averse. Two subjects who share the endowment equally guarantee themselves to receive half of the endowment for sure. If both transfers are equal to zero, each subject receives the entire endowment with probability $\frac{1}{2}$. Risk aversion clearly implies that the first situation is Pareto superior to the second (See for example Dutta et al. (2020))

This suggests that the right place to look for an explanation of non-selfish choices in the Dictator Game is the large literature on cooperation in the PGG. One of the best established empirical evidence in this field is that individuals reveal conditionally cooperative preferences: they are willing to contribute to the public good, but only insofar as other subjects contribute as well. Few individuals (if any) are willing to give more than they expect others to give (Fischbacher et al., 2001; Fischbacher and Gächter, 2010; Chaudhuri, 2011; Fehr and Schurtenberger, 2018). There is no reason to believe that reciprocally cooperative preferences of this kind cannot also explain positive transfers in a Dictator Game. To see this, consider the following thought experiment. Anna decides to transfer an amount x to the subject she will be matched with, in case she will be selected to play as dictator. Anna is now matched with a specific player, Bruno, and she is given the opportunity to observe the transfer y Bruno would make if *he* were to be the dictator. If observing Bruno's hypothetical transfer prompts Anna to revise her choice, then her initial choice was motivated by her belief about what her opponent would have chosen if he happened to be the dictator.[4] If instead Anna's choice would remain the same whatever the content of Bruno's choice, then Anna's preferences are truly unconditionally altruistic. Intuition suggests that in the usual Dictator Game played anonymously among students, little of the altruism observed, if any, is unconditional. [5]

[4]Akdeniz and van Veelen (2021) discuss the difference between the kind of direct reciprocity one observes in Prisoner's Dilemmas and PGG (I cooperate because I believe you cooperate) and the "hypothetical" reciprocity observed in Dictator Games (I transfer money because I believe you would have transferred money if roles were reversed).

[5]In a frequently quoted paper, Bicchieri and Xiao (2009) show that subject's decision in DG is influenced by what they expect others to do. Bicchieri et al. (2021) contains a more up-to-date discussion of this issue. The existing experimental evidence summarized in the latter paper agrees in finding that observing other subjects' choices reduces the compliance with social norms of cooperation. These experiments differ from ours because they consider subjects' reaction on observing the behavior of other subjects involved in the experiment, while we consider the reaction to the specific individual they have been matched with. We also consider the kind of non-reciprocal altruism one might

One should not jump to the conclusion that only reciprocal altruism can be observed using the Dictator Game. To see this, imagine that Anna plays the same game with another subject, Paul, who lives in poverty in a refugee camp in a civil war-ridden country. It is natural to assume, and in line with the existing evidence (Branas-Garza, 2006; Konow, 2010), that Anna would be more generous in this setting than she had been when she played with Bruno.[6] But this is not the only difference, and not even the most important. The crucial difference is that we expect Anna's choice to be less responsive to the choice made by Paul than it was to Bruno's. Would Anna decide to transfer nothing to Paul, if she discovers that Paul would transfer nothing to her? In fact, if Anna could talk to Paul before the game is played, it is plausible that she asks him *not* to transfer anything to her. She might prefer not to receive a few coins from a person who is living in poverty. The point of this example is that Anna's altruism towards Paul is likely to be truly unconditional, in the sense that it does not depend on the action she believes Paul will choose in the game that is being played.

The argument developed so far has important implications both for the theory of social preferences and for their experimental elicitation. From a theoretical point of view, our considerations suggest that a satisfactory theory should be able to answer the *wrong beneficiary* criticism (i.e. why so much altruism towards random strangers is revealed in experimental settings) and the *weak situation* criticism (i.e. why apparently irrelevant variations of the game usually determine dramatic change in behavior). Finally, it should accommodate the intuition that any prosocial behavior observed in the Dictator Game is mostly driven by reciprocity in symmetric settings, while it may be unconditional in the asymmetric setting in which one of the two players has a (much) lower

observe in the interaction between a "rich" and a "poor" subject.

[6]There is also evidence that millionaires are more generous in the Dictator Game when matched with ordinary people Smeets et al. (2015)

socioeconomic status than the other.

In this paper, we reconsider the existing models that explain positive transfers in the Dictator Game and show that the traditional social preferences models based on reciprocal altruism and (ex-ante) inequity aversion do a remarkably good job in accommodating all these desiderata. By contrast, models that invoke other motives like social image or guilt aversion fail in one or more respects.

From an experimental point of view, the reciprocity hypothesis has a clear, testable implication: non-selfish preferences should be reciprocal in standard Dictator Game played between two symmetrically placed individuals, and should be unconditional when played between a rich and a poor subject. To test this intuition, we run an experiment with two treatments. In the first treatment, a standard symmetric Dictator Game with randomly assigned roles was played between pairs of students from the University of Trento, Italy. In a second treatment, students from Trento played the same game with other subjects recruited in a refugee camp in Uganda. We call these treatments Trento and Uganda respectively. We elicited subjects' conditional giving using the strategy method as in Fischbacher et al. (2001) and Fischbacher and Gächter (2010).

First, trivially, we expected students to be more altruistic in the Uganda treatment than in the Trento treatment. *Second*, in the Trento treatment we expected students to display the same reciprocally altruistic preferences they reveal in analogous PGG. *Third* we expected part of the students to be unconditionally altruistic in the Uganda treatment.

The first two hypothesis were confirmed, the third one was not. Our data show that subjects are more generous in the Uganda treatment than they are in the Trento treatment. Also, as expected, they are reciprocally altruistic in the Trento treatment. However, the majority of the participants display the same type of reciprocal altruism in the Uganda treatment. Apparently, our subjects were willing to donate money to very poor people in Uganda, but only provided that they received similar gifts from them. This result is difficult to reconcile with intuition and is at odds with all existing models of social preferences. In the conclusion we speculate about its possible interpretations and discuss the impact this result should have on the way social preferences are elicited in laboratory settings.

The article proceeds as follows. Section 2 introduces the hypothesis that motivated our experiment and the predictions we made. We relegate a complete theoretical justification of these predictions to Appendix A. There, we show that traditional models of social preferences can be easily accommodated to produce reciprocally altruistic preferences in the symmetric Dictator Game. We also show that models incorporating more sophisticated preferences involving social image and guilt aversion can only explain unconditional giving. Section 3 describes the experiment and Section 4 presents the results. Section 5 concludes by discussing the relevance of our results for the theoretical and the experimental literature and suggests avenues for future research.

2 Predictions

We consider simple dictator games with randomly assigned roles. Each player knows that he will be paired with another randomly chosen player and that he will be selected with probability $\frac{1}{2}$ to act as dictator. When in this role, she will be assigned a unit of money to divide with the other subject. Decisions are made before roles are assigned. We shall denote the decision maker (DM) as M (me) and the other player as Y (you). $d_m, d_y \in [0, 1]$ will be the transfers chosen by M and Y respectively.

We distinguish two contexts in which decisions take place. In the *rich-rich* context, the two players have roughly the same background income, as it is typically the case in experiments run among students enrolled in the same University. In the *rich-poor* context, the DM has a substantially larger background income than the other player, who is a subject "in need".

We shall indicate with $B(d_y)$ and with $\hat{B}(d_y)$ the optimal transfer for the decision maker in a rich-rich and in a rich-poor context respectively, when the transfer made by the other player is d_y.[7] As in standard game theory, $B(d_y)$ and $\hat{B}(d_m)$ are the optimal transfers the DM would make if he were sure that the other player had chosen d_y. For example, this could be the case if, before making his own choice, the DM could secretly observe the choice the other player has made. Notice that this choice would be in general different from the choice the DM would make in a sequential game in which he played after the other player.[8]

Different models of non-selfish preferences make different predictions on $B(d_y)$ and $\hat{B}(d_y)$. The common practice is to use these correspondences to determine the Nash equilibria for the game at hand, that are then tested experimentally. This methodology is unsatisfactory for the DG, because most of the literature focuses on one-shot interactions. This is perfectly legitimate as long as the DG is considered a decision problem in which there is little, if anything, to learn. But if, as we claim, a player's optimal choice depends on her belief concerning the other player's choice, what is

[7]Different models of non-selfish preferences make different assumptions about the determinants of the optimal giving for the DM. For example, in guilt aversion models, that are based on psychological games, the DM's optimal choice may depend on his second (or higher) order beliefs, that is what he believes the other player expects him to do. In a more rigorous notation, the optimal giving should then be represented by $B(d_y, \mu)$, where μ is a vector that contains all other aspects of the game that may determine the DM's choice. Since we are only interested in the way the optimal choice is determined by the transfer of the other player, and hence keep all the other elements constant, we omit the vector μ.

[8]In standard game theory, players are only interested in the final allocation of money. In such a setting, it would make no difference, as long as the best response correspondence is concerned, between the simultaneous and the sequential version of a game. Instead, this is a delicate issue if the players have preferences that depend (beside money) on the motives behind the other players' choices. We shall discuss this matter when we introduce our experimental setting in Section 3.

observed in a one-shot DG is at best a noisy best reply to whatever belief a subject may have at the beginning of the experiment.

One way to deal with this problem is to test directly the best reply correspondences $B(d_y)$ and $\hat{B}(d_y)$. From a theoretical point of view, this involves finding the optimal choice a player holding a certain kind of non-selfish preferences would make if he happened to know the transfer made by the other player. These predictions can then be experimentally tested by eliciting subjects' best responses using the strategy method.

One should not expect this approach to produce a single winner among the competing models, as several models may generate qualitatively similar best response correspondences. Here we settle for a more realistic goal. We put forward a minimal set of properties we believe the best response correspondence generated by *any* social preference model should satisfy. These are properties we expect to characterise the best replies of a substantial fraction of the subjects we test experimentally and hence are our experimental hypothesis. A model is deemed to be unsatisfactory if there is *no* specification of that model that satisfies one or more of these properties.

We start with two conditions that apply to the rich-rich context. First, we impose that the DM's transfer is a weakly monotonic function of the other player's transfer. In other words, DM will always be more generous towards a player who makes a larger transfer.

Property 1. (Reciprocity) *$d'_y > d_y$ implies that $B(d'_y) \geq B(d_y)$ and the second inequality is strict for at least one pair d_y, d'_y.*

Second, we assume that in a rich-rich context, the DM is never willing to be more generous towards the other player than he believes the other player will be if roles were reversed. This is reminiscent of *egocentric altruism* as defined in Cox and Friedman (2008).

Property 2. (Self-centered altruism) *$B(d_y) \leq d_y$ for every $d_y \in [0, 1]$.*

The next two properties compare choices in the rich-rich context with those in the rich-poor one. We first impose that the DM will always be weakly more generous when interacting with a poor subject than he would be when interacting with a rich one.

Property 3. (Larger altruism for the poor) $\hat{B}(d_y) \geq B(d_y)$ *for every* $d_y \in [0,1]$ *with a strict inequality for at least one* d_y.

Finally, we impose that the DM's transfer towards the poor individual is independent from the transfer he expects to receive from her. This formalizes the idea we discussed in the Introduction that Anna's decision to donate money to Paul does not depend on what Paul would transfer to Anna, if Paul is much poorer than Anna.

Property 4. (Unconditional giving to the poor) $\hat{B}(d_y) = \bar{d}_m > 0$ *for some* $\bar{d_m} \in (0,1]$.

In Appendix A we evaluate the most prominent social preferences models on the basis of their ability to respect the four properties above. For each model, our strategy consists in finding a plausible specification that accommodates our four properties. A model that has *no* such specification is not a plausible explanation for DG giving, either in the rich-rich context or in the rich-poor context or both. We obtain a somewhat counter-intuitive result: The earlier models involving reciprocal altruism and inequity aversion do a better job at accommodating our desiderata than their more recent counterparts invoking motives like social image or norm following.

3 Experimental Design

To elicit conditional giving preferences, we adapt the DG the experimental design introduced in Fischbacher et al. (2001) and

Fischbacher and Gächter (2010) conditional cooperation in the PGG. Each subject is paired with another subject and both are asked to make two choices: an Unconditional Choice (*UC*) and a Conditional Choice (*CC*). The Unconditional Choice is a standard strategy-method version of the Dictator Game. Each subject receives 10 tokens and must decide how many tokens she would transfer to the other participant if she were chosen to be the Dictator. After they have completed this stage, subjects make the Conditional Choice. They choose how they would allocate the same number of tokens, for each possible transfer made by the other player in the Unconditional Choice. In other words, they have to state how many tokens they want to transfer, if the other player has given zero, one, two, ..., ten tokens in the UC.[9] After decisions are made, one of the players is selected to act as Dictator and one of the two choices, CC or UC, is randomly selected for the final payment.

In our experimental design the entire set of choices is carefully explained to the subjects before any decision is taken. Hence, when making the Unconditional Choice, subjects know that it will influence their payoffs in two ways. Directly, if they happen to be chosen as Dictators and their Unconditional Choice is implemented, and indirectly, if they are chosen as Recipient, and the Conditional Choice of their opponent is implemented. This design has obvious limitations. Since the entire chain of decisions is known in advance, one cannot exclude that they influence each other. A sophisticated selfish player who believes that his opponent is likely to be a reciprocator may make a particularly generous transfer in the Unconditional Choice, because there is a chance that the Conditional Choice of the other player will be selected for payment.

Anticipating this, sophisticated reciprocally altruistic players may become less generous in the Conditional Choice, because they cannot

[9]See Appendix B.4 for the decision screens.

exclude that part of the generosity revealed in the Unconditional Choice stems from such a strategic consideration.[10] To circumvent this problem, we could have run first the Unconditional Choice, initially leaving the subjects unaware of the existence of a second stage in which the Conditional Choice would have been taken. In this way, in the first stage we would have recorded subjects' "candid", un-strategic transfer. We decided against this option mostly because it would have implied a form of deception. On the other hand, the strategic considerations discussed above have only a marginal impact on the choices that are the focus of the present study. To see this, consider that these considerations magnify deviations from self-interest in the UC (pushing selfish subjects to transfer more) and reduce such deviations in the CC (inducing reciprocators to transfer less). Since the focus of our study in on the reciprocity revealed in the CC (and not the generosity revealed in the UC), we concluded that our design would have not magnified the type of deviations from self-interest we were mostly interested to observe. At any rate, as we shall see, the distribution of types in our experiment is not dissimilar from the one usually observed in comparable experiments involving the PGG. If strategic considerations played a role at all, it must have been small.[11]

3.1 Treatments

The first treatment, which we will refer to as *Recipient ITA*, was conducted only in Trento, Italy, with all the subjects from the University of Trento's

[10] See Gul and Pesendorfer (2016) for a theoretical discussion of this point. Stanca et al. (2009) show that the decision of the second mover in a social dilemma is indeed influenced by whether the generosity of the first mover it is perceived as stemming from pure altruism or it may be attributed to a strategic consideration of this type.

[11] Running the two phases separately may have not solved the problem anyway. There is evidence that making the subjects aware of the existence of an unspecified further decision pushes them to be more cooperative. (Kimbrough and Vostroknutov, 2016)

experimental economics lab (CEEL) pool. In this treatment, each subject was matched with another subject in the same experimental session.

