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## Generosity and social distance in dictator game field experiments with and without a face

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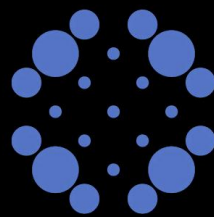
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# Generosity and social distance in dictator game field experiments with and without a face

Sosina Bezu and Stein T. Holden



**CLTSUMB**

Centre for Land Tenure Studies Working Paper 01/13

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# Generosity and social distance in dictator game field experiments with and without a face<sup>1</sup>

By

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## Abstract

*Field experiments combining dictator games with stated preference questions are used to elicit within subject and between subject sharing behavior with known family members and anonymous villager. A simple theoretical model incorporating social preferences, social distance and inter-dependent preferences is developed. The results show that generosity in form of probability of giving and amounts given are much lower towards anonymous villagers than to known family members. The probability of giving to the spouse is positively correlated with probability of giving to anonymous villager. Husbands and wives receiving positive amounts from their spouses (without knowing), were also more likely to give positive amounts to their spouses than those that received nothing from their spouses. Receiving positive amounts from spouse was uncorrelated with giving behavior towards anonymous villager. How sharing behavior is correlated with marriage type (parental arrangement, parental and bride agreement, love marriage, and kidnapping marriage), and other socioeconomic characteristics was assessed separately for husbands and wives to explore the sensitivity of responses to such socio-economic characteristics.*

Key words: Generosity, social distance, within-family generosity.

JEL codes: C93, D03, O12.

## 1. Introduction

The dictator game was introduced by Forsythe et al. (1994) and has been considered as one of the simplest tools for investigating generosity (Dufwenberg and Muren 2006). The extent of generosity in dictator games has been found to be sensitive to framing conditions and the extent to which the money for sharing represents a “windfall” or has been “earned” and whether the

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game also opens for “taking” some money from other players (Hoff et al. 2008). More people give zero amounts when the option to take money from others is also open than when giving zero amounts is the most selfish alternative. A variety of theories have been developed to explain behavior in dictator games, including social preferences and interdependent preferences (Fehr and Schmidt 2005).

We develop a simple theoretical model that captures social preferences, interdependent preferences and social distance. We use it as a basis for testing a number of hypotheses including higher generosity within families towards specific family members than towards anonymous villager, within-subject correlation of generosity towards spouse versus towards anonymous villagers (social preferences), higher generosity towards family members that are themselves more generous (interdependent preferences), whether within-family generosity spills over to anonymous villagers (stimulated social preferences), and whether women are being more generous than men. To our knowledge these are novel contributions to the literature. We furthermore explore how the generosity in dictator games is correlated with a range of socioeconomic characteristics, including type of marriage contract. We assessed how sharing behavior was associated with type of marriage as defined separately by husbands and wives (marriage types: parental arrangement, parental and bride agreement, love marriage, and kidnapping marriage). Our basic hypothesis is that particularly wives’ generosity towards their husbands is higher in love marriages and in marriages where the bride agreed to marry than in marriages based purely on parental arrangement and in particular in kidnapping marriages.

We explore the within-family and within-village sharing behavior in dictator games in field experiments in Southern Ethiopia where women traditionally have a weak position. The gender-specific generosity among spouses within families and towards anonymous villager is explored by combining stated preference questions in dictator games to get within-subject differences in such generosity. Pairs of family members were exposed to the same questions without knowing the responses of the other family member to assess intra-family correlation in generosity. Our sample included about 600 households of which about 15% were polygamous households. We obtained pairs of husbands and wives in monogamous households for 385 households. In households where two spouses were unavailable another person within the family was included.

Our hypothesis testing is based on the assumption that wives are able to keep the money from the games for themselves (separate budgeting) which implies a rejection of the unitary household model based on a single decision-maker and income-pooling within the family even in families where the wife may have a weak position (Lundberg and Pollack 1993). We provide additional evidence of such separate budgeting. The games were also designed in a way such that wives were able to hide what they gave to their husbands and retained.

## 2. Literature Review

Sharing behavior in dictator games should be free from strategic concerns unlike in ultimatum games and public goods games. Dictator games may therefore be a preferred tool for investigating willingness to share based on fairness norms or altruistic preferences. However, such behavior is found to be sensitive to context (Eckel and Grossman 1996).

Double blind dictator games have been used to ensure between-subject anonymity and minimize the researcher-player influence on decisions (Hoffman et al. 1994). Voluntary contributions tend to be low in such allocation exercises and various studies have assessed the effects of providing additional information about the recipients in dictator games. Informed dictators have been found to be willing to give substantially more when the recipients are poor or needy, are well reputed charity organizations, or are individuals that the dictator knows such that social distance and removal of anonymity may matter (Bohnet and Frey 1999; Brañas-Garza 2006). One-way identification in dictator games avoids that reciprocal expectations influence the decisions.

Eckel and Grossman (1998) used a double blind dictator game to investigate the selfishness of men and women in lab experiments in three universities in the US. They suggested that the mixed evidence on this issue in earlier studies was due to the variation in methods confounding gender and a range of other factors. They found that women on average donate twice as much as men to their anonymous partners and claimed that this was a baseline difference between men and women. However, one may question the external validity also of this experiment. It is far from obvious that gender differences are universal across cultures or other socioeconomic conditions that could be confounded with gender.

Dufwenberg and Muren (2006) investigated how discrimination was associated with gender and social distance and found in lab experiments that fewer men than women give non-zero amounts and that men receive less than women. They also explored the effect of anonymity and found that less is given in public than when anonymity of giving is retained.

Fehr and Schmidt (2005) distinguish three types of preference models; a) Models of “social preferences” that value relative resource allocation within a reference group; b) Models of “interdependent preferences” that may include conditional altruism; and c) “Intention based reciprocity” that implies that other players’ intentions or assumptions about these affect reciprocal responses. The reasons for giving may not be easy to reveal. One distinction made is between “pure altruism” and “warm glow”, the latter being an egoistic motive for giving (it makes the donor feel good). Attempts have been made at identifying and distinguishing these types but the evidence is mixed as there are studies that find both types (Andreoni 1989; 1990; Andreoni et al. 2007; Crumpler and Grossman 2008).

Bardsley (2008) argues that the dictator game gives misleading information about the faceless interpersonal altruism, is sensitive to experimental design, and therefore making it highly

uncertain how the results generalize to naturally occurring contexts. By introducing dictator games with taking opportunities Bardsley (2008) shows that taking behavior is common and the outcomes become much less generous than when only giving and no giving options are available.

### 3. Theoretical Model

Fehr and Schmidt (2005) provide an overview of theoretical models of altruism, fairness and reciprocity. These models include social preference models with altruism where the utility of one person is positively related to the welfare of other persons, models where relative income matters, models with inequity aversion, models with interdependent preferences, models with intention-based reciprocity, and hybrid models between these.

We define the utility of dictators in dictator games as functions of the direct utility of the money retained for own consumption and the indirect utility from sharing part of the income with another person where this indirect utility increases with the amount given, decreases with the social distance ( $d$ ), and varies with the individual and interpersonal characteristics of the person ( $\alpha_j$ ). This allows for social preferences through a concern for the marginal utility effect on the other party,  $v_j[X - x_i]$ , as well as interdependent preferences based on personal characteristics of both parties. A positive  $\alpha_j$  indicates that the dictator  $i$  perceives the known recipient  $j$  to be particularly disserving due to his/her personal characteristics, social capital or relationship to  $i$ . The utility function has a superscript  $g$  that allows for systematic gender-specific differences in utility functions that affect allocation decisions in dictator games.

$$U_i^g(\cdot) = U_i^g\left(x_i, \frac{\alpha_j v_j[X - x_i]}{d}\right)$$

s.t.  $0 \leq x_i \leq X$

Based on this simple model we postulate the following hypotheses to be tested:

- a. Family members are more likely to receive positive amounts/receive larger amounts in dictator games than anonymous villagers from the same village (effect of social distance)
- b. Generous family members (spouses) are more likely to get positive amounts (and receive larger amounts) than less generous family members (spouses) (interdependent preferences)
- c. Persons who are more generous towards anonymous villagers are also likely to be more generous towards their own family members and vice versa (social preferences)
- d. Exposure to generous family members contributes to generous behavior towards anonymous persons (responsive social preferences)
- e. Women are more generous to their husbands and anonymous villagers (have stronger social preferences) than men are.
- f. Spouses that themselves selected each other through voluntary marriage contracts (love marriage) are more generous towards each other in dictator games than spouses that were married through involuntary or enforced marriages

We assume that these hypotheses are testable by playing dictator games with pairs of family members because of limited pooling of money within families. With perfect pooling of money within families this opportunity would break down. As a test of this assumption we have used additional questions separately to spouses within families about their ability to mobilize cash for an urgent need and their sources of such mobilized cash. We found very limited sharing of cash between spouses within families.

