Watching the embezzler: an experiment on unethical behaviour

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Abstract
Embezzlement is a type of unethical behavior that occurs in our daily life. We examine the importance of watching eyes for reducing this type of behavior. We focus on the decision of an intermediary, who gets an amount of money donated by some people to an NGO and decides how much to give to the beneficiaries of that money. We explore how implementing watching eyes can effectively reduce embezzlement. The variable sex is also considered, analyzing the sex of the subject and the interaction between the sex of the decision maker and the sex of the eyes. A laboratory experiment is run, controlling for who is watching you (woman vs. man), and how realistic it feels (static image vs. GIF). Gender differences on embezzlement decisions appear statistically significant. Furthermore, significant differences are found regarding the realism of the tool of watching eyes and the sex of it. Therefore, the type of tool used in order to reduce unethical behavior, the sex of that tool (eyes in this case) as well as the sex and other individual characteristics of the sample population matter. We propose policy makers to consider the tool of watching eyes when defining policy in order to accurately reduce unethical behavior.

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Introduction

Embezzlement is a type of human behavior that involves "the fraudulent appropriation of property by one lawfully entrusted with its possession" (Jorgensen 1986, p. 513). Embezzlement has been often observed in some NGOs. The International Federation of Red Cross and Red Crescent Societies reported in 2016 fraud of more than $3 million in Ebola operations in Guinea and Sierra Leone (The IFRC and RCS, 2016).

In the lab, embezzlement has been analyzed through the embezzlement game (EG henceforth). In general, it is a three-player game divided in two stages, in the first one a donor sends a donation for some people in need, and this money goes to an intermediary, who, in a second stage can transfer everything, nothing, or just part of it to the recipients, on its own benefit. The EG implemented in this study follows the design in Attanasi et al. (2019) and Di Falco et al. (2020).

Previous studies using the EG conclude that an important amount of subjects consistently decide to embezzle, and they embezzle important shares of the available amounts [Attanasi et al. (2019); Di Falco et al. (2020); Attanasi et al. (2023)].

This paper explores the usefulness of watching eyes as a tool to discourage unethical behavior. We propose that the implementation of watching eyes may reduce the existing levels of embezzlement. This conjecture is based on previous evidence showing that the presence of images of real human eyes or fictitious compositions of them have an effect on human behavior. This is called the 'watching eyes effect', which according to Dear et al. (2019) "suggests that just feeling watched may be enough to make us modify our actions independent of deliberative, explicit, conscious, evaluation of the costs and benefits of an action" (p. 269).

In the lab, this effect has been observed using different games and experimental designs. For instance, Kobis et al. (2019) find that the presence of an observer is not enough to reduce unethical behavior: the observer has to be actually looking at the participant while deciding in order to influence decision making.

There are also some field situations in which watching eyes are already being implemented, and they lead to a reduction on unethical conducts as littering or theft. Dear et al. (2019) review some examples: pictures of eyes to try to reduce bicycle and other thefts; posters of eyes reducing crime by 40 per cent; cues appearing at motorway service stations across Britain reducing littering from drivers by 23 per cent (p. 271).

Going a step forward, we aim at testing the importance of watching eyes in reducing unethical behavior in a context where embezzlement may happen. The specific context examined here is charitable giving because embezzlement occurs in this type of situation, as there are real examples of embezzlement on NGOs donations. In addition, charitable giving

reinforces the role of social norms, and embezzlement in this context shows a strong motivation to act dishonestly and to take advantage of the situation, as intermediaries should be less willing to embezzle money intended for a good cause.

For that purpose, we design an experiment in which participants are the intermediaries of a three-player embezzlement game and face watching eyes. One innovative point of our design is that we consider two different mechanisms of watching eyes: fixed images of eyes with a direct gaze, focused to the camera, and moving images (GIF).

Furthermore, we want to consider whether the sex of the eyes plays a role in this type of context. To our knowledge, the potential effects of the sex of the eyes on reducing unethical behavior has not been examined yet. In our setting, this question is addressed through different treatments.

All in all, any type of unethical behavior and the possible effects of the sex of the observing eyes have not been examined so far. Our design allows us to test for the occurrence of this type of effect. This could be directly applicable to our daily lives, since if such differences occur, policy makers should take these characteristics into account when using visual tools on public places in order to reduce unethical behavior.

The remaining of the paper is organized as follows: the second section includes the design of the experiment; the third section presents the hypotheses to be tested; the fourth section shows the main results found and fifth section concludes.

The experiment

The experiment was run during 2022 in the Laboratorio de Economía Experimental (LEE), Universitat Jaume I of Castellón (Spain) using the software Qualtrics. The recruitment process for subjects was made through ORSEE (Greiner, 2004) with the subjects of the lab's database. The experiment was run through different sessions of around one hour each.

Participants were told to take decisions knowing that they were the intermediaries of an NGO; some people made donations to that NGO, and their duty was to transfer directly the money donated to the people in need that the NGO wanted to help.[1] Subjects were informed that they could transfer all the money, part of it, or nothing, being aware that they could keep the left money (if any) for themselves. Nonetheless, subjects were aware that this was not the only amount they could earn, but according to their decisions throughout the experiment, there were other possible gains for them.

The experiment was divided into a baseline and four treatments. The baseline followed the setting previously explained. For the rest of the treatments, the control variables were the sex of the observing eyes, and the level of realism of the watching eyes; in two of the treatments subjects faced a static image of a man or a woman; in the other two, the image was a GIF of the same man/woman.

The total number of observations in our study is 500,[2] 100 observations per treatment. The sample was gender balanced, with 251 women and 249 men. Table 1 summarises all information details about the treatments.

Table 1. Treatments' characteristics

	DEFINITION	N	N women	N men
BASELINE	No watching eyes	100	50	50
MI	Man-Image	100	50	50
WI	Woman-Image	100	50	50
MG	Man-GIF	100	50	50
WG	Woman-GIF	100	51	49
TOTAL		500	251	249

As regards monetary incentives, subjects were paid a fixed amount of money plus an extra amount that was dependent on their decisions and a random component.[3] The main decision deals with the allocation of 1,000 ECUs (converted for the payment at the rate **100 ECUs = 1€**). Considering the five treatments, the minimum actual payment was 5€, and the maximum 108€,[4] with average earnings of 10.37€.

Our main aim is to analyze the impact of being observed in subjects' decisions; and the control variables are: the sex of the observer and the type of image used (static or dynamic). Clearly, the dynamic (GIF) image is more realistic. Four treatments and a baseline condition (no eyes) are designed. Figure 1 shows the images used in the experiment. As we wanted to use a GIF, we generated our own images of watching eyes, through a deep searching process in order to find the most convenient ones. We looked for neutral faces, with clear feminine and masculine attributes, respectively. In addition, when taking the pictures, we made sure they showed neutral facial expressions. The GIF[5] consists in a short sequence of video of the man/woman looking naturally at the camera that is repeated every 5 seconds.

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[1]Experimental instructions are available in the Supplementary Material (osf.io/tvs59/?view_only=f3a82b77800740698323aadf727f75b1).

[2]In order to determine the number of observations needed for the analysis, we conducted an *ex ante* power analysis through the software G*Power 3. The sample size needed for the study was determined considering standard levels of α (0.05) and medium effect size (Cohen's $d = 0.5$) for two-tailed Mann–Whitney–Wilcoxon tests. Power above 90 per cent was achieved with a sample of 90 observations per group. We set 100 observations per treatment, which a priori corresponds to power above 93 per cent.

[3]We elicited subjects risk attitudes through an incentivized lottery panel task.

[4]Such a huge variability in experimental earnings was due to the fact that in the risk-elicitation task (Sabater-Grande & Georgantzís, 2002) it is likely that subjects get 0€ and those accepting to bear the highest risk could gain up to 100€, although this is very unlikely (with probability 1/40). Indeed, the latter is what occurred to the subject who earned 108€.

[5]Since we are concerned about the decreasing effect over time of the exposure to the image, in all cases the time available for the subject to decide was 30 seconds during which the subject could see the image/GIF – depending on the treatment – on the screen.

Figure 1. The woman and man watching eyes used in the experiment

After deciding, each subject had to answer some tests.[6] Specifically, this experiment controls for subjects' personality traits through the Big Five Inventory (Benet-Martínez & John, 1998), to analyze the influence of different levels of extroversion, neuroticism, agreeableness, conscientiousness and openness on subjects' decisions. Moreover, the Levenson Psychopathy Scale is presented (Levenson et al., 1995; Rodríguez et al., 2018), subjects' risk aversion is measured through the lottery-panels of Sabater-Grande & Georgantzís (2002), the levels of emotional intelligence are also measured with the scale developed by Hall et al. (1998), and subjects' empathy levels are accounted for through the Basic Empathy Scale (Jolliffe & Farrington, 2006; Villadangos Fernández et al., 2016).