In the second treatment, which we will refer to as *Recipient UGA*, the two subjects involved in the game lived in different locations. The first subject, as in the Recipient ITA treatment, was a student living in Trento. The second subject was chosen from the Achioli community, located in Kitgum District in Northern Uganda. At the time of the experiment, members of the Acholi community were returning to the village after several years spent in a refugee camp as a consequence of a conflict lasted twenty years. They average earning was around 2000-4000 Ugandan Schillings, which was equal to roughly 0.6 - 1.2 Euros for a day's work. The main income source of the members of the Achioli society was subsistence farming, and they did not have steady access to employment.[12] Italian subjects were given this information in addition to some other information on the life standards and prices of general consumption goods of the participants in Uganda (see Instructions in Appedix B.5). A similar information about life standards of the Italian subjects was given to subjects from Uganda. The pictures in Figure 1 were shown to Italian subjects in order to increase salience on the socioeconomic status of the participants in Uganda. We assumed that Italian subjects already had a clear idea about the average socioeconomic status of their peers in the *Recipient ITA* treatment; therefore, we did not provide similar information in this treatment. The sessions with Italian subjects were conducted with computers in the lab in both treatments.

[12]We could have run the same experiment recruiting poor subjects in several different groups. For example, we could have chosen disadvantaged people (unemployed, homeless) in Trento or elsewhere in Italy. This would have reduced the social distance between the Dictators and the Recipients. However, donations may have been influenced by Dictators' ideas concerning the origin of the poor subjects' misfortune. A subject's generosity may be reduced if she believes that homeless people in wealthy societies like Italy are responsible for their situation.(Fong, 2007). We concluded that a refugee was most likely to be perceived as an innocent victim of misfortune by the majority of our subjects.

The sessions in Uganda were conducted, two days after the session in Trento, with pen and paper, with the help of an experimenter and a translator. Italian participants were invited to come back to the laboratory after two days and they were informed about the outcome of the experiment and they were paid [13]

Figure 1: A collage of pictures taken in the field, which show the participants in Uganda and their living environment. These pictures were shown to the Italian subjects in the *Recipient UGA* treatment, in order to provide a salient picture of the socioeconomic status of the recipients.

In the *Recipient UGA* we used a simplified procedure in which the CC decision was only made by the Italian subjects, while the Ugandian subjects only made the UC. This decision was taken in order to reduce the complexity of the choices made by subjects in Uganda (see the instructions in Appendix B.5). As we were only interested in the choices made by the Italian subjects, we did not expect this change to affect our analysis in a relevant way.

Below we summarize the experimental flow:

[13]All the Italian participants showed up for the payment

Recipient ITA	Recipient UGA
Instructions UC & CC	Instructions UC & CC (Italy)
Control questions	Control questions (Italy)
UC	UC (Italy)
CC	CC (Italy)
Coin tossing	Instructions UC (Italy)
Role assignment	Coin tossing (Italy)
Feedback and payment	UC (Uganda)
	Role assignment (Uganda)
	Feedback and payment (Uganda)
	Feedback and payment (Italy)

Table 1: Experimental Flow in Two Treatments

We ran five sessions for the *Recipient ITA* treatment in Trento, with 100 subjects in total; four sessions for the *Recipient UGA* treatment in Trento, with 59 subjects in total; and three sessions with members of the Acholi Community in the Kitgum District in Uganda, with 59 participants in total. The sessions were run between 2010 and 2011. The show-up fee was of 3 euros for the Italian participants and 3500 UGX (0.85 euro) for the Ugandan participants. We used z-Tree for the lab sessions in Trento (Fischbacher, 2007).

3.2 Payoffs

In order to balance the payments according to purchasing power parity, we used different exchange rates for the subjects in Italy and subjects in Uganda[14]. Subjects in Italy received 1 EUR (European Euro) for each token they earned, while subjects in Uganda earned 700 UGX (Ugandan

[14]We also wanted to avoid possible reactions of people not selected for the experiment by giving too much money to the Ugandan participants.

Schilling) for each token, which corresponded to about 0.20 EUR at the time the study was conducted.

Selected Dictator	Selected Stage	*Recipient ITA*	*Recipient UGA*	
			Italian	Ugandan
Player i	UC	$10 - UC_i$	$10 - UC_i$	$10 - UC_i$
	CC	$10 - (CC_i \vert UC_j)$	$10 - (CC_i \vert UC_j)$	-
Player j	UC	UC_j	UC_j	UC_j
	CC	$(CC_j \vert UC_i)$	-	$10 - (CC_i \vert UC_j)$

Table 2: Payoffs of Player i in Two Treatments. UC_i refers to the unconditional choice of Player i and $(CC_i|UC_j)$ refers to the conditional choice of Player i to the amount UC_j. Please note that, since we do not collect conditional choices from participants in Uganda, if a participant in Uganda is selected as the dictator, his/her unconditional choice is implemented.

4 Results

Result 1 - Unconditional giving towards subjects in Uganda is higher compared to the unconditional giving towards subjects in Italy. Table 3 shows the summary statistics in the UC made by subjects in Italy in the two treatments. A Mann-Whitney-Wilcoxon (MWW) test reveals that the average transfer towards Italian subjects (2.05 tokens) is significantly lower than the average transfer towards Ugandan subjects (4.05 tokens).

Treatment	Min	Median	Max	Mean	Std.Dev.	p-value
RecipITA	0.00	2.00	6.00	2.06	1.78	$< .001$
RecipUGA	0.00	3.00	10.00	4.05	3.21	

Table 3: Comparison of Summary Statistics of Two Treatments and p-Value of Mann-Whitney U-test on equal-means.

Figure 2 shows that the modal transfer in the *RecipITA* treatment is 0 tokens, while the modal transfer in the *RecipUGA* treatment is 3 tokens. In addition to that, transfers above 6 tokens are non-existent in the *RecipITA* treatment, whereas in the *RecipUGA* treatment those constitute roughly 27% of all the transfers. In this treatment, around 14% of the subjects decide to transfer the total endowment to the subjects with whom they have been matched. This result shows that (predictably) the low socioeconomic status of the recipients leads to a higher level of transfers.

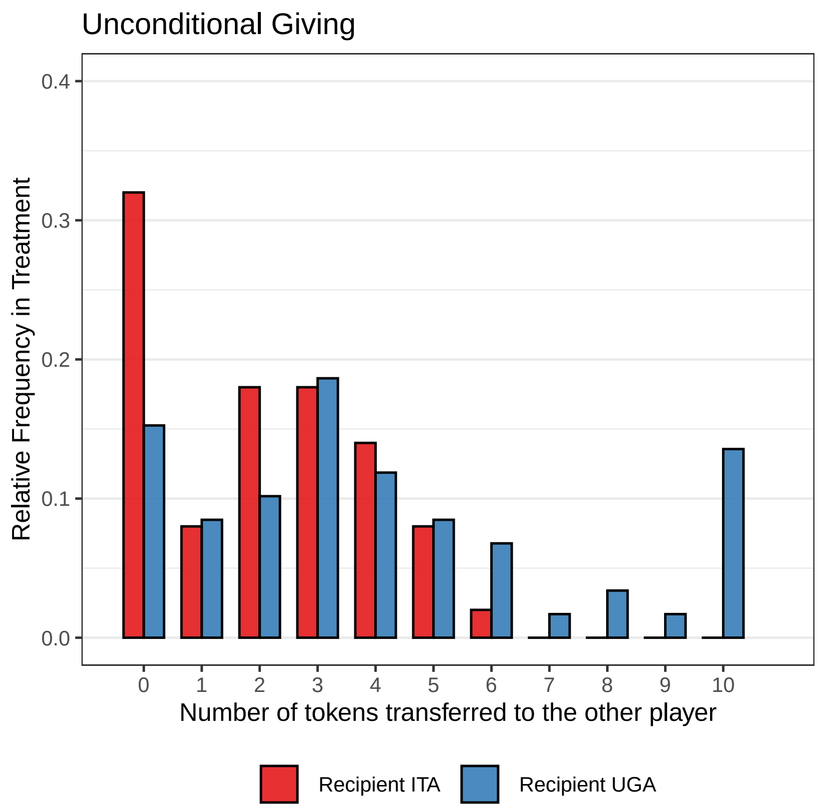

Figure 2: Distribution of transfers in the UC for Each Treatment

Result 2 - The distributions of conditional types are similar in the two treatments. To classify subjects' conditional giving, we use a procedure similar to Fischbacher et al. (2001). A giving subject is classified as *conditional altruist* if the Spearman rank correlation coefficient between the other's transfer and the response to it is greater than zero and significant at 0.05 level. A subject is classified as *unconditional altruist* if the correlation is insignificant, the standard deviation is smaller than one and the average transfer is greater or equal to one. A subject is *selfish* if her average transfer is smaller than one. Some subjects make small transfers in response to high and low transfers, and high transfers is response to intermediate transfers. These subjects are usually referred to as *hump-shaped* and are classified visually. The rest of the subjects as classified as *other*.

Figure 3 shows the fraction of conditional types by treatment. The distribution of subjects among types is strikingly similar. Conditional altruists are the most common type in both treatments (43% for *RecipITA* and 55.6% for *RecipUGA*), and they are followed by selfish types (11.9% for each treatment). The order of unconditional subjects and hump-shaped subjects is reversed. In the *RecipUGA* treatment, the fraction of unconditional cooperators is around 11.9% of the subjects, nearly double than in *RecipITA* (6%). However, we cannot reject the hypothesis that the proportion of conditional cooperators is the same for both treatments, neither with Fischer's Exact Test (see Table 8) nor with a logistic regression over whether the subject is unconditionally altruist or not (see Table 4). The logistic regression suggests that the proportions of selfish and hump-shaped individuals are both lower in *RecipUGA* treatment, however these differences are not significant.

	Dependent variable:			
	Conditional	Selfish	Hump-Shaped	Unconditional
RecipUGA	0.520	-0.754^{*}	-1.111^{*}	0.373
	(0.331)	(0.445)	(0.659)	(0.291)
Constant	-0.282	-1.099^{***}	-1.815^{***}	-1.555^{***}
	(0.202)	(0.231)	(0.288)	(0.199)
Observations	159	159	159	159
Log Likelihood	-108.811	-79.650	-52.356	-44.185
Akaike Inf. Crit.	221.622	163.299	108.711	92.371

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: Logit Regression on Dummy Variable for each conditional type classification.

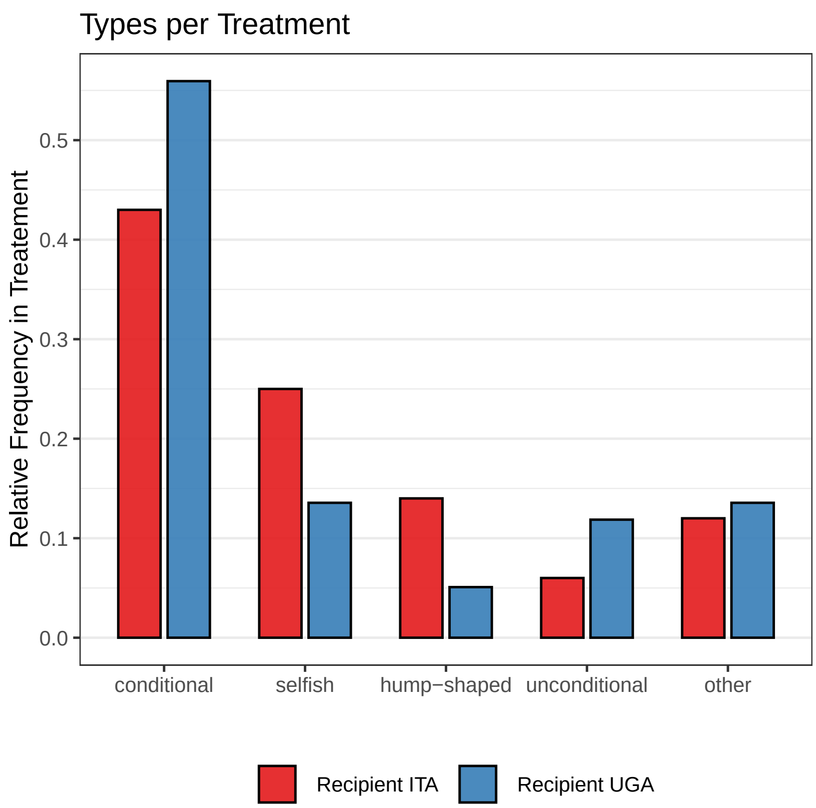

Figure 3: Type Classifications for Both Treatments According to the Decision in Conditional Choice

Dependent variable: Conditional Giving		
	Model 1	Model 2
(Intercept)	0.09	0.28
	(0.24)	(0.24)
UC_{other}	0.57^{***}	0.53^{***}
	(0.01)	(0.02)
RecipUGA	0.90^{**}	0.46
	(0.35)	(0.37)
UC_{other}:RecipUGA		0.09^{***}
		(0.03)
AIC	2926.50	2922.95
BIC	2950.14	2951.32
Log Likelihood	-1458.25	-1455.48
Num. obs.	836	836
Num. groups: subject	76	76
Var: subject (Intercept)	2.10	2.10
Var: Residual	1.47	1.45

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 5: Linear Mixed-Model Regression Analysis of the Conditional Giving for the Types that are Classified as Conditional Altruists.

We further look at the details concerning the behavior of conditional altruists. Our analysis is summarized in Table 5. We compare two models which differ in terms of their assumptions on interaction effect between treatment and contribution of the other. According to Model 1, which assumes no interaction, in *RecipUGA* treatment subjects give 0.90 tokens unconditionally while for each token the other would give we observe a 0.57 token increase to the given amount. In Model 2, which assumes the interaction effect, a unit increase in the other subject leads to an increase of 0.53 tokens in both treatments. Moreover, it seems that conditionality of giving is even stronger in the *RecipUGA* treatment, which leads to a further nearly 0.09 tokens more. The Akaike Information Criteria (AIC) favors Model 2, while the Bayesian Information Criteria (BIC) favors Model 1. Regardless of which model one takes into account, we conclude that the higher need of the opponent does not decrease the slope of the conditional giving function.

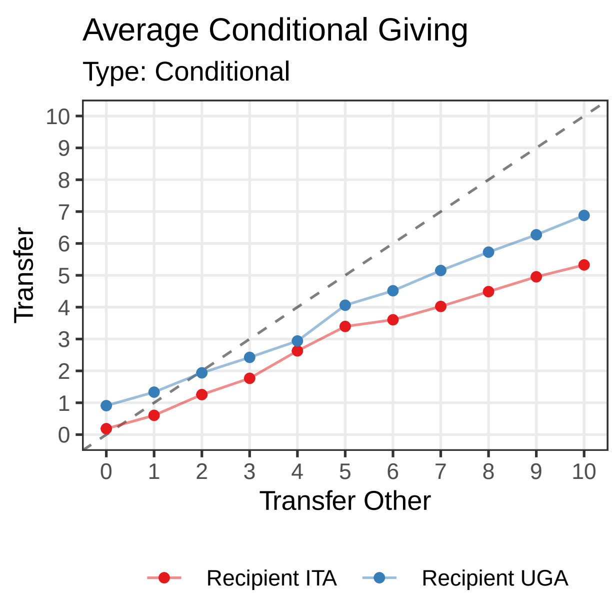

Figure 4: Average Conditional Choice of the subjects who are Classified as Conditional Altruists

Result 3 - The difference between treatments in UC is mostly caused by unconditional altruists Considering that the most common types are conditional altruists, and the distribution of conditional strategies is not different in two treatments, the puzzle emerges as how to explain the difference in unconditional giving between the two treatments. At first glance, this seems to require that Italian subjects expected larger transfers from subjects in Uganda than from other subjects in Italy. To explain this behavior, we look at the unconditional giving of the subjects with different conditional types.

