

# Eye-image in Experiments: Social Cue or Experimenter Demand Effect?<sup>\*</sup>

Subhasish M. Chowdhury,<sup>a</sup> Joo Young Jeon,<sup>a</sup> and Bibhas Saha<sup>b</sup>

<sup>a</sup> School of Economics, Centre for Behavioural and Experimental Social Science, and Centre for Competition Policy, University of East Anglia, Norwich NR4 7TJ, UK

<sup>b</sup> Economics in the Business School, Durham University, Durham DH1 3LE, UK

*November 18, 2014*

## **Abstract**

Across the fields of neuroscience, economics and psychology, experimenters have observed that the presence of an image of a pair of eyes may result in higher level of altruistic behavior by subjects. Hence, it is asserted that the eye-image serves as a ‘social cue’. We test this against an alternative hypothesis that the higher level of altruism may occur since the eye-image triggers an experimenter demand effect in the same direction with the perceived altruism. We run a ‘Taking game’ with and without an eye-image in which the recipient holds an endowment from which a dictator can take any amount. In such a case the social cue and the experimenter demand effect go in opposite directions. We find no overall difference in the amount taken in those treatments. However, males take significantly less and females take insignificantly more under the treatment with eye-image. We conclude that the presence of eyes may act as both a social cue and trigger experimental demand effects, with the net effect depending upon the relative magnitude and the direction of the two. For males, the social cue effect is more prominent.

**Keywords:** Dictator-game; Taking-game, Eye-image; Gender; Social Cue; Experimenter Demand Effect

---

<sup>\*</sup> Corresponding author: Subhasish M. Chowdhury ([s.modak-chowdhury@uea.ac.uk](mailto:s.modak-chowdhury@uea.ac.uk)).

We thank Melissa Bateson, Michael Brock, Rachel Croson, Daniel Zizzo, the seminar participants at the University of Amsterdam, University of East Anglia, University of Essex, and the Korea Institute of Industrial Economics and Trade for useful comments, and Zoë Bett for excellent research assistance. Any remaining errors are our own.

## 1. Introduction

A fundamental question explored in neuroscience, economics and psychology asks ‘why do people behave pro-socially?’ Researchers have suggested various explanations. These include social preference theories such as pure and impure altruism, reciprocity, inequality aversion etc. (Andreoni, 1989; Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Charness and Rabin, 2002), economic effects such as property rights, income, price of giving etc. (Ruffle, 2000; Chowdhury and Jeon, 2014; Andreoni and Vesterlund, 2001), demographic effects such as gender, age, race, etc. (Eckel & Grossman, 1998; Croson and Gneezy, 2003), and social control effects such as social distance, information, and social cues (Burnham, 2003; Leider et al., 2009; Alevy et al., 2014).<sup>1</sup> A recent stream of literature has shown that one of the interesting components to guide pro-social behavior is that of a social cue (Rigdon et al., 2009). A social cue (SC) is a verbal or visual hint that guides conversation, transaction and other social interactions. SCs can be of various kinds, but visual cues are the most prolific type that are employed in laboratory and field experiments investigating social preferences. It is argued that introducing an image of a pair of eyes in the experimental environment is one such example of a visual SC.

It has been found in biology, psychology and economics experiments that presence of such eye-image in an experimental environment often increases the level of pro-social behavior. Examples of such pro-social behavior include making proper payment for something bought (Bateson et al., 2006), changing the amount given in a dictator game (Haley and Fessler, 2005), raising contribution levels in a public good game (Burnham and Hare, 2007), increasing donations made for a local library (Croson and Krupka, 2008), lowering theft (Nettle et al., 2012), keeping an area cleaner (Ernest-Jones et al., 2011) etc. A weaker version of the eye-image, such as three dots, in a dictator game causes a similar outcome on giving behavior (Rigdon et al., 2009). The effect of the eye-image, however, is not symmetric across games and agents. Ernest-Jones et al. (2011) and Ekstrom (2012) find that an eye-image has a greater effect when there are fewer people around. Rigdon et al. (2009) find that male subjects are affected more by the image than females. There are some studies, such as ones run by Fehr and

---

<sup>1</sup> See Engel (2011) for a meta-analysis and discussions about each of these issues in detail.