#### **4. Sampling and Experimental Design**

The sample used for the experiment is a stratified random sample of about 600 households that has been involved in household surveys in 2007 and 2012 for the evaluation of the gender impacts of a land registration and certification program that aimed to strengthen the tenure security of households and in particular the property rights of women within households (Holden and Tefera 2008). Stratification was done to ensure considerable variation in socioeconomic and agro-ecological characteristics, see next section. The sampling of households within villages was random from lists of all registered resident households. The experiments were introduced after both husbands and wives have been involved in survey interviews and they had thereby “earned” the right to participate in the experiments which also served to compensate them for their time involvement in the surveys. We cannot rule out that many of the gender-related questions in the survey instruments may have affected the responses in our experiments.

A public place for the experiment was identified in the village (such as an office in the health station or agricultural extension office) and all households in the sample in a village were handled in one session to minimize communication and leakage of information before the household members had played the game. Husbands and wives were asked to come together as two household members should participate in the game. For households where one spouse was unable to come another household member, preferably of the opposite sex of the other member that was able to come, could be a substitute. The pairs were invited into the play room one by one. They were informed that a lucky winner among the two should be identified by tossing a coin. The loser was asked to wait in a separate place such that s/he does not observe what happens or cannot influence it. The losers were called one by one after all the winners have played the game.

We combined the dictator game with a stated preference approach to get within subject willingness to share with spouse/other family member and with anonymous villager. Each winner of the first coin toss is told that s/he can decide freely how to dispose 40 EB (Ethiopian Birr) (approx. 2.5US\$ which is about two days salary for unskilled workers in the study areas) put in front of her/him on the table between her/himself and one of the losers of the game. The winner is asked how much of the money s/he will share with the loser if a) the loser is the spouse (or substitute family member), b) if the loser is another unknown loser from the sample of households in the same village. This implies that they are as “disserving” as participants in the survey as the respondents themselves. The choice of a) and b) was determined by tossing a coin after the winner has decided how much to allocate in each case but after s/he was informed that

the outcome would be determined by the toss of a coin. The difference between sharing behavior towards the spouse (or other family member) and the anonymous villager was therefore identified with this within-subject approach. The coin was then tossed and money allocated in an envelope according to whom would be the receiver (family member or anonymous loser) while the winner could keep the remaining amount. The winner is then instructed to hide the money and to leave the place (go home) and not talk to anybody else among the waiting households or the spouse till after the experiment is finished for everybody.

After all winners have played, the losers are asked to come one by one to the game room in the same order as they came in first. The losers are then asked the same questions (hypothetical) as to what they would have done if they had won the game in the two cases; a) the spouse (or other family member) is the receiver, b) if another anonymous villager in the sample is the receiver. After the decisions are recorded the respondent is given an envelope which is either containing the amount from the spouse/family member or a random envelope in case the coin toss of the spouse/family member resulted in allocation for an anonymous villager. All the envelopes of the losers were topped up with EB10 to ensure that nobody received empty envelopes. The losers were not informed about how much the spouse had given to them or what was the outcome of the second coin toss for their spouses/family co-player. After receiving the money in an envelope they were asked to hide the money/envelope and go home without talking to any of the others still waiting to play the game.

The gender effect and the eventual hypothetical bias could then be identified or controlled for as between subject differences. During the experiments the names of the players were recorded, their position in the household, gender, and the stated type of marriage, in addition to their stated preferences and outcomes of coin tosses. Our household surveys give us a very rich data set for assessing correlations between experimental decisions and socio-economic characteristics.

## **5. Socio-economic Context**

The field experiments were run in five different districts in two regions (Oromia and Southern Nations Nationalities and Peoples (SNNP)) in Southern Ethiopia. Traditionally women have a weak position in the society and within families. Young girls had little influence in relation to marriage decisions that were usually decided by the parents and the girl moved to the home of the husband upon marriage and the marriage typically involved a bride price. The weak position of women can also be illustrated by the tradition that it is expected that a widow has to marry the brother of her late husband if she wants to continue to stay in the household and keep the land they were allocated from her husband's family. Another tradition that has been declared illegal was the kidnapping of young girls by boys/men in order to then negotiate with the girl's parents to marry her. In recent years love marriages have become more common and education standards have improved for girls and boys (see distribution by marriage type in Table A2 in Appendix 3).

The study area also contains variation in religion (Moslems, protestants and orthodox Christians are the three dominating religions) and ethnicity. Oromo, Sidama and Wollaita are the three

dominant ethnic groups, each having its own language (see Table A3 in Appendix 3 for the distribution by ethnicity and religion). See Tables A4 in Appendix 3 for distribution by ethnic group and religion and Table A5 for distribution by recipient household member type and sender type.

Traditionally the men have a very dominant position in the households and are the ones responsible for household economic decisions. Recently introduced changes in laws and implementation of joint land certification of husbands and wives aim to make them equal owners of household land resources and may have contributed to strengthen the position of women.

## 6. Results and Econometric Analysis

Figure 1 shows the distribution of allocations by husbands and wives to their spouses. Equal sharing (20 EB) was the most common response for both men and women (about 65% of the respondents respectively) but wives were more likely (about 23%) to allocate nothing to her husband than husbands were (about 15%).

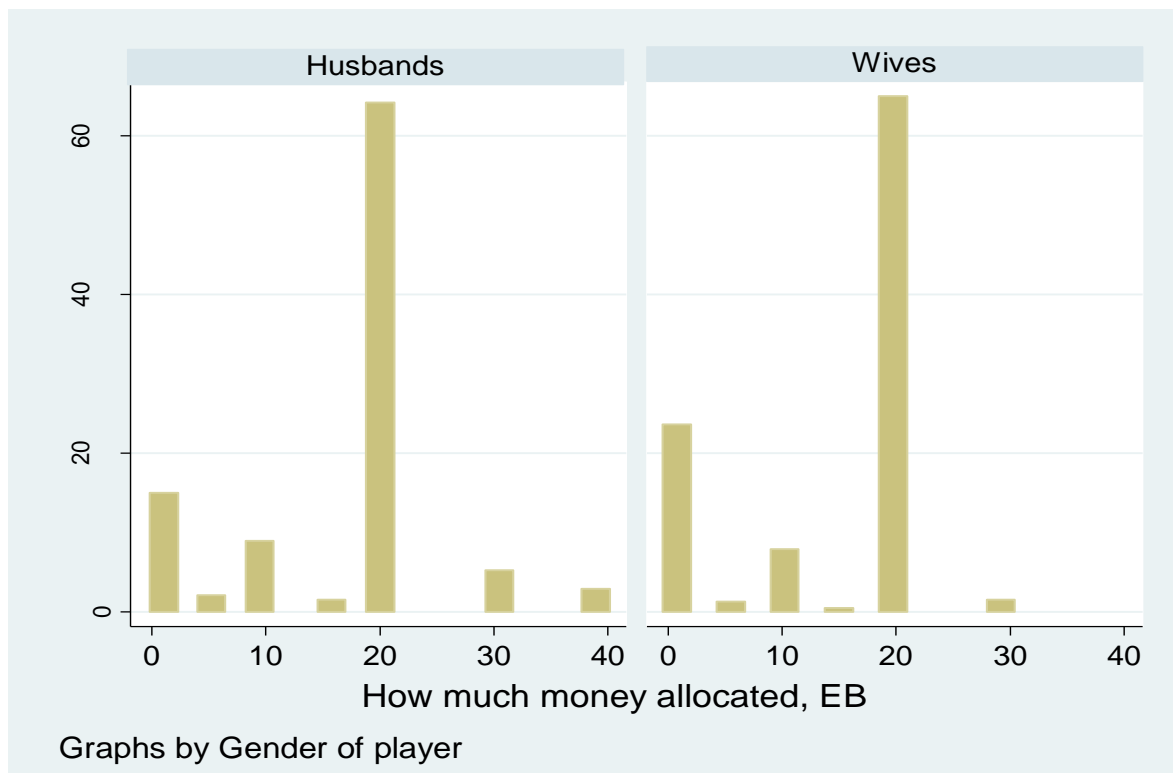


Figure 1. Distribution of allocations (out of 40 Ethiopian Birr) to the spouse by husbands and wives in monogamous households.