Finally, some sociodemographic information is collected for each subject: gender, age, field of studies, having siblings and the position with respect to their siblings (e.g., the oldest, the youngest), having a partner and the duration of the relationship so far, and religiosity and professed religion (in case of being religious).

Testable hypotheses

We propose the following general testable hypotheses, for whatever watching eyes mechanism is used:

> *H1: Embezzlement-unethical behavior will be significantly reduced with watching eyes.*

Previous studies show an effect of being observed on unethical behavior. In particular, Dear et al. (2019) find in their meta-analysis a general and consistent reduction of unethical behavior due to the presence of images of watching eyes, for instance on reducing littering in a forest, or by drivers, but also crimes. Hence, we suggest that embezzlement will be reduced, on average, through the implementation of watching eyes conditions.[7]

> *H2: There will be significant differences on embezzlement-unethical behavior depending on whether the watching eyes are from a male vs. a female.*

Regarding the importance of the sex of the person observing, there are mixed results when applied to prosocial actions. Some studies like Manesi et al. (2016) find no effect of this variable. These authors use three conditions in which the level of attention of the eyes in the image varied, and found no differences between the use of male or female eyes. But others conclude that higher donations take place when a poster of male eyes rather than female eyes is used (Bateson et al., 2006).

Data analysis and main results[8]

Some descriptive statistics of our subject sample are presented first. Table 2 shows the main descriptive statistics of some of the variables we want to control for in the analysis. Later, we present additional graphs for the variables that refer to the specific characteristics of the sample and that are not included in Table 2. Then, Table 3 includes the percentages of embezzlement for the different treatments and by sex. Our sample has 500 observations (251 women and 249 men). Ages range from 18 to 31 years old, with an average age of 21.5 years old.

Concerning gender differences in our sample let us observe data of the last column of Table 2. First, women are more neurotic and extraverted than men, and this is in line with the related literature (Weisberg et al., 2011; Lehmann et al., 2013). In our sample, women also present higher scores in conscientiousness. Second, regarding psychopathy and, consistent with Levenson et al. (1995), women are less psychopathic (primary scale) than men. Third, in line with the findings in Jolliffe & Farrington (2006) and Villadangos Fernández et al. (2016), women are more empathic (both in the affective and cognitive scales) than men. Fourth, as generally observed in previous literature, women are more risk-averse than men (Croson & Gneezy, 2009).[9]

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[6]See the Experimental Instructions in Appendix A of the Supplementary Material.

[7]Either images, or GIFs, or both.

[8]In Appendix B of the Supplementary Material we include a set of tables with different models: Table S1 shows an OLS model for each treatment, with sex as the only explanatory variable. Tables S2 and S3 present OLS models comparing pairs of treatments with only females or males' observations, respectively. Table S4 includes three OLS models using different explanatory variables. Finally, Table S5 shows an OLS model for risk aversion with sex as the only variable of interest.

[9]The model in Table S5 (Appendix B of the Supplementary Material) shows this finding.

Table 2. Descriptive statistics of the subject pool

VARIABLE	N	MEAN	STANDARD DEVIATION	MIN	MAX	Gender difference
Extraversion – BFI*	500	3.12	0.26	2.38	3.88	+ (5%)
Agreeableness – BFI	500	3.09	0.30	2.22	4.33	
Conscientiousness – BFI	500	2.87	0.38	1.78	3.89	+ (1%)
Neuroticism – BFI	500	3.14	0.32	2.25	4.25	+ (1%)
Openness – BFI	500	3.05	0.35	2.10	4.20	
LSRP** primary	500	2.39	0.23	1.75	3.50	- (5%)
LSRP secondary	500	2.22	0.31	1.40	3.50	
Emotional intelligence	500	3.70	0.31	2.70	4.82	
Affective empathy	500	3.09	0.50	1.36	4.27	+ (1%)
Cognitive empathy	500	3.59	0.28	2.56	4.56	+ (1%)
Risk aversion	500	0.49	0.20	0.1	0.93	+ (5%)
Sex	500	0.50	0.50	0 (man)	1 (woman)	
Age	500	21.47	2.34	18	31	- (1%)
Humanities (Field of studies)	500	0.15	0.36	0	1	+ (1%)
Law_Economics (Field of studies)	500	0.40	0.49	0	1	
Health (Field of studies)	500	0.19	0.40	0	1	+ (1%)
Technology_Experimental (Field of studies)	500	0.25	0.44	0	1	- (1%)
Siblings	500	0.88	0.32	0	1	
Oldest (Siblings)	442	0.47	0.50	0	1	
Partner	500	0.52	0.50	0	1	+ (10%)
Time_Partner (in months)	262	25.45	20.58	1	101	
Religious	500	0.27	0.45	0	1	+ (1%)
Christianity	133	0.88	0.33	0	1	
Islam	133	0.12	0.33	0	1	

