

# Gender Differences in the Giving and Taking Variants of the Dictator Game\*

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## Abstract

We run between-subject dictator games with exogenously specified ‘give’ or ‘take’ frames involving a balanced pool of male and female dictators and constant payoff possibilities. We find the following: Females allocate more under the taking frame than under the giving frame. Males allocate more under the giving frame than under the taking frame. In the taking frame females are more generous than males. But in the giving frame both are equally generous. Finally, when the combined population of males and females is considered, giving is found to be equivalent to ‘not taking’, because the opposing gender effects offset each other.

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## 1. Introduction

The ‘Dictator game’ has been one of the most popular experimental workhorses to understand and estimate altruism. In the standard form (Kahneman et al., 1986; Forsythe et al., 1994) of the game, a subject (called the dictator) is given a certain amount of money and is asked to decide upon how much of that money to allocate between himself/herself and a passive subject (called the recipient). Since the dictator does not otherwise have any incentive to share the money with the recipient, the amount allocated is often used as a measure of altruism. Indeed, several experiments consistently find that dictators, on average, allocate a non-trivial sum of money (Camerer, 2003; Engel, 2011).

There are variations of frames in the dictator game. A ‘taking’ frame (in short, TG) different to the ‘giving’ frame (as explained above and in short GG) is often employed, where the recipient is given an endowment and the dictator decides how much to ‘take’ from the recipient’s endowment. The aim of this framing is to investigate greed and to test whether ‘not taking’ is equivalent to ‘giving’. Suvoy (2003), who was the first to introduce the ‘taking’ frame in the social preference literature,<sup>1</sup> did not find any significant difference in the allocations between the two frames, a conclusion both shared and contested in subsequent studies, which we discuss later.

The literature, however, has not investigated whether the implementation of the giving and taking frames would give rise to any gender effects. The current study is aimed at this particular question. We run a between-subject dictator game with two alternative framing, ‘give’ (GG) and ‘take’ (TG), involving a balanced pool of male and female dictators while holding the total amount to be divided constant.

We expect the gender issue to be potentially important for the following reasons. Various studies in economics and psychology alike suggest that a change in framing may cause diverse and gender specific cognitive biases, and in turn different behaviors (Croson and Gneezy, 2009). These include endowment effects (Thaler, 1980) or status-quo bias (Samuelson and Zeckhauser, 1988). It has also been evidenced that males and females differ in their perception of the entitlement effects and property rights (Bylsma and Major,

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<sup>1</sup> Eichenberger and Oberholzer-Gee (1998) and Falk and Fischbacher (2002) have earlier introduced this game in the context of crime.

1992), or endowment effects (Dommer and Swaminathan, 2013). In standard dictator giving games Eckel and Grossman (1998) found different behaviors between male and female dictators.

Based on the above evidence, it is reasonable to expect that the introduction of two alternative framings, as we have done in this paper, would permit us to study asymmetric gender effects, if any. Specifically, the giving frame introduces a salience of the dictator's property right (over the fund), while the taking frame does the same for the recipient's property right. Since males and females tend to have different perceptions of property right, we should see asymmetric behaviors across the two genders under two different framings.

Indeed, our results support this hypothesis. We find that: (i) Males are less generous in taking games than in giving games. (ii) Females are more generous in taking games than in giving games. (iii) In taking games, females are more generous than males. (iv) In giving games, females' generosity is not significantly different from the males' generosity. (v) Females are more likely to be egalitarian under taking frames than under giving games. (vi) Males are more likely to be selfish under the taking frame than under the giving frame.

We infer that the results obtained are due to males' (relatively) stronger sense of entitlement and property right as shown by Bylsma and Major (1992) and females' (relatively) stronger endowment effect as shown by Dommer and Swaminathan (2013). On one hand, the taking frame may trigger differing degrees of entitlement effect between males and females, resulting in divergent behaviors. On the other hand, the giving frame may trigger an endowment effect. Although the (hypothesized) endowment effect is not discernably different between males and females, it is probably weaker than the entitlement effect for males and stronger than the entitlement effect for females – as discussed in the literature, so that the two genders end up behaving in opposite ways under the two framings.

