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Eye-image as nonverbal social cue has asymmetric gender effects in dictator taking games

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ABSTRACT

Dictator giving games often demonstrate that nonverbal social cues, such as drawn-in eyes on display, induce pro-social behavior in the form of giving more. Notably, sometimes this effect is seen to differ between males and females. However, the effects of social cues on negative behavior along with its gender dimension have not been studied in a controlled setting. We investigate this with a dictator taking game with and without an eye-image involving a gender balanced subject pool. We find that the eye-image affects the taking behavior of the males and females very differently. Males take significantly *less,* and females take significantly *more* in the presence of the eye-image, compared to a baseline. The two groups' opposing effects cancel each other to produce no overall treatment effect. Furthermore, while with the eye-image males are less likely to act selfishly (i.e., to take the whole amount) and more likely to act as an egalitarian, the females exhibit the opposite behavior. We discuss possible reasons for this asymmetric gender effects.

1. Introduction

There is a broad and active area of research in behavioral economics investigating pro-social behavior. Determinants of such pro-social or other-regarding behaviors include social preferences such as pure and impure altruism, inequality aversion, reciprocity (Andreoni, 1989; Fehr & Schmidt, 1999; Bolton & Ockenfels, 2000; Charness & Rabin, 2002), economic factors such as property rights, price of giving, income (Ruffle, 1998; Andreoni & Vesterlund, 2001; Chowdhury & Jeon, 2014), demographic components such as gender, age, identity (Eckel & Grossman, 1998; Croson and Gneezy, 2009; Ben-Ner et al., 2009), and social components such as information, social network, social cues (Burnham, 2003; Leider et al., 2009; Rigdon et al., 2009).

Amidst the plethora of findings of the above studies, one interesting phenomenon observed also in ethology and psychology is that social cues enhance pro-social behaviors. A social cue is a verbal or non-verbal hint that guides conversation, transaction, or social interactions. Social cues can be of various types, but nonverbal visual cues, such as an image of a pair of eyes, are most frequently employed in experiments on social preferences (e.g., Bateson et al., 2006; Haley and Fessler, 2005). A steady stream of research has found that the eye-image as a nonverbal social cue often increases pro-social behavior. Examples of such pro-social behavior include making appropriate payments for a purchase (Bateson et al., 2006), amount given in a dictator game (Haley & Fessler, 2005), contributing to a public good game (Burnham & Hare, 2007), donations made for a local library (Krupka & Croson, 2016) etc. A minimalist version of the eye-image, three dots, is also found to increase giving behavior in dictator games (Rigdon et al., 2009).

The effect of the eye-image or being observed, however, is not always symmetric. Ernest-Jones et al. (2011) and Ekstrom (2012) find that an eye-image has a greater effect when there are fewer people around. Andersson et al. (2020) find decision revelation while being observed has effect on cooperative but not pro-social behavior. Many other studies (such as Fehr & Schneider, 2010; Carbon & Hesslinger, 2011; Raihani &

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Bshary, 2012; Manesi & Pollet, 2017) do not find any significant effects of the eye-image; neither do the meta-analyses by Nettle et al. (2013) and Northover et al. (2017). These studies argue that an eye-image might only promote pro-social behavior in relatively public settings, and the existing results might have been influenced by uncontrolled implicit cues, or by bystander effects.

Researchers have also investigated whether such nonverbal social cues can be employed to reduce negative or anti-social behavior. Indeed, several studies found that eye-images are effective in reducing littering (Ernest-Jones et al., 2011), lowering theft (Nettle et al., 2012), curbing fare evasion (Ayal et al., 2021) etc. In a meta-analysis, Dear et al. (2019) find highly significant effects of eye-image in reducing anti-social behaviors.

While these findings have policy implications for inexpensive ways of controlling negative behaviors, one needs to keep in mind that these results have been obtained from field experiments that suffer from imperfect control of the environment. Experiments in a properly controlled setting are a must for a broader understanding of the above effect. No laboratory experiment on negative behavior is run to investigate the effects of easy to implement social cues such as the eye-image. In this study we run a dictator game in a negative frame with social cue to fill in this gap.

