Dishonest behavior is not affected by an image of watching eyes

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Abstract

Previous research has demonstrated that implicit reputation cues promote prosocial

However, the effect of implicit reputation cues on dishonesty has not been investigated in the laboratory. An image depicting observant eyes has been used as an implicit reputation cue in studies. Three experiments were conducted to investigate whether the use of such an image was significantly associated with dishonesty. In the current study, participants had opportunities to cheat to obtain higher economic profits (Experiments 1 and 2) or to appear more intelligent (Experiments and 3). The participants were randomly assigned to the watching eyes image or a neutral image conditions. There was no difference in the extent of dishonesty between the two conditions.

these results were consistent across different tasks and different motivations for dishonesty. Our results extended findings from previous studies on the effects of an image of watching eyes and demonstrated that implicit reputation cues may not decrease dishonest behaviors. Thus, explicit reputation cues may be necessary in interventions for dishonesty.

Keywords: watching eyes image; dishonest behavior; implicit reputation cues; reputation

Dishonest behavior is not affected by an image of watching eyes

1. Introduction

If you noticed an image of watching eyes on a wall, would it influence your behavior? Burnham (2003) found that dictators in an experimental paradigm wanted to give more money to recipients if they saw the recipient's photo before making a decision, and Haley and Fessler (2005) demonstrated that simply presenting an image of watching eyes, which represents an *implicit reputation cue*, could also increase individuals' prosocial behaviors. However, to the best of our knowledge, only a few studies have attempted to examine the effects of implicit reputation cues on dishonest behaviors. For example, one study (Nettle, Nott, & Bateson, 2012) demonstrated that an image of watching eyes with an associated verbal message (e.g., "Cycle thieves: We are watching you") decreased theft on campus. However, it is already known that verbal messages are sufficient to reduce thefts effectively (McNees, Egli, Marshall, Schnelle, & Risley, 1976), but the effect of an image of watching eyes alone on dishonesty is still unknown. Therefore, this study explored the influence of an image of watching eyes on dishonest behaviors.

In ancestral environments (and currently), dishonest people can always obtain resources at less cost, if at any cost at all (if they are not caught and punished), than honest people can (Buss, 1999). However, when individuals realize that others might be observing their behaviors, they often consciously adjust their behaviors in meet social norms to build and maintain a good reputation & Gachter, 2002; Wedekind & Milinski, 2000). In relation to sustaining a good reputation, researchers have distinguished between two distinct reputation cues: *explicit reputation* and *implicit reputation cues*. Explicit reputation cues (e.g., a camera) clearly indicate that an individual's behaviors are being observed by others, whereas implicit reputation cues (e.g., an image of eyes) are subtle cues that "over the course of human evolution, would have reliably indicated the potential observability of one's behaviors" (p 249, Haley & Fessler, 2005). Because implicit reputation cues are very simple, economical, and easily manipulated, many studies have examined whether and how they influence behaviors. Since Burnham (2003) introduced the idea that an

reputation cue could increase individual's prosocial behavior, abundant research on this topic has demonstrated a positive effect of an image of watching eyes, as an implicit reputation cue, on prosocial behaviors in both laboratory experiments and field studies (Burnham & Hare, 2007; Haley & Fessler, 2005; Mifune, Hashimoto, & Yamagishi, 2010; Nettle et al., 2013; Raihani & Bshary, 2012; Rigdon, Ishii, Watabe, & Kitayama, 2009). These effects may be due to activation of an automatic cognitive mechanism shaped by reputational concerns in an ancestral environment (Burnham & Hare, 2007; Haley & Fessler, 2005; Izuma, 2012; Nettle et al., 2013). However, it is unknown whether this mechanism would also be effective as an implicit reputation cue for behaviors.