Our study contributes to two related streams of literature. First, it contributes to the investigations of the effects of gender in the dictator game. Second, it also relates to the literature investigating the effects of framing in dictator games. Below we specify our contribution in both the streams.

Bolton and Katok (1995) are the first to test the effect of dictator gender on dictator giving in the GG and find no such effect. Eckel and Grossman (1998), however, find that women are more generous than their male counterparts in a GG when the recipient is a

charity. Further studies such as Selten and Ockenfels (1998), Dickinson and Tiefenthaler (2002), Cadsby et al. (2010) contribute to this mixed result. There is no existing study investigating the same for a pure Taking Game. There are studies that allow cues and the effects of being observed, or reveal gender identities – issues that we do not consider. Alevy et al. (2014) consider the effects when the dictator decisions are being observed and find that males take less and females remain unaffected in allocation decisions while being observed. In a study along the same lines, Chowdhury et al. (2014) find males take less and females take more in presence of social cues in a TG. Kettner and Ceccato (2014) investigate the effects of framing while interacting with revelation of dictator and recipient gender. They find that dictators take significantly less when the recipient is of the opposite gender. Our study shows that independent of cues and identities, the interaction of framing and gender itself can be significant effects.

Our study also shades light on the question of equivalence between ‘giving’ and ‘not taking’ by comparing the recipient’s payoff under two alternative framings. Since Suvoy’s (2003) claim of equivalence the issue has been investigated time and again by changing the type of recipient, using laboratory or online experiment, and by varying the decision space (i.e., by giving the dictator an option to ‘give’ or ‘take’). Among them, Dreber et al. (2013) Kettner and Ceccato (2014) and Grossman and Eckel (2015) find equivalence between giving and not taking.<sup>2</sup> We support and extend their results. We also show that although the overall equivalence prevails in terms of overall payoff, the framing effect is opposite when we consider dictator’s gender.

The paper is organized as follows. Section 2 describes the experimental design, Section 3 reports the results, and Section 4 concludes with further discussions.

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<sup>2</sup> In our design and in the design of the studies mentioned the decision space is fixed, i.e., the dictators play either a GG or a TG, and do not have the option to give and take simultaneously. Furthermore, in our experiment the price of giving or taking is fixed. Combining these two features, the total payoff in these two games (GG and TG) remains the same. However, there are studies following List (2007) and Bardsley (2008) in which the decision space has been set different among frames, or the price of action is different – and as a result the total payoff is also different. In such cases Oxoby and Spraggon (2008), Cappelen et al. (2013), Korenok et al. (2013, 2014, 2015), and Cox et al. (2016) find that the payoff to the recipient may be different with a change in framing.

## 2. Experimental Design

We employed a between-subject Dictator game with 280 subjects spread over 2 treatments. Each treatment had 70 dictators and 70 recipients. To ensure gender balance, in each treatment we recruited 35 male and 35 female dictators. Only one treatment was run in a particular session. In each session, subjects were randomly and anonymously placed into pairs and were asked to sit in cubicles. They were then assigned the role as either a dictator or a recipient (however, we did not use those terms). Each subject played only one role and the roles remained the same until the end of the session.

All subjects were told that they would receive a £3 show-up fee. In the ‘giving’ treatment the dictator was given access to an additional £10 fund and could transfer any amount between £0 and £10 (in denominations of 1 penny) to the recipient. In the ‘taking’ treatment the recipient was given access to an additional £10 and the dictator could transfer any amount between £0 and £10 (in denominations of 1 penny) to himself/herself. We executed neutral word such as ‘transfer’ instead of ‘give’ and ‘take’, and ‘access’ instead of ‘belong’ to minimize any experimenter demand effect (Zizzo, 2010) arising from the instruction (which are available in the Appendix). The role of the recipients was passive, meaning that they had to accept the dictators’ decision.

Each session consisted of two parts. In the first part, the dictators made decisions. In the second part, the recipients had to guess the amount the dictator had given or taken. If the absolute difference between the actual amount and the guess was within 50 pence, then the recipient received an extra £1.<sup>3</sup> As we did not find any treatment or gender effect in the guesses, this element is not discussed further.

Subjects were students at the University of East Anglia, with no prior experience of participating in a GG or a TG experiment, recruited randomly through the online recruitment system ORSEE (Greiner, 2015). The sessions were computerized with z-TREE (Fischbacher, 2007). A subject could participate in only one session. Each session took around 30 minutes and the average payment was £8.

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<sup>3</sup> This incentive mechanism for guess is similar to the one by Chowdhury and Jeon (2013). The instructions for the second part was given only after the first part was finished. It was also mentioned in the instruction of the first part that the recipient’s decision was payoff irrelevant to the dictator, restricting any strategic interaction between dictator decision and recipient anticipation.

### 3. Results

Table 1 shows the average amount allocated (amount given in the GG, or (£10 – amount taken) in the TG) for both aggregated data and also for male and female by treatment. In the GG, an average of £2.066 is given to the recipients. In the TG, the dictators take on average £7.87 and as a result, the amount left to the recipient is £2.13. A Mann-Whitney test shows no significant difference in final amount allocated to recipients between the two treatments (p-value = 0.583). This result is consistent with the established result (Dreber et al., 2013; Grossman and Eckel, 2015) that there is no effect of framing in dictator allocation. We now investigate these actions across gender. Male dictators on average allocate £2.117 in the GG and £0.997 in the TG towards the recipients, and a Mann-Whitney test shows significant difference at 1% level. However, the average allocation by female dictators is £2.014 in the GG and £3.263 in the TG, and the difference is significant at 5% level. The results also confirm within treatment gender differences. In the GG, the amount given by male and female are not different (p-value = 0.594). The TG, however, shows gender differences. The average amount left by the male dictators is significantly lower than the amount left by the female dictators at 1% level.

**Table 1.** Average (Standard Dev) allocation to recipient

Data	Giving game	Taking game	Mann-Whitney test (Giving vs. Taking)
All (70 obs. / treatment)	2.066 (1.734)	2.130 (2.394)	No difference (p=0.583)
Male (35 obs. / treatment)	2.117 (1.530)	0.997 (1.589)	Different at 1% (p = 0.001)
Female (35 obs. / treatment)	2.014 (1.938)	3.263 (2.543)	Different at 5% ( p = 0.039)
Mann-Whitney test (Male vs. Female)	No difference (p=0.594)	Different at 1% (p= 0.0001)	—

To control for interactions and to test robustness of the results above we further run a series of OLS regressions as reported in Table 2. The dependent variable is the amount allocated to the recipient and the independent variables are treatment dummy, gender

dummy, their interactions and an age dummy ( $\text{Age}_{21}=1$  if  $\text{age} \leq 21$ ).<sup>4</sup> We run the analysis for the whole data and separately for males and females.

**Table 2.** Regression of amount allocated to the recipient

OLS	Total	Total	Male	Female
Intercept	0.720 (0.738)	0.242 (0.721)	0.164 (0.765)	2.588** (1.150)
Giving game	-0.004 (0.345)		1.159*** (0.373)	-1.186** (0.552)
Female	1.097*** (0.342)			
TG $\times$ Female		2.262*** (0.464)		
GG $\times$ Male		1.155** (0.465)		
GG $\times$ Female		1.084** (0.467)		
Age <sub>21</sub>	0.037 (0.029)	0.033 (0.028)	0.036 (0.031)	0.029 (0.047)
# of Obs.	140	140	70	70
Adjusted R <sup>2</sup>	0.059	0.133	0.109	0.051

**Note:** Standard errors in parentheses. \*\*\*, \*\* and \* indicate significance at the 1%, 5%, and 10% level.

In the first column of Table 2 we use a dummy for the GG to test for the framing effect while controlling for gender and age. Complying with the result in Table 1, the coefficient for GG is insignificant, but the coefficient of Female is positive and significant at 1% level. The first observation implies no overall treatment effect and mirrors the findings of Dreber et al. (2013, Table 1), who report a similar result from their lab experiment. The second observation shows that female dictators are more generous than males.

These observations, still, do not reveal any effect of framing on gender. The existing literature also does not focus on this issue. Therefore, in order to examine the gender effect further, in Colum 2 of Table 2 we introduce interactions of gender and

<sup>4</sup> We include age as a control variable for two reasons. First, Engel (2011) shows in his meta-analysis that the effect of age is significant in dictator games. Second, a line of research (Grusec, 1972; Bahry and Wilson, 2006; Sutter and Kocher, 2007) shows effects of age in various social preference experiments.

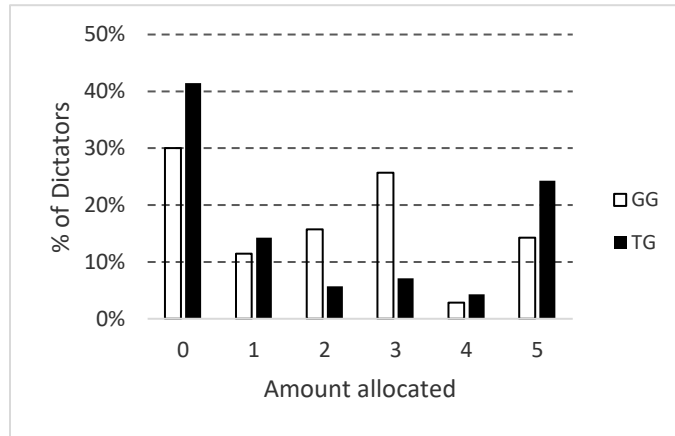
treatment. The coefficient for the interaction of TG and Female and the corresponding post-regression tests show that females allocate significantly higher amounts in the TG frame compared to their male counterparts. Then we run the same regression, without the interaction terms, for males and females separately and discover a gender-wise treatment effect. In particular, males allocate more amount in the GG compared to the TG (at 1% level), but females do exactly the opposite (at 5% level).

Until now we have analyzed the average amount allocated, and found asymmetric effects of framing on gender. But this analysis does not reveal the mechanism through which this asymmetry arises. Understanding the mechanism, however, is important since it is related to the distribution of the ‘social type’ of the dictators. A social type in a dictator game is a broad categorization of the subjects given their allocation behavior (see, e.g., Fehr et al., 2008). This categorization will help us to understand whether a specific type of allocation behavior is observed across treatments or across gender. We define a dictator to be ‘selfish’ if he/she does not allocate any money to the recipient, ‘egalitarian’ if he/she divides the pie equally, and ‘in-between’ if he/she allocates an amount between zero and half-of-the-pie to the recipient.

To visualize the allocation distribution in these two frames, we plot the proportion of dictators by the amount allocated to the recipients (in approximated blocks) in Figure 1. Note that the allocation in both frames exhibits a bimodal distribution of the social types; but the second mode as well as the frequency distribution at the modes vary between the two frames. In the TG, two modes appear at the ‘selfish’ and ‘egalitarian’ types, while in the GG, they appear at the ‘selfish’ and ‘in-between’ types. The difference in the distribution suggests that the two frames invoke different social types. Moreover, the TG increases the frequency of both extreme types, selfish as well as egalitarian, by about 10 percentage points over the GG.

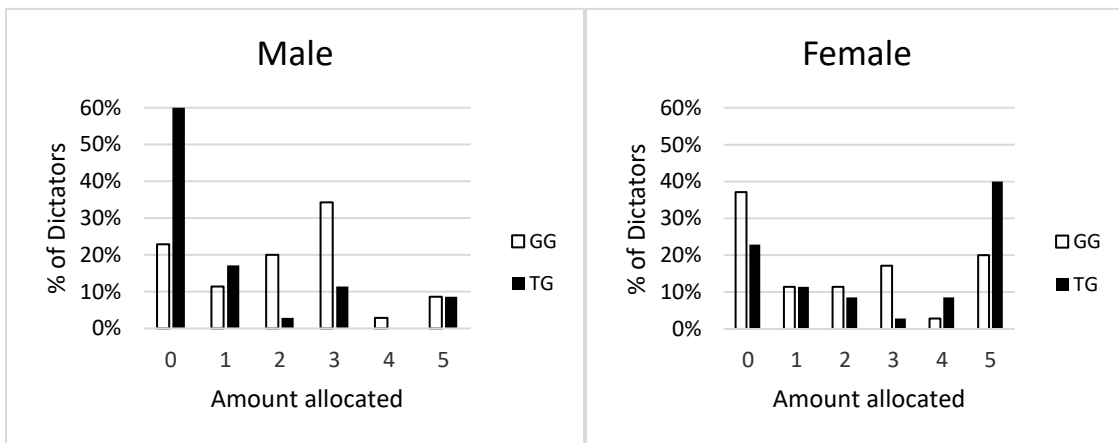


**Figure 1.** Allocation in GG and TG.



We plot the allocation distribution in these two frames by gender in Figure 2. The allocation distribution for the GG does not show a specific pattern for either gender; if anything it shows a weak form of bimodal distribution. But for the TG the distribution drastically changes to a right-skewed one for males and a left-skewed one for females. Under the taking frame 60% of the males turn ‘selfish’ and 40% of the females turn ‘egalitarian’. Most striking is the way the proportion of the selfish type changed for each gender with the change in framing. With the taking frame, the proportion of the selfish males massively increased from 22% to 60%; but the proportion of the selfish females dropped from 38% to 22%. Clearly, the taking frame is invoking a strong sense of selfishness amongst males, but a fairly strong sense of generosity amongst females.

**Figure 2.** Allocation in GG and TG by gender



To test the significance of these observations, we run two sets of Probit regressions. The dependent variable in the first set is a dummy for whether a subject is selfish, and in the second set a dummy for whether a subject is egalitarian, with the independent variables being the treatment dummy and age.<sup>5</sup> We first run the regressions for the whole data, and then separately for males and females. We discuss only the gender-specific regressions by reporting the marginal effects in Table 3.

**Table 3.** Probit Regressions investigating dictators' social type

	Male		Female	
	Y=Selfish	Y=Egalitarian	Y=Selfish	Y=Egalitarian
Giving game	-0.389*** (0.110)	0.006 (0.067)	0.075 (0.107)	-0.190** (0.109)
Age <sub>21</sub>	-0.012 (0.012)	0.003 (0.005)	-0.006 (0.013)	0.005 (0.009)
# of Obs.	70	70	70	70
Pseudo R <sup>2</sup>	0.118	0.009	0.011	0.043

**Note:** Standard errors in parentheses. \*\*\*, \*\* and \* indicate significance at the 1%, 5%, and 10% level.

The Probit models confirm that broad observations of Figure 2 are indeed correct; there exists a framing effect across gender for the social type distribution. The first two regressions show that males tend to be more selfish in the TG compared to the GG, but the frame does not affect their likelihood of being egalitarian. In contrast, the last two regressions show that females tend to be more egalitarian in the TG compared to the GG, but the frame does not affect their likelihood of being selfish.<sup>6</sup>

## 4. Discussion

We investigate the effects of gender on the framing of dictator game when the total payoff remains the same across treatments. We employ a giving and a taking frame and compare

<sup>5</sup> A male subject, who gave £0.09 in the GG, is categorized as a selfish and a Female subject, who took £4.90 in the TG, is categorized as an egalitarian. Two female subjects, who took £2.10 and £0.00 in the TG, are not included in any categories.

<sup>6</sup> The frames do not show a significant effect in the whole data (and hence we do not report the regressions), further supporting the overall results of the existing studies. Kolmogorov-Smirnov tests, corresponding to the data of Figure 1 and Figure 2, show no framing effect in allocation for the whole data (p-value = 0.288); but significant effects separately for males and for females (p-values of 0.001 and 0.039, respectively).

the amount given in the giving frame with the amount left for the recipient in the taking frame. We expected a gender effect due to possible endowment effect or the effect of perceived entitlement and hence employed a balanced pool of male and female dictators.

Both non-parametric tests and regressions reaffirm the observations from existing studies (Dreber et al., 2013; Grossman and Eckel, 2015) that *overall* there is no framing effect within the dictator game and giving is indeed equivalent to not taking. However, further investigations by gender show that framing has opposing effects for females and males. Females take less in a taking game compared to what they give in a giving game; but the males do just the opposite. Furthermore, we find that this occurs since the male dictators are significantly more likely to be selfish in the taking frame compared to the giving frame. On the other hand, the female dictators are significantly more likely to be egalitarian in the taking frame compared to the giving frame.

Our result is of interest for a number of reasons. First, this result sheds light on a very active line of research regarding the gender effect on behavioral decision making. Since the frame induces social-type variations in the dictator, in opposite directions, for the two genders, the question of the effect of framing in general on gender-specific behavior remains a promising line of research. Such studies will also be helpful to understand why the males and females behaved differently in our study of the dictator game.

Second, we contribute to the debate on the equivalence between ‘giving’ and ‘not taking’. One existing line of research finds such equivalence when the total payoff is constant, whereas other studies find the opposite result when the total payoff is different. We add to this debate showing that as long as we consider the whole population we may see equivalence. But when we turn our attention to gender-specific subgroups we see non-equivalence, an observation novel to this literature.

Finally, as a consequence of our results, one can alternatively use a giving or a taking frame in various research questions without changing the decision space – so long as the investigation is not focused on gender; or the issue of taking/giving price, or the choice of the game (Korenok et al., 2014; 2015) are absent.

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# Appendix: Instructions

## 1. Instruction for Dictator in Taking game



Welcome to this experiment! In this experiment each of you will be paired with a different person. You will not be told who you are matched with during or after the experiment, and he or she will not be told who you are either during or after the experiment.

Your decisions will be strictly anonymous and cannot be linked to you in any way.

The experiment has two parts and is conducted as follows:

- Everyone in this room has already been allocated a show up fee of £3. You have been paired with someone else in the room.
- The other person you are paired with has access to an additional £10.
- In the first part of the experiment, you will have to make a simple decision. You have to decide what portion, if any, of the £10 to transfer to yourself. Your choice can be anywhere from £0 to £10, in 1p increments. Your take-home earnings from this experiment will be your initial £3 show up fee plus the money you transfer from the person you are paired with. The earnings of the person you are paired with will be his/her £3 show up fee plus the money left over from the £10 after you transfer to yourself.
- In the second part of the experiment, the person you are paired with will make a decision, but that decision will NOT affect your earnings.

You will have 1 minute to come to a decision about your choice. Please do not talk to the other people in this room until your session is completed. Do not be concerned if other people make their decisions before you.

## 2. Instruction for Dictator in Giving game



Welcome to this experiment! In this experiment each of you will be paired with a different person. You will not be told who you are matched with during or after the experiment, and he or she will not be told who you are either during or after the experiment.

Your decisions will be strictly anonymous and cannot be linked to you in any way.

The experiment has two parts and is conducted as follows:

- Everyone in this room has already been allocated a show up fee of £3. You have been paired with someone else in the room.
- You have access to an additional £10. The other person you are paired with does not have access to that extra £10.
- In the first part of the experiment, you will have to make a simple decision. You have to decide what portion, if any, of the £10 to transfer to the person you are paired with. Your choice can be anywhere from £0 to £10, in 1p increments. Your take-home earnings from this experiment will be your initial £3 show up fee plus the money left over from the £10 after you transfer to the person you are paired with. The earnings of the person you are paired with will be the amount you transfer to him/her plus his/her £3 show up fee.
- In the second part of the experiment, the person you are paired with will make a decision, but that decision will NOT affect your earnings.

You will have 1 minute to come to a decision about your choice. Please do not talk to the other people in this room until your session is completed. Do not be concerned if other people make their decisions before you.