Schneider (2010), Carbon and Hesslinger (2011) and Raihani and Bshary (2012), which cannot find significant effects of introducing an eye-image. They argue that this might only promote cooperative behavior in relatively public settings, and that the existing results might be caused by uncontrolled implicit SCs. Sparks and Barclay (2013), however, find a robust positive effect of eye-image on pro-social behavior in their meta-analysis of 25 studies. Hence, the majority of the related area of literature considers the eye-image to constitute a ‘social cue’, i.e., a signal that cues the subjects to be pro-social.

We observe that almost all the existing analyses on the effects of eye-image employ a ‘positive frame’ in the sense that as in a dictator game, the subjects can choose between being pro-social or not. It is argued that several settings such as a dictator game or a public good game may be prone to an experimenter demand effect. Experimenter demand effect (EDE) is defined by Zizzo (2010) as the “*changes in behavior by experimental subjects due to cues about what constitutes appropriate behavior (behavior ‘demanded’ from them)*”. Zizzo (2010) further notes that EDE can be “*a potential problem only when they are positively correlated with the true experimental objectives’ predictions*”. If the employment of eye-image in a standard dictator game triggers the subjects about ‘the behavior demanded from them’ in the game, i.e., to give *more*; and that behavior is inseparable from the effects of a pro-social behavior due to SC, these experiments cannot disentangle the effects of EDE from that of SC.

Ekstrom (2012) addresses this by employing a field setting, arguing that since “*subjects are unaware of participating in an experiment, demand effects are unlikely*”. Yet the issue of the cue instilling ‘appropriate behavior’ in a social encounter persists in the field experiments. Lowenstein (1999), for instance, recognizes that “*in social encounters, including laboratory experiments, most are engaged in a constant search for cues about how they are supposed to behave*”. Hence, even if one is not aware about the fact that the social encounter is an experiment, the eye-image may still trigger cues that are similar to the EDE. And for a positive frame this trigger will make the effect of the SC indistinguishable from the EDE. In this study we aim to overcome this issue by implementing a ‘negative frame’, in which the effects of the SC and the possible EDE are opposite. In particular, we use a specific version of the dictator game – the ‘taking game’.

In a standard dictator game a *dictator* has some money and decides upon how much of that money to give to a *recipient*. The recipient has to accept the dictator's decision. We call this a 'giving' game. This game is introduced by Forsythe et al. (1994) and it is well known that a significant number of subjects as dictators give a non-trivial amount of money to the recipient (Kahneman et al., 1986; Forsythe et al., 1994; Camerer, 2003; Engel, 2011). In a 'taking' game, however, the recipient starts with some money and the dictator decides upon how much to take from the recipient. Again, the recipient has to accept the dictator's decision. Suvoy (2003) is the first to introduce the game and allows dictators to make separate decisions under a 'give' and a 'take' frame.<sup>2</sup> Variations of this frame are implemented by List (2007), Bardsley (2008), Dreber et al. (2012), Korenok et al. (2013), Chowdhury et al. (2014) among others. List (2007) and Bardsley (2008) allow dictators not only to give, but also to take from a recipient's endowment. They show that this causes a reverse-generosity effect whose results cannot be explained through previous social preference theories. The other studies conclude that when only one option (giving or taking) is available, then giving is equivalent to not taking.

We note that if the eye-image indeed acts as a SC, then introducing the image in a taking frame should provide the dictator with cues to take *less* from the recipient, as that would be the pro-social behavior. However, if the eye-image triggers an EDE, then the image should provide cues about the behavior demanded in a taking frame through the control variable, i.e., to take *more*. Unlike other games that have a positive frame, in this game two possible effects act in opposite directions. This frame should then allow us to investigate whether the existing results are obtained due to SC or due to EDE.

We implement the taking game in two treatments with and without eye-image.<sup>3</sup> As it is found that the image may have asymmetric effect across gender (Rigdon et al., 2009), we keep a gender balance among subjects in each treatment. Hence, we make a two-fold contribution. First, we run the first laboratory experiment with eye-image in a negative frame and control for gender effects. Second, we for the first time investigate the issue of EDE vs. SC effects, and use a controlled setting to test the same.

---

<sup>2</sup> Note, however, that a negative frame was implemented earlier in a public good game by Andreoni (1995).

<sup>3</sup> Since the possible effect of a positive frame is already explored multiple times, we do not replicate a positive frame again and concentrate on our specific question of separating SC and EDE.

We do not find any overall significant effects of the eye-image on the amount taken by the dictator. However, we do find an effect on gender. Supporting Rigdon et al. (2009), we find that eye-image makes male dictators more pro-social by becoming less selfish and more egalitarian. The effect of the eye-image on the female dictators, although apparently in the direction of the EDE, is not significant. We conclude that, at least for males, the net effect of the eye-image is that it can act as a social cue.

## 2. A Theoretical Framework

In any standard social preference model, the utility of a dictator is assumed to depend upon one's own payoff, the payoff of the recipient, and sometimes the amount transferred that again contributes to the payoff of the dictator and the recipient. Hence, an implicit utility function for dictator  $i$ , when eye-image may be available, can be written as -

$$u_i = u_i(x_i, x_j; SC_i(I_E), EDE_i(I_E)) \quad (1)$$

Where  $x_i$  is dictator payoff,  $x_j$  is the recipient payoff.  $I_E$  is an indicator variable that takes value 1 when the eye-image is included.  $SC_i(I_E)$  is a subject-specific SC effect and  $EDE_i(I_E)$  is a subject specific EDE trigger with  $|SC_i(1)| \geq |SC_i(0)|$ ,  $|EDE_i(1)| \geq |EDE_i(0)|$ . For expositional purposes, we assume  $SC_i(0) = EDE_i(0) = 0$ . If the total amount to be allocated is  $F$ , then by construction  $x_i + x_j = F$ .

For the standard dictator game, the control variable for the dictator is the amount given ( $x_j$ ) and the utility function is written as:

$$u_i = u_i(F - x_j, x_j; SC_i(I_E), EDE_i(I_E)) \quad (2)$$

For the taking game the control variable for the dictator is the amount taken ( $x_i$ ) and the utility function is written as:

$$u_i = u_i(x_i, F - x_i; SC_i(I_E), EDE_i(I_E)) \quad (3)$$

When  $SC_i(I_E)$  takes high value, it provides a social cue to the dictator and a higher weight to the payoff of the recipient, denoted through  $x_j$  for the dictator game and  $F - x_i$  for the taking game. But the effect of  $EDE_i(I_E)$  is different. An EDE makes the dictator follow the 'behavior demanded in the frame'. This would involve applying a higher weight to the control variable,  $x_j$  in the dictator game but to  $x_i$  in the taking game.

Hence, the effects of  $SC_i(I_E)$  and  $EDE_i(I_E)$ , when the eye-image is visible, go in the same direction (higher weight for  $x_j$ ) for the standard dictator game. If either effect is strictly positive, then the dictator will give more to the recipient when the eye-image is visible. It is not possible to disentangle the two effects in this frame.

However, the effects of  $SC_i(I_E)$  and  $EDE_i(I_E)$  when eye-image is visible will go in opposite directions (higher weight for  $x_j$  due to the SC, and higher weight for  $(F - x_j)$  due to the EDE) for the taking game. If the eye-image has only an SC effect, then the amount taken decreases with certainty. But, if it triggers only an EDE, then the amount taken instead increases with certainty. If both effects coexist, then the relative strength of the two effects determines whether a dictator will take more, less or the same amount in the treatment with eye-image compared to the control treatment.

As the function in (3) is individual specific, the effects can also be heterogeneous. Furthermore, given the existing studies, one may expect the SC effect to be stronger for the males (Rigdon et al., 2009) and the effect of EDE to be stronger for the females (Croson and Gneezy, 2003). But whether that is actually the case is an empirical question.

### 3. Experimental Design and Procedure

We employed a computerized one-shot Taking Game with 2 treatments. In the treatment with eyes (the ‘Eye’ treatment), the computer screen and the paper instructions had a rectangle with a pair of eyes imprinted on it, whereas in the ‘Baseline’ treatment there was a grey colored rectangle of the same size instead of the eye picture.