Before acting dishonestly, people weigh the external and internal benefits and costs of the dishonesty (Allingham & Sandmo 1972; Becker 1968, 1993; Mazar, Amir, & Ariely, 2008). The external trade-off of ensuring that their behaviors will not be observed by others is a key factor for potential cheaters (Gneezy, 2005; Hechter, 1990; Mazar et al., 2008). However, in anonymous conditions that can elicit dishonest behaviors, such as a dark room (Zhong, Bohns, & Gino, 2010), impact of a watching eyes image may disappear because individuals might be aware that they be identified and that the image of watching eyes is a false cue. As Haley and Fessler (2005) noted, implicit reputation cues work by activating the automatic cognitive mechanisms that formed in ancestral environments based on reputation concerns. Therefore, when individuals are motivated to take some conscious control over their cognitive processes and find the implicit reputation cue to be invalid, the effects of implicit reputation cues may disappear (Fehr & Schneider, 2010; Sparks & Barclay, 2013). Although none of the previous studies directly demonstrated a null effect of an of watching eyes on dishonesty, there is some suggestive evidence. For example, previous studies have shown that people are more selfish in a truly anonymous situation (Burnham, 2003) and that explicit and implicit reputation cues have no effect on cooperative behaviors in such anonymous situations (Lamba & Mace, 2010; Raihani & Bshary, 2012; Tane & Takezawa, 2011). Specifically, Tane and Takezawa (2011) used the same materials and experimental settings as Haley and Fessler

(2005) except for their use of light. They turned off all of the lights in the experimental cubicle, leaving only the light of the computer screen, and found that the watching eyes image had no effect generosity in a dictator game. In addition, Raihani and Bshary (2012) conducted an anonymous online large-scale cross-cultural dictator game using the online labor market Amazon Mechanical Turk and did not observe the "watching eyes" effect on generosity. Therefore, given that dishonest behavior often occurs under such anonymous situations, it is reasonable to hypothesize that an of watching eyes, as an implicit reputation cue, would not exert an influence.

Moreover, people also use positive self-concept maintenance as a key method to increase internal rewards during the process of internal trade-offs before acting dishonestly (Mazar et al., 2008). According to previous research, two main mechanisms allow for maintaining self-concept: categorization malleability and inattention to moral standards (Mazar et al., 2008). However, to the best of our knowledge, no evidence has indicated that implicit reputation cues might influence these factors. First, categorization malleability is the extent to which people "reinterpret themselves in a self-serving manner" to the self and others, which "depends heavily on stimuli and actions" (Mazar al., 2008). For example, it is easier to reinterpret stealing a book from a friend than stealing money from the friend's wallet because friends borrow books from each other, and the act of taking a book can be construed as unintentional. In addition, the image of watching eyes has no effect on the itself (i.e., the book or money itself would not change because of the watching eyes image); it would not influence the categorization malleability. Second, inattention to moral standards is the unawareness of one's own criteria for moral conduct, which "relies on internal awareness or (Mazar et al., 2008). However and also to the best of our knowledge, no evidence has indicated that an image of watching eyes could elicit individuals' self-awareness in the same way as a mirror (Diener & Wallbom, 1976). Thus, it would not influence the inattention-to-moral-standards mechanism either. In addition, previous research has also shown that the image of watching eyes is related to the expectation of future rewards from a third party, not fear of punishment (Oda, Niwa,

Honma, & Hiraishi, 2011). Dishonest behavior, however, may decrease when individuals' punishment exceeds their rewards (Allingham & Sandmo 1972; Becker 1968, 1993).

In summary, the aim of this study was to explore the influence of an implicit reputational cue on dishonest behaviors. This investigation will help us understand more about the nature of dishonest behaviors and reputational cues, and define the boundaries of the effect of implicit reputational cues. Considering the available evidence previously summarized, we hypothesized that an image of watching eyes may not influence dishonest behaviors.

To explore our hypotheses, one pilot experiment and three experiments were conducted. The pilot experiment replicated a classical experiment about the effect of an image of watching eyes on generosity (Haley & Fessler, 2005) to test the validity of the materials and setting in China. Experiment 1 used a typical dishonesty task (matrices task; Gino, Ayal, & Ariely, 2009; Mazar et al., 2008; Zhong et al., 2010) to measure the extent of dishonesty after exposure to an image of watching eyes. Experiment 2 focused on the effect of economic motivation using a simple click-button task without calculation to remove the motivation of appearing to be more intelligent, whereas in Experiment 3, a modified matrices task was used to exclude economic motivation. We hypothesized that regardless of participants' assigned motivation group, there would be no effect of the image of watching eyes on dishonesty.