Note: A positive gender difference indicates women have higher average value than men on that variable.
*Big Five Inventory
**Levenson's Self-report Psychopathy Scale

Table 3 shows the distribution of embezzlement decisions by treatment and sex. From this table and the models presented in Appendix B of the Supplementary Material, the following results[10] can be postulated:

- **Result 1.** On aggregate, males embezzle significantly more than females.

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[10]The dependent variable in our analysis is the share that intermediaries embezzle from the total amount available. It has been checked that our dependent variable does not follow a normal distribution (Shapiro-Wilk W test for normal data: p-value close to 0), and therefore, the methods used are non-parametric. In order to test for differences between groups, the Mann-Whitney U test is used.

When considering the whole sample, men are found to embezzle significantly more than women (p-value = 0.010). This result is confirmed by the last model included in Table S1, which reports a strong and negative sex effect on embezzlement when considering all conditions together (-0.083***). In other words, women embezzle 8.3 per cent less than men, on average. This result is in line with previous findings in the EG, showing that men embezzle significantly more than women (Di Falco et al., 2020).

- **Result 2.** In treatments WI (Woman-Image) and MG (Man-GIF), men embezzle more than women.

Table 3. Percentage of the total amount embezzled, by treatment and sex

Treatment	Sex	Embezzlement percentage	Tool	Eyes sex
0	Man	34.90%	–	–
	Woman	28.95%		
1	Man	34.87%	Image	Man
	Woman	24.55%		
2	Man	36.27%	Image	Woman
	Woman	20.76%		
3	Man	46.58%	GIF	Man
	Woman	28.92%		
4	Man	33.37%	GIF	Woman
	Woman	41.28%		
Global average	**Man**	**37.21%**	–	–
	Woman	**28.94%**		

A significant sex difference is observed in WI (p-value = 0.025) and MG (p-value = 0.015), with greater average percentages of embezzlement for men in both cases. The models included in Table S1 replicate these findings, with coefficients of -0.155** and -0.177**, respectively. In other words, women embezzle, on average, 15.5 per cent less and 17.7 per cent less than men, respectively, in the referred treatments. Once again, this is consistent with the EG literature.

- **Result 3.** Unlike the GIF, the image is the watching eyes tool that actually reduces embezzlement in women.

When comparing together the interaction between sex and watching eyes mechanisms, some important effects arise. For instance, a significant difference between the use of a Woman-Image and a Woman-GIF is observed for women (p-value = 0.010), indicating that the most effective tool for reducing embezzlement of women is the image. OLS models included in Table S2 confirm this result. There is a strong and negative effect of the WI (-0.205***) with respect to the WG treatment. More specifically, women embezzle, on average, 20.5 per cent less when facing the WI, as compared to the WG. Additionally, a marginal positive effect of the Woman-GIF is found compared to the baseline. This corroborates the previous finding, as the WG leads to an average increase on embezzlement of 12.3 per cent (0.123*), as compared with the case in which no one watches. This result supports the previous discussion on the relevance of the type of watching eyes implemented and its features depending on the specific target audience.

In other words, in order to reduce embezzlement levels of women in this context, it is more effective to use a static image as the watching eyes tool, rather than the dynamic option.

- **Result 4.** Both males and females embezzle marginally less with the GIF of the opposite sex, as compared to the same sex GIF.

Men embezzle marginally less when they see the Woman-GIF (p-value = 0.078) instead of the Man-GIF. The models included in Table S3 confirm this result through two figures. First, the negative coefficient of WG (-0.132*) when comparing with the MG condition. And second, the opposite effect (0.117*) of MG with respect to the baseline. In other words, men embezzle 13.2 per cent less on average in front of the Woman-GIF, compared to the Man-GIF.