There were 160 subjects spread across 8 sessions. Only one treatment was run in a particular session. In each session, subjects sat in cubicles and were randomly and anonymously placed into pairs with roles as either a ‘Dictator’ or a ‘Recipient’.<sup>4</sup> Hence, there were total 80 dictators, 40 being in each treatment. Furthermore, we ensured a gender balance, i.e., there were 20 male dictators and 20 female dictators; and 20 male recipients and 20 female recipients in each treatment. However, the dictator or the recipient did not know any information, including the gender, about their partner. Each

---

<sup>4</sup> The subjects were not aware about the tags and they were only referred as ‘you’ and ‘the person you are paired with’. A better terminology for this game could have been ‘Taker’ and ‘Owner’. But, following the literature, we continue to refer them as ‘Dictator’ and ‘Recipient’.

subject received a £3 show-up fee, but the recipients were endowed with an additional £10. The dictators then could take any amount between £0 and £10 from the recipient, and the recipients were left with the residual amount. All of this was common knowledge.

Each session consisted of two parts. In the first part, dictators were informed that they can take any amount, in denominations of 1 penny, from the £10 which the recipient held and the recipients would have to accept this decision. In the second part, recipients had to guess the amount the dictator had taken. If the absolute difference between the actual amount taken and the guess was within 50 pence, then the recipient received an extra £1.<sup>5</sup> The instructions for the second part was given only after the decisions in the first part were made. It was mentioned in the first part that the recipient's decision was payoff irrelevant to the dictator. This was done to avoid any possible strategic interaction between dictator giving and recipient anticipation. However, we do not find any treatment or gender effect in the guesses and hence it is not discussed in the continuation.

The experiment was computerized with z-TREE (Fischbacher, 2007). Each subject could participate in only one session. The subjects were students at the University of East Anglia without any prior experience with giving / taking / social cue experiments, and were recruited through the online recruitment system ORSEE (Greiner, 2004). The sessions were run by a research assistant who read the instructions and answered any questions in private. Each session took around 30 minutes and the average payment was about £8. The instructions are available in the Appendix.

## **4. Results**

We start by comparing the amount taken in Table 1 that reports the descriptive statistics by treatment and by gender. Hardly any treatment effect appears in the overall amount taken: in the Baseline on average £7.77 is taken and under Eye-image this only falls to £7.47. Decomposing these by gender, however, reveals larger differences. It seems that the presence of an eye-image the amount taken decreases for males (from £8.80 to £7.48), but increases for females (from £6.74 to £7.48). Hence, it may be suggested that the eye-image has a net SC effect on males but a net EDE effect on females.

---

<sup>5</sup> This linear incentive mechanism for guess is similar to the ones in Brañas-Garza and Rodriguez-Lara (2014) or Chowdhury and Jeon (2013) who apply it for standard dictator games.

**Table 1.** Average amount (Std. Dev) taken in GBP

Data	Baseline	Eye
All	7.773 (2.156)	7.477 (2.348)
Male	8.805 (1.70)	7.475 (2.370)
Female	6.740 (2.097)	7.480 (2.389)

To test whether the results stated above are statistically significant, we run six OLS regressions. Table 2 reports the results of OLS regressions in which the dependent variable is the amount taken and the independent variables are treatment and gender dummies, their interaction, and age. The first and the fourth columns report results for the whole dataset, the second and the third columns report the results by gender, whereas the last two columns report the results by treatment.

**Table 2. Regression of amount taken on treatment and controls**

Dep var: amount taken	Total	Female	Male	Total	Baseline	Eye
Intercept	9.064*** (0.988)	7.086*** (1.175)	10.739*** (1.790)	9.499*** (0.988)	9.952*** (1.025)	7.307*** (1.682)
Eye	-0.335 (0.496)	0.715 (0.723)	-1.386** (0.652)			
Female	-1.026** (0.494)				-2.032*** (0.601)	0.007 (0.763)
Male with Eye				-1.350* (0.684)		
Female without Eye				-2.045*** (0.684)		
Female with Eye				-1.357* (0.685)		
Age	-0.032 (0.036)	-0.014 (0.042)	-0.080 (0.071)	-0.029 (0.036)	-0.047 (0.038)	0.007 (0.068)



# of Obs.	80	40	40	80	40	40
Adjusted R <sup>2</sup>	0.030	-0.022	0.081	0.072	0.226	-0.054

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

The first three columns of Table 2 reiterate the results from Table 1. Overall and for females the Eye-image does not have any treatment effect, yet this effect is negative and significant for males (p-value = 0.033).<sup>6</sup> We further explore the effects of gender in the next three columns. It shows that females take less than males in the Baseline treatment. But that is not the case when there is an eye-image. This happens, as we have noted earlier, due to an increase in the amount taken by females and a decrease in the amount taken by males with the eye-image present. These are also reflected in the coefficients of the first two interaction variables (i.e., Male with Eye and Female with Eye in the fourth column), which are negative and significant.<sup>7</sup> Hence, it seems that including an eye-image has an SC effect for males; but no overall effect for females.

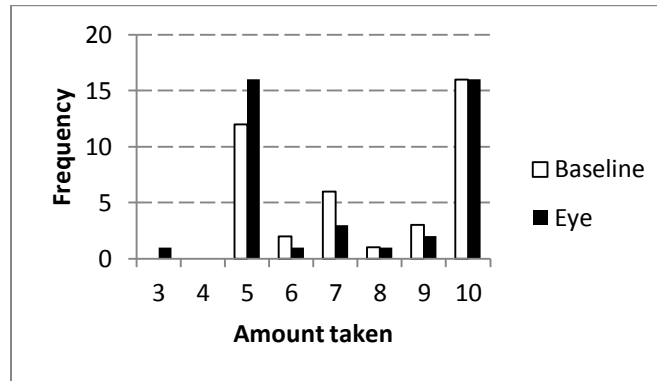
Our result matches qualitatively with that of Rigdon et al. (2009), who find SC effects for males but not for females. Their significance level, however, was stronger. This may be due to two reasons. Firstly, both the SC and EDE effects might be prevalent for both male and females. Since both the effects work in the same direction in Rigdon et al. (2009), they find a stronger effect of the eye-image; but the effects are in the opposite direction in this study, causing us to find a weaker effect. Secondly, their experiment was run manually as opposed to ours, which was computer-based. This lower level of social contact may have an effect on the level of pro-social behavior and thus decrease the effect of the eye-image.

Since these results confirm a difference in the effects of the eye-image across gender, we investigate this issue further by classifying the dictators in terms of taking behavior. Figure 1 reports the amount taken distribution for all the subjects separated by treatments. The X-axis is the amount taken by a dictator, and the Y-axis shows the number of dictators.

<sup>6</sup> We also ran Mann-Whitney tests and found no difference for the total and the female data. But the amount taken by the male subjects in the two treatments turn out to be different at 10% significance level.

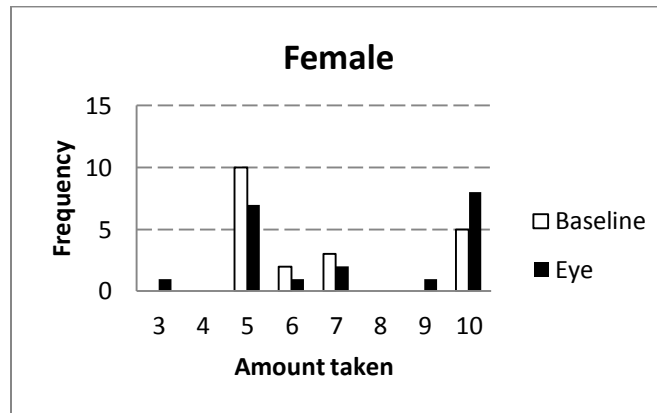
<sup>7</sup> The baseline for the fourth regression is males with eye-image. Also, a Wald-test shows that coefficients of Female with Eye and Male with Eye are not statistically different.

**Figure 1.** Distribution of amount taken: Overall data

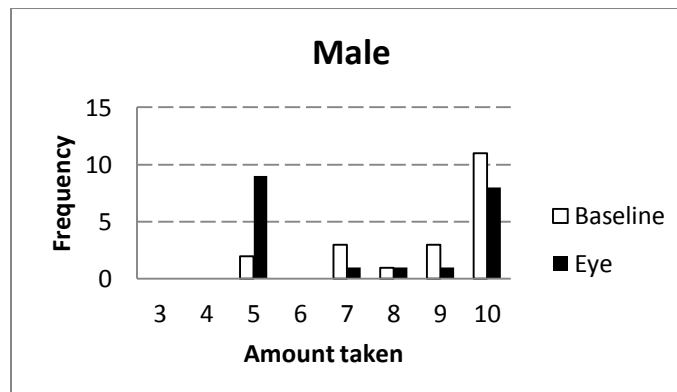


Amount taken follows a bimodal distribution with most of the dictators being ‘selfish’ (taking the entire amount, i.e., £10), or ‘egalitarian’ (taking half or almost half of the amount, ~£5). This matches with observations from a standard dictator game (Engel, 2011). However, there is not much difference in the distribution by treatment. We then plot the same figure for males and for females separately in Figure 2 and Figure 3.

**Figure 2.** Distribution of amount taken: Female



**Figure 3.** Distribution of amount taken: Male



Figures 2 and 3 demonstrate that whilst the overall bimodal feature persists, the treatment effect is different between genders. When the eye-image is not present, the majority of the female dictators act like egalitarians, but a large proportion turn selfish when the eye-image is introduced. The result, surprisingly, is exactly the opposite and even more extreme for males. This reiterates the idea that the effects of eye-image as SC might be stronger for males whereas an eye-image becoming a trigger to EDE might be stronger for females.

We test this by running three ordered probit models. Here the dependent variable is whether the dictator is selfish, or egalitarian, or in between (i.e., the dictator has taken £10, or ~£5 or in between).<sup>8</sup> The independent variables consist of the treatment dummy and age. We run this for the whole data and by gender. The regression results are reported in Table 3 whereas the marginal effects are included in Table 4.

**Table 3.** Ordered probit results.

All:	$\text{Category}_i = -0.156 \text{ Eye}_i - 0.337 \text{ Female}_i - 0.021 \text{ Age}_i$ <p>(0.259) (0.258) (0.020)</p> <p>No. of obs. = 79. Pseudo R-Sq = 0.018</p>
Female:	$\text{Category}_i = 0.400 \text{ Eye}_i - 0.009 \text{ Age}_i$ <p>(0.367) (0.023)</p> <p>No. of obs. = 39. Pseudo R-Sq = 0.017</p>
Male:	$\text{Category}_i = -0.770^{**} \text{ Eye}_i - 0.061 \text{ Age}_i$ <p>(0.381) (0.042)</p> <p>No. of obs. = 40. Pseudo R-Sq = 0.065</p>

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

The coefficient of the treatment dummy in Table 3 is significant for only males and therefore yields no effects for either females or for the total data. Hence, this reaffirms the existing result that there is no significant effect of including an eye-image overall or on females; but that this does significantly affect the decision-making of males. Table 3, however, extends this result in terms of the social type of the dictators.

<sup>8</sup> We consider three subjects taking £5.5, £5.5, £5.8 as egalitarians. Also one subject who took less than £5 is excluded here. Variations of these do not change the qualitative (signs and significance levels) results.

**Table 4.** Marginal effects of ordered probit regressions

Dep var: Ordered categories		Egalitarian	Mixed	Selfish
All	Eye	0.055 (0.091)	0.004 (0.008)	-0.059 (0.097)
	Female	0.119 (0.089)	0.009 (0.013)	-0.128 (0.095)
	Age	0.007 (0.007)	0.001 (0.001)	-0.008 (0.008)
	# of Obs.	79	79	79
Female	Eye	-0.149 (0.132)	0.007 (0.020)	0.142 (0.126)
	Age	0.004 (0.009)	-0.000 (0.000)	-0.003 (0.008)
	# of Obs.	39	39	39
Male	Eye	0.235** (0.107)	0.043 (0.032)	-0.277** (0.118)
	Age	0.019 (0.012)	0.003 (0.003)	-0.022 (0.014)
	# of Obs.	40	40	40

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

Table 4 shows again that the treatment dummy is significant only for males. Furthermore, it has a negative and significant coefficient for the “selfish” category and a positive and significant coefficient for the “egalitarian” category. Hence, when the eye-image is available, males move from being the ‘selfish’ type, towards being an ‘egalitarian’ type. Both are statistically significant at a 5% level. Although just the opposite movement is observed for females (the treatment dummy has a negative coefficient for the egalitarian category and a positive coefficient for the selfish category), it is not significant at a conventional level.

## 5. Discussion

Existing studies implement positive frames to investigate the effects of eye-images in altruistic behavior and conclude a social cue effect. We, for the first time in the literature, study the effects of eye-image on social-preference in a negative frame. We hypothesize that if the dictators take less in a taking game under the presence of an eye-image, it may be concluded that the net effect of the eye-image is a social cue effect. But if they take more, then the net effect may be interpreted as a trigger to an experimenter demand effect. Since the existing literature found asymmetric effects across gender, we balance the gender of dictators in our experiment.

Overall, we find no significant effect of the eye-image on the amount taken by dictators. This indifference, however, does not extend across gender, with males taking significantly less and females insignificantly more when an eye-image is included. Furthermore, this decrease in the amount taken by males comes from an increase in egalitarian behavior and a decrease in selfish behavior when the eye-image is employed. We conclude that for males, the net effect of the eye-image definitely acts as a social cue. However, for females the net effect of the eye-image is either diluted or that it has no bearing on their decisions at all.

These aggregate results match those of Rigdon et al. (2009), but contradict those of Alevy et al. (2014). The latter find males to be unaffected yet females to take less when their decisions are being observed by others in a frame where giving and taking are simultaneously possible. This raises the importance of further analysis on the effects of strategy space in dictator type games, as suggested in Bardsley (2008) and List (2007). Our study also suggests the need for further research in this area. In particular, applying this framework to other relevant games and in the field would test the robustness of these results.

## References

- Alevy, J. E., Jeffries, F. L., & Lu, Y. (2014). Gender-and frame-specific audience effects in dictator games. *Economics Letters*, 122(1), 50-54.
- Andreoni, J. (1989). "Giving with impure altruism: applications to charity and Ricardian equivalence." *Journal of Political Economy* 97 (6): 1447–1458.
- Andreoni, J. (1995). Warm-glow versus cold-prickle: the effects of positive and negative framing on cooperation in experiments. *The Quarterly Journal of Economics*, 1-21.
- Andreoni, J., & Vesterlund, L. (2001). "Which Is The Fair Sex? Gender Differences in Altruism," *Quarterly Journal of Economics* 116: 293-312.
- Bardsley, N. (2008). Dictator game giving: Altruism or artefact? *Experimental Economics*, 11(2), 122-133.
- Bateson, M., Nettle, D., & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology Letters*, 2(3), 412.
- Bolton, G., & Ockenfels, A. (2000). "ERC—A theory of equity, reciprocity and competition." *American Economic Review* 90: 166–193.
- Brañas-Garza, P., & Rodriguez-Lara, I. (2014). "What Do We Expect of Others?" MPRA Working Paper No. 53760.
- Burnham, T. C. (2003). Engineering altruism: A theoretical and experimental investigation of anonymity and gift giving. *Journal of Economic Behavior and Organization*, 50(1), 133-144.
- Burnham, T. C., & Hare, B. (2007). Engineering human cooperation. *Human Nature*, 18(2), 88-108.
- Camerer, C. (2003). "Behavioral game theory: Experiments in strategic interaction." Princeton University Press.
- Carbon, C., & Hesslinger, V.M. (2011). Bateson et al.'s (2006) Cues-of-being-watched paradigm revisited. *Swiss Journal of Psychology*, 70(4), 203-210
- Chowdhury, S.M., & Jeon, J. (2013). Altruism, Anticipation, and Gender, UEA Centre for Behavioural and Experimental Social Science Working Paper, #13-06.
- Chowdhury, S.M., & Jeon, J. (2014). Impure Altruism or Inequality Aversion?: An Experimental Investigation Based on Income Effects, *Journal of Public Economics*, 118, 143-150.
- Chowdhury, S.M., Jeon, J. & Saha, B. (2014). Giving, Taking, and Gender in Dictator Games. Mimeo.
- Croson, R., & Gneezy, U. (2009). "Gender differences in preferences." *Journal of Economic Literature* 47: 448-474.
- Dreber, A., Ellingsen, T., Johannesson, M., & Rand, D. G. (2013). Do people care about social context? Framing effects in dictator games. *Experimental Economics*, 16(3), 349-371.
- Eckel, C.C., & Grossman, P.J. (1998). "Are Women Less Selfish than Men? Evidence from Dictator Experiments," *Economic Journal* 108: 726-735.
- Ekstrom, M (2012). Do watching eyes affect charitable giving? Evidence from a field experiment. *Experimental Economics*, 15(3), 530-546

- Engel, C (2011). "Dictator games: a meta study." *Experimental Economics* 14: 583-610.
- Ernest-Jones, M., Nettle D. & Bateson B. (2011) Effects of eye-image on everyday cooperative behavior: a field experiment. *Evolution & Human Behavior*, 32, 172–178.
- Fehr, E., & Schmidt, K. (1999). "A theory of fairness, competition, and cooperation." *Quarterly Journal of Economics* 114: 817–868.
- Fehr, E., & Schneider, F. (2010). Eyes are on us, but nobody cares: are eye cues relevant for strong reciprocity? *Proceedings of the Royal Society B: Biological Sciences*, 277, 1315–1323.
- Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments, *Experimental Economics*, 10 (2), 171-178.
- Forsythe, R., Horowitz, J., Savin, N., & Sefton, M. (1994). "Fairness in Simple Bargaining Experiments," *Games and Economic Behavior* 6: 347-369.
- Greiner, B. (2004). "The Online Recruitment System ORSEE – A Guide for the Organization of Experiments in Economics," In K. Kremer and V. Macho (eds) *Forschung und wissenschaftliches Rechnen*, Goettingen. 79-93.
- Haley, K. J., & Fessler, D. M. T. (2005). Nobody's watching? Subtle cues affect generosity in an anonymous economic game. *Evolution and Human Behavior*, 26(3), 245-256.
- Kahneman, D., Knetsch, J., & Thaler, R. (1986). "Fairness as a constraint on profit seeking: entitlements in the market." *American Economic Review* 76: 728–741.
- Korenok, O., Millner, E. L., & Razzolini, L. (2013). Taking, giving, and impure altruism in dictator games. *Experimental Economics*, 1-13.
- Krupka, E., & Croson, R. (2009). Somebody's watching: The differential impact of observation on cooperation in a field setting. UT Dallas Working Paper.
- List, J. A. (2007). On the interpretation of giving in dictator games. *Journal of Political Economy*, 115(3), 482-493.
- Loewenstein, G. (1999). Experimental Economics from the Vantage-Point of Behavioural Economics. *Economic Journal*, 109, 25–34.
- Nettle, D., Nott, K., & Bateson, M. (2012). 'Cycle Thieves, We Are Watching You': Impact of a Simple Signage Intervention against Bicycle Theft. *PLoS One*, 7(12), 1-5.
- Raihani, N. J., & Bshary, R. (2012). A positive effect of flowers rather than eye-image in a large-scale, cross-cultural dictator game. *Proceedings of the Royal Society B: Biological Sciences*, <http://dx.doi.org/10.1098/rspb.2012.0758>.
- Rigdon, M., Ishii, K., Watabe, M., & Kitayama, S. (2009). Minimal social cues in the dictator game. *Journal of Economic Psychology*, 30(3), 358-367.
- Ruffle, B. J. (1998). "More Is Better, But Fair Is Fair: Tipping in Dictator and Ultimatum Games." *Games and Economic Behavior* 23: 247-265.
- Sparks, A., & Barclay, P. (2013). Eye-image increase generosity, but not for long: the limited effect of a false cue. *Evolution and Human Behavior*, Forthcoming
- Zizzo, D. J. (2010) Experimenter demand effects in economic experiments. *Experimental Economics*, 13(1), 75–98.

## Appendix: Instructions

### 1. Baseline instruction for Dictator



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. Eye-image instruction for Dictator



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.