2. Pilot Experiment

To test the validity of the eyes image and setting in China, we replicated a classic study on the effect of the watching eyes image on generosity by Haley and Fessler (2005).

2.1. Method

2.1.1. Participants and Design

A total of 49 paid undergraduates (11 males; age $M \pm SD = 21.63 \pm 2.32$) participated in the study. No selection criteria were used. Participants were randomly assigned to the eyes condition (presented with an image of watching eyes; n = 25) or the control condition (presented with a neutral image; n = 24). The images were 249 mm × 89 mm in size and presented on a 17" color monitor.

2.2.2. Procedure and Materials

The experiment was carried out with participants in groups of four. The study began with the experimenter delivering a verbal overview of the task to the four participants gathered in a common area. The participants needed to complete a generosity measure known as the dictator game (e.g., Haley & Fessler, 2005), answer some questions about the task, and then respond to a demographic questionnaire.

The dictator game requires two people: a divider and a recipient. The participants were then asked to draw lots for the roles, and the anonymity of participants' responses from each other and from the experimenter was stressed. Participants were not allowed to read the lots until they had randomly entered one of the four separate cubicles. All of the participants in this study were dividers and were asked to divide 10 *yuan* (10 *yuan* ≈ 1.61 dollars) between himself or herself and an anonymous other participant.

During this study, participants saw the image stimulus twice, as depicted in Figure 1. First, it was presented on the computer's desktop background when the participants entered their separate cubicles and before they begin to use the computer program. Second, it was presented after confirming that the participants knew the allocation rules, just before they made the distributive decision. For each participant, the image presented was consistent. In the eyes condition, the participants were exposed to an image of watching eyes used in previous research (Fehr & Schneider, 2010; Haley & Fessler, 2005; Mifune, Hashimoto, & Yamagishi, 2010; Oda et al., 2011; Sparks & Barclay, 2013), whereas the control participants saw a neutral image.

[Insert Fig. 1 here]

After the dictator game, all participants completed questions about the perceived anonymity in the game using a 7-point Likert scale (six items; e.g., *I believed that no one else had any idea about my distributive decision*. Cronbach's α = .72). Finally, they completed a demographic questionnaire and were debriefed and paid by the experimenter.

2.2. Results and Discussion

A one-sample t-test was used to test whether participants believed that the experimental situation was anonymous. The results showed that mean perception of anonymity was higher (M = 4.23, SD = 1.24) than the midpoint (3.5) of the 7-point Likert scale, $t(48) = 4.11$, $p < .001$. This finding suggests that people really felt that their behavior in the experiment was anonymous.

Across conditions, 45 of 49 (91.8%) participants gave 1 *yuan* or more, and mean giving was 4.38 (SD = 0.98) out of 10 *yuan*. An independent-sample t-test was used to test the difference in generosity between the two conditions. Consistent with previous results, mean giving to others was significantly higher in the eyes condition (M_{eye} = 4.48, SD_{eye} = 0.87) than in the control condition ($M_{control}$ = 3.54, $SD_{control}$ = 1.91), $t(47) = 2.23$, $p = .035$, Cohen's $d = 0.63$. Furthermore, as predicted and in agreement with previous results, people in the eyes condition felt less anonymous (M_{eye} = 3.87, SD_{eye} = 1.30) than those in the control condition ($M_{control}$ = 4.60, $SD_{control}$ = 1.07), $t(47) = -2.16$, $p = .036$, Cohen's $d = -0.612$. After controlling for the level of anonymity, participants in the eyes condition behaved more generously than in those in the control condition, $t = 2.45$, $p = .018$, ΔR^2 = 0.12.