Figure 2 shows that a substantial higher share (about 73%) of the men and their wives allocated nothing to an anonymous villager in the sample while less than 15% allocated 20 of the 40 EB.

This indicates that social distance matters for the responses. This is also clear from the responses from some respondents who wanted to know more about the anonymous person; if this person were poor, they were more willing to allocate money but we were not providing them such additional information. We cannot, based on these findings, reject hypothesis a); generosity is larger within families than towards anonymous villagers.

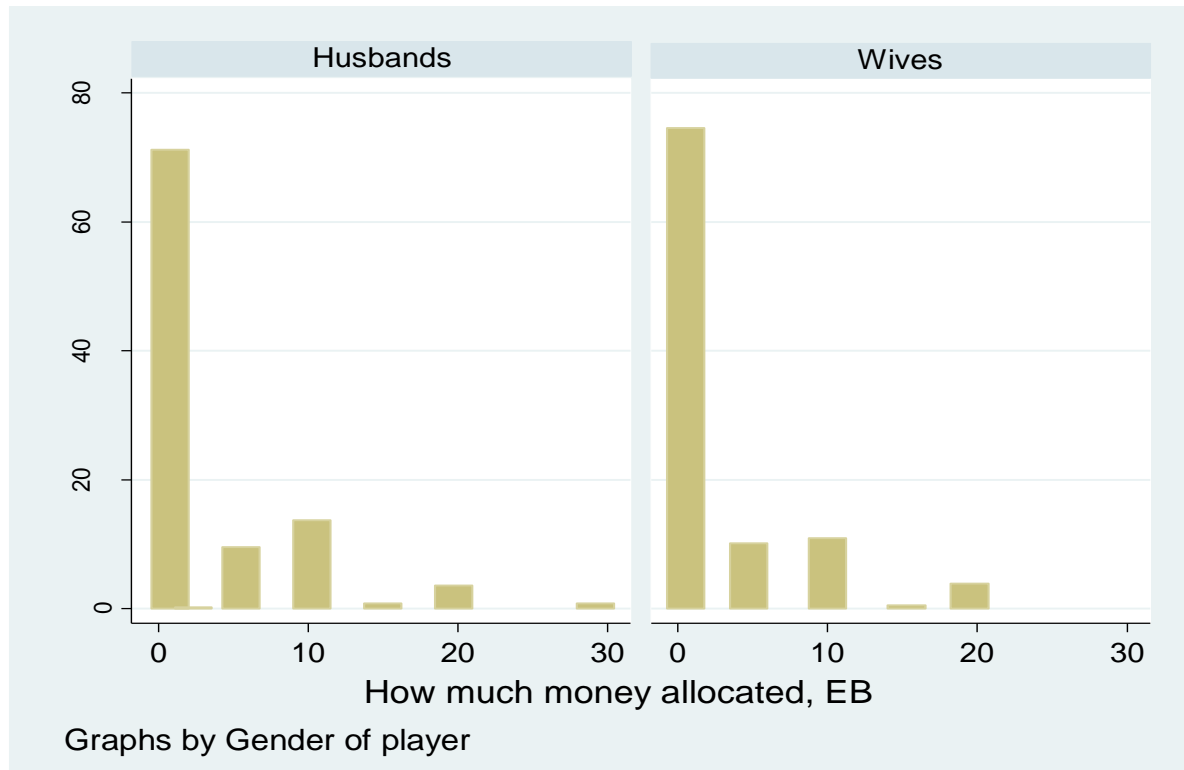


Figure 2. Distribution of allocations (Out of 40 Ethiopian Birr) to anonymous villagers by husbands and wives in monogamous households

Table 1 presents the probabilities of non-zero allocations and average allocations by husbands and wives to their spouses and to anonymous villagers with standard errors demonstrating that the probability of non-zero allocation to the spouse was significantly higher for husbands (0.85) than wives (0.77) and so were the amounts allocated; average 16.8 EB for husbands against 14.4 EB for wives. The probabilities of non-zero allocations to anonymous villagers were much lower than for their spouses, 0.31 and 0.28 for husbands and wives and so were the amounts allocated with average amounts of 2.9 EB and 2.5 EB for husbands and wives. However, the differences between husbands' and wives' allocations were not significant in this case. These findings indicate that our hypothesis e) that women are more generous than their husbands towards their spouses and towards anonymous villagers can be rejected.

Table 1. Allocation by monogamous husbands and wives to spouse and to anonymous villager

		Allocation to spouse		Allocation to anonymous villager	
		Probability of non-zero allocation	Average amount allocated	Probability of non-zero allocation	Average amount allocated
Husbands	Mean	0.850	16.816	0.291	2.940
	St. error	0.018	0.462	0.023	0.283
	N	380	380	385	385
Wives	Mean	0.766	14.408	0.255	2.455
	St. error	0.022	0.448	0.022	0.251
	N	380	380	385	385
Total	Mean	0.808	15.612	0.273	2.697
	St. error	0.014	0.324	0.016	0.189
	N	760	760	770	770

Source: Own experimental data.

The validity of our experiments rests on the rejection of the unitary household model with perfect pooling of resources. The responses from husbands and wives to questions about their ability to quickly mobilize cash for an urgent need and whether the spouse is the source of such cash are summarized in Table 2 below.

Table 2. Ability of husbands and wives to mobilize cash for urgent need and the assistance from the spouse for such purpose, monogamous households

	Wives' cash mobilization	Get cash from husband, prob.	If cash from husband, how much	Husbands' cash mobilization	Get cash from wife, prob.	If cash from wife, how much
Mean, EB	491.64	0.20	145.93	1219.85	0.02	325.00
Median, EB	200		100	500		150
St. error	118.00	0.02	17.49	185.60	0.01	150.42
N	366	367	75	352	359	6

Source: Own survey data

Table 2 shows that only 20% of the wives were able to obtain cash from their husbands upon urgent need and only 2% of the husbands were able to obtain cash from their wives upon short-term need. This illustrates the limited sharing of cash within households. The husband as the head of the household has more responsibility for the household economy and is therefore more obliged to help his wife with cash than the other way around.

We can now proceed to test our hypotheses about social and interdependent preferences as revealed by the responses in the dictator game experiments. Table 3 presents econometric estimates for the generosity of and among monogamous spouses.

Table 3. Factors associated with probabilities of giving to spouse and to anonymous villager by husbands and wives in monogamous households

	Wife gives to husband, dummy	Husband gives to wife, dummy	Wife gives to anonymous, dummy	Husband gives to anonymous, dummy
Real game dummy	0.031 (0.040)	0.076** (0.030)	-0.024 (0.040)	-0.042 (0.050)
Received positive amount from husband, dummy	0.312**** (0.060)		0.018 (0.060)	
Received positive amount from wife, dummy		0.207**** (0.040)		0.083 (0.060)
Giver to anonymous, dummy	0.219**** (0.050)	0.162**** (0.040)		
Giver to spouse, dummy			0.257**** (0.050)	0.311**** (0.070)
Constant	0.425**** (0.060)	0.609**** (0.040)	0.058 (0.070)	-0.016 (0.070)
Prob > chi2	0.000	0.000	0.000	0.000
R-squared	0.128	0.137	0.068	0.075
Number of observations	380	380	385	385

Linear probability models with village fixed effects. Standard errors in parentheses. Significance levels:

\*=significant at 10%, \*\*=significant at 5%, \*\*\*=significant at 1%, \*\*\*\*=significant at 0.01% level.