Since its introduction by Forsythe et al. (1994) the dictator game has become a template for studying social preference, and various studies have shown that dictators on average give a non-trivial sum of money to the recipients (Forsythe et al., 1994; Engel, 2011). In literature, the dictator game is implemented in three frames: (1) the pure giving frame – the standard dictator game in which the dictator can only give, but not take. In this case the decision space consists of only to 'give' a positive amount; (2) the pure taking frame – the one we use (or used by Suvoy, 2003; Dreber et al., 2013; Grossman & Eckel, 2015; Smith, 2015; Chowdhury et al., 2017 etc.), in which the dictator can only take but not give. Here, the decision space consists of only to 'take' a positive amount (or, in a negative frame, to 'give' a negative amount). Hence, it is also called the negative frame. Finally, give-or-take frame – used by List (2007), Bardsley (2008), Korenok et al. (2013) among others, in which dictator can either give or take. Here, the decision space ranges from negative to positive amount. Studies comparing pure giving and pure taking games often find equivalence in behavior. However, as shown in List (2007) and Bardsley (2008), the mixed frame has two effects – it not only changes the frame, it also often changes the decision making.

While existing laboratory studies have implemented social cues on pure giving games, we implement it in the pure taking game. As stated above, this reflects the opposite to the giving behavior and does not have confound with the decision space as in a mixed frame. Arguably, this frame can reflect on the negative behavior of the dictators. This is because the property rights of the amount to be divided crucially depicts the nature of behavior in a dictator game. In a standard dictator giving game, where the dictator possesses the amount, any giving reflects generosity. Similarly, in this pure taking frame, taking any amount reflects own self-interest driven behavior. While considering the property rights of the amount remains with the recipient, taking indeed is a negative behavior as well. Taking frame also reflects various real-life situations in which the dictator is violating the recipient's property rights and taking from him or her. Some examples would be stealing, IPR infringement, claiming credits for others' work etc.

Furthermore, social cue studies – especially the ones focusing on negative behavior – rarely aim to investigate gender effects. However, as observed in the literature (e.g., Croson & Gneezy, 2009), gender plays an important role in social preference. Bolton and Katok (1995) are the first to test the effect of dictator gender on dictator giving and find no such effect, while Eckel and Grossman (1998) find that women are more generous than men, when the recipient is a charity. Cochard et al. (2020) show that when subjects can choose the frame, then females are more generous under a loss frame. From a policy point of view, as well, understanding the interaction of gender and social cue remains crucial. In this study we also fill this gap in the literature. We arrange a gender balanced pool of subjects for the dictator taking game to investigate any interaction between gender and the social cue.

The current investigation is closely related to the results obtained in three existing studies, namely Rigdon et al. (2009), Alevy et al. (2014), and Chowdhury et al. (2017). Rigdon et al. (2009) study a giving game with and without a minimal social cue. They find an overall positive effect of the social cue on dictator giving. Investigating the effects on gender they find that social cue affects the behavior of males but not of females. The other two studies use both giving and taking frames and investigate gender differences. Chowdhury et al. (2017), with no social cue, compare a pure giving frame with a pure taking frame. They find no gender difference in the giving frame, but in the taking frame females are more generous than males. Alevy et al. (2014) consider a 2×2 factorial setting where the dictator's decisions are either kept anonymous or been observed, whereas the dictator has the option to give (standard giving game) versus either to give or to take (as in List, 2007). It can be argued that being observed can have similar effect to the eye-image social cue, and the treatments where the dictator can have the mixed option to both give and take can reflect a degree of negative behavior. They find that overall being observed reduces taking in the mixed option. Moreover, being observed does not affect male taking behavior, but it significantly reduces the amount taken by females. Note that none of these studies introduce a clear design to investigate the effects of social cue on pure taking behavior.

In summary, the eye-image is the most common social cue used in the literature and implemented as a policy tool due to its costless nature in preventing negative behavior. Taking game is also the easiest game to understand social preference in a negative frame. In this study we employ the eye-image in a taking game and investigate for possible gender effects. We find overall no effect of the social cue on dictator taking when we consider the aggregate pool of subjects. However, the males take significantly less, and the females take significantly more in the presence of the eye-image. Further investigation reveals that the males are more likely to behave selfishly without the social cue but become egalitarian if the social cue is present, while the females behave in exactly the opposite way. These findings are an important reminder that social cues, while easy to deploy, may unexpectedly have differential impacts on people based on their gender (and the frame). Clearly, the question begs further investigations and gender specific scrutiny while implementing such social cues to deter negative behaviors.

The remainder of the paper is organized as follows. Section 2 provides the experimental details and relevant hypotheses. We present the results in Section 3, whereas Section 4 discusses the results and presents some concluding remarks.

2. Experimental design and hypotheses

We employ a computerized one-shot Taking Game with 2 between-subject treatments. In the treatment with eye-image (henceforth the 'Eye' treatment), the computer screen and the paper instructions had a rectangle on top in which a pair of eyes was imprinted on. In an alternative treatment, which we call the 'Baseline' treatment, the eye-image was replaced with a gray colored solid rectangle of the same size. Everything else in these two treatments remained the same. The instructions are included in Appendix II.

We recruited 280 subjects spread across 16 mixed-gender sessions. Only one treatment was run in any given session. In each session, subjects were seated in private cubicles randomly and anonymously paired as a 'Dictator' and a 'Recipient'.[2] Thus, there were 140 dictators in total,

[2] There were 8 sessions with 20 subjects, 4 sessions with 16 subjects, and 4 sessions with 14 subjects. The subjects were not aware about the label 'Dictator' or 'Recipient'. In the experiment they were only referred to as 'you' and 'the person you are paired with'. Please see the instructions for further details.

with an even split of 70 dictators in each treatment. Furthermore, we ensured a perfect gender balance; that is, the number of male and female dictators was exactly equal: 35 each.[3] But neither the dictator nor the recipient knew the gender or any other information about their (randomly matched) partner. All subjects received a £3 show-up fee, and only the recipients were endowed with an additional £10. The dictator could then take any amount from the endowment (between £0 and £10), leaving the rest for the recipient. All the above information was common knowledge.

Each session consisted of two parts. In the first part, dictators were informed that they could transfer any amount (in denominations of 1 penny) from the £10 endowment of the recipient to themselves, and the recipients must accept the dictator's decision. In the second part, recipients had to guess the amount the dictator had transferred. If the absolute difference between the amount taken and the guess was within 50 pence, then the recipient received an extra £1.[4] The instructions for the second part were given only after the decisions in the first part were made. To avoid any possible strategic interactions between dictator taking and recipient anticipation, it was pointed out in the first part that the recipient's decision was payoff irrelevant to the dictator.

The experiment was coded with the z-TREE (Fischbacher, 2007) software and was run in a laboratory at the University of East Anglia, UK. The subjects were university students with no prior experience with dictator games or social cue recruited through the online recruitment system ORSEE (Greiner, 2015). Each session took about 30 min, and the average payment was £8.

Given our experimental design and the existing results on social cues and pro-social behaviors in the literature, we state the following hypothesis:

- **Hypothesis 1** (reduction in negative behavior): An inclusion of the eye-image will result in a decline in the amount taken.

In a standard taking game without social cue, dictators often take significantly more than an equitable amount (see Dreber et al., 2013; Grossman & Eckel, 2015, Chowdhury et al., 2017). However, in several field studies it is observed that a social cue reduces negative behavior (Ernest-Jones et al., 2011; Nettle et al., 2012; Ayal et al., 2021). Also, Haley and Fessler (2005) and Rigdon et al. (2009) find an increase in dictator giving with the presence of a social cue that makes the final allocation more equitable. Hence, we also expect an overall reduction in the money taken (especially above an equitable allocation level) by the dictators in the Eye treatment.

As we have described earlier, there are prominent gender differences in behavior in social preferences (Croson & Gneezy, 2009). While no study investigated gender differences in the effects of social cue on negative behavior, in a pure giving game social cue is observed to be affecting males more than females (Rigdon et al., 2009) and they give more. Hence, we expect the males not only to take less amount under the eye-image in a pure taking game, but such reduction should also be more than the reduction by the females. This is the basis for our next hypothesis.

- **Hypothesis 2** (gender effect): An inclusion of the eye-image will result in a greater decline in the amount taken by males than the decline in the amount taken by the females.

The results from the literature on the observability (not social cue) of the dictator behavior is split. Alevy et al. (2014) find that when in a mixed frame where either giving or taking is possible, then being observed in the laboratory reduces taking for females but not for males. In a field setting Buchanan et al. (2017) find no gender effect in dictator giving. Note, however, that as argued in Section 1, the mixed frame has the issue of mixed decision space, and a field setting works differently from a laboratory setting. Moreover, there is no methodological study that compares social cues with observability. Hence, we rely on Rigdon et al. (2009) to form this hypothesis.

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

Data	Baseline	Eye	M-W test
Total	7.870	7.765	$z = 0.490$
	(2.394)	(2.240)	($p = 0.624$)
Male	9.003	7.414	$z = 2.981$
	(1.589)	(2.356)	($p = 0.003$)
Female	6.737	8.117	$z=-2.239$
	(2.543)	(2.092)	($p = 0.025$)
M-W test	$z = 3.907$	$z=-1.069$	
	($p = 0.0001$)	($p = 0.285$)	

3. Results

We begin by comparing the amount taken by dictators in each treatment and by gender, as shown by the descriptive statistics in Table 1. Given that we have one independent observation per dictator, there are 70 observations per treatment, and 35 observations for each gender per treatment. Table 1 shows no overall treatment effect (for the whole population): in the Baseline treatment the average amount taken is £7.87 and in the Eye treatment the average amount drops slightly to £7.77. Decomposing the data by gender, however, we see striking differences between males and females. In the presence of the eye-image the amount taken decreases for males (from £9.00 to £7.41) but increases for females (from £6.74 to £8.12).

To formally test the differences in the average amount taken between the two treatments, we run the pair-wise Mann-Whitney test. The last column in Table 1 reports the test statistics for the overall data and for the gender-wise data. As expected, there is no significant difference in the overall amount taken in Baseline and Eye ($p = 0.624$). This allows us to reject Hypothesis 1 stated in the previous section. It seems that in a controlled laboratory environment with neutral instructions, eye-images do not have an overall effect on subject's negative behavior.

The treatment effect, however, is statistically significant for both males ($p = 0.003$) and females ($p = 0.025$), although in opposite directions. This only partially supports our Hypothesis 2. The eye-image truly reduces the amount taken by the male dictators but induces the female dictators to take more in defiance of our expectation. Hypothesis 2 predicted a reduction in the negative behavior of the males in the presence of the social cue, and by a greater magnitude than that of the females; but it could not predict an *increase* in the negative behavior of the females.

Within the baseline treatment, the difference in the taking behavior between males and females is significant. Males take £9.00 on average, while the females take £6.74 on average. The significance of their difference is confirmed by the Mann-Whitney test statistic at the last row (p value of 0.001). Interestingly, within the Eye treatment this difference disappears because males' negative behavior declines (they take

[3] We decided upon 70 dictators per treatment out of which 35 were male and 35 were female. Note that the number of independent observations, 35, was at per with the relevant literature in this area (e.g., Rigdon et al. (2009) had between 24 and 34 independent observations per treatment; Alevy et al. (2014) had between 21 and 32 independent observations per treatment; and Grossman and Eckel (2015) had between 25 and 30 independent observations per treatment). We also run a power analysis and find that for males, 35 dictators generate 80.55% power, whereas for females, the sample size generates a power of 78.96%.

[4] We implemented the second part to understand whether there is a gender difference in recipient anticipation for the taking game. Some existing studies (e.g., Branas Garza et al., 2018; Chowdhury et al., 2020) have shown gender differences in anticipation in the giving games, but no such study investigated the taking games. However, we do not find any treatment or gender effect in the recipient guesses and hence it is not discussed in the continuation.

Table 2
Tobit Regressions of amount taken.

Dep var: Amount taken	Total	Female	Male
Eye	−0.068	1.797**	−2.219**
	(0.610)	(0.757)	(0.911)
Female	−1.018		
	(0.620)		
Age	−0.031	−0.069	−0.049
	(0.064)	(0.066)	(0.144)
Undergraduate	0.503	−0.925	1.163
	(0.827)	(1.080)	(1.218)
Asian	0.025	−1.550	1.514
	(0.718)	(0.933)	(1.016)
Other ethnicities	−0.090	−1.106	1.329
	(0.970)	(1.116)	(1.602)
Intercept	9.453***	9.912***	9.858**
	(1.986)	(2.188)	(3.923)
Number of Obs.	132	70	62
Pseudo R^2	0.0075	0.0303	0.1040

Note: Robust s.e. in parentheses. ***,**
* indicate significance at the 1%, 5%, and 10% level.

relatively less) and the females do the opposite, thus the two sides coming closer eliminating their difference. We discuss this further later.

Next, note that the non-parametric tests can neither incorporate cardinal information nor control for other variables. To achieve these objectives and to test the robustness of the results above, we run a series of Tobit regressions.[5] The regression results are reported in Table 2 where the dependent variable is the amount taken and the independent variables are the treatment dummy, an indicator for female (only for the overall data), age, an indicator for undergraduate student (where the baseline is post graduate), and two indicator variables for Asian ethnicity, and other ethnicities (where the baseline is White). There are a total of 8 missing values in these demographic variables. Dropping those variables to incorporate all the observations do not change the results.

These regressions support the results obtained from the non-parametric tests. The first column reports the results for the whole population. The second and the third column report for females and males respectively. The sign of the Eye dummy, showing the direction of the treatment effect, is insignificant for the whole data, but it is significant and positive for the females, and significant and negative for the males. Clearly, the opposite treatment effect by gender is confirmed. In Appendix I, we also report (i) equivalent OLS regressions and (ii) both Tobit and OLS regressions with gender and treatment interactions. These results are in line with the ones in Table 2.

Some existing studies (e.g., Fehr, Bernhard, & Rockenbach, 2008) have shown that such gender effects may arise due to a difference in 'social-type' of the dictators across gender. In one treatment males may be relatively more pro-social type than their female counterparts; but in another treatment it can be the opposite (e.g., Dreber et al., 2013; Chowdhury et al., 2017). The within treatment Mann-Whitney tests (the last row of Table 1) indicate similar direction in our data as well. Hence, we follow an approach akin to Rigdon et al. (2009) by looking at the amount taken distribution by treatments and by genders. Fig. 1 represents the treatment effect on the distribution of the amount taken for the three data groups: the total population, for males, and for females.

For the total data, the amount taken follows a bimodal distribution with most of the dictators being either 'selfish' (taking the entire amount: £10), or 'egalitarian' (taking half of the amount: £5). The Eye treatment does not alter this distribution in any noticeable way. When we split the data by gender the overall bimodal feature of the distribution persists, but the treatment reshuffles the subjects across, very differently for the two genders. Most of the male dictators act as selfish in the Baseline but turn egalitarian in the treatment. It is just the opposite for the females.

We test this formally by running three ordered Probit regressions: for the whole data and then by gender. The dependent ordered category is whether the dictator is 'selfish' (i.e., taken ~£10), or 'in between' (i.e., taken an amount between ~£5 and ~£10), or 'egalitarian' (i.e., taken ~£5).[6] The independent variables consist of the treatment dummy, female dummy (only for the overall data), and the other demographic controls in the previous regressions. The regression results and the marginal effects are reported in Appendix I. The marginal effect for the overall data shows again that the treatment dummy is not significant. Furthermore, for males the Eye dummy 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 made available, males are less likely to act as a selfish type and more likely to act in an egalitarian manner. This behavior of males conforms the result of Nettle et al. (2013), who also find that such nonverbal social cue makes subjects less selfish. An entirely opposite effect is visible for the females who move from being egalitarian in the baseline to being selfish under the eye-image.

4. Discussion

Several existing studies implement experimental designs with positive frame, such as the dictator giving game, to investigate the effects of nonverbal social cues such as an eye-image and often conclude that there is a pro-social effect. However, the effects of such social cues on negative behavior, and related gender effects are rarely investigated. We investigate this issue by implementing a dictator taking game with and without an eye-image while maintaining a gender-balanced pool of subjects. We find no significant effect of the eye-image on the amount taken by dictators for the overall subject pool. However, segregating the data by gender reveals that the males take significantly less, and the females take significantly more when the eye-image is introduced. Furthermore, this decrease in the amount taken by the males comes from an increase in their egalitarian behavior and a decrease in selfishness, whereas the females act the opposite.

This experiment makes contribution in two dimensions. First, we introduce an experiment that combines a social cue, negative framing, and gender differences for the first time. Second, various field studies that show the effectiveness of eye-image to deter negative behavior (e.g., stealing, littering), it is likely that most of the perpetrator are male. Our result implies that when most of the target population is female, the effect of eye-image may remain unclear. Hence, further investigation in the field focusing on gender differences in social cues is needed.

The mechanism behind this asymmetric gender effect of the social cue, however, remains unclear. The cause of the asymmetric response to the social cues may be rooted in social and cultural asymmetries that men and women are conditioned to; or it may purely be due to psychological or biological reasons. Here we aim to provide some ex-post rationalizations of this result.

First, the result may be a combination of the design and a preference reversal. Note that without social cues women are more egalitarian, while males are more selfish. With the eyes present, the social cue effect nudges both males and females to take less. Males do so, making them more egalitarian. However, since females were already egalitarian, if they decrease their taking, then it will result into a situation with disadvantageous inequality for them. If this reverses the preference

[5] The range of decision is 0-10 and out of the 140 subjects, 47 took the whole amount. For males (females) the number is 26 (21) out of 70. This indicates that the subjects have the latent intention to take even more than 10 if that was possible. Hence, the appropriate model is a Tobit regression with the upper censor of 10 (Moffatt and Zevalos, 2021).

[6] We categorized three subjects taking £4.90, £5.50, £5.50, £5.80 as egalitarian and two subjects taking £9.80 and £9.99 as selfish. Also subjects who took less than £4 are excluded. Variations of these do not change the results.

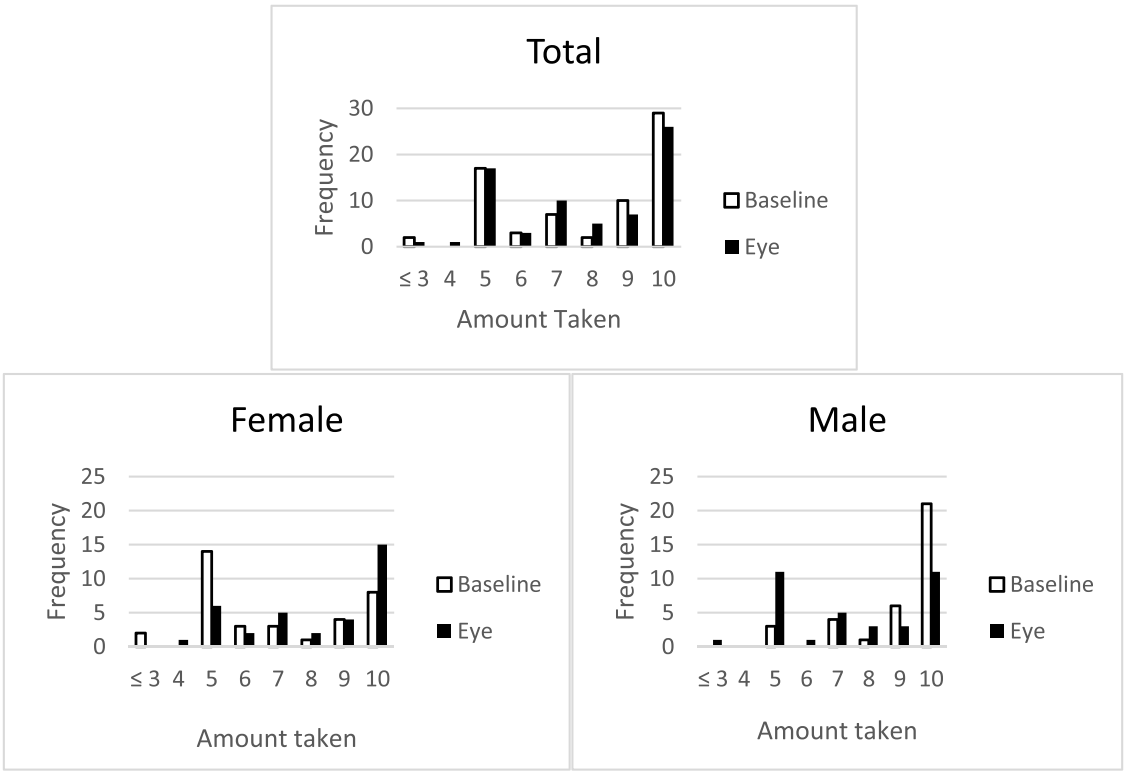

Fig. 1. Distribution of the amount taken.

resulting them taking more to have advantageous inequality (instead of disadvantageous inequality), then it also matches our result. This is also observed in a dictator giving game (Rigdon et al., 2009) where the proportion of egalitarian females decreases after inclusion of the social cue.

Second, it may be that the eye-image has two effects: the first is a social cue effect, and the other is an experimenter demand effect (Zizzo, 2010). The social cue effect results in the subjects taking less. The experimenter demand effect is the phenomenon where the subjects make decisions that they believe the experimenter considers fitting. If the subjects view 'taking less' as appropriate behavior, then the experimenter demand effect makes the subjects to take even less. However, the experiment is about taking. Hence, if the subjects think 'taking' is demanded by the experimenter, then the eye-image nudges the subjects to take more. If the social cue effect is more prominent among males, and the experimenter demand effect where the perceived demanded behavior is to 'take' is more prominent among females, then it supports our result. This matches with De Quidt et al. (2018), who run 11 different games and estimate the sensitivity of the experimenter demand effect. They find that females are overall more sensitive to experimenter demand than males. Moreover, females tend to follow orders more than males (Schram & Charness, 2015). Hence, the eye-image is likely to trigger the experimenter demand effect more among females, resulting for them to follow the behavior demanded from them in the experiment, and take more.

Third, it is observed in the literature on social loafing and 'sucker effect' that negative social cues can decrease cooperation or effort within group (Schnake, 1991). If the eye-image result in such an effect in

Table 3
OLS Regression of amount taken.

Dep var: Amount taken	Total	Female	Male
Eye	0.049	1.360**	−1.321**
	(0.413)	(0.567)	(0.562)
Female	−0.658		
	(0.419)		
Age	−0.025	−0.051	−0.029
	(0.044)	(0.050)	(0.091)
Undergraduate	0.338	−0.581	0.624
	(0.556)	(0.802)	(0.775)
Asian	−0.092	−1.167*	0.798
	(0.480)	(0.696)	(0.619)
Other ethnicities	0.119	−0.693	1.121
	(0.672)	(0.849)	(1.034)
Intercept	8.407***	8.739***	8.559***
	(1.357)	(1.633)	(2.500)
Number of Obs.	132	70	62
R^2	0.0312	0.1337	0.1365

Note: Robust s.e. in parentheses. ***,**.
* indicate significance at the 1%, 5%, and 10% level.

Table 4
Regression results with interaction term between gender and treatment variable.

Dep var: Amount taken	Tobit	OLS
Eye	−2.249**	−1.394**
	(0.879)	(0.582)
Female	−3.137***	−2.088***
	(0.877)	(0.582)
Female*Eye	3.963***	2.705***
	(1.181)	(0.797)
Age	−0.040	−0.032
	(0.061)	(0.043)
Undergraduate	0.197	0.092
	(0.794)	(0.539)
Asian	−0.083	−0.171
	(0.687)	(0.461)
Other ethnicities	−0.326	−0.034
	(0.925)	(0.647)
Intercept	11.132***	9.571***
	(1.968)	(1.348)
Number of Obs.	132	132
Pseudo R^2 (Tobit) / R^2 (OLS)	0.0285	0.1135

Note: Robust s.e. in parentheses. ***,**.
* indicate significance at the 1%, 5%, and 10% level.

Table 5
Ordered probit results.