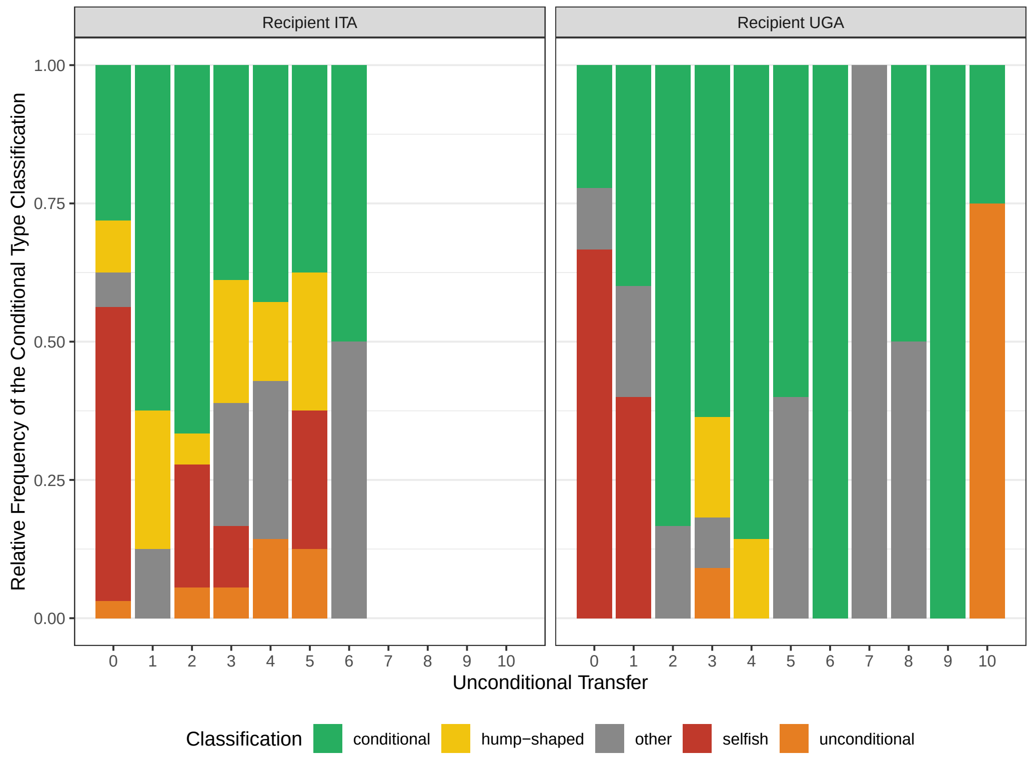

Figure 5: Unconditional Choices and the Classification of Donors According to Their Types in the Second Stage

Figure 5 shows the proportion of conditional types in the second stage grouped by their unconditional choice in the first stage. In the *RecipITA* treatment, unconditional altruists transfer on average around 3 tokens to the recipient, while in the *RecipUGA* treatment a vast majority of those types transfer the maximum possible amount ten tokens, which results in an average of nine tokens.

To illustrate this further, we analyze unconditional giving with a Generalized Linear Model shown in Table 6. In this model, we analyze unconditional choices, with respect to conditional types and treatments.

Model 1 ignores the interaction effect of the two dependent variables. Model 2 considers the interaction effect and Model 3 controls for the demographic variables as well. Model 2 explains our data better according to the Bayesion Information Criterion and Model 3 explains the data according to the Akaike Information Criterion, considers it. In Model 2, the increase in unconditional giving is explained jointly by the treatment effect which has the size of 1.821 tokens and the interaction between unconditional type and the treatment effect which has the size of 4.179 tokens. That amount is more than double the base treatment effect. Obviously, it would be a mistake to assume that the same subjects would be unconditional altruists in both treatments. However, as the distribution of types is similar, the evidence suggests that the main driver of such differences in the dictator game are those who have unconditional giving preferences. While Model 3 suggests a significant decrease in giving by Male participants and Economics students, it suggest the significance levels of the variables stays the same and the effect sizes do not change considerably.

	Model 1	Model 2	Model 3
(Intercept)	2.31 (0.29)***	2.21 (0.30)***	2.58 (1.23)*
Type (Base-Conditional)			
Selfish	-1.91 (0.44)***	-1.25 (0.49)*	-1.06 (0.48)*
Unconditional	3.07 (0.63)***	0.79 (0.86)	0.80 (0.83)
Hump-shaped	-0.00 (0.57)	0.22 (0.61)	0.38 (0.59)
Other	0.35 (0.53)	0.71 (0.64)	0.62 (0.63)
Treatment (Base - *RecipITA*)			
RecipUGA	1.59 (0.35)***	1.82 (0.46)***	1.79 (0.44)***
Hump-Shaped:*RecipUGA*		-0.92 (1.33)	-1.17 (1.29)
Other:*RecipUGA*		-0.86 (1.01)	-1.27 (0.99)
Selfish:*RecipUGA*		-2.53 (0.92)**	-2.70 (0.89)**
Unconditional:*RecipUGA*		4.18 (1.19)***	4.33 (1.16)***
Demographics			
Age			0.02 (0.05)
Male			-0.72 (0.32)*
Econ Student			-0.82 (0.33)*
AIC	695.20	678.01	670.51
BIC	716.68	711.77	713.48
Log Likelihood	-340.60	-328.00	-321.26
Deviance	675.40	576.43	529.52
Num. obs.	159	159	159

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 6: Generalized Linear Model (GLM) Regression for the Dependent Variable Unconditional Giving.

Overview of Conditional Giving: Before we further discuss the implications of our results, we show aggregated conditional strategies of all types. Figure 6 shows a similar slope of both treatments, while having different intercepts which mostly caused by the increased giving of unconditional altruists.

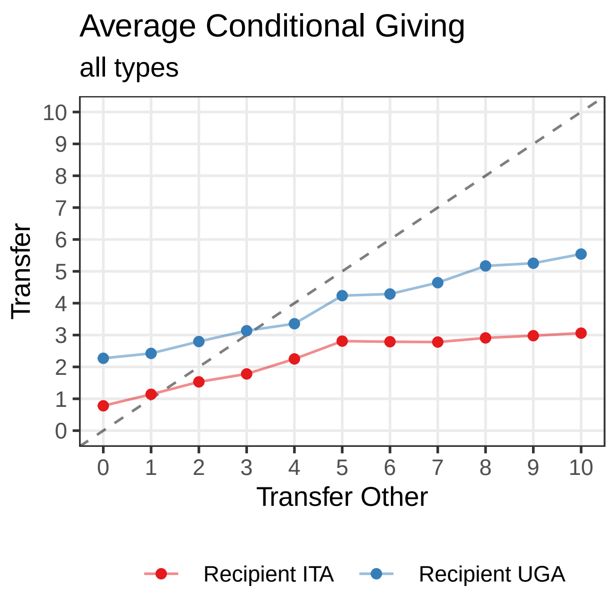

Figure 6: Average Conditional Giving

To investigate this pattern, we run a Generalized Linear Mixed Model (GLMM) regression of which results are shown in Table 7. The best model to explain the data following Akaike Information Criterion(AIC) and Bayesian Information Criterion(BIC), is Model 2, which confirms our graphical explanation of the results. According to the model, the effect of low socioeconomic status has two implications in overall subjects: it increases the intercept by nearly one token, and it rewards the generosity of the opponent with an extra 0.12 tokens, in addition to the mean conditional marginal reward of 0.23 tokens.

Overall, our results show that conditional giving is the main driver of the giving in dictator games. We do not observe any age effects, gender effects, or economics education on conditional giving.

	Model 1	Model 2	Model 3
(Intercept)	0.87***	1.10***	0.14
	(0.23)	(0.23)	(1.38)
Unconditional Giving$_{other}$	0.28***	0.23***	0.23***
	(0.01)	(0.02)	(0.02)
Treatment (Base - *RecipITA*)			
RecipUGA	1.66***	1.06**	0.98*
	(0.36)	(0.39)	(0.39)
Unconditional Giving$_{other}$:*RecipUGA*		0.12***	0.12***
Demographics			
		(0.03)	(0.03)
Age			0.07
			(0.06)
Male			−0.62
			(0.35)
Economics Student			−0.26
			(0.37)
AIC	7200.59	7185.92	7191.16
BIC	7227.92	7218.72	7240.36
Log Likelihood	−3595.30	−3586.96	−3586.58
Num. obs.	1749	1749	1749
Num. groups: subject_unq	159	159	159
Var: subject_unq (Intercept)	4.65	4.66	4.60
Var: Residual	2.71	2.68	2.68

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 7: Linear Mixed Model Regression Analysis of the Dependent Variable Conditional Giving.

5 Discussion

Our data show that the generosity observed in the symmetric DG is of the reciprocal type usually observed in standard PGG experiments. This suggests that, just like the cooperative choices in the PGG, this deviation from self-interest is fragile, and would be eroded if the game were to be repeated over time (Brosig-Koch et al., 2017). Our data are thus consistent with those models, like reciprocal altruism or ex-ante inequity aversion, that are compatible with conditional giving, while militate against those models, like social image and guilt aversion, that predict unconditional giving.[15]

Reciprocity models can also easily deal both with the wrong recipient and with the weak situation objection. The wrong recipient objection can be dismissed by noticing that, in real life contexts, expectations about other people's behavior are mostly correct, while in non-repeated experimental settings they are not. In real life, Anna would not leave money on the sidewalk for Bruno to grab, because she believes (correctly) that Bruno would have done the same if roles were reversed. Similarly, Anna *may* donate the same money to Paul, who is begging nearby, even if she (correctly) believes that Paul would have never donated those money to her if he had been the first to spot them. When playing in the lab with Bruno, on the other hand, Anna may donate part of the windfall money to him because she has incorrect beliefs about what an ordinary person (and hence Bruno) would do in that specific, unfamiliar situation.

[15]Of course, it would be wrong to conclude that reciprocity is the only factor behind deviations from pure selfishness in the DG. Other considerations, for example social image, are also likely to play a role and may explain phenomena that reciprocity alone cannot explain. For example, reciprocity cannot explain why subjects are willing to pay not to play a DG (Dana et al., 2006) and why anonymity reduces generosity. However, it can easily explain the prevalence of the 50-50 splits, which is the empirical evidence that Andreoni and Bernheim (2009) try to explain. A reciprocally altruistic subject is willing to match whatever transfer she expects the other player to make, and the fifty-fifty division is the salient division in the sense of Schelling (1980)

The type of conditional preferences revealed by our subjects imply that, with correct beliefs, transfers would be negligible in the lab just like in ordinary life.

The reciprocity hypothesis provides also an immediate answer to the weak situation criticism. If subjects best respond to their beliefs about what the other subjects will do, it is not surprising that changing the framing of the game may induce ample variations in behavior. Just like in the PGG, individuals with the same underlying reciprocally altruistic preferences may make different choices in strategically equivalent games, because a different framing may trigger different beliefs about the behavior one should expect from the other player. That choices in the DG are prone to framing effects is only puzzling if one is committed to the view that the DG has not a strategic component.[16]

Paradoxically enough, we fail to observe just the type of unconditional generosity that the DG was originally thought to reveal. Subjects seem to be unwilling to donate unconditionally even in those settings, like our Uganda treatment, in which pure generosity is expected to appear. We start our discussion of this apparent paradox by clearing the ground from two factors that *cannot* explain the data. *First*, it is unlikely that the results of the rich-poor setting can be explained by experimenter demand effect. It is hard to believe that students reveal conditionally altruistic preferences when playing with poor subjects in an attempt to look good in the eyes of the experimenter. If there is any pressure to "look good", it would push them towards unconditional generosity. A *second* weak explanation is that subjects didn't believe that money would have really been transferred to receivers in the rich-poor context, or that they even

[16]Notice that we contend that framing effects are possible both in the DG and in the PGG, and that in both cases frames influence decisions mostly through beliefs. It is an empirical question to see whether the DG is more or less prone to framing than the PGG. For example, the experiments presented in Ellingsen et al. (2012) and Dreber et al. (2013) show that, contrary to what was is usually thought, it is easier to manipulate subjects' choices in the Prisoners' Dilemma than in the DG.

had doubts that actual people had been recruited in Uganda to participate to the experiment. This explanation is unconvincing because if this were the case, subjects should have been unconditionally egoistic, or at least *less* conditionally altruistic than in the rich-rich treatment. What is the point in reciprocating the good action of a subject that may not even exist?

We are left with two main alternative explanations. First, one may take the choices made by our subjects as revealing their "true", stable preferences. The message of our data would then be that pure, unconditional altruism is in fact rare and that the only form of prosocial behavior is fundamentally driven by reciprocity. This is not as unlikely as it may appear at first sight. In a seminal paper, Falk (2007) showed that reciprocity plays an important role even in charity giving. His experiment involved potential donors who were solicited to give contributions for founding schools in the district of Dhaka (Bangladesh). The data revealed that donations increased by 17 percent if a small gift from the children from Dhaka was included in the letter, and by 75 percent is the gift was large. Apparently, a non-negligible fraction of wealthy people in Zurich were willing to transfer money to poor people in Bangladesh, but only conditionally on receiving a gift from them.

Alternatively, our data may be taken as a proof that even in extremely simple contexts like our Uganda treatment, the choices made by inexperienced subjects can be rarely taken to represent their "true", or stable, preferences. This is in line with the frequently made observation that the choices subjects make in the early stages of any experiment are determined to some extent by confusion or misunderstanding (Andreoni, 1988). The data presented in a series of recent articles suggest that this is particularly true for the reciprocally cooperative preferences elicited with the strategy method. For example, Burton-Chellew et al. (2016) show that subjects reveal the same type of reciprocity when playing against other human subjects or against computers. In a companion paper, we show that reciprocally cooperative preferences in a standard PGG appear to be unstable (Andreozzi et al., 2020). When subjects are asked to fill the strategy method questionnaire several times during the same experiment, there is a steady increase in the fraction of selfish players and a parallel decrease of reciprocators. Taken together, this evidence lends support to the thesis that the preferences elicited in one-shot settings are unreliable, as they are prone to change as subjects gain familiarity with the game. An important avenue for further research is to investigate to what extent a better understanding of the game may induce subjects to make choices that are more in line with what intuition and theoretical models dictate.