The results of the pilot experiment were consistent with previous results indicating that an image of watching eyes could increase prosocial behavior. In the following three experiments, we explored the relationship between the image of watching eyes and dishonesty using a variety of measurements.

3. Experiment 1

3.1. Method

3.1.1. Participants and Design

In total, 131 paid undergraduates participated in the study (54 males; age $M \pm SD = 21.94 \pm 2.44$; four people were excluded due to not understanding or completing the task). This sample size exceeds Cohen's (1992) recommendation for finding a moderate effect at .80 power ($\alpha = .05$). No selection criteria were used. The participants were randomly assigned to the eyes condition (presented with an image of watching eyes) or the control condition (presented with a neutral image). The images were 166 mm × 61 mm in size.

3.1.2. Procedure and Materials

Participants were first instructed that they would be participating in an experiment on target searching (i.e., the matrices task described below). Before beginning the experiment, they received the following: (1) a small brown envelope that contained 20 *yuan* (one 10-*yuan*, one 5-*yuan*, and five 1-*yuan* denominations; 20 *yuan* is equivalent to the cost of three meals in the participants' university); (2) a large brown envelope that contained a worksheet with 20 matrices (Gino et al., 2009; Mazar et al., 2008; Zhong et al., 2010), each consisting of 12 three-digit numbers, only two of which could be added to equal 10 (e.g., 2.12 and 7.88); and (3) a collection slip. The following items were presented from the top to the bottom of the slip: an introduction of the task with an example, an image of watching eyes or a neutral image (the same stimulus images as used in the pilot experiment) and a response portion in which participants could report their gender, age, and performance.

Matrices task. After the participants received these materials, they were led to individual cubicles and asked to find two numbers per matrix that added up to 10 as many times as possible

within 4 min. In a pilot experiment (n = 10), the participants were able to find an average of 9 of 20 pairs (range = 5-16) during the 4 min. Participants were promised 1 *yuan* for each matrix solved. At the end of the experiment, they were instructed to count their money privately in the cubicle without the experimenter watching and to leave the rest of the money in the small brown envelope. There was a garbage can in the corner of each cubicle. Participants were asked to throw the worksheet with the 20 matrices in the trash and were asked to give only the collection slip and the remaining money to the experimenter. Because there was no apparent identifying information anywhere on the two sheets, the results were anonymous. In this experiment, participants had the opportunity to over-report the correct number of solved matrices.

All of the participants received the same matrices to solve, except that a single number in the example matrix was unique. This unique number was repeated in one of the matrices on the worksheet. Based on this design, it was possible to match the collection slip with the returned worksheet; over-reporting was included in the analysis as a dependent variable.

After handing in the collection slip to the experimenter, participants were asked to enter their perception of the study's purpose in a computer[1]. None of the participants suspected that the picture (the image of watching eyes or the neutral image) on the collection slip was related to the study's purpose. Last, the participants received the payment they earned based on their reported results; the maximum payment was 20 *yuan*.

3.2. Results and Discussion

[1] Some participants (n = 55, 23 males; $M_{age} \pm SD$ = 22.34 ± 2.50 ys) completed the Situational Self-Awareness Scale (SSAS, Govern & Marsch, 2001) after the matrices task. One previous study found a positive correlation between the rewards expectation and private self-consciousness (Oda, Niwa, Honma, & Hiraishi, 2011). Thus, we measured this potential underlying mechanism of dishonest behavior in Experiment 1. Because the eyes image is a situated stimulus, we chose to measure a situational self-focus, which is labeled self-awareness (Fenigstein, Scheier, & Buss, 1975) on the SSAS. The SSAS includes three subscales: surroundings self-awareness (three items, e.g., "Right now, I am keenly aware of everything in my environment."), private self-awareness (three items, e.g., "Right now, I am reflective about my life.") and public self-awareness (three items, e.g., "Right now, I am concerned about the way I present myself."). Each item is rated on a 7-point scale, which ranges from 1 (strongly disagree) to 7 (strongly agree). Participants were asked to respond to each statