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# Gender Differences in Giving and the Anticipation-about-giving in Dictator Games <sup>\*</sup>

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## **Abstract**

Research on altruistic behavior and associated anticipatory beliefs, as well as related gender differences is limited. Using data from Chowdhury & Jeon (2014), who vary a common show-up fee and incentivize recipients to anticipate the amount given in a dictator game, we find that the show-up fee has a positive effect on dictator giving for both genders. While female dictators are more generous than males, male recipients anticipate higher amounts than the amount male dictators give. As the show-up fee increases, the female dictators become a more generous social-type, whereas males do not show such effect. There is no gender-difference in anticipation about dictator social-type by the recipients.

*JEL Classifications:* C91; D64; D84; J16

*Keywords:* Dictator-game; Altruism; Anticipatory-belief; Gender

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*“I would rather trust a woman's instinct than a man's reason.”*

- Stanley Baldwin (former Prime Minister of the United Kingdom).

## **1. Introduction**

In a decision-making procedure, both actual payoff and payoff anticipation are important (Elster & Loewenstein, 1992; Frey & Stutzer, 2002). Theoretical (e.g., Loewenstein, 1987; Kőszegi, 2010) and applied (e.g., Easterlin, 1995) studies show how anticipation regarding decision-making procedures and related outcomes affect utility. This is especially important for altruism, which focuses on the welfare of the recipients. It is also well documented that there are gender differences in behavior related to altruism (e.g., Eckel & Grossman, 1998). However, investigation of the gender differences in altruism and its anticipatory beliefs is sparse. We use data from a dictator game (Chowdhury & Jeon, 2014) to investigate gender differences in behavior as dictator and the recipient's anticipation of the same.

The common show-up fee is varied across treatments and the dictator divides £10 between him/herself and the recipient. Recipients are incentivized to anticipate the possible amount to be passed to them. The game is one-shot, double-blind, and subjects do not know their partner's demographics (including gender). We find that female dictators are more altruistic but there is no gender difference in payoff anticipation. Male recipients anticipate more than what male dictators give, but females do not show such diversion.

We contribute to three areas of literature. Some studies on gender difference in altruism find females to be more altruistic (Eckel & Grossman, 1998; Dickinson & Tiefenthaler, 2002; Engel, 2011, Rand et al., 2016; Chowdhury et al., 2017; Brañas-Garza et al., 2018), other studies find either mixed or no pattern (Bolton & Katok, 1995; Andreoni & Vesterlund, 2001; Cox & Deck, 2006; Cadsby et al., 2010). We support the results on higher female altruism.

Second, we contribute to the altruism-anticipation literature.<sup>1</sup> Ellingsen et al. (2010) reveal recipient-anticipation to the dictator but find no guilt aversion effect on dictator giving. Iriberry & Rey-Biel (2013) find that dictators who give more anticipate others to give more as well. Aguiar et al. (2009) find that female recipients prefer to be matched with female dictators as they anticipate females to be more generous. We show that there is no significant gender difference in altruism anticipation.

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<sup>1</sup> We use the term ‘anticipation’ instead of ‘expectation’ to distinguish psychological anticipation from statistical expectation. Furthermore, in common terms, whereas ‘expectation’ is normative, ‘anticipation’ is more rational and positive, which we investigate.

Relatedly, we contribute to the investigation on altruism, anticipation, and their interplay with gender. Brañas-Garza et al. (2017) focus on the anticipation of dictators regarding the amount given by other dictators and incentivize recipients' guess of the amount given to them. Dictators anticipate a near bimodal (zero and equal split) distribution of giving, while giving in the distribution's interior themselves. Recipients anticipate approximately 40% of the endowment. Rigdon & Levine (2018) find that females give more than males when the price of giving is high, and males give more otherwise; but the differences disappear in the baseline. They conclude that the gender difference in altruism is a result of a difference in anticipation. Both studies either have subjects play both roles or anticipate the amount. Brañas-Garza et al. (2018) run an M-Turk experiment with fixed roles, gender revealed, and payoff anticipation incentivized. They find that females give more, and both genders anticipate females to give more. However, this study does not investigate the effects of own gender on anticipation behavior without knowing the dictator gender, neither does it compare giving and payoff anticipation by gender. We show that, independent of partner gender, male recipients anticipate more than what male dictators give, but females do not show such discrepancies.

Third, our results contribute to and extend the literature on the interplay of gender and other effects. Andreoni & Vesterlund (2001), Cox & Deck (2006), and Korenok et al. (2012) show that the price of altruism, social distance, pie-size etc. have heterogeneous effects on altruistic behavior by gender. No study, however, investigates income effects or anticipation about altruism. In this experiment the show-up fee is increased across treatments. We find that as the show-up fee increases, the female dictators become a more generous social-type, whereas males do not show such effect. There is no gender-difference in anticipation about dictator social-type by the recipients.

## **2. Experimental Design in Chowdhury & Jeon (2014)**

Chowdhury & Jeon (2014) ran five between-subject treatments with three 16-subject sessions in each treatment at the University of East Anglia. The experiment was run manually and the subjects were recruited through ORSEE (Greiner, 2015). Treatments differed only through a varying (50p, £5, £10, £15 and £20) show-up fee. In each session, subjects were randomly and anonymously paired and assigned either the dictator or the recipient role. They were informed about the show-up fee but not about their partners' gender.

Sessions consisted of two parts. In part 1, dictators were endowed with £10 and had to decide how much of this £10 to pass to their recipients. In part 2, recipients had to guess the

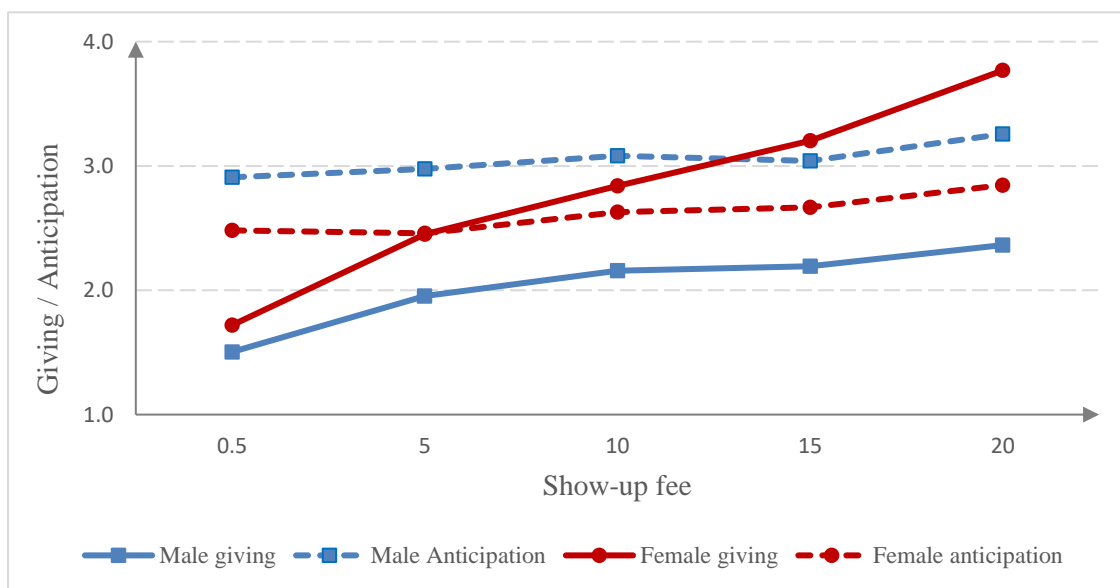
amount they would receive from the dictator. If the absolute difference between the amount given and the guess was within 50 pence the recipient received an extra £1. The instructions for part 2 was given only after the part 1 decisions were made. To avoid any possible strategic interaction between dictator giving and recipient anticipation, instructions stated that the recipient’s decision was payoff irrelevant to the dictator. Subjects also completed a survey of demographic characteristics after the experiment. The instructions are given in Appendix B.