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A Theory

In this appendix we shall revise current theories that explain giving in the DG, starting with the more traditional rich-rich context. We shall then see how these models could be accommodate to our rich-poor setting.

A.1 Reciprocal giving in rich-rich contexts

Altruism, Inequity Aversion and Reciprocity. A natural starting point for an economist is to assume that the DM has rational preferences over outcomes of the game in the form (m, y), where m is the amount of money for the DM and y is the amount of money for the other player. Most of the classic social preferences models can be represented as if the decision maker is maximizing the following utility function.

$$V(m, y, s) = (1 - \theta^{\star})m^{\rho} + \theta^{\star} y^{\rho} \tag{1}$$

where

$$\theta^{*} = \begin{array}{cc} \theta + \alpha(s) & y \leq m \\ \theta - k + \alpha(s) & y > m \end{array}$$

This is a parsimonious model in which each parameter captures one element of the DM's social preferences. $\theta \in [0, 1)$ represent how altruistic she is when she gets more money than the other player. k represents how much such altruism is reduced when the other player gets more than her. ρ captures the curvature of the indifference curves, the "marginal utility of money" or risk aversion. In a strategic setting, s is the strategy chosen by the other player and $\alpha(s)$ is a function that depends on how "nice" the strategy s is perceived to be. When $\alpha(s) = 0$ for every s, any pro-social behavior revealed by the DM only depends upon the final distribution of money between himself and the other player. Otherwise, the function

$\alpha(s)$ models the way in which the preferences of the DM (in particular his altruism) are influenced by the strategy chosen by the other player, independently from the final allocation of money.

Fehr and Schmidt (1999) (FS) assume that $k \geq \theta \geq 0$, $\rho = 1$ and $\alpha(s) = 0$. This implies that the decision maker is altruistic when he gets more money than the other player ($\theta^* > 0$) and spiteful when he gets less ($\theta^* < 0$). Also, the marginal rate of substitution between her own money and the other player's is constant for co-monotonic allocations, that is for transfers that leave unchanged the relative position of the two players. When these preferences are extended to lotteries, this implies risk-neutrality. Finally, $\alpha(s) = 0$ for every s means that preferences over strategies are determined exclusively by the final allocation of money between the two players.

Andreoni and Miller (2002) (AM), Cox et al. (2007) and Fisman et al. (2007) set $k = 0$, $\rho < 1$ and $\alpha(s) = 0$. This is a pure altruism model in which the concavity of the indifference curve is entirely attributed to decreasing marginal utility of money (represented by ρ) and preferences admit an additively separable representation.

Charness and Rabin (2002) (CR) set $\rho = 1$ and $k < \theta$, which implies that when the other player is getting more, the decision maker's altruism is somewhat reduced, but not to the point of making him spiteful. This implies that preferences are monotonic. In the more complex model they develop in Appendix A, CR assume that $\alpha(s) < 0$ if by choosing strategy s the other player has "misbehaved". This means that θ represents the decision maker's altruism against an opponent who has not misbehaved. In many applications it may be problematic to give a definition of "misbehavior", but in the DG this is rather straightforward. A reasonable, if crude, assumption is that $\alpha(d_y) = a\, d_y$ where $a \geq 0$ is a constant, which amounts to assume that the DM's altruism towards the other player increases linearly with the transfer the latter makes. To keep with the terminology of CR, one could say that transferring half of the endowment is the appropriate behavior in a rich-rich environment, while in transferring less than that a player "misbehaves". With this terminology, $\theta + \frac{a}{2}$ represents the DM's altruism towards a player who has not misbehaved (because he donated half of the endowment), while $\theta \geq 0$ is the residual altruism towards a player who misbehaved donating nothing.[17]

For transfers $d_m, d_y \in [0, \frac{1}{2}]$, the ex-ante expected payoff for the DM is

$$\begin{aligned}\pi(d_m, d_y) &= \frac{1}{2}V(1-d_m, d_m, d_y) + \frac{1}{2}V(d_y, 1-d_y, d_y) \\ &= \frac{1}{2}((1-d_m)^\rho + (\theta + a\, d_y)d_m) + \frac{1}{2}((d_y^\rho + (\theta + a\, d_y)(1-d_y)^\rho)\end{aligned}$$

The decision maker maximizes $\pi(d_m, d_y)$ by choosing d_m. For $\rho < 1$ the first order condition for an interior solution is

$$\frac{\partial \pi(d_m, d_y)}{\partial d_m} = (\theta + a\, d_y)\rho\, d_m^{\rho-1} - \rho\,(1-d_m)^{\,\rho-1} = 0$$

which can be rewritten as

$$\theta + a\, d_y = (\frac{d_m}{1-d_m})^{(\rho-1)} \tag{2}$$

The optimal choice of d_m given d_y, $B(d_y)$, is the solution to Equation 2. For $a = 0$ the left hand side of Equation 2 does not depend on d_y and hence the optimal value of d_m does not depend on the choice made by the other player. This is the case in which individuals have

[17] This assumption is crude because one could imagine, for example, that the DM's altruism does not increase, and may even decrease, for transfers larger than $\frac{1}{2}$. This may be the case if very large transfers are interpreted as insulting. On the other hand, our main result would remain unchanged with the milder assumption that $\alpha(d_y)$ is any increasing function of d_y, for any $d_y \in [0, \frac{1}{2}]$.

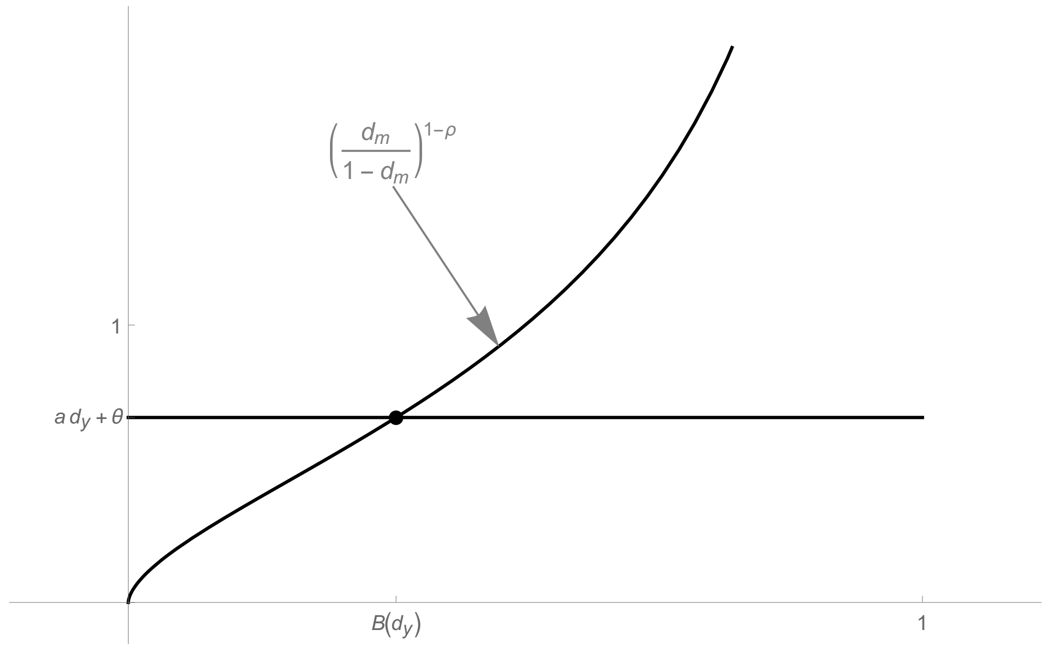


Figure 7: Optimal transfer for a reciprocally altruistic player.

purely outcome-oriented preferences. For $a > 0$, the left hand side is an increasing function of d_y and hence the optimal value of d_m is increasing in d_y (see Figure 7). The model is thus consistent with Property 1. When $\theta = 0$ any deviation from self-interest that is revealed in the experiment (that is any $d_m > 0$) stems from reciprocity and would disappear if $d_y = 0$. Such a model would fulfill Property 2.

Ex-Ante Inequity Aversion Trautmann (2009), Fudenberg and Levine (2012) and Saito (2013) introduced models in which players are inequity averse, but assess inequality ex-ante rather than ex-post. The following example illustrates this difference. The decision maker is asked to choose between two coin flips (A and B) that award a unit of money to himself and the other player. The coin flips differ in the fact that in A winnings are uncorrelated: the decision maker wins on Head, the other player on

Tail. In lottery B winnings are correlated: they both win on Head and lose on Tail.

	A			B	
	M	Y		M	Y
H	1	0	H	1	1
T	0	1	T	0	0

It is immediate to show that when preferences are represented by the FS specification of Equation 1, lottery B is better than A. This is not surprising, because, ex-post, A produces inequality while B produces perfect equality. However, ex-ante the two lotteries produce no inequality, because in both each player stands a fair chance of getting a unit of money. A player who is averse to inequality, but evaluates it ex-ante, will thus be indifferent between them.

FS model can be easily modified to account for ex-ante inequality aversion. Players' preferences are still represented by Equation 7 with $\rho = 1$, $k > \theta \geq 0$ and $\alpha(s) = 0$. The difference is that (in decisions that involve lotteries) m and y will be replaced by $\hat{m}$ and $\hat{y}$, which stand for the expected value of the lotteries involved in the choice. The symmetric Dictator game provides a nice illustration of this point. When transfers are d_m and d_y the decision maker obtains a lottery whose expected value is $\hat{m} = \frac{1}{2}(1 - d_m) + \frac{1}{2}d_y$ while the other subject obtains $\hat{y} = \frac{1}{2}d_m + \frac{1}{2}(1 - d_y)$. Replacing m with $\hat{m}$ and y with $\hat{y}$ in Equation 1 we obtain

$$\pi(d_m, d_y) = \frac{1}{2}(1 - d_m) + \frac{1}{2}d_y + \theta^*(\frac{1}{2}d_m + \frac{1}{2}(1 - d_y)) \qquad (3)$$

Notice that $\frac{\partial \pi(d_m, d_y)}{\partial d_m} = \frac{1}{2}(\theta^* - 1)$ and that $\theta^* = \theta - k < 0$ if $d_m > d_y$ and $\theta^* = \theta \geq 0$ if $d_m \leq d_y$. Like any model with piece-wise linear functions, this model cannot account for interior solutions. The optimal choice is thus $B(d_y) = 0$ if $\theta \leq 1$ and $B(d_y) = d_y$ if $\theta > 1$. In other words, if the subject is sufficiently averse to ex-ante inequality ($\theta > 1$), he will match exactly the transfer he expects from the other player. Otherwise he will give nothing.[18] The intuition is that any transfer d_m that is different from d_y produces inequality ex-ante. It follows that a model incorporating ex-ante inequity averse preferences will satisfy Property 1 and 2.

Reciprocal Altruism Levine (1998) provides an alternative formulation of reciprocal altruism based on incomplete information. The main ingredient of the model is the idea that individuals vary in their degree of altruism, and want to be more altruistic towards other altruistic individuals. Given a two players game in which payoffs are m and y, the decision maker maximizes

$$V(m, y) = m + (\theta_m + \lambda\,\theta_y)y \tag{4}$$

where $\theta_i \in [0, 1)$ is the coefficient that determines how much player $i = M, Y$ cares about the payoff of the other player.[19] $\lambda \in [0, 1)$ is a parameter that determines how much a subject's altruism is influenced by the other player's altruism. When $\lambda = 0$ a player's altruism is unconditional. For $\lambda > 0$ a player is more altruistic towards altruistic players. The crucial assumption is that θ_i is private information and only the strategy chosen by an individual can be observed. In games with observable moves like the ultimatum game, reciprocal altruism gives rise to signalling, as players will choose strategies that influence other player's beliefs about their own type. This is not the case, however, for simultaneous moves games like the PGG and the DG.

[18] This is a rather extreme result, in that a fair minded individual will always match perfectly the transfer he expects from the other player. In a more complex model the DM would care both about ex-ante and about ex-post inequality and would have non-linear utility function for money. Such a model may produce imperfect reciprocity.

[19] The original model contains a normalizing factor that we omit.

In a DG, if types are observable, the DM maximizes

$$\pi(d_m, d_y) = \frac{1}{2}(1 - d_m + (\theta_m + \lambda\,\theta_y)d_m) + \frac{1}{2}(d_y + (\theta_m + \lambda\,\theta_y)(1 - d_y))$$

Because preferences are assumed to be linear in money, this model cannot explain partial transfers. A subject will give noting if $\theta_m + \lambda\theta_y < 1$ and will transfer the maximum feasible amount if $\theta_m + \lambda\theta_y > 1$. In principle this could be fixed by letting utility be a non linear function of money, or by introducing kinks in the utility function as in FS. Instead of considering such more complex models, we assume that a Dictator can transfer at most half of the endowment, so restricting attention to transfers in the range $[0, \frac{1}{2}]$ (See Rotemberg (2008) for a similar approach).

We follow Levine (1998) in assuming that there is a finite set of types: one selfish, $\theta_i = 0$, and one altruistic, $\theta_i = \bar{\theta}$ with $1 > \bar{\theta} > \frac{1}{2}$ [20]. These numbers are chosen to insure that transferring nothing is a dominant strategy for the selfish type, and that the altruistic type will only make a positive transfer to another altruistic type. Lets start with the selfish type. If the other player is selfish too $\theta_m + \lambda\theta_y = 0$ and hence no transfer takes place. If the other player is altruistic, $\theta_y = \bar{\theta} < 1$ and $\theta_m + \lambda\theta_y = \bar{\theta} < 1$. So a selfish player will transfer nothing, regardless of the type of the other player. For an altruistic player, when the other player is selfish, we have $\theta_m + \lambda\theta_y = \bar{\theta} < 1$ while when the other player is altruistic we have $\theta_m + \lambda\theta_y = \bar{\theta} + \lambda\bar{\theta} > 1$ if $\lambda > \frac{(1-\bar{\theta})}{\bar{\theta}}$. Hence, an altruistic player who is sufficiently motivated by reciprocity will make a positive transfer to another altruistic type, but not to a selfish type.

These are the choices the DM would make in the complete information case in which types are observable. Notice that in this scenario the optimal choice for each type depends on the *type* of the other player θ_y, but not on his *transfer* d_y. The optimal choice instead depends on the

[20] In the original paper Levine (1998) assumed also the existence of a spiteful type. We do not include this type because it would make no difference for our argument.

other player's transfer d_y if transfers, but not types, are observable. To see this, let $p(d_y = \frac{1}{2}|\theta_y = 0)$ and $p(d_y = \frac{1}{2}|\theta_y = \bar{\theta})$ be the probabilities with which a DM expects a selfish and an altruistic type to make a transfer $d_y = \frac{1}{2}$. Since $d_y = 0$ is a dominant strategy for the selfish type, we shall assume that $p(d_y = \frac{1}{2}|\theta_y = 0) = 0$, that is the DM is aware of the fact that the selfish type will never make any transfer. The transfer made by an altruistic type who does not observe the choice made by the other player depends on his belief about the distribution of other altruistic types in the population. In equilibrium these beliefs will have to be correct, but in the non-equilibrium setting we are considering they can be arbitrarily fixed. To avoid unecessary complications, we shall assume that $p(d_y = \frac{1}{2}|\theta_y = \bar{\theta}) > 0$. That is, the DM believes that at least some altruistic subjects make a positive transfer when they cannot observe the other player's choice. With these assumptions, it is immediate that the ex-post probabilities that the other player makes a positive transfer are given by: $p(\theta_y = \bar{\theta}|d_y = 0) = 0$ and $p(\theta_y = \bar{\theta}|d_y = \frac{1}{2}) = 1$. In other words, after having observed a zero transfer the DM puts probability one of the other player being an egoist while after observing a positive transfer this probability is 1. It follows that $B(0) = 0$ and $B(\frac{1}{2}) = \frac{1}{2}$. This implies that an altruistic DM will always match the transfer made by the other player and for this reason the model satisfies Property 1 and 2.

Social image Andreoni and Bernheim (2009) model is meant to explain two behavioral regularities observed in experiments involving the DG: (i) the prevalence of equal splits among positive transfers and (ii) the fact that the DM's transfer depends on whether it can be observed by the recipient. The model assumes that subjects have a shared belief about how the money should be divided in a DG (a "social norm"), and are willing to sacrifice part of their final payoff to respect the norm. Crucially, subjects are heterogeneous in the degree with which they care about respecting the norm and this is private information. They also care about what the other player (or, more generally an "audience") think about their willingness to respect the norm. In symmetric DG, subjects' preferences are assumed to be represented by the following equation

$$\pi(d_m, d_y) = \frac{1}{2}(f(1 - d_m, m(d_m)) + t\, g(d_m - d^F)) + \frac{1}{2}f(d_y, \bar{m}) \qquad (5)$$

The first term of this expression represents the decision maker's utility in the event that he will be chosen as dictator and his transfer d_m implemented. d^F is the transfer that is considered appropriate, the "social norm". In symmetric Dictator Games it is natural to assume $d^F = \frac{1}{2}$. $g(.)$ is a continuous function with a maximum at 0, which represent the decision maker's dis-utility if she chooses a transfer that deviates from the norm. t is a parameter that measures how much a subject cares about the social norm. $f(1 - d_m, m(d_m))$ represents the decision maker's personal preferences. $(1 - d_m)$ is the money he earns at the end of the experiment if he happens to be the dictator, while $m(d_m)$ is his "social image", which may depend on the transfer d_m he chooses. If the game involves no asymmetric information, so the parameter t is common knowledge, then $m(d_m) = t$. In other words, a player's social image is simply the degree with which she cares about the social norm and cannot be influenced by the transfer d_m she chooses. With asymmetric information, the value of t must be inferred by the observed transfer d_m. The function f is increasing in both arguments, so that a player cares about both money and her social image.

The second term in Equation 5 represents the DM's payoff when he plays as recipient. Here $\bar{m}$ represents her ex-ante social image, that cannot be changed by d_m because when the DM's plays as recipient her transfer is not implemented.

The optimal transfer $B(d_y)$ is the solution to

$$m'\left(d_m\right) f_2\left(1-d_m, m\left(d_m\right)\right)-f_1\left(1-d_m, m\left(d_m\right)\right)+t g'\left(d_m-d^F\right)=0 \quad (6)$$

where f_i represents the partial derivative of f with respect to argument $i = 1, 2$. Notice that Equation 6 does not depend on d_y and therefore the optimal choice $B(d_y)$ will be a non negative constant. The model thus fails both Property 1 and 2. This is a consequence the fact that the DM is assumed to care only about the way in which his choice d_m will influence the inferences the audience will make about his type (represented by $m(d_m)$), but not about the transfer made by the other player.

Guilt aversion Battigalli and Dufwenberg (2007) introduced the idea that part of the non-selfish behavior observed in games is due to people's aversion to disappoint other people's expectations. They term this psychological disposition *guilt aversion*. In a symmetric DG, a guilt averse player maximizes the following utility function

$$\pi(d_m, d_y) = \frac{1}{2}(u(1-d_m) - \eta\, max(0, u(\hat{d}_m) - u(d_m))) + \frac{1}{2}u(d_y)$$

where $u(.)$ represents the players' preferences over money and $\hat{d}_m$ is the transfer the second player expects from the decision maker. The idea is that the decision maker is averse to disappoint the other player's expectation (measured by $u(\hat{d}_m) - u(d_m)$) and the weight of this aversion is represented by η.[21]

One can easily see how the model works by assuming that utility is linear in money: $u(x) = x$. With this assumption, the optimal solution turns out to be $B(d_y) = 0$ if $\eta < 1$ and $B(d_y) = \hat{d}_m$ if $\eta > 1$. In other words,

[21]See Khalmetski et al. (2015) for an extension of this model in which a decision maker can take pleasure from generating positive surprises in the other player.

a subject who is sufficiently motivated by guilt aversion will always match the gift that the other player expects to receive. When concern for guilt is sufficiently small, no transfer takes place.

Just like in Andreoni and Bernheim (2009), guilt aversion contains no reciprocity, so the optimal choice of the decision maker is independent from the transfer chosen by the other player. Therefore, the model fails both Property 1 and 2. A somewhat counter-intuitive implication of the model is that the decision maker would transfer more money to an opponent with larger expectations concerning the DM tranfer (large $\hat{d}_m$) and very little generosity ($d_y = 0$), than to a very generous opponent (large d_y) with low expectations (small $\hat{d}_m$).

A.2 Nonreciprocal giving in rich-poor contexts

None of the models we discussed in the previous section makes explicit predictions for the rich-poor version of the DG. However, they are all easy to adapt in order to fulfill Property 3 and 4.

Altruism, Inequity Aversion and Reciprocity. To see how subjects whose preferences is represented by Equation 7 may come to satisfy Property 3 and 4, consider again Equation 2 and let $\hat{a}$ and $\hat{\theta}$ be the values of a and θ in the rich-poor setting. Property 4 is satisfied if $\hat{a} = 0$, because in this case the optimal value of d_m is independent from d_y. Property 3 is satisfied if $\hat{\theta} > \theta + a$, because in this case $\hat{B}(d_y) > B(d_y)$ for every $d_y \in [0, 1]$. Both these conditions are appealing. $\hat{a} = 0$ corresponds to the idea that a poor player does not "misbehave" if he transfers nothing. $\hat{\theta} > \theta + a$ formalizes the idea that in making interpersonal comparisons the DM attaches a larger value to a dollar in the pocket of a poor subject than in the pocket of a rich subject (with respect to a dollar in his own pocket).

Ex-ante inequity aversion Models of ex-ante iniquity aversion are easy to adjust to unconditional transfer in the rich-poor context. It is sufficient to assume that subjects evaluate ex-ante inequality considering also the background income. In this case, the optimal choice is $\hat{B}(d_y) = 1$ for every d_y and hence the model satisfies both Property 3 and 4.

Reciprocal altruism The model by Levine (1998) can be accommodated to satisfy Property 3 and 4 in the following way. The altruism coefficient θ represents interpersonal comparisons when the background income is the same for the two players. It will then be different when the DM is richer or poorer than the other player. We shall indicate with θ^R and θ^P the values of the coefficient θ when a subject is rich and poor respectively. We assume that the selfish type will be selfish regardless of his income: $\bar{\theta} = \theta^R = \theta^P = 0$. The altruistic type instead will become more altruistic when rich and less altruistic when poor. To simplify matters, we shall assume that when poor an altruistic player will put no weight on the payoff of the rich player: $\theta^R > \bar{\theta} > \theta^P = 0$. We keep the assumption that a player's reciprocal preferences depend on $\bar{\theta}$, that is the altruism a player would display in interactions in which the background income is symmetric.

A poor player will give nothing whether is selfish or not, as he will maximize

$$\pi(d_m, d_y) = \frac{1}{2}((1 - d_m) + (0 + \lambda\,\theta_y)d_m) + \frac{1}{2}(d_y + (0 + \lambda\,\theta_y)(1 - d_y))$$

and $(0 + \lambda\,\theta_y) < 1$ because $\lambda < 1$ and $\theta_y \leq \bar{\theta} < 1$. This implies that in a rich-poor setting observing a poor subject donating nothing conveys no information about his type. So the optimal choice for the DM will depend upon the ex-ante probability with which he expects the other subject to be altruistic, which we shall denote as $p(\bar{\theta})$. If the DM is altruistic, he will maximize

$$\begin{aligned}\pi(d_m, d_y) &= p(\bar{\theta})(1 - d_m + (\theta^R + \lambda\bar{\theta})d_m) + (1 - p(\bar{\theta})(1 - d_m + (\theta^R + \lambda\, 0)d_m) \\ &= 1 - d_m + (\theta^R + p(\bar{\theta})\lambda\,\bar{\theta})d_m\end{aligned}$$

The optimal choice is $\hat{B}(0) = \hat{B}(\frac{1}{2}) = \frac{1}{2}$ if $p(\bar{\theta}) \geq \frac{1-\theta^R}{\lambda\,\bar{\theta}}$ and $\hat{B}(0) = \hat{B}(\frac{1}{2}) = 0$ otherwise. The intuition is that, because all poor subjects transfer nothing, the DM will only donate if he puts a sufficiently large probability on the other player to be altruistic. Since his positive transfer does not depend on the transfer made by the other player, Property 3 and 4 are satisfied.

Social image In the Andreoni and Bernheim (2009) model choices are always unconditional, so Property 3 is trivially satisfied. Property 4 can be accommodated by assuming that the rich-poor setting triggers a different norm, in which the rich subject is supposed to give more. Formally, this amounts to assume that that in the rich-poor setting $d^F > \frac{1}{2}$, which insures that in the optimal solution $\hat{B}(d_y) > B(d_y)$ for every d_y.

Guilt Aversion Just like in the Social Image model, Guilt Aversion produces un-condtional transfers so Property 3 is satisfied. Property 4 can be accommodated assuming that in a rich-poor context $\hat{d}_b m$ is larger (because a rich subject believes that a poor subject expects to receive more) and that η is larger (because a rich subject feels more guilty if he disappoints a poor subject's expectations).

B Additional Data and Analysis

B.1 Distribution of Types

Treatment		Conditional	Selfish	Unconditional	Hump-shaped	Other	Total
RecipITA	n	43	25	6	14	12	100
	%	43.00	25.00	6.00	14.00	12.00	
RecipUGA	n	33	8	7	3	8	59
	%	55.93	13.56	11.86	5.08	13.56	
p-value		0.1397	0.1063	0.2349	0.1105	0.8074	

Table 8: Type distributions in treatments and Fisher's test for differences in proportion. We cannot reject the null hypothesis that the distribution of types are the same in two treatments.

B.2 Unconditional Giving Uganda

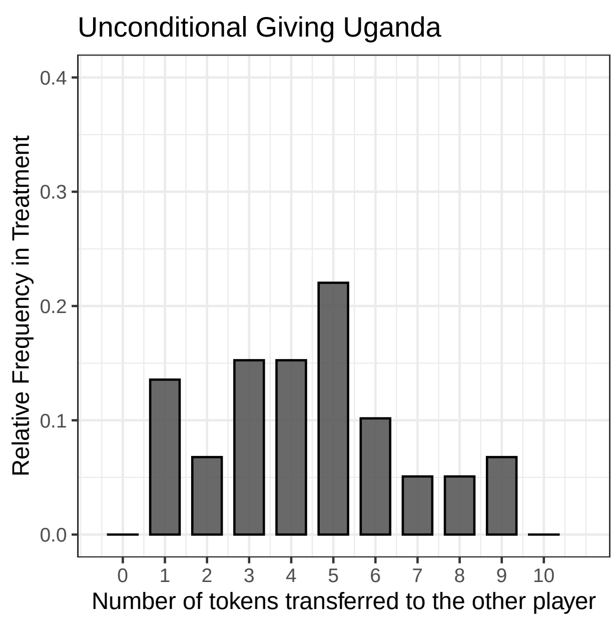


Figure 8: Distribution of Unconditional Givng by Ugandan Subjects

B.3 Individual Giving Schedules Categorized by the type of Conditional Choices

Treatment: Recipient ITA

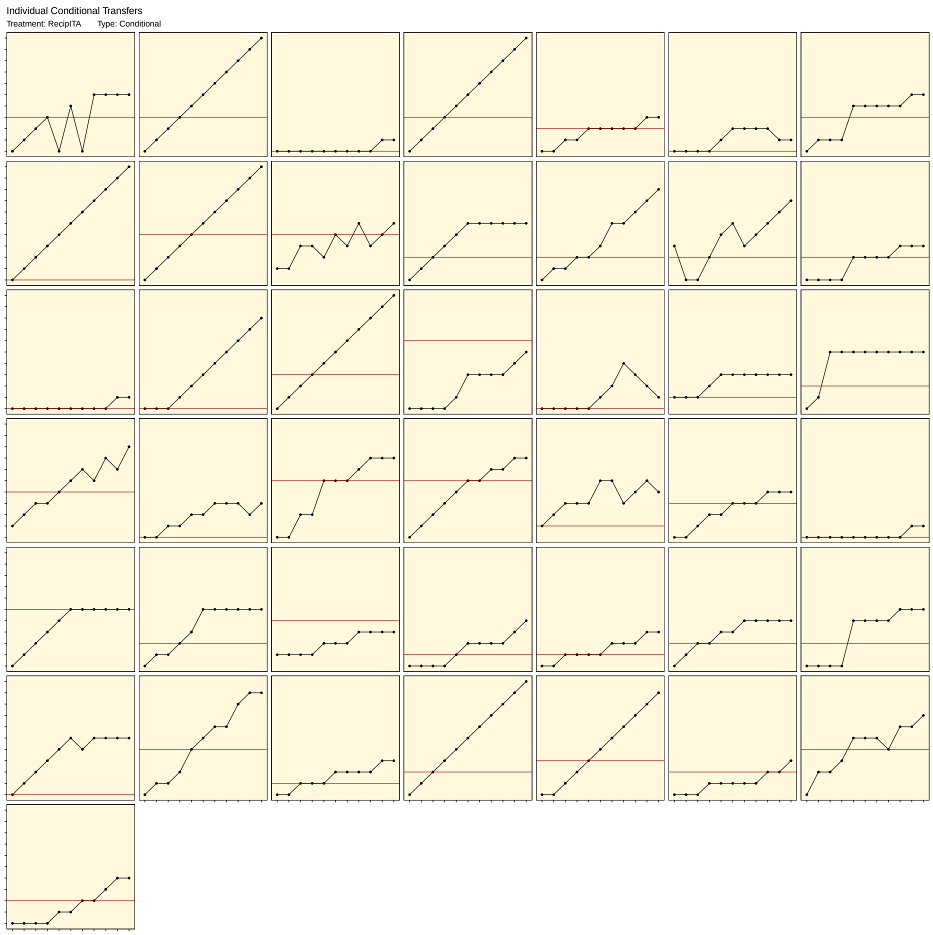


Figure 9: Giving Schedule: Conditional Types

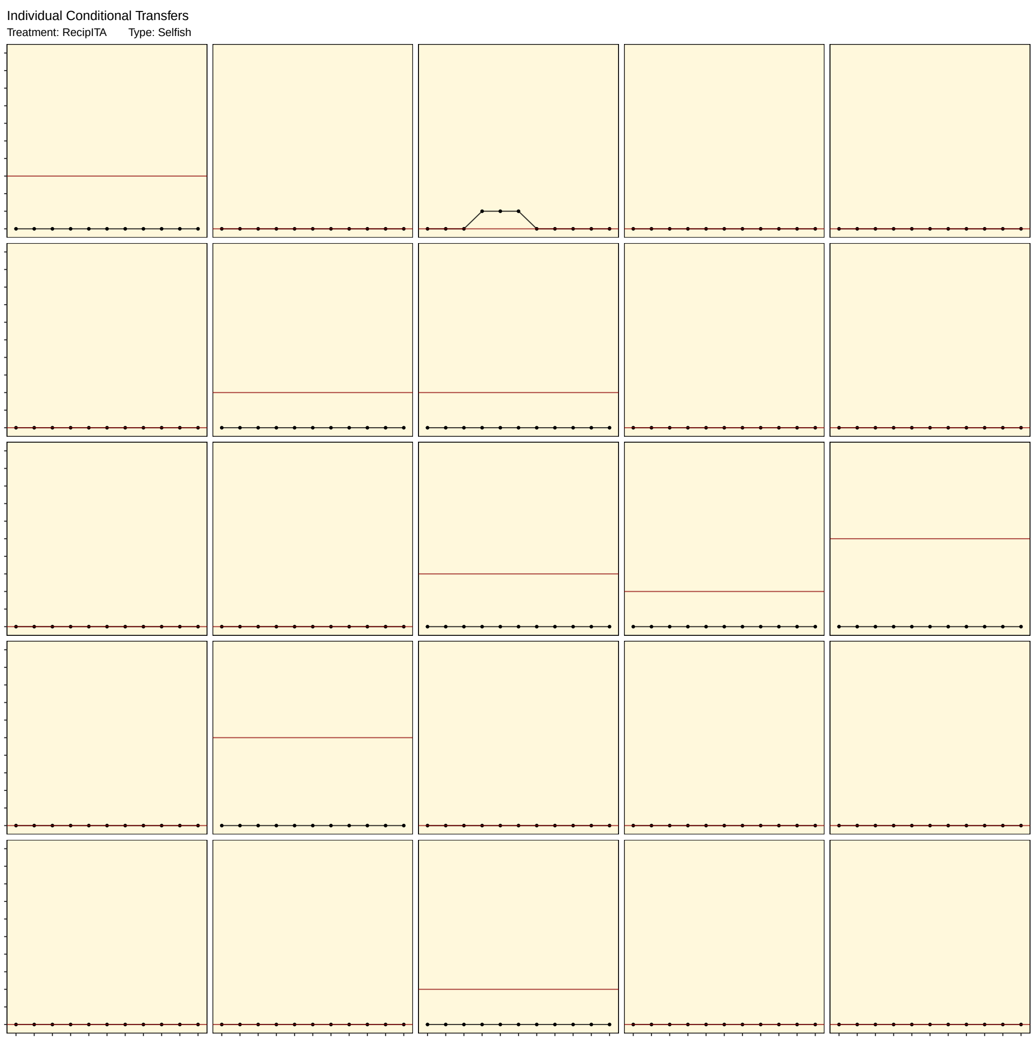


Figure 10: Giving Schedule: Selfish Types

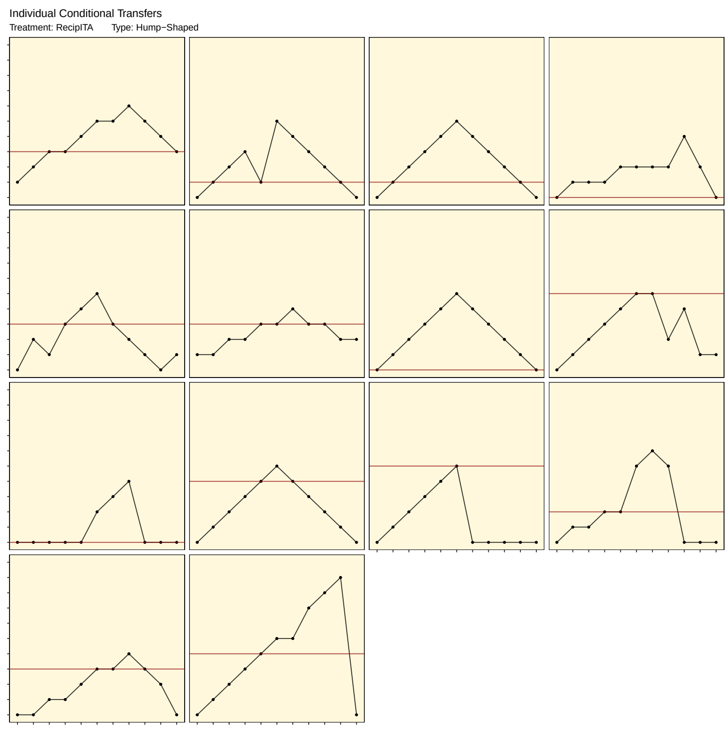


Figure 11: Giving Schedule: Hump-Shaped Types

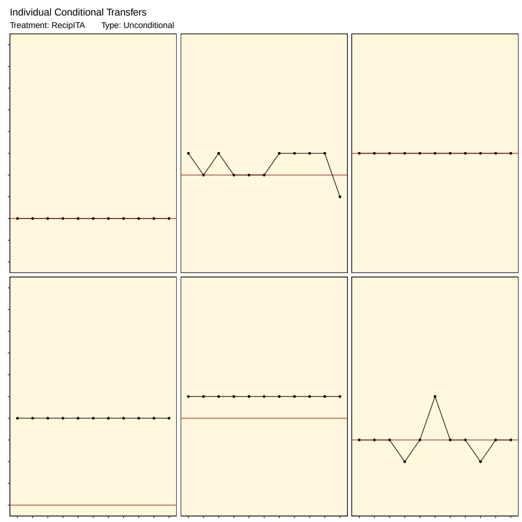


Figure 12: Giving Schedule: Unconditional Types

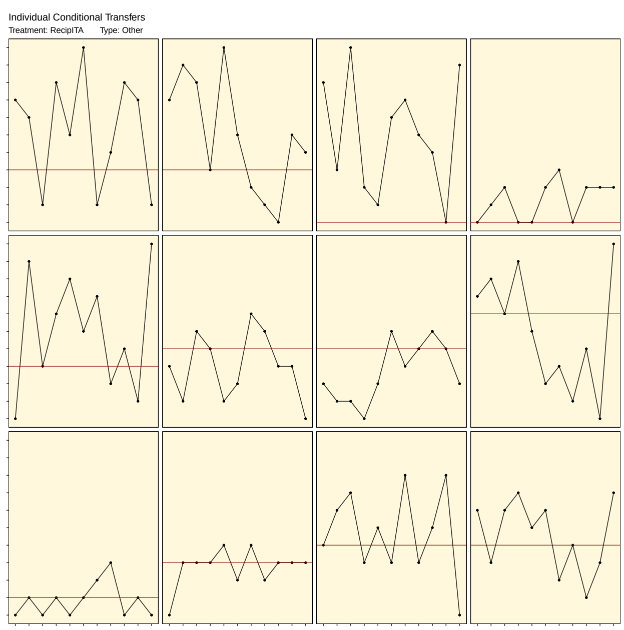


Figure 13: Giving Schedule: Unclassified Types

Treatment: Recipient UGA

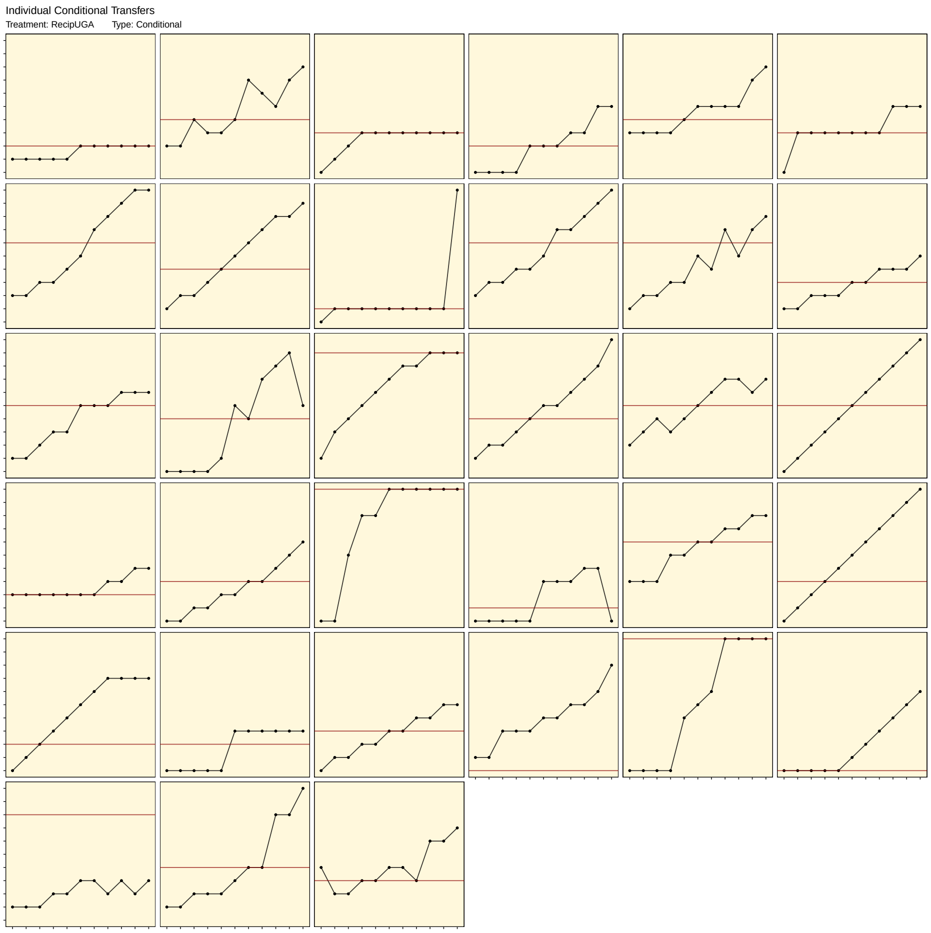


Figure 14: Giving Schedule: Conditional Types

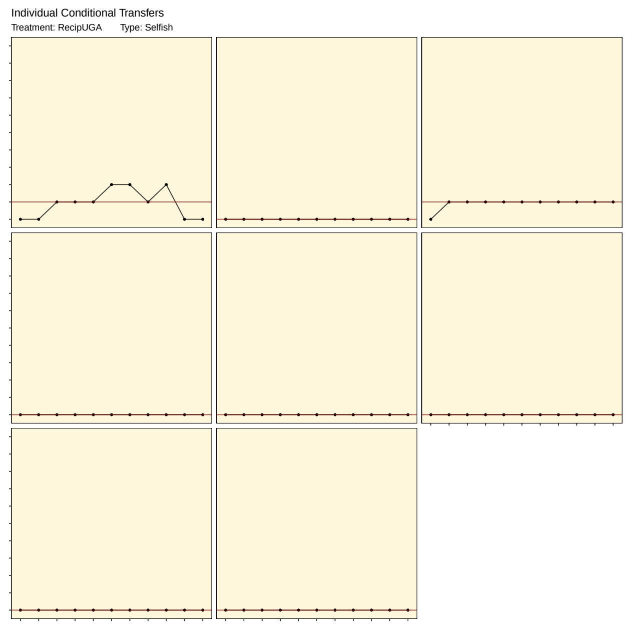


Figure 15: Giving Schedule: Selfish Types

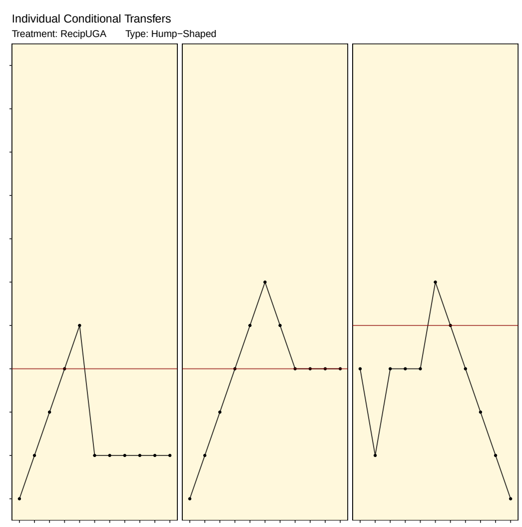


Figure 16: Giving Schedule: Hump-Shaped Types

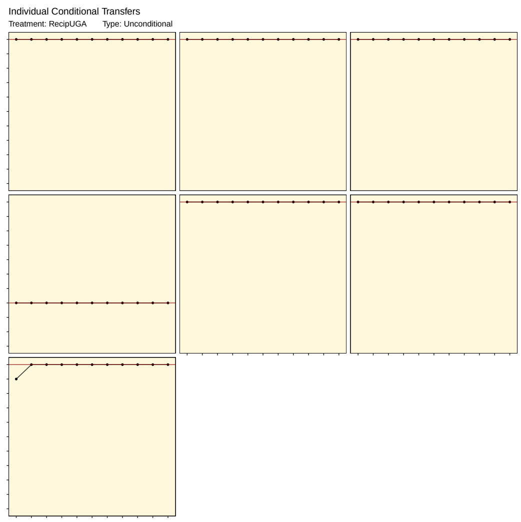


Figure 17: Giving Schedule: Unconditional Types

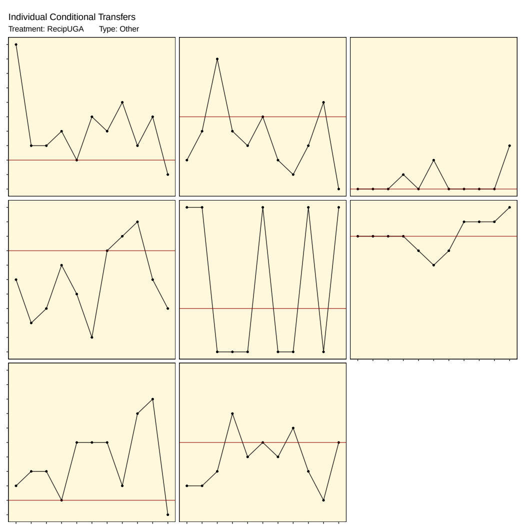


Figure 18: Giving Schedule: Unclassified Types

B.4 Screenshots for Italian Participants

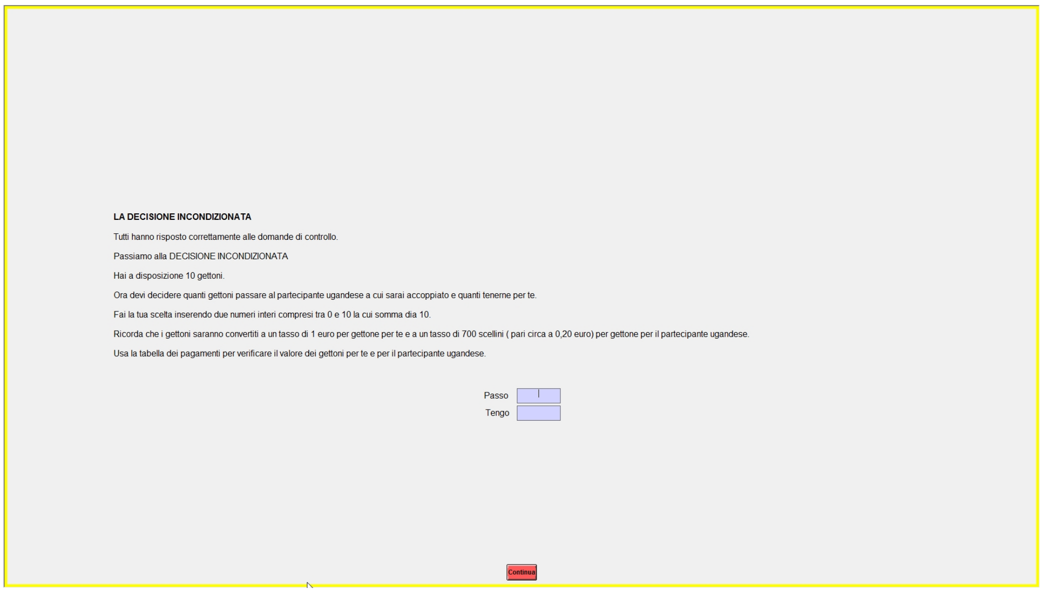


Figure 19: Decision Screen: Unconditional Choice

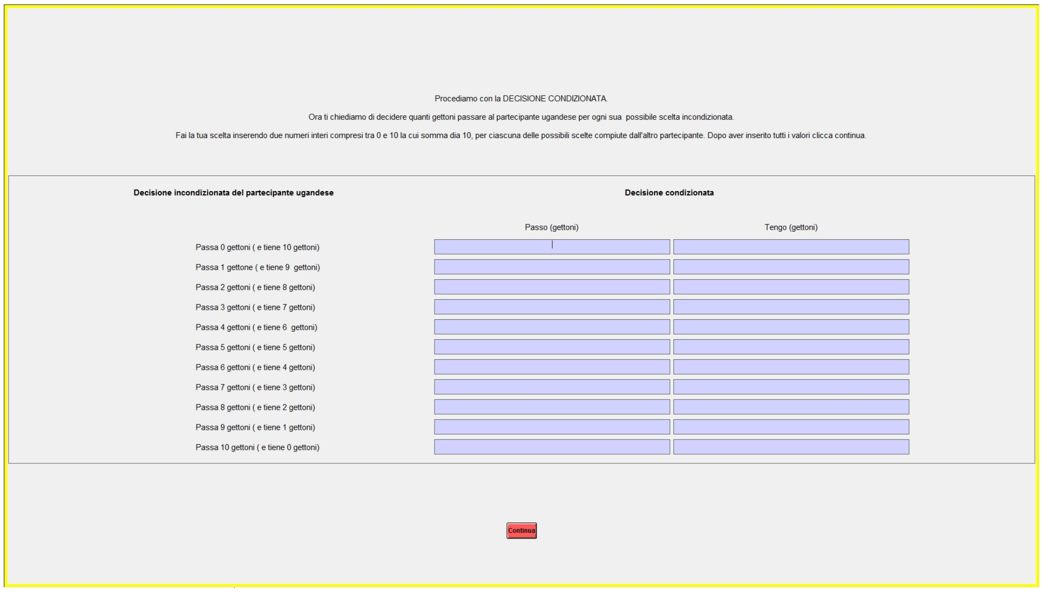


Figure 20: Decision Screen: Conditional Choice

B.5 Instructions

INSTRUCTIONS

1) TREATMENT: Recipient ITA

Welcome.

Thank you for participating in this experiment on decision making.

The experiment will last about 40 minutes.

You will receive €3 as show-up fee. You can earn an additional amount of money, which will depend on your decision and on the decisions of the other participants in the experiment.

We kindly ask you to avoid to communicate with the other participants.

Your choices will be kept anonymous. The experimenters will not be able to associate your choices with your name.

Please read the instructions carefully. Instructions will appear on your computer screen and will be also read aloud by one of the experimenter.

If you have any doubt or question please rise your hand.

THE TYPICAL DECISION

Before proceeding with the experiment let's introduce the typical decision that we will ask you to make.

Participants will we matched in pairs. The matching is random.

The members of the pair will be assigned different roles. Roles are assigned as follows: before entering the room, the software has assigned to half of the PCs the role of PARTICIPANT A and to the other half the role of PARTICIPANT B.

PARTICIPANT A is given a sum of €10 and she must decide how much of this sum to keep for herself and how much to transfer to PARTICIPANT B. The choice is made by choosing two numbers between 0 and 10. The sum of the two numbers must be €10.

PARTICIPANT A will be paid a sum equal to the number of euros she has decided to keep. PARTICIPANT B will be paid a sum corresponding to the number of euros sent by PARTICIPANT A.

THE EXPERIMENT

In the course of the experiment you will be asked to make two decisions: the *Unconditional Decision* and the *Conditional Decision*.

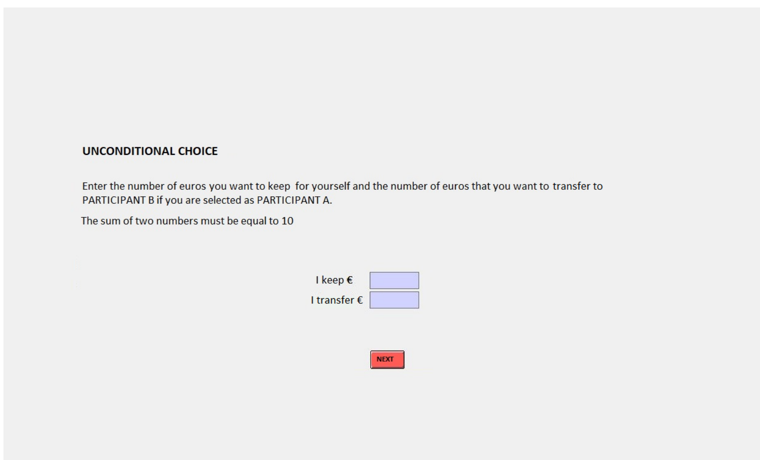
At the end of the experiment we will toss a coin. In case of heads we will pay you according to the outcome of your Unconditional Decision, otherwise we will pay you on the basis of the outcome of your Conditional Decision

Please note that even if only one of the two choices will be considered for your final payment, we ask you to decide what to do both in the case of heads and in the case of tails.

THE UNCONDITIONAL CHOICE

With your Unconditional Choice (which will be selected in the case of heads) you must decide, in the case in which you will be selected as PARTICIPANT A, how many euros you want to keep for yourself and how many euros you want to transfer to PARTICIPANT B.

You will enter this amount in the following computer screen



THE CONDITIONAL CHOICE

The next choice is the Conditional Choice (which will be selected for payment in case of tails).

You must choose, in the case in which you are selected as PARTICIPANT A, how many euros to send to PARTICIPANT B for each possible Unconditional Choice made by the PARTICIPANT B.

In particular uou must choose how many euros to transfer to PARTICIPANT B if in her Unconditional Choice she has decided to send you €0 , €1, €2, etc. (notice that this is the sum that the other participant will transfer to you in the case in which the toss of the coin gives heads and she is selected as PARTICIPANT A)

You will decide by filling the following table

UNCONDITIONAL CHOICE OF THE OTHER PARTICIPANT	YOUR CONDITIONAL CHOICE	
	Keep	Transfer
Transfer €0 (and keep €10)		
Transfer € 1 (and keep € 9)		
Transfer € 2 (and keep € 8)		
Transfer € 3 (and keep € 7)		
Transfer €4 (and keep € 6)		
Transfer € 5 (and keep € 5)		
Transfer € 6 (and keep € 4)		
Transfer €7 (and keep € 3)		
Transfer €8 (and keep € 2)		
Transfer € 9 (and keep € 1)		
Transfer €10 (and keep € 0)		

If the toss of the coin gives tails and you are selected as PARTICIPANT A, you will transfer a sum to PARTICIPANT B corresponding to the sum you decided to transfer given her actual Conditional Choice

The following examples should make that clear.

Assume that in your Unconditional choice you have decided to keep €7 and to transfer €3 to PARTICIPANT B. Assume also that you have filled Conditional Choice table as in the figure below

UNCONDITIONAL CHOICE OF THE OTHER PARTICIPANT	YOUR CONDITIONAL CHOICE	
	Keep	Transfer
Transfer €0 (and keep €10)	2	8
Transfer € 1 (and keep € 9)	4	6
Transfer € 2 (and keep € 8)	5	5
Transfer € 3 (and keep € 7)	4	6
Transfer €4 (and keep € 6)	3	7
Transfer € 5 (and keep € 5)	2	8
Transfer € 6 (and keep € 4)	5	5
Transfer €7 (and keep € 3)	6	6
Transfer €8 (and keep € 2)	3	7
Transfer € 9 (and keep € 1)	4	6
Transfer €10 (and keep € 0)	8	2

Assume you are paired with a participant who, in her Unconditional Choice, has decided to transfer €2 and to keep €8.

Assume that the coin lands on heads. In this case, the payment will be decided by considering the Unconditional Choice.

If you have been assigned the role of PARTICIPANT A, then your Unconditional Choice will be implemented and you will be paid €7 and the other participant will be paid €3. If, instead, you have been assigned the role of PARTICIPANT B, then the other participant's Unconditional Choice will be implemented and you will be paid €2 and the other will be paid €8

Now assume that the toss of the coin gives tails. In this case the Conditional Choice will be considered for payment.

If you have been assigned the role of PARTICIPANT A, then your Conditional Choice will be implemented and you will be paid €5 and the other participant will be paid €5, since you have decided to transfer €5 if the other's Unconditional choice was €2 (row n.3 of the table)

Assume now that the other participant's Unconditional Choice was to keep €5. In this case, if the coin gives tails your payment will be €2 and the other's payment will be €8, since you have decided to transfer €8 if the other's Unconditional choice was €5 (row n.6 of the table)

SUMMARY

To summarize, the phases of experiment are the following:

1. Participants are matched in pairs.
2. The roles of PARTICIPANT A and PARTICIPANT B are assigned (but not communicated to the participants)
3. Unconditional Choice: participants decide how many euros to keep for themselves and how many euros to transfer in the case in which they are assigned the role of PARTICIPANT A.
4. Conditional Choice: participant decide, for each possible Unconditional choice of the participant with whom they are matched, how many euros to keep and how many euros to transfer if they are assigned the role for PARTICIPANT A
5. We toss the coin: in the case of heads the Unconditional Choice is implemented, otherwise the Conditional Choice is implemented.
6. Final feedback on roles, choices and payment.

CONTROL QUESTIONS

In your Uncondititonal choice you have decided to transfer €3 to PARTICIPANT B and to keep €7.

You have filled the following Conditional Choice table

Your Conditional Choice		
Unconditional Choice of the other participant	Conditional choice	
	Keep	Transfer

Transfer €0 (keep €10) Transfer €1 (keep €9)	3 1	7 9
Transfer €2 (keep €8)	2	8
Transfer €3 (keep €7)	7	3
Transfer €4 (keep €6)	0	10
Transfer €5 (keep €5)	4	6
Transfer €6 (keep €4)	5	5
Transfer €7 (keep €3)	8	2
Transfer €8 (keep €2)	9	1
Transfer €9 (keep €1)	10	0
Transfer €10 (keep €0)	4	6

You are paired with a participant who, in her Unconditional Choice has decided to keep €10 and to transfer €0. The other participant has filled the following Conditional Choice table.

Your Conditional Choice		
Unconditional Choice of the other participant	Conditional choice	
	Keep	Transfer
Transfer €0 (keep €10) Transfer €1 (keep €9)	9 3	1 7
Transfer €2 (keep €8)	2	8
Transfer €3 (keep €7)	6	4
Transfer €4 (keep €6)	9	1
Transfer €5 (keep €5)	0	10
Transfer €6 (keep €4)	5	5
Transfer €7 (keep €3)	2	8
Transfer €8 (keep €2)	9	1
Transfer €9 (keep €1)	4	6
Transfer €10 (keep €0)	3	7

Assume that the toss of the coin gives heads, and then the Unconditional Choice is implemented.

If you are selected as PARTICIPANT A

Your payment is €______ and the other participant's payment is €_____

If you are selected as PARTICIPANT B

Your payment is €______ and the other participant's payment is €_____

Assume that the toss of the coin gives tails, and then the Conditional Choice is implemented.

If you are selected as PARTICIPANT A

Your payment is €______ and the other participant's payment is €_____

If you are selected as PARTICIPANT B

Your payment is €______ and the other participant's payment is €_____

2) TREATMENT: Recipient UGA

Italian participants

Welcome.

Thank you for participating in this experiment on decision making.

The experiment will last about 40 minutes.

You will receive €3 as show-up fee. You can earn an additional amount of money, which will depend on your decision and on the decisions of the other participants in the experiment.

We kindly ask you to avoid to communicate with the other participants.

Your choices will be kept anonymous. The experimenters will not be able to associate your choices with your name.

Please read the instructions carefully. Instructions will appear on your computer screen and will be also read aloud by one of the experimenter.

If you have any doubt or question please rise your hand.

In this experiment you will interact with people leving in Uganda, in a rural village of the Kitgum district, in the north of the country.

They belong to the Acholi ethnic group, and they recently came back to their village after spending four years in a refugee camp as a consequence of civil war lasted twenty years. The war started with a revolt of the Lord's Resistance Army (LRA) against the central government and has causes about 20,000 deaths and 1,200,000 refugees. This conflict is particularly well-known because of the forced recruitment, by the rebels of LRA, of more than 25,000 children soldiers.

The age of the people participating in the experiment is between 18 and 45 year. About half of them are women.

Their village is made of traditional houses made of mud and bricks with thatched roof and dirt floor.

They earns 2000 UGX (around € 0.70) a day or less on average. They might earn around 2000-4000 UGX (€ 0.70-€ 1.20) for a day's work, but they do not have steady access to employment.

The current exchange rate between euro and UGX is of 3500 per euro.

Below you find a list of the prices they have to pay to buy certain goods:

Motorbike-taxi ride: 1000 UGX for a short trip (about €0.30)

Loaf of bread = 3,500 UGX (about €1)

Kilo of beef = 7000 UGX (about €2)

600 ml bottle of milk = 1700 (about €0.50)

Kilo of rice = 2600 UGX (about €0.75)

Bottle of coke = 1000 UGX (about €0.30)

If you want, at the end we can provide further details about the Ugandan participants and their life conditions.

PARTICIPANTS AND MATCHING

Each Italian participant will be randomly paired with a participant from Uganda.

When entering the room you took a card with an identification code, please keep this card until the end of the experiment.

The matching will be made by using that code: you will be paired with Ugandan participant holding the same code.

The Ugandan participant will be given 3000 UGX (about €0.85) as show-up fee and she will be asked to make decisions which are very similar to the decision you will be asked to make.

A random draw will decide if the decision which will be implemented for the final payment is the yours or that of the Ugandan participant.

The random draw will take place in Uganda.

Two cards of different colors will be put in a box. One card will be associated to your choice and the other to the choice of the Ugandan participant. A person will draw one of the two card to select the choice to be implemented.

Your choices will be communicated to the Ugandan participant only at the end of the experiment.

The experiment in Uganda will take place on the [date of the session]. We ask you to come back on the [date and time of the payment, two days after the sessions in Uganda] to be informed about the outcome of the random draw, the decision of the Ugandan participant and your payment.

You will receive the show-up fee today, at the end of the session.

THE TYPICAL DECISION

Before proceeding with the experiment let us introduce the typical decision that we will ask you to make.

You will receive a 10 tokens, and you must decide how much of this sum to keep for yourself and how much to transfer to Ugandan participant. Each token that you keep for yourself is worth €1, while each token that you transfer to the Ugandan participant is worth 700UGX (about €0.20)

For example, if you decide to transfer 3 tokens and keep 7 token, your payment will be €7 and the payment of the other participant will be 3 x 700 = 2100 UGX (about €0.60).

If you transfer 10 tokens, your payment will be €0 and the payment of the other participant will be 10 x 700 = 7000 UGX (about €2) and so on.

You make your choice by choosing two numbers between 0 and 10. The sum of the two numbers must be €10.

If you want, you can use the payment table [see below] that you find on your desk to make your decision. Consider that 1 token transferred to the other participant is worth €0.20 for her. Consider also that, as we already explained, the average daily salary is between 2000 and 4000 UGS (about €0.60 - €1,20).

THE EXPERIMENT

In the course of the experiment you will be asked to make two decisions: the *Unconditional Decision* and the *Conditional Decision*.

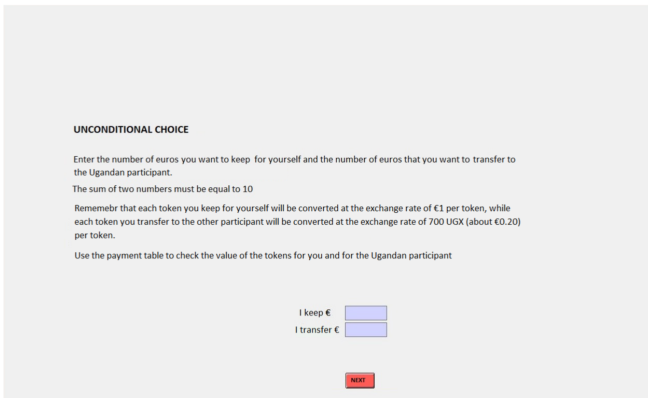
At the end of the experiment we will toss a coin. In case of heads we will consider your Unconditional Decision, otherwise we consider your Conditional Decision

Please note that even if only one of the two choices will be considered for your final payment, we ask you to decide what to do both in the case of heads and in the case of tails.

THE UNCONDITIONAL CHOICE

With your Unconditional Choice (which will be selected in the case of heads), you must decide how many tokens you want to keep for yourself and how many tokens you want to transfer to the Ugandan participant.

You will enter this amount in the following computer screen



As you can see in your payment table [see below], each token you keep for yourself will be converted at the exchange rate of €1 per token, while each token you transfer to the other participant will be converted at the exchange rate of 700 UGX (about €0.20) per token.

The Ugandan participant will make the same decision: each token she keeps for herself will be converted at the exchange rate of 700UGX (about €0.20) per token, while each token she transfers to you will be converted at the exchange rate of €1.

THE CONDITIONAL CHOICE

The next choice is the Conditional Choice (which will be selected for payment in case of tails).

You must choose how many tokens to transfer to the Ugandan participant for each of her possible Unconditional Choice.

In particular you must choose how many tokens to transfer if in her Unconditional Choice she has decided to send you 0 , 1, 2, etc. tokens.

You will decide by filling the following table

UNCONDITIONAL CHOICE OF THE OTHER PARTICIPANT	YOUR CONDITIONAL CHOICE	
	Keep	Transfer
Transfer 0 (and keep 10)		
Transfer 1 (and keep 9)		
Transfer 2 (and keep 8)		
Transfer 3 (and keep 7)		
Transfer 4 (and keep 6)		
Transfer 5 (and keep 5)		
Transfer 6 (and keep 4)		
Transfer 7 (and keep 3)		
Transfer 8 (and keep 2)		
Transfer 9 (and keep 1)		
Transfer 10 (and keep 0)		

If the toss of the coin gives tails, then the number of tokens that you transfer to the Ugandan participant will be decided by using this table together with the Unconditional choice made by the Ugandan participant.

The following examples should make that clear.

Assume that you have filled Conditional Choice table as in the figure below

Your Conditional Choice		
Unconditional Choice of the other participant	Conditional choice	
	Keep	Transfer
Transfer 0 (keep 10)	1	9
Transfer 1 (keep 9)	1	9
Transfer 2 (keep 8)	1	9
Transfer 3 (keep 7)	1	9
Transfer 4 (keep 6)	2	8
Transfer 5 (keep 5)	3	7
Transfer 6 (keep 4)	3	7
Transfer 7 (keep 3)	4	6
Transfer 8 (keep 2)	5	5
Transfer 9 (keep 1)	5	5
Transfer 10 (keep 0)	5	5

If this is your Conditional Choice, then, if the Ugandan participant transfers 0 tokens you transfer 1 token, if the she transfers 1 tokens you transfer 1 token, etc.

The Ugandan participant will make ONLY THE UNCONDITIONAL CHOICE AND NOT THE CONDITIONAL ONE.

END OF THE EXPERIMENT

Once you have made both the choices, we will toss the coin to decide which choice to implement: the Conditional or the Unconditional one.

The experiment will be suspended to wait for the Ugandan participants' decision and for the random draw to decide whether to implement your choice or the choice of the Ugandan participant.

SUMMARY

Let us summarize the phases of the experiment.

1) You have been matched with another person living in Uganda by means of a code.

2) Unconditional choice: you have 10 tokens and you must decide how many tokens to keep for yourself and how many tokens to transfer to the other person.

This choice is made also by the Ugandan participant..

3) Conditional choice: you have to choose how many tokens to keep for each possible choice made by the Ugandan participant

4) Coin tossing: in case of heads, we will consider only your Unconditional choice, otherwise we will consider only your Conditional choice.

5) Experiment in Uganda. The other participant, before knowing your choices, will make her Unconditional choice, deciding how many tokens to keep for herself and how many tokens to transfer to you.

6) Random draw to decide whether to implement your choice or the Ugandan participant choice.

7) Feedback and payment to the Ugandan participant.

8) [Day and time of the payment]: feedback and payment to the Italian participants.

EXAMPLES.

We conclude we some example.

Assume that your Unconditional Choice is : transfer 6 and keep 4 tokens.

Assume that you filled the following Conditional choice table:

Your Conditional Choice		
Unconditional Choice of the other participant	Conditional choice	
	Keep	Transfer

Transfer 0 (keep 10)	2	8
Transfer 1 (keep 9)	2	8
Transfer 2 (keep 8)	2	8
Transfer 3 (keep 7)	3	7
Transfer 4 (keep 6)	3	7
Transfer 5 (keep 5)	4	6
Transfer 6 (keep 4)	4	6
Transfer 7 (keep 3)	6	4
Transfer 8 (keep 2)	7	3
Transfer 9 (keep 1)	8	2
Transfer 10 (keep 0)	8	2

Assume that the Ugandan participant's Unconditional choice is : transfer 3 and keep 7 tokens.

Scenario 1.

Assume that the toss of the coin gives heads (Unconditional choice is selected for payment) and that the random draw decides that the choice to be implemented is that of the Italian participant.

In this case your Unconditional choice will be chosen and the final payment will be of 6 tokens (€6) for you and 6 tokens (6 x 700 = 4200 UGX = €1,20) for the Ugandan participant.

Scenario 2.

Assume that the toss of the coin gives tails (Conditional choice is selected for payment) and that the random draw decides that the choice to be implemented is that of the Italian participant.

In this case your Conditional choice will be chosen: you decided to transfer 3 token if the Ugandan participant transfer 3 tokens, so the final payment will be of 7 tokens (€7) for you and 3 tokens (3 x 700 = 2100 UGX = €0.60) for the Ugandan participant.

Scenario 3.

Assume that the toss of the coin gives tails (Conditional choice is selected for payment) and that the random draw decides that the choice to be implemented is that of the Ugandan participant.

In this case the final payment will be of 3 tokens (€3) for you and 3 tokens (7 x 700 = 4900 UGX = €1.40) for the Ugandan participant.

CONTROL QUESTIONS

In your Unconditional choice you have decided to transfer €3 to the Ugandan participant and to keep 7 tokens.

You have filled the following Conditional Choice table

Your Conditional Choice		
Unconditional Choice of the other participant	Conditional choice	
	Keep	Transfer
Transfer 0 (keep 10)	3	7
Transfer 1 (keep 9)	1	9
Transfer 2 (keep 8)	2	8
Transfer 3 (keep 7)	7	3
Transfer 4 (keep 6)	0	10
Transfer 5 (keep 5)	4	6
Transfer 6 (keep 4)	5	5
Transfer 7 (keep 3)	8	2
Transfer 8 (keep 2)	9	1
Transfer 9 (keep 1)	10	0
Transfer 10 (keep 0)	4	6

You are paired with a participant who, in her Unconditional Choice has decided to keep €10 and to transfer €0.

Assume that the toss of the coin gives heads, and then the Unconditional Choice is implemented.

If in the random draw in Uganda your choice is selected

Your payment is €______ and the other participant's payment is €_____

If in the random draw in Uganda the other participant's choice is selected

Your payment is €______ and the other participant's payment is €_____

Assume that the toss of the coin gives tails, and then the Conditional Choice is implemented.

If in the random draw in Uganda your choice is selected

Your payment is €______ and the other participant's payment is €_____

If in the random draw in Uganda the other participant's choice is selected

Your payment is €______ and the other participant's payment is €_____

PAYMENT TABLE

PAYMENT AND CURRENCY CONVERSION TABLE

Your choice (tokens)	Your payment	Ugandan participant's payment
Transfer 0 (keep 10)	10 euro	0 UGX (0 euro)
Transfer 1 (keep 9)	9 euro	700 UGX (0.20 euro)
Transfer 2 (keep 8)	8 euro	1400 UGX (0.40 euro)
Transfer 3 (keep 7)	7 euro	2100 UGX (0.60 euro)
Transfer 4 (keep 6)	6 euro	2800 UGX (0.80 euro)
Transfer 5 (keep 5)	5 euro	3500 UGX (1.00 euro)
Transfer 6 (keep 4)	4 euro	4200 UGX (1.20 euro)
Transfer 7 (keep 3)	3 euro	4900 UGX (1.40 euro)
Transfer 8 (keep 2)	2 euro	5600 UGX (1.60 euro)
Transfer 9 (keep 1)	1 euro	6300 UGX (1.80 euro)
Transfer 10 (keep 0)	0 euro	7000 UGX (2.00 euro)

----

3) TREATMENT: Recipient UGA

Ugandan participants

Good morning and thank you for participating in our experiment.

You will receive 3000 UGX as show-up fee.

You will have to make a single, very simple decision. Depending on your decision and the decision of another person, you may receive an additional variable sum of money.

We will not deceive you. The decision you will make will not be revealed to anyone. All the information we shall give to you during the experiments is true.

At the beginning of the experiment you have been given a card with a number.

Please keep this card until the end of the experiment.

You will be matched with another person who lives in Trento, Italy, Europe who has been given a card with the same number of yours and who has made decision which is very similar to the one you are going to make.

Your decision:

A total of 10 tokens will be given to you. We ask you to decide how many tokens to keep for yourself and how many to give to this other Italian person with whom you have been paired. You will be asked to put the tokens you want to keep in an envelope with the label “TAKE” and the tokens you want to give to the other person in another envelop labelled “GIVE”.

You may decide for example to send 3 tokens to the other person. Alternatively, you may decide to keep all the 10 tokens for yourself, send them all to the other person or any other division you like.

At this point the game ends.

The person in Italy with whom you have been matched has already made a very similar decision. This person has already told us what he/she would do if he/she received the tokens. To this person we also asked what he/she would do if he/she where to know that you would pass him nothing, or one token, or two tokens and so on.

Only one choice - either yours or your Italian partner’s choice - will be selected as the actual choice that determines your payment.

Once you have made your choice, we will draw a piece of paper from a box containing five pieces with the word “Italy” and five with the word “Uganda”.

If we draw a piece of paper with “Uganda“ written on it, than your choice will be taken into account, otherwise we will consider the Italian participants' choices. In the latter case, we will show you what your Italian partner has decided and we will pay you accordingly.

For each token you earn, you will receive 700 UGX while your Italian partner will receive one euro for each token s/he earns. [more on euro/UGX exchange rate?]

[SHORT PROFILE OF THE ITALIAN PARTICIPANTS]

Italian participants are students of the University of Trento (north-east of Italy).

About 50% of them are female and their average age is 22.

Almost all of them live with their parents and are not married.

About 15% has a part-time job in pubs, shops, or at the University. The average hourly wage for this jobs is 6 euros.

The following are the average prices of some goods in Trento:

Bus ticket (single ride) = € 1.

2lb of bread= € 4.

2 lb of beef = € 13.

0.25 gal of milk = € 1,30.

2 lb of rice = € 2.

1 can of Coke (supermarket) = € 0,50

Let's make some examples.

Example 1.

You decide to take 8 tokens for yourself and to send 2 tokens to the Italian person you have been paired with. This is your choice.

Your Italian partner has decided to take 6 tokens for himself and to send you the remaining 4 tokens. This is the Italian person choice.

After your decision we proceed with the draw to decide which choice to consider and we pick out a piece of paper with “Uganda” written on it. This means that your choice will be taken into account.

Your payment in this case will be of 8 tokens x 700 UGX=5600 UGX, while your Italian partner will be paid 2 tokens x 1 euro= 2 euro.

Example 2.

Suppose your choice and your Italian partner's choices are the same as in the previous example, but now we pick out a piece of paper with "Italy" written on it. In this case we will take into account the Italian participant's choice.

Since he decided to send you 4 tokens, your payment will be of 4 tokens x 700 UGX=2800 UGX, while his payment will be of 6 tokens*1 euro= 6 euro.

It is important that you understand that nobody will observe the decision you make.

You will need your number to collect your payment. One of us will record how much money you receive from the game according to this number (point at "counter"). He will be the only one who knows how many tokens you put in the envelope but he won't know whose number goes with whom! He'll count out your payment. A different person will give you an envelope with the tokens you receive from the game according to this number. This person who sees your face and knows your number won't know what you decided. So your decision is totally anonymous.

We ask you to make your decision now

You will collect your payment right after the draw.