Dep var: Amount taken	Total	Female	Male
Eye	−0.052	0.591**	−0.706**
	(0.201)	(0.283)	(0.311)
Female	−0.201		
	(0.205)		
Age	−0.028	−0.045	−0.038
	(0.024)	(0.030)	(0.050)
Undergraduate	−0.102	−0.772*	0.275
	(0.280)	(0.420)	(0.426)
Asian	0.242	−0.173	0.567
	(0.237)	(0.353)	(0.347)
Other ethnicities	−0.184	−0.497	0.268
	(0.321)	(0.419)	(0.545)
Number of Obs.	128	67	61
Pseudo R^2	0.0205	0.0624	0.0712

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

our setting for females, then it can explain our result. However, such documentation on gender is not available in that area of literature.

These ex-post rationalizations above also highlight the need for further research. The reasons for the result need to be investigated separately. The possible interactions of inequality aversion and preference reversal, or social cue and experimenter demand effect can be explored. Corgnet et al. (2015) show that cognitive basis of behavior, reflected through the Cognitive Reflection Test (CRT) can partially explain pro- and anti-social behaviors. Kamas and Preston (2021) show that empathy can explain such gender differences. A follow up study in social cue with the CRT score or with a measure of empathic behavior will help further in this line. It will also be useful to carry out neuro-economics studies on social cue both in positive and negative frames and investigate whether the brain signals are different for males and females. This will help us understanding the specific neurological nature of the social cues on our brains.

As we point out earlier, no existing methodological study compares the effects of being observed (e.g., Alevy et al., 2014) versus the effects of a visual social cue (e.g., Rigdon et al., 2009). As a result, distinguishing the two effects remains open, and a structured investigation in this respect is warranted. Investigating the effects of social cues on a dictator game with mixed frame (a la List, 2007; Bardsley, 2008) is not carried out yet and will be interesting to explore. Note that the results from Alevy et al. (2014), who uses such a mixed frame will be useful for such a study. Finally, we have focused only on a specific type of visual social cue, the eye-image. Although this is the most popular tool implemented in the laboratory and in the field, the effects of other social cues to deter negative behavior and related gender effects remain to be investigated.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.socec.2023.102087.

Table 6
Marginal effects of ordered Probit regressions.

Dep var: Ordered categories		Egalitarian	In-between	Selfish
Total	Eye	**0.016**	**0.003**	**−0. 019**
		(0.063)	(0.011)	(0.074)
	Female	0.063	0.011	−0.074
		(0.064)	(0.013)	(0.075)
	Age	0.009	0.002	−0.010
		(0.007)	(0.002)	(0.009)
	Undergraduate	0.032	0.006	−0.037
		(0.088)	(0.016)	(0.103)
	Asian	−0.074	−0.018	0.091
		(0.072)	(0.020)	(0.090)
	Other Ethnicity	0.064	0.0002	−0.064
		(0.114)	(0.010)	(0.109)
	Number of Obs.	128	128	128
Female	Eye	**−0.183****	**−0.009**	**0.193****
		(0.084)	(0.026)	(0.087)
	Age	0.014	0.0007	−0.015
		(0.009)	(0.002)	(0.010)
	Undergraduate	0.240*	0.012	−0.252*
		(0.126)	(0.034)	(0.131)
	Asian	0.053	0.005	−0.057
		(0.109)	(0.010)	(0.115)
	Other Ethnicity	0.164	−0.012	−0.152
		(0.144)	(0.038)	(0.116)
	Number of Obs.	67	67	67
Male	Eye	**0.196****	**0.052**	**−0.248****
		(0.084)	(0.032)	(0.097)
	Age	0.010	0.003	−0.013
		(0.014)	(0.004)	(0.017)
	Undergraduate	−0.076	−0.020	0.096
		(0.118)	(0.032)	(0.148)
	Asian	−0.159	−0.041	0.200*
		(0.097)	(0.032)	(0.116)
	Other Ethnicity	−0.082	−0.009	0.092
		(0.160)	(0.032)	(0.188)
	Number of Obs.	61	61	61

Note: Delta method s.e. in parentheses. ***,**.
* indicate significance at the 1%, 5%, and 10% level.

Appendix I: Regression results

Tables 3–6.

Appendix II: Instructions

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 min 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.

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 min 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.

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