Women do the opposite, they embezzle marginally less when they face the Man-GIF (p-value = 0.085), instead of the Woman-GIF. This finding is replicated by the last model in Table S2, through the MG coefficient (-0.124*) with respect to the reference condition WG. The coefficient indicates that women embezzle, on average, 12.4 per cent less in this case. Additionally, women embezzle marginally more (0.123*) when they see the Woman-GIF, compared to the baseline, with no eyes.

As for other characteristics determining embezzlement decisions, Table S4 includes three OLS models in which we control for all the explanatory variables. The first model includes all observations and the different explanatory factors. The second model is restricted to those observations of subjects having siblings (nearly all the sample; N = 442), as we include in the regression the variable Oldest (1 if the subject is the oldest among the siblings; 0 otherwise). The third model only includes those observations of subjects having a partner (N = 230). In this case, the regression includes the variable Time Partner, which indicates the number of months the subject has been on that relationship. These models allow us to state:

- **Result 5.** Primary psychopathy significantly increases embezzlement.

This result is supported by the three models, showing that embezzlement is increased by 22.5 per cent, 20.3 per cent or 29.5 per cent respectively on average as the level of

primary psychopathy grows (Model 1: 0.225***; Model 2: 0.203***; Model 3: 0.295***). This is consistent with Levenson et al. (1995), who find the primary psychopathy scale is highly related to unethical action. The primary psychopathy scale measures selfishness, indifferent behavior, lack of sensitivity, tendency to lie, absence of regrets and manipulation (Rodríguez et al., 2018).

- **Result 6.** Affective empathy significantly reduces embezzlement.

Greater levels of empathy reduce unethical behavior. This is confirmed by the three models, with a reduction on embezzlement of 7 per cent, 6.8 per cent or 10.8 per cent, respectively (Model 1: -0.070**; Model 2: -0.068*; Model 3: -0.108*). This finding supports the conclusions of Jolliffe & Farrington (2006) and Villadangos Fernández et al. (2016), that empathy is positively linked to prosocial behavior, and thus negatively associated to unethical behavior.

- **Result 7.** Older subjects embezzle significantly more than younger ones.

A positive and significant effect of age is found in models 1 and 2 (0.019*** in both models) indicating that, in both cases, older subjects embezzle 1.9 per cent more than younger ones. Model 3 (the most restrictive) does not corroborate this finding. However, it is important to note that our sample is quite restricted as regards age. In particular, the minimum and maximum ages are 18 and 31, respectively, with an average age of 21.47, and a standard deviation of 2.34. That is to say, there is not much dispersion on this variable. Hence, in order to draw conclusions as regards the effect of age on embezzlement, one should get a wider sample.

Discussion and conclusion

The use of visual cues of watching eyes has been found to reduce unethical behavior (embezzlement). This study highlights the relevance of using the appropriate tool and sex of the tool for the target people, considering gender and other individual personal characteristics. The main idea confirmed here is that, when trying to reduce unethical behavior through visual cues, one should identify the specific profile of the target group of people to whom the intervention has to be addressed.

In general terms, men are more prone to show this type of unethical behavior. Hence, maybe the effort to reduce conducts such as embezzlement should be more specifically addressed to men.

Moreover, the sex of the tool needs to be considered when defining the intervention. In particular, if the target person is a woman, we should use a static-same sex tool, or a dynamic-opposite sex tool of watching eyes. And, if it is a man, the best choice is to use a dynamic-opposite sex tool of watching eyes. It is also important to note the positive effect on the reduction of embezzlement levels by the GIF of the opposite sex, which suggests there might be a sexual connotation on it. This intuition should be further explored.

Additionally, if we were able to obtain information about some personal traits and demographic characteristics of the people to whom we want to address the measures, the tools would be much more effective. In this respect, this study shows that embezzlement decisions are importantly affected by primary psychopathy, affective empathy levels or, to a less extent, by age.

In conclusion, embezzlement occurs in the real world, and the purpose of reducing it is a realistic aim. In this study, we show that embezzlement in the context of charitable giving can be reduced through the implementation of watching eyes. This should be considered when addressing specific ethical policies and interventions trying to reduce unethical or dishonest behavior in our real daily life.

Acknowledgments

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