### 3. Results

Descriptive statistics by gender of amount given and amount anticipated for each show-up fee are included in Appendix A. It also shows the number of observation per dictator social-type (according to the giving behavior), and the payoff anticipated by dictator social-type.

Figure 1 presents the effect of the show-up fee on dictator and recipient behavior by gender. Male (female) giving is indicated by the solid line with square points (circular points), and male (female) anticipation is indicated by the dotted line with square points (circular points). It shows that the dictators of both gender increase their giving as the show-up fee increased. The gender specific regressions in Table 1 support this result; the show-up fee coefficients are positive and significant. This reaffirms that income has a positive effect on giving behavior (Chowdhury & Jeon, 2014), and extends that result for both genders. Figure 1 also indicates that the amount anticipated by both female and male recipients is unaffected by the show-up fee. This is supported by Table 1, where the relevant coefficients are insignificant.

**Figure 1. Average amount-given and amount-anticipated by gender**



**Table 1. Tobit regression of amount given and payoff anticipated by gender**

Dependent variable: amount	Giving			Anticipation		
	Total	Male	Female	Total	Male	Female
Intercept	0.855** (0.404)	0.693 (0.502)	1.908*** (0.567)	2.621*** (0.356)	2.665*** (0.460)	2.156*** (0.432)
Show-up Fee	0.079*** (0.028)	0.067* (0.038)	0.100** (0.038)	0.023 (0.023)	0.019 (0.035)	0.028 (0.030)
Female	0.830** (0.390)			-0.404 (0.318)		
Age $\leq$ 21	0.492 (0.403)	1.397** (0.550)	-0.542 (0.552)	0.376 (0.330)	0.357 (0.472)	0.427 (0.469)
Obs.	120	68	52	120	64	56
Pseudo R <sup>2</sup>	0.0304	0.0297	0.0352	0.0085	0.0036	0.0063

Standard errors in parentheses; \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ .

**Result 1.** Amount given by both male and female dictators is positively related to the show-up fee. Amount anticipated by recipients of neither gender is related to the show-up fee.

Figure 1 furthermore indicates that female dictators are more generous than male dictators across show-up fees (Mann-Whitney test  $p$ -value = 0.016). The significant female dummy in Table 1 for total giving supports this result. Male recipients anticipate higher amounts than female recipients, consistent with a general ‘dovish’ nature of female subjects (Eckel & Grossman 2001; Rigdon & Levine, 2018), but the difference is not statistically significant (Mann-Whitney  $p$ -value = 0.174).

**Result 2.** Female dictators give more than male dictators. There is no statistical difference in the amount anticipated by male and female recipients.

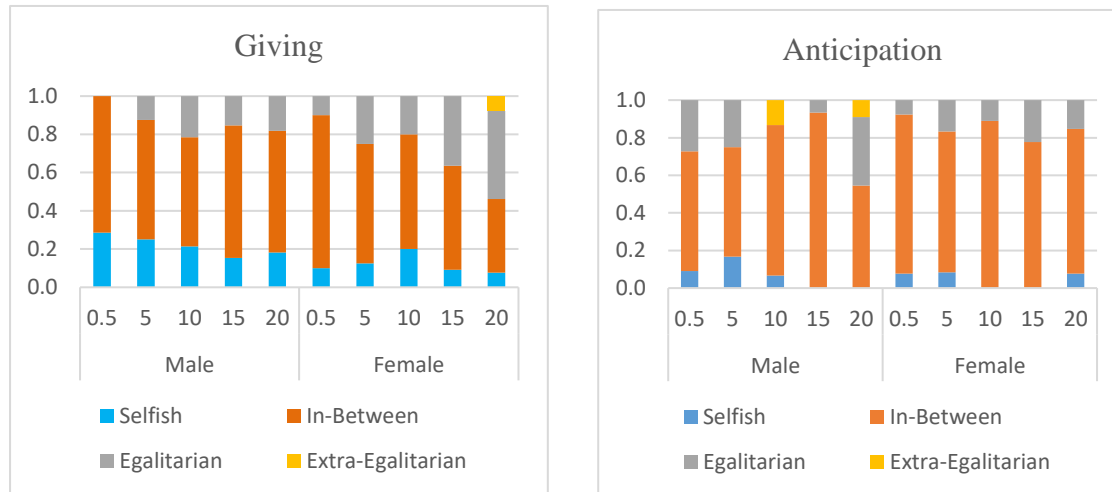
Next, we compare the giving and anticipation behaviors of each gender. Figure 1 shows that male recipients anticipate higher amounts than the actual amounts male dictators give; females do not show such pattern (Mann-Whitney  $p$ -values: Male=0.001; Female=0.393).

**Result 3.** Male recipients anticipate higher amount being given to them compared to the amount the male dictators give. There is no discrepancy between the amount female dictators give and the amount female recipients anticipate.

Finally, we investigate the gender difference in the distribution of the actual and anticipated ‘social-type’ of the dictators. It is well known from dictator game that subjects often behave in terms of a particular social-type and divide the pie accordingly (Andreoni &

Vesterlund, 2001; Chowdhury et al., 2017). We define a dictator as ‘selfish’ if zero is transferred, ‘in-between’ if between zero and £5 (equal share) is transferred, ‘egalitarian’ if £5 is transferred, and ‘extra-egalitarian’ (Bull, 2014) if more than £5 is transferred.<sup>2</sup>

**Figure 2. Distribution of the dictator social-type by gender**



The left panel of Figure 2 shows the distribution of the social-type of the dictators in terms of amount given, separated by gender. Female dictators are more likely to become a more generous social-type as show-up fee rises. With a show-up fee of £0.5, 10% of female dictators are egalitarian; with a show-up fee of £20, this becomes 46%. For male dictators, social-type does not significantly change with the show-up fee. The Giving regressions in Table 2 support this, in which the Show-up fee is significant for regression with only Female data, but not with only Male data. Furthermore, the coefficient for Female\*show-up fee is positive and significant at 1% level, but not for Male\*Show-up fee in the Total regression.<sup>3</sup>

The right panel of Figure 2 shows the recipient anticipation about the dictator social-type. As the show-up fee increases, the male recipients seem to expect the dictators to become more generous. With a show-up fee of £0.5, 27% of male recipients expect the dictator to be egalitarian; with a show-up fee of £20, this becomes 45%, and none expects the dictator to be selfish. For female recipients, anticipated social-type does not change much with the show-up fee. This is reflected in the Anticipation regressions: the coefficient for Male\*show-up fee is positive and weakly significant, but not for Female\*Show-up fee in the Total regression.

<sup>2</sup> We observe such behavior for a few subjects when the show up fee is very high.

<sup>3</sup> One female dictator gave more than half for show-up fee £20. Two male recipients for showup fee £10 and one male recipient for show-up fee £20 also expected more than half. They all are included into the egalitarian category in the regressions. Changing this does not change the qualitative result.



However, a post-estimation test shows that the coefficients for Male\*Show-up Fee and Female\*Show-up Fee are not statistically different (p-value=0.292). Furthermore, when we run the regression for Male and Female separately, the coefficients for Show-up fee are not significant (possibly due to the lack of power, as we discuss later). This gives our next result.

**Table 2. Ordered Probit regressions of amount given and amount anticipated**

Dependent variable: dictator social-type	Giving			Anticipation		
	Total	Male	Female	Total	Male	Female
Show-up Fee		0.033 (0.022)	0.045** (0.023)		0.026 (0.023)	0.014 (0.025)
Male*Show-up Fee	0.020 (0.018)			0.032* (0.019)		
Female*Show-up fee	0.060*** (0.018)			0.012 (0.019)		
Age ≤ 21	0.022 (0.221)	0.339 (0.311)	-0.312 (0.321)	0.034 (0.236)	0.116 (0.306)	-0.106 (0.384)
Obs.	120	68	52	120	64	56
Pseudo R <sup>2</sup>	0.054	0.0259	0.0503	0.0167	0.0146	0.0075

Standard errors in parentheses; \*p<.1, \*\*p<.05, \*\*\*p<.01.

**Result 4.** As show-up fee rises, female dictators are more likely to become a more generous social-type. Male response of the anticipation of social type to show-up fee is positive with marginal significance and the female response is not significantly different from that.

## 4. Discussion

We investigate giving and anticipation-about-giving in a dictator game. We find that while female dictators are more generous than males, male recipients anticipate higher amounts than the amount male dictators give. The show-up fee makes female dictators more generous than males, affects the social-type of female dictators, and the anticipation of male recipients about the dictator social-type. Existing studies find that female dictators give more when the relative price of giving, or the social distance, is lower. In contrast, we find that females give more when the show-up fee is higher, i.e., the marginal value of money is lower. While income and price effects work differently in altruistic decisions, especially across gender, this matches with the general finding that females are more sensitive to context (Croson & Gneezy, 2009).

Male recipients anticipate higher amounts being received compared to what male dictators actually give, but females do not show such a pattern. Overall females are better at introspecting about the amount given to them. This may be explained by the fact that males

have a relatively higher feelings of entitlement (Bylsma & Major, 1992) as well as overconfidence (Barber & Odean, 2001). McBride (2010) shows in an experiment that, *ceteris paribus*, high anticipations result in lower satisfaction. It is also found in the field that an increase in income that is not matched with anticipation may fail to improve utility (Easterlin, 1995). Since the (mis)match of anticipation with reality plays a role in overall wellbeing, one can conjecture from our results that females may actually be better off in terms of subjective wellbeing than their male counterparts.

We need to point out a few limitations of this study, which also provide paths for future research. First, although we find no statistically significant effect of the show-up fee on the anticipatory behavior, the trend is increasing while the standard error (compared to the coefficient of the regression) is relatively small. Therefore, it may be possible that the lack of significance is driven by a lack of statistical power. This warrants further investigations on the relationship between income effect and the anticipatory belief about altruism. Second, to elicit anticipation, a linear incentive function (recipients earn £1 extra if their anticipation is within  $\pm$  £0.5 of actual amount). This implicitly assumes risk neutrality. However, if the subjects are risk averse, then it is more optimal for them to guess £0.5; since it will allow a certain payoff (either the amount transferred, if the guess is wrong, or the prize of the guess, if the guess is right), which is better than a probabilistic payoff. As males are known to be less risk averse than females (see, e.g., Byrnes et al., 1999), it is possible that the anticipation elicitation process results in a higher guesstimate by males. Future investigation with a quadratic incentive function may be further helpful in such a case. Finally, the genders of the subjects were not revealed. An interesting extension could be to control for such information (as in Brañas-Garza et al., 2018) and investigate the related effects.

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## Appendix A: Descriptive statistics

**Table A. Descriptive statistics of amount given**

	Male						Female					
	0.5	5	10	15	20	Total	0.5	5	10	15	20	Total
<b>Amount given</b>												
Mean	1.50	1.95	2.16	2.19	2.36	2.02	1.72	2.45	2.84	3.20	3.77	2.88
Selfish	4	4	3	2	2	15	1	1	2	1	1	6
Between	10	10	8	9	7	44	8	5	6	6	5	30
Egalitarian	0	2	3	2	2	9	1	2	2	4	6	15
Extra Egalitarian	0	0	0	0	0	0	0	0	0	0	1	1
# of Obs.	14	16	14	13	11	68	10	8	10	11	13	52
<b>Amount anticipated</b>												
Mean	2.91	2.98	3.08	3.04	3.26	3.05	2.48	2.46	2.63	2.67	2.85	2.60
Selfish	1	2	1	0	0	4	1	1	0	0	1	3
Between	7	7	12	14	6	46	11	9	8	7	10	45
Egalitarian	3	3	0	1	4	11	1	2	1	2	2	8
Extra Egalitarian	0	0	2	0	1	3	0	0	0	0	0	0
# of Obs.	11	12	15	15	11	64	13	12	9	9	13	56

## APPENDIX B: Instructions

### Instructions for the experiment (Baseline case: £10 of participation fee)

#### General Instruction

This is an experiment in the area of economic decision making. Various research agencies have provided funds for this research. The instructions are simple. If you follow them closely, then depending on your decision and the decision of the others, you can earn an appreciable amount of money. The experiment has two parts. At the end of today's experiment, you will be paid in private and in cash. Your identity and your decisions will also remain private. 16 participants are in today's experiment.

It is very important that you remain silent and do not look at other people's work. If you have any questions, or need assistance of any kind, please raise your hand and an experimenter will come to you. If you talk, laugh, exclaim out loud, etc., you will be asked to leave and you will not be paid. We expect and appreciate your cooperation.

#### Your Decisions

You have already received a £10.00 participation fee. This experiment contains the decision problem that requires you to make economic choices that determine your earnings over and above your participation fee.

At the beginning of the experiment, you will be randomly and anonymously placed into one of 8 groups (groups 1, 2, 3, 4, 5, 6, 7, and 8). Each group consists of 2 types of participants '**Participant A**' and '**Participant B**'. Again you will be randomly assigned either as a '**Participant A**' or a '**Participant B**' in your group. Both the group name and your type will be written in a card given to you at the start of the experiment. Other participants will not know your group number or your type (A or B).

Both '**Participant A**' and '**Participant B**' are paid £10 each as their respective participation fee. Every Participant A will receive an additional amount of £10.

## Part I. Participant A

Participant A will make the decision to allocate this additional £10 between himself / herself and the Participant B in his/her group. Participant A can decide to give any amount in British Pounds, between 0.00 and 10.00 (up to two decimal points), to Participant B. Suppose Participant A gives  $X$  to Participant B. Then Participant A will have the remaining  $Y = £10.00 - X$ . The total earnings of Participant A will be the participation fee plus the share of the additional £10. Hence, earnings of Participant A =  $£10 + Y$ . Earnings of Participant B =  $£10 + X$ . See the following examples for clarification. All the numbers are in British Pounds:

**Example 1.** Suppose Participant A decides to give 7.29 to Participant B. Then the total earnings of Participant B is (participation fee + share of the additional amount) =  $10 + 7.29 = 17.29$ . And the total earnings of the Participant A is =  $10 + (10 - 7.29) = 10 + 2.71 = 12.71$ .

**Example 2.** Suppose Participant A decides to give 3.37 to Participant B. Then the total earnings of Participant B is (participation fee + share of the additional amount) =  $10 + 3.37 = 13.37$ . And the total earnings of the Participant A is =  $10 + (10 - 3.37) = 10 + 6.63 = 16.63$ .

Every participant will get a card at the start of the experiment. **Line 1** of the card indicates your group number. **Line 2** indicates your role in the experiment. **Line 3** shows your participation fee. **Line 4** shows the participation fee of the other participant in your group. **Line 5** shows the additional amount (£10.00) given to Participant A to be allocated between himself/herself and the Participant B in the same group. The next lines are different for Participant A and Participant B.

Participant A's card looks like the one given below. In **Line 6**, Participant A will write a number between £0.00 and £10.00 (up to 2 decimal points) in the blank space. This is the amount given to Participant B. In **Line 7**, Participant A will calculate the amount left for him/her. To calculate this, Participant A will subtract the amount written in line 6 from £10. **Line 8** shows Participant A's total earnings. This will be the participation fee plus the share of the additional £10. Hence, Participant A will **add line 3 and line 7 and write the number in line 8**. Finally, in **line 9**, Participant A calculates the total earnings of Participant B, which is the **sum of line 4 and line 6**.

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| <ol style="list-style-type: none"><li>1. Your group number: <b>8</b></li><li>2. Your role: <b>Participant A</b></li><li>3. Your participation fee: <b>£10</b></li><li>4. Participation fee of Participant B: <b>£10</b></li><li>5. Additional amount to be allocated: <b>£10</b></li><li>6. Amount given to Participant B (between 0.00 and 10.00): <math>X = \underline{\hspace{2cm}}</math></li><li>7. Amount left for you: <math>£10 - X = \underline{\hspace{2cm}}</math></li><li>8. Your total earnings: <b>£10</b> + <math>\underline{\hspace{2cm}}</math> = <math>\underline{\hspace{2cm}}</math></li><li>9. Participant B total earnings: <b>£10</b> + <math>\underline{\hspace{2cm}}</math> = <math>\underline{\hspace{2cm}}</math></li></ol> |
|--|

Here is an **example** that draws numbers from Example 1 in page 2.

1. Your group number: **8**
2. Your role: **Participant A**
3. Your participation fee: **£10**
4. Participation fee of Participant B: **£10**
5. Additional amount to be allocated: **£10**
6. Amount given to Participant B (between 0.00 and 10.00):  $X = £7.29$
7. Amount left for you:  $£10 - X = £2.71$
8. Your total earnings:  $£10 + £2.71 = £12.71$
9. Participant B total earnings:  $£10 + £7.29 = £17.29$

Here is another **example** that draws numbers from Example 2 in page 2.

1. Your group number: **8**
2. Your role: **Participant A**
3. Your participation fee: **£10**
4. Participation fee of Participant B: **£10**
5. Additional amount to be allocated: **£10**
6. Amount given to Participant B (between 0.00 and 10.00):  $X = £3.37$
7. Amount left for you:  $£10 - X = £6.63$
8. Your total earnings:  $£10 + £6.63 = £16.63$
9. Participant B total earnings:  $£10 + £3.37 = £13.37$

Participant A will get 2 minutes to make his/her decision. After making the decision, each Participant A will put his/her card inside the envelope given and seal the envelope.

To summarize, if you are Participant A, make your decision and fill out the card. But if you are Participant B, you do not have to do anything in this part of the experiment. The total earnings of Participant A will be the sum of the participation fee, and the residual amount from the additional £10 (after giving an amount to Participant B), as calculated in **line 8**. Participant A's earnings will not be affected by the decisions of participant B in the next round. This will conclude the first part of the experiment. **Are there any questions?**



## Part II. Participant B

Participant B's card looks like the one given below. **Line 6** indicates participant B's guess about the amount offered to Participant B by Participant A. Line 7 shows the total guessed earnings of Participant B, which is the sum of line 3 and line 6.

1. Your group number: **8**
2. Your role: **Participant B**
3. Your participation fee: **£10**
4. Participation fee of Participant A: **£10**
5. Total amount to be divided: **£10**
6. Your guess about the amount offered to you (between 0.00 and 10.00): \_\_\_\_\_
7. Your guess about your total earnings: **£10** + \_\_\_\_\_ = \_\_\_\_\_

In the previous part of the experiment, Participant A decided to give any amount between £0.00 and £10.00 (up to two decimal points) to Participant B. In this part of the experiment, Participant B will have to guess the amount Participant A has given to him/her. If the guess is close enough to the actual amount given by Participant A, then Participant B will get an extra reward of £1.

Suppose Participant A has given X to Participant B. Participant B guesses that the amount is Z. If the difference between X and Z is less than or equal to 50 Pence, then Participant B will get the £1 reward over and above the participation fee and the amount given by Participant A.

**Example 1.** Suppose Participant A decides to give £7.29 to Participant B. If Participant B rightfully guesses an amount which is in between £6.79 and £7.79, then Participant B will get the reward of £1. This is because  $£7.29 - £0.5 = £6.79$  and  $£7.29 + £0.5 = £7.79$ . If Participant B guesses numbers outside this range, then he/she will not get the reward.

**Example 2.** Suppose Participant A decides to give £3.37 to Participant B. If Participant B rightfully guesses an amount which is in between £2.87 and £3.87, then Participant B will get the reward of £1. This is because  $£3.37 - £0.5 = £2.87$  and  $£3.37 + £0.5 = £3.87$ . If Participant B guesses numbers outside this range, then he/she will not get the reward.

Participant B will write the guess in **Line 6**. He/she will also need to write the total earnings in **line 7**. This will be the **sum of line 3 and line 6**. Participant B will get 2 minutes to make his/her decision. After making the decision, each Participant B will put his/her card inside the envelope given and seal the envelope. The total earnings of Participant B will be the sum of the participation fee, amount given to him/her by Participant A, and the £1 reward (if won). This will conclude the second part of the experiment. **Are there any questions?**