Table 3 shows that wives and husbands that give positive amounts to anonymous villagers are 21.9 and 16.2% more likely to give positive amounts also to their respective spouses. These are results after we have controlled for the actual generosity of their spouses through inclusion of dummy variables for actual receipt of positive amounts from their respective spouses in the dictator games. While this is unknown to the respondents when they made their decisions, their generosity to their spouse may be affected by the perceived generosity of the spouse or mutual good relationship with their spouse.

Furthermore, we see that wives and husbands that give positive amounts to their spouses are 25.7 and 31.1% more likely to give positive amounts to anonymous villagers. Their generosity in terms of probability of giving to anonymous villagers is, however, unaffected by the generosity of their spouses as measured by dummy variables for receipt of positive amounts from their spouses. Generosity therefore appears to be an internal personal characteristic but generous persons are also likely to stimulate reciprocal generosity. Exposure to generous family members may not necessarily stimulate generosity towards anonymous persons outside the family. These findings imply that we cannot reject hypotheses b) and c) but that we have to reject hypothesis d).

We will now explore how the social context may be correlated with generosity in our dictator games. Especially we explore how the type of marriage contract and the gender imbalance in

such contracts may be related to generosity within marriage as well as with generosity towards anonymous villagers. Some descriptive statistics follow in Tables 4, 5 and 6.

Table 4. Allocation to spouse in dictator games by gender and marriage type: Probability of non-zero allocation and average amount allocated out of EB 40.

Marriage type	Stats	Women Prob. of non-zero allocation	Women Average amount allocated	Men Prob. of non- zero allocation	Men Average amount allocated
Parental arrangement	Mean	0.796	15.417	0.876	18.000
	St. error	0.039	0.840	0.032	0.902
	N	108	108	105	105
Parental & Bride agreement	Mean	0.733	13.664	0.815	15.504
	St. error	0.041	0.836	0.036	0.808
	N	116	116	119	119
Love marriage	Mean	0.787	14.685	0.869	17.263
	St. error	0.036	0.739	0.029	0.738
	N	127	127	137	137
Wife exchange	Mean	0.800	16.000	0.600	12.000
	St. error	0.200	4.000	0.245	5.831
	N	5	5	5	5
Kidnapping marriage	Mean	0.667	11.667	0.857	16.429
	St. error	0.098	1.896	0.097	2.695
	N	24	24	14	14
Total	Mean	0.766	14.408	0.850	16.816
	St. error	0.022	0.448	0.018	0.462
	N	380	380	380	380

Source: Own data

Table 4 presents data on allocation behavior towards spouses by stated marriage type. There were no significant differences between marriage types based on parental arrangement, parental and bride agreement and love marriages while wives married through kidnapping appeared to be less likely to give non-zero amounts to their husbands and gave on average smaller amounts than wives living in the other marriage types. No significant differences between marriage types were found for men, but fewer men than women admitted that they got married through kidnapping.

Table 5 presents allocations to anonymous villagers by marriage type. Also here no significant difference was found between the three main marriage types, parental arrangement, parental and bride agreement, and love marriage. However, women living in kidnapping marriages appeared to be slightly more willing to give to anonymous villagers than women living in the other marriage types while men who admitted to have married through kidnapping were significantly less likely to give and gave smaller amounts to anonymous villagers.

In order to assess the reliability of stated marriage types by husbands and wives we have matched their responses for households where both were present in the experiments, see Table 6. There were some differences in the perceptions of/stated marriage types. There were eight cases where the woman stated that they were married after kidnapping while their husbands stated these as love marriages which could be consistent with their own feelings behind the kidnapping.

Kidnapping marriages also involved negotiations with the parents after the kidnapping and before the marriage. There were also some mix-ups in the three main marriage type classifications but still a strong consensus for the majority of the respondents. It is difficult to tell whether the inconsistency in responses is due to the process where love marriages would often also involve parental support at some stage or whether shame could cause some to respond in a dishonest way. Such dishonest response may be most likely for men in the case of kidnapping marriages but there were also four cases where the husband admitted a kidnapping marriage while the wife classified it differently.

Table 5. Spouses' willingness to allocate money to others (anonymous person) in the community by marriage type

Marriage type	Stats	Women Prob. of non-zero allocation	Women Average amount allocated	Men Prob. of non-zero allocation	Men Average amount allocated
Parental arrangement	Mean	0.294	2.982	0.318	3.617
	St. error	0.044	0.522	0.045	0.639
	N	109	109	107	107
Parental & bride agreement	Mean	0.231	1.966	0.261	2.395
	St. error	0.039	0.393	0.040	0.477
	N	117	117	119	119
Love marriage	Mean	0.225	2.248	0.317	3.022
	St. error	0.037	0.430	0.040	0.423
	N	129	129	139	139
Wife exchange	Mean	0.600	9.000	0.400	6.000
	St. error	0.245	4.000	0.245	4.000
	N	5	5	5	5
Kidnapping Marriage	Mean	0.280	2.200	<b>0.067</b>	<b>0.667</b>
	St. error	0.092	0.768	0.067	0.667
	N	25	25	15	15
Total	Mean	0.255	2.455	0.291	2.940
	St. error	0.022	0.251	0.023	0.283
	N	385	385	385	385

Source: Own survey data

Table 6. Correspondence between husbands' and wives' stated types of marriage for monogamous households

Marriage type: males' responses	Marriage type: females' responses					Total
	Parental arrangement	Parental and bride agreement	Love marriage	Wife exchange	Kidnapping marriage	
Parental arrangement	60	7	11	1	4	83
Parental and bride agreement	14	81	7	1	3	106
Love marriage	11	12	132	0	11	166
Wife exchange	0	1	2	5	0	8
Kidnapping marriage	1	1	2	0	18	22
Total	86	102	154	7	36	385

Source: Own survey data.

In order to further explore the correlations between the social context and behavior in the dictator games we used the broader sample including polygamous households and households where other family members substituted for one of the spouses to assess the allocation by husbands and wives. This facilitates a further inspection of the importance of social distance within families and towards anonymous villagers while using the spouse as the baseline. Linear probability models for non-zero allocations and truncated tobit models for non-zero amounts are presented in Table 7.

The hypothetical responses from losers in the dictator games were not significantly different from the responses of the winners except for the amount allocated by wives. The allocation was 1.5 EB lower for wives in the real game (winners) than in the hypothetical game (losers) and this difference was significant at 1% level. Sons and daughters and mothers and fathers that substituted for spouses for some households did not receive significantly less or more than the spouses in households that were able to bring their spouse. Wives in households that brought another relative were significantly more likely to allocate a non-zero amount to such relatives. The first wives in polygamous households that played with one of the other wives in such households were 21.5% less likely (significant at 0.1% level) to allocate a non-zero amount and the non-zero responses were on average 7.1 EB lower than for the allocation to the male spouse for wives that played with their male spouse. Husbands in polygamous households were not less likely to allocate non-zero amounts to their second or later wives than to their first wife but they allocated on average 2.5 EB less to their later wives than to their first wife and this difference was significant at 0.1% level.

Allocations to anonymous villagers were 49.2% and 55.8% less likely to be non-zero for wives and husbands respectively as compared to their allocations to their spouses, the differences were highly significant (0.1% levels). The non-zero responses were also 9.3 EB lower for anonymous villages than to the spouses of wives and husbands, and also these differences were significant at 0.1% levels and illustrates that the willingness to give declines with social distance.

Next we assess whether the type of marriage is related to the sharing behavior of husbands and wives. While there were small differences in the probabilities of non-zero allocations for the different marriage types, the amounts allocated both by wives and husbands were significantly (at 5 and 10 % levels) lower (1.5-1.9 EB) in love marriages and in marriages with parental and bride agreements than in the traditional parental arrangement marriages. Wives' allocations in kidnapping marriages were 3.9 EB lower (significant at 0.1% level) than in parental arrangement marriages, indicating that women exposed to such involuntary marriages are less willing to give than other wives.

Sensitivity to social context was further investigated by inclusion of district dummies, dummies for ethnic group and for religion. Many of the district dummies were significant and these dummies capture important differences in market access, agro-ecological conditions and income opportunities. The probabilities of non-zero allocations were significantly higher in Sashemene district, which also is a market center, than in the other districts. On the other hand there were few significant differences for the ethnic dummies. When it comes to the religion dummies, protestant and orthodox wives were 16.8 and 16.0 % more likely to allocate non-zero amounts than wives in Moslem households (significant at 5 and 10% levels) and Protestant and Orthodox husbands allocated 3.2 and 3.1 EB higher amounts (significant at 5 and 10 % levels) than Moslem men.

Table 7. Factors associated with probability of giving and the amount given by husbands and wives in dictator games, all households and household members

	<b>Prob. of non-zero allocation</b>		<b>Non-zero amounts allocated</b>	
	Linear probability models		Truncated tobit models	
	Wives	Husbands	Wives	Husbands
<b>Dummy for real game,</b>	-0.018 (0.040)	0.023 (0.030)	-1.541*** (0.510)	-0.573 (0.600)
<b>Allocation for whom: Baseline=Allocation for spouse</b>				
<b>Son or daughter</b>	0.115 (0.080)	-0.009 (0.070)	-2.478 (1.550)	0.888 (1.110)
<b>Mother or father</b>	0.153 (0.090)	. (.)	-1.104 (1.110)	. (.)
<b>Other relative</b>	0.322*** (0.070)	0.432 (0.410)	-2.442 (2.030)	0.211 (0.780)
<b>Wife 2-3 (polygamous hhs)</b>	-0.215*** (0.050)	-0.020 (0.040)	-7.125*** (0.910)	-2.521*** (0.650)
<b>Anonymous person</b>	-0.492*** (0.030)	-0.558*** (0.020)	-9.251*** (0.590)	-9.290*** (0.650)
<b>Type of marriage: Baseline=Parental arrangement</b>				
<b>Parental and bride agreement</b>	-0.053 (0.050)	-0.013 (0.040)	-1.678** (0.670)	-1.904** (0.900)
<b>Love marriage</b>	-0.041 (0.050)	0.020 (0.040)	-1.522** (0.590)	-1.449* (0.770)
<b>Wife exchange</b>	-0.003 (0.160)	-0.105 (0.200)	-0.337 (1.390)	1.883 (3.620)
<b>Kidnapping marriage</b>	-0.083 (0.090)	-0.148* (0.090)	-3.911*** (1.010)	-1.540 (2.000)
<b>District: Baseline=Sashemene</b>				
<b>Arsi Negelle</b>	-0.135** (0.060)	-0.136*** (0.050)	-1.609** (0.750)	-0.757 (1.100)
<b>Wondo Genet SNNP</b>	-0.249*** (0.090)	-0.116 (0.080)	-0.094 (1.300)	-2.727 (2.130)
<b>Wolaita</b>	-0.163 (0.110)	-0.064 (0.130)	-1.872 (1.590)	-9.540** (3.890)
<b>Wondo Genet Oromia</b>	-0.202*** (0.070)	-0.270*** (0.060)	0.184 (0.880)	0.726 (1.230)
<b>Polygamous household dummy</b>	-0.019 (0.050)	0.027 (0.040)	0.996 (0.680)	-1.165* (0.700)
<b>Female-headed household dummy</b>	-0.048 (0.080)		1.938 (1.230)	

<b>Age of household head</b>	-0.001 (0.000)	0.000 (0.000)	-0.033** (0.010)	-0.029 (0.020)
<b>Ethnic group baseline: Oromo</b>				
<b>Sidama</b>	-0.087 (0.070)	-0.032 (0.060)	-1.929 (1.270)	-2.038 (1.540)
<b>Wollaita</b>	-0.073 (0.100)	-0.136 (0.120)	0.426 (1.460)	4.102 (3.400)
<b>Amhara</b>	0.083 (0.150)	0.097 (0.090)	-3.406** (1.530)	5.205* (2.710)
<b>Other</b>	0.084 (0.120)	0.009 (0.090)	1.650 (1.680)	1.750 (2.840)
<b>Religion baseline: Moslem</b>				
<b>Protestant</b>	0.168** (0.080)	0.025 (0.060)	-0.120 (1.030)	3.207** (1.520)
<b>Orthodox</b>	0.160* (0.080)	0.036 (0.070)	-0.085 (1.210)	3.098* (1.590)
<b>Other</b>	-0.208* (0.110)	-0.048 (0.130)	9.955***** (2.630)	3.871 (2.860)
<b>Constant</b>	0.965***** (0.080)	0.989***** (0.060)	23.279***** (0.990)	22.941***** (1.540)
<b>Sigma constant</b>			4.862***** (0.210)	5.989***** (0.290)
<b>Prob &gt; chi2</b>	0.000	0.000	0.000	0.000
<b>R-squared</b>	0.265	0.352		
<b>Number of observations</b>	986	958	503	574

Standard errors corrected for clustering at household level, \*=significant at 10%, \*\*=significant at 5%, \*\*\*=significant at 1%, \*\*\*\*=significant at 0.1% level. Standard errors corrected for clustering at household level.

Table 8 includes more of the socio-economic variables when assessing the probabilities of giving and amounts given to the spouses by husbands and wives when also polygamous households were included in the sample. We find the same pattern for marriage types and for religion as in Table 7.

To summarize the results for our hypotheses, we found; hypothesis a) that family members are more likely to receive positive amounts/receive larger amounts in dictator games than anonymous villagers from the same village (effect of social distance); cannot be rejected; hypothesis b) that generous family members (spouses) are more likely to get positive amounts (and receive larger amounts) than less generous family members (spouses) (interdependent preferences), cannot be rejected; hypothesis c) that persons who are more generous towards anonymous villagers are also likely to be more generous towards their own family members and vice versa (social preferences); cannot be rejected; hypothesis d) that exposure to generous family members contributes to generous behavior towards anonymous persons (responsive social preferences), was rejected; hypothesis e) that women are more generous to their husbands and anonymous

villagers (have stronger social preferences) than men are; was rejected; and hypothesis f) that spouses that themselves selected each other through voluntary marriage contracts (love marriage) are more generous towards each other in dictator games than spouses that were married through involuntary or enforced marriages; was partly rejected. Wives married through love marriages and through parental and bride agreement were less generous than wives married through parental arranged marriages. Wives married through kidnapping marriages were less generous towards their husbands, in line with the hypothesis.

## **7. Conclusion**

We developed a hybrid theoretical model for social and interpersonal preferences as the basis for observed behavior in dictator game field experiments that compared within subject allocation to anonymous villager versus known family members and especially the spouse. We found substantial higher levels of generosity towards known family members than towards anonymous villagers. Positive giving to spouses and to anonymous villagers was positively correlated, indicating existence of general generosity in some individuals that stretches outside known family members and demonstrates social preferences. Spouses that received positive amounts from their spouse (without knowing) were also significantly more likely to give positive amounts back, indicating personal positive synergies (interdependent preferences) that stimulate generosity. However, spouses exposed to generous spouses were not likely to give more to anonymous villagers. Finally, we found more complicated correlations between marriage type and behavior in dictator games where love marriages and kidnapping marriages were associated with less generosity from the wives than in parental arrangement marriages.

Table 8. Factors associated with probability of giving and the amount given by husbands and wives to their spouses, including all households where two spouses participated.

	Linear probability models		Truncated tobit models	
	Wives	Husbands	Wives	Husbands
<b>Dummy for real game</b>	-0.047 (0.040)	0.092*** (0.030)	-0.812 (0.570)	-0.541 (0.660)
<b>Type of marriage: Baseline=Parental arrangement</b>				
<b>Parental and bride agreement</b>	-0.062 (0.050)	-0.015 (0.040)	-1.286* (0.770)	-1.693** (0.860)
<b>Love marriage</b>	-0.014 (0.050)	-0.004 (0.040)	-1.500** (0.660)	-1.401* (0.800)
<b>Wife exchange</b>	-0.105 (0.200)	-0.347 (0.220)	-0.859 (0.800)	4.612 (3.700)
<b>Kidnapping marriage</b>	-0.223** (0.100)	-0.080 (0.110)	-3.518** (1.380)	-1.796 (2.510)
<b>District: Baseline=Sashemene</b>				
<b>Arsi Negelle</b>	-0.134** (0.060)	-0.023 (0.050)	-0.924 (0.790)	-1.904 (1.220)
<b>Wondo Genet SNNP</b>	-0.270** (0.110)	-0.090 (0.080)	-0.793 (1.400)	-4.765** (2.270)
<b>Wollaita</b>	-0.289** (0.140)	-0.183 (0.160)	-3.402** (1.680)	-11.355*** (3.770)
<b>Wondo Genet Oromia</b>	-0.077 (0.090)	-0.065 (0.090)	0.932 (0.930)	-0.356 (1.510)
<b>Give to anonymous dummy</b>	0.279*** (0.030)	0.214*** (0.030)	-1.095** (0.550)	-0.916 (0.710)
<b>Polygamous household dummy</b>	-0.085 (0.050)	-0.065 (0.040)	-0.103 (0.830)	-2.600*** (0.750)
<b>Age of household head</b>	-0.001 (0.000)	0.002* (0.000)	-0.019 (0.020)	-0.017 (0.020)
<b>Ethnic group baseline: Oromo</b>				
<b>Sidama</b>	-0.047 (0.100)	0.064 (0.070)	-1.235 (1.490)	-2.129 (1.700)
<b>Wollaita</b>	0.047 (0.130)	-0.028 (0.160)	1.603 (1.570)	4.451 (3.350)
<b>Amhara</b>	-0.080 (0.170)	0.064 (0.080)	-1.555 (1.990)	4.188 (2.740)
<b>Other</b>	0.122 (0.090)	0.130* (0.080)	-0.068 (1.350)	2.804 (3.480)
<b>Religion baseline: Moslem</b>				
<b>Protestant</b>	0.229***	0.104	-0.208	4.156***

	(0.080)	(0.070)	(1.060)	(1.470)
<b>Orthodox</b>	0.205**	0.079	-0.325	3.648**
	(0.090)	(0.070)	(1.250)	(1.570)
<b>Other</b>	-0.223	0.010	8.003***	4.792
	(0.180)	(0.160)	(2.800)	(3.290)
<b>Constant</b>	0.876****	0.724****	22.715****	23.684****
	(0.090)	(0.060)	(1.200)	(1.870)
<b>Sigma constant</b>			4.542****	5.826****
			(0.250)	(0.320)
<b>Prob &gt; chi2</b>	0.000	0.000	0.000	0.000
<b>R-squared</b>	0.154	0.158		
<b>Number of observations</b>	426	421	320	361

Standard errors corrected for clustering at household level, \*=significant at 10%, \*\*=significant at 5%, \*\*\*=significant at 1%, \*\*\*\*=significant at 0.01% level. Standard errors corrected for clustering at household level

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## Appendix 1 Experimental protocol

### Introduction to social experiment 1

As a participant of our survey on land certification we end this first survey round with a small experiment also to inform you that in about one month time we will come back and have additional interviews and run more social experiments with you where you can get some rewards.

This first game will first find a lucky winner in your household, who will be either the household head or the spouse (or another person in the household if there is no spouse). There should be no communication between the husband and wife during these games.

**Woreda:** \_\_\_\_\_ (use code)

**Kebelle:** \_\_\_\_\_ (use code)

**Household name:** \_\_\_\_\_ **Household number:** \_\_\_\_\_ (2007 number)

**For monogamous households** (separate format for polygamous households).

1. Stage: a) We toss a coin where Head on the coin represents the man and Tail represents the woman (wife).  
b) Outcome of the coin toss: The lucky winner is:
  - 1) Man: Name: \_\_\_\_\_
  - 2) Woman: Name: \_\_\_\_\_The loser is asked to wait in a separate place such that s/he does not observe what happens or can influence it. The losers will be called after all the winners of households have played.

**Marriage type stated by winner: 1=Kidnapping, 2=Love marriage, 3=Parental agreement, 4=Parental and bride agreement, 5=Wife exchange**

2. Stage: a) The winner can now freely and independently decide how to share 40 Birr (4 “10 Birr” notes between him-/herself and one of the losers of the game. The money is put on the table in front of the winner together with an envelope.
  - a. Before s/he decides how much to share, more information about who will get the remaining share will be provided: This other person is either
    - i. The spouse of the winner
    - ii. Another unknown loser from the sample of households in the same kebele.
  - b. The winner is asked how much s/he will allocate to the other party in each of the cases above. Afterwards a coin is tossed to determine which of these alternative persons will be the receiver of the amounts shared by the winner.
  - c. Allocation decisions of winner:
    - i. If the spouse is the receiver: \_\_\_\_\_ Birr
    - ii. If another anonymous sample household member is receiver: \_\_\_\_\_ Birr
  - d. Toss a coin: Head for Spouse, Tail for Another anonymous person
    - i. Outcome of coin toss (circle): \_\_\_\_\_ i. \_\_\_\_\_ ii. \_\_\_\_\_
  - e. Money allocated to winner (cash in hand): Amount: \_\_\_\_\_ Birr

- f. Amount shared to other receiver is put in an envelope to be allocated to that person by game organizers. Write the Household Number on the envelope if it is the spouse.
3. The person is then instructed to leave the place (go home) and not talk to anybody else from the waiting households or spouse till after the experiment is finished for everybody.
4. The next couple is asked to come for the game.
5. 3.Stage: After all the winners have played, the losers will be called one by one to be introduced to the game in the same order as the households were asked to come first (order by Household 2007 number):
6. **Marriage type stated by loser: 1=Kidnapping, 2=Love marriage, 3=Parental agreement, 4=Parental and bride agreement, 5=Wife exchange**
7.
  - a. Name:\_\_\_\_\_ is called upon and explained the game and can him/herself play it as a hypothetical game (as if s/he won the first round)
  - b. Allocation decisions if loser had won the game (hypothetical):
    - i. If the spouse is the receiver: \_\_\_\_\_Birr
    - ii. If another anonymous sample household member is receiver:\_\_\_\_\_Birr
  - c. Give the envelope with money share to the loser which is either an envelope from her/his spouse or from an anonymous donor (randomly selected envelope) among the other winning household members. Do not tell whether it was from the spouse or from another anonymous donor.
  - d. Indicate amount of Birr received:\_\_\_\_\_Birr
8. The person is asked to go home and not talk to any of the others who have not yet played. New chances will come as we come back for the next survey and experiment round.

## Appendix 2 Graphs of significant relationships in regressions

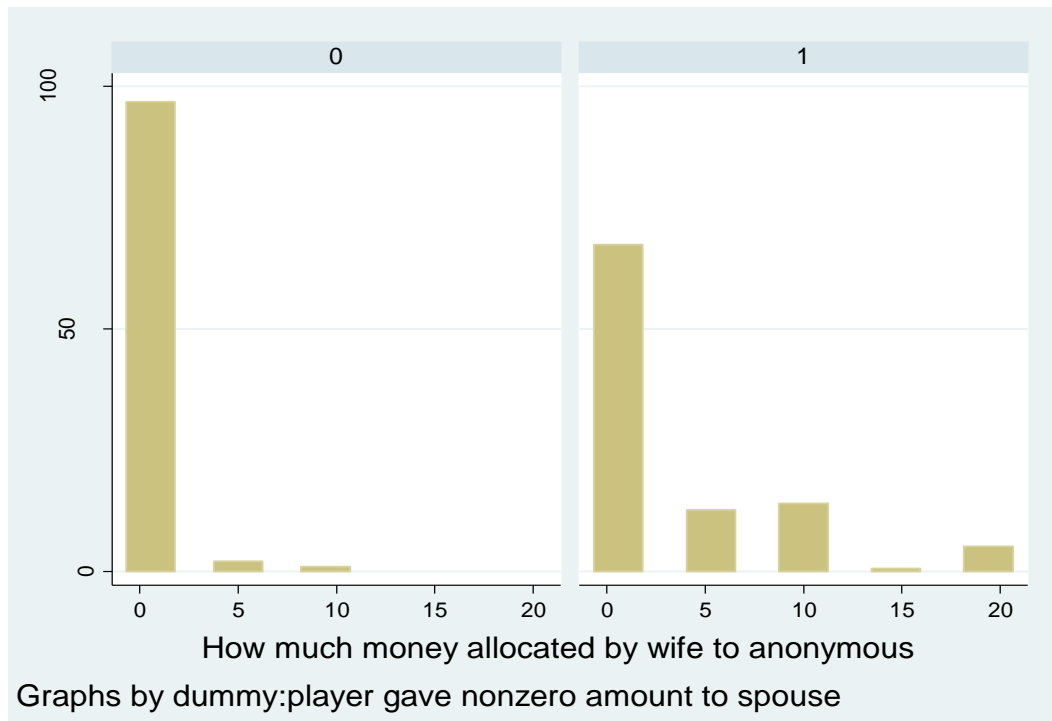


Figure A1. Allocation by wives to anonymous villager by zero or non-zero allocation to husband

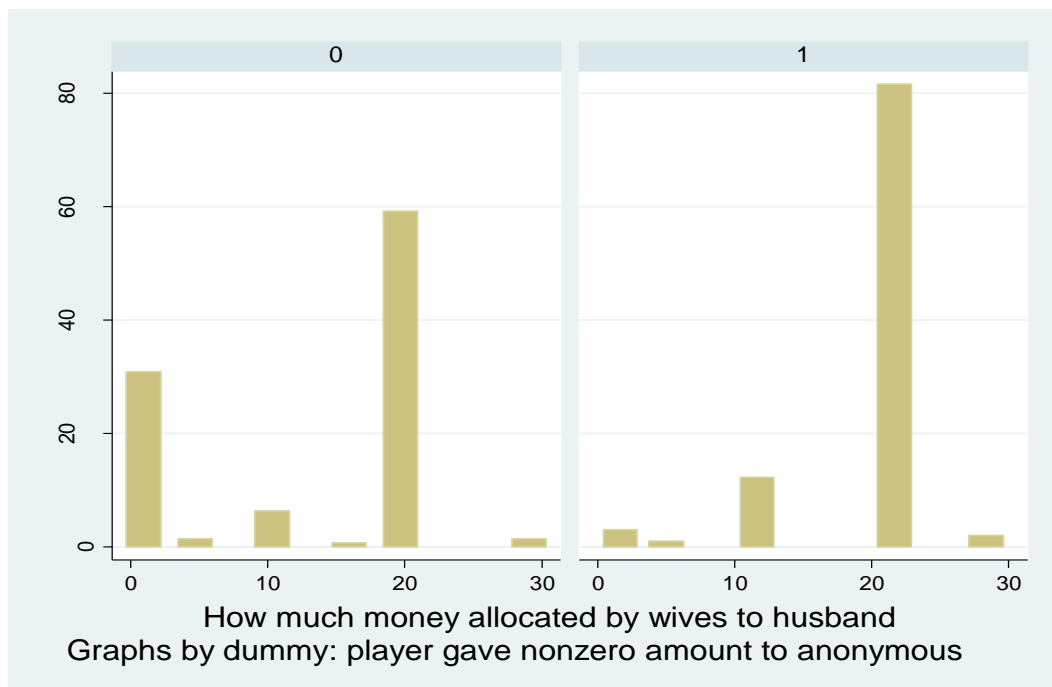


Figure A2. Allocation by wives to husband by whether they gave or did not give to anonymous villager

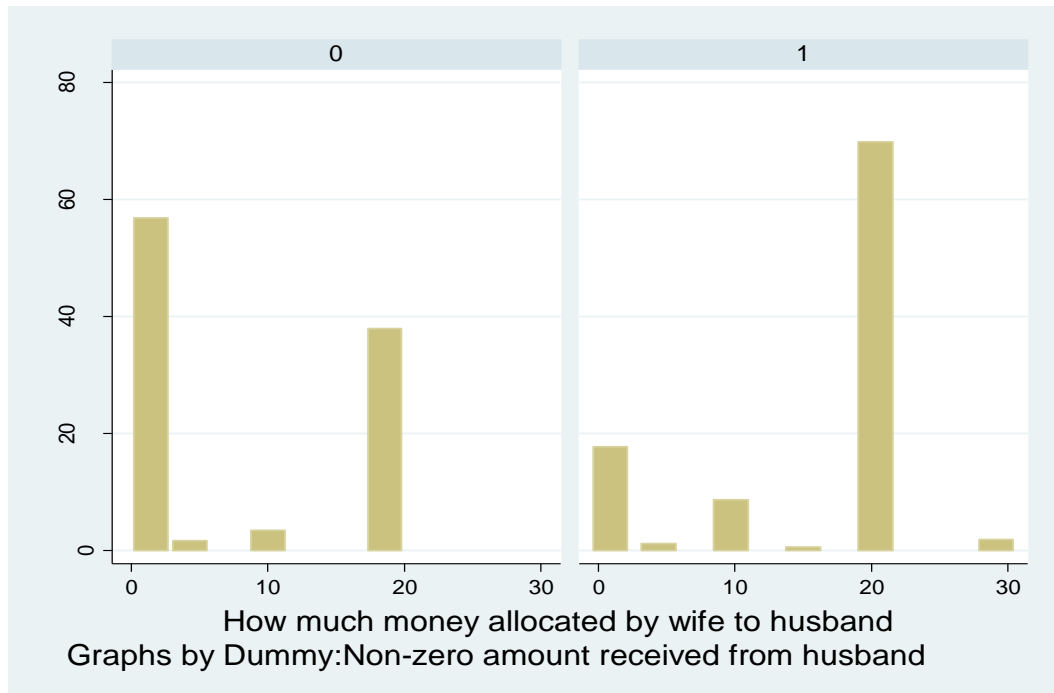


Figure A3. Allocation by wives to husband by no receipt or receipt from husband

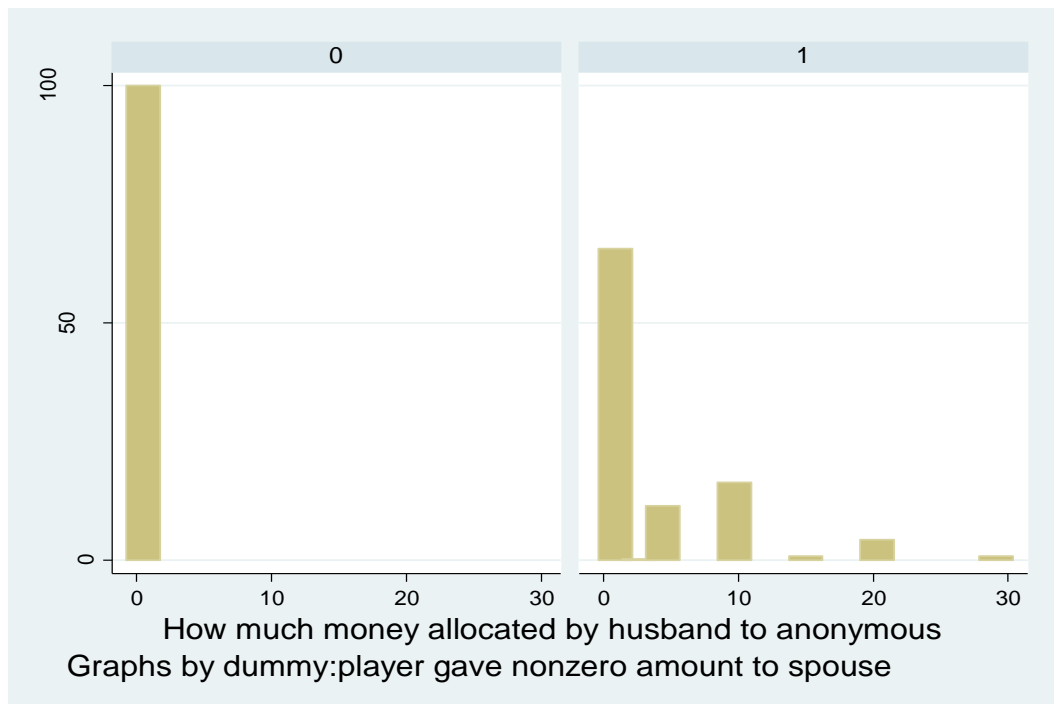


Figure A4. Allocation by husbands to anonymous by giving zero or non-zero amount to wife

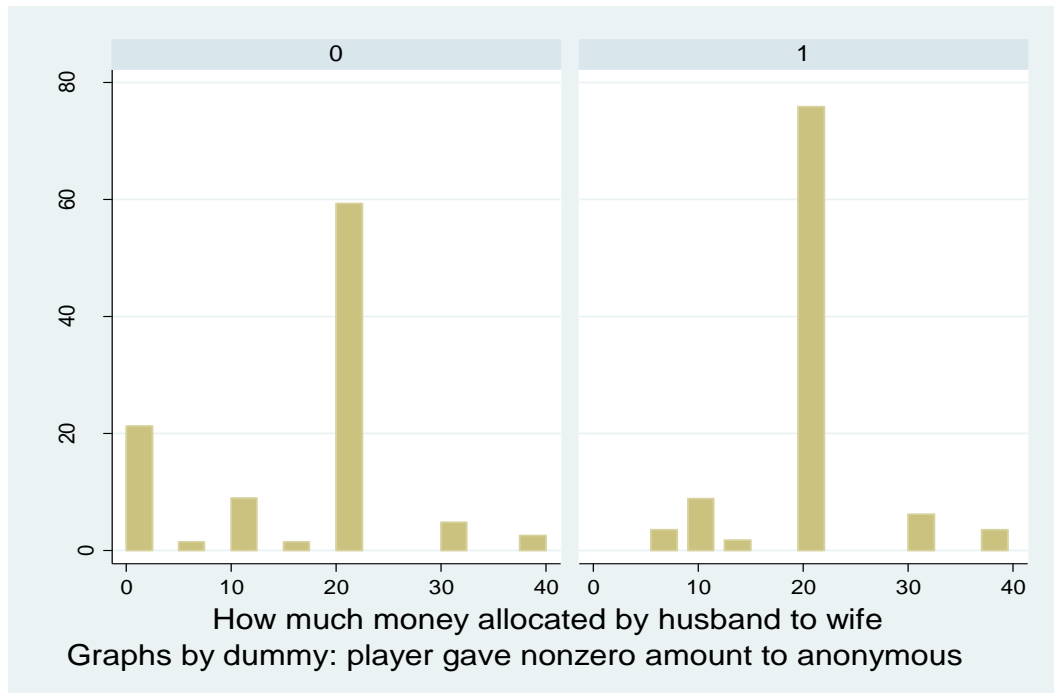


Figure A5. Allocation by husbands to their wives by zero or non-zero allocation to anonymous villager

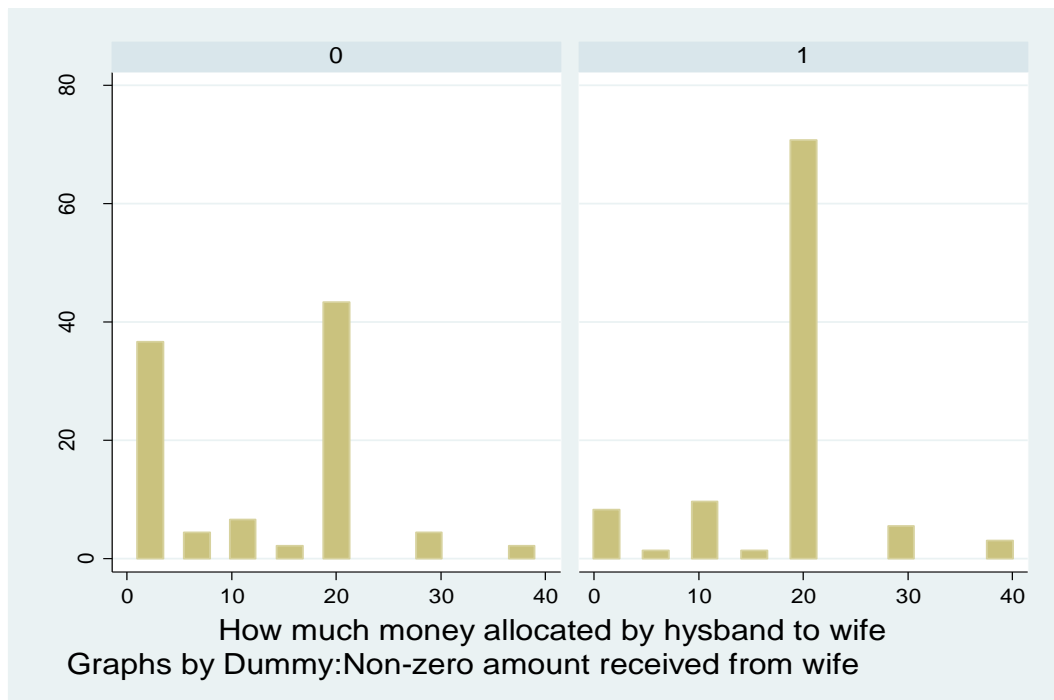


Figure A6. Allocation by husbands to their wives by receiving zero or non-zero amounts from their wives

### Appendix 3. Descriptive statistics

Table A1. Distribution of play groups observations in the dictator game

<b>Play group</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
<b>Couples</b>	1,540	59.99	59.99
<b>Polygamous HHs</b>	651	25.36	85.35
<b>Household head with son/daughter</b>	138	5.38	90.73
<b>Played with other relatives</b>	32	1.25	91.98
<b>Played alone</b>	206	8.02	100
<b>Total observations</b>	2,567	100	

Table A2. Distribution of marriage types in sample

<b>Marriage type</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
<b>Parental arrangement</b>	858	33.5	33.5
<b>Parental &amp; bride agreement</b>	772	30.14	63.65
<b>Love marriage</b>	774	30.22	93.87
<b>Wife exchange</b>	34	1.33	95.2
<b>Kidnapping marriage</b>	123	4.8	100
<b>Total</b>	2,561	100	

Table A3. Distribution of marriage types across districts

<b>District</b>	<b>Marriage type</b>					<b>Total</b>
	<b>Parental arrangement</b>	<b>Parental and bride agreement</b>	<b>Love marriage</b>	<b>Wife exchange</b>	<b>Kidnapping marriage</b>	
<b>Shashemene</b>	148	145	116	12	18	439
<b>Arsi Negelle</b>	316	84	214	22	28	664
<b>Wondo Genet</b>	229	44	200	0	57	530
<b>Wollaita</b>	120	457	193	0	12	782
<b>Wondo Oromia</b>	45	42	51	0	8	146
<b>Total</b>	858	772	774	34	123	2,561

Table A4. Sample distribution by ethnicity and religion

<b>Ethnic group</b>	<b>Own religion</b>				<b>Total</b>
	<b>Moslem</b>	<b>Protestant</b>	<b>Orthodox</b>	<b>Other</b>	
<b>Oromo</b>	233	46	9	0	288
<b>Sidama</b>	4	76	0	0	80
<b>Wollaita</b>	1	106	85	10	202
<b>Amhara</b>	0	3	6	0	9
<b>Other</b>	1	9	2	1	13
<b>Total</b>	239	240	102	11	592

Table A5. Distribution of person types receiving the allocations in dictator games by sex of dictator

		Allocation by whom		
Allocation for whom		Men	Women	Total
<b>Spouse</b>	N	450	509	959
	Row %	46.92	53.08	100
	Column %	39.89	36.23	37.86
<b>Son or daughter</b>	N	26	89	115
	Row %	22.61	77.39	100
	Column %	2.3	6.33	4.54
<b>Mother or father</b>	N	34	7	41
	Row %	82.93	17.07	100
	Column %	3.01	0.5	1.62
<b>Other relative</b>	N	18	21	39
	Row %	46.15	53.85	100
	Column %	1.6	1.49	1.54
<b>Wife 2</b>	N	67	132	199
	Row %	33.67	66.33	100
	Column %	5.94	9.4	7.86
<b>Wife 3</b>	N	5	18	23
	Row %	21.74	78.26	100
	Column %	0.44	1.28	0.91
<b>Wife 4</b>	N	1	4	5
	Row %	20	80	100
	Column %	0.09	0.28	0.2
<b>Anonymous person in village</b>	N	527	625	1,152
	Row %	45.75	54.25	100
	Column %	46.72	44.48	45.48
<b>Total observations</b>	N	1,128	1,405	2,533
	Row %	44.53	55.47	100
	Column %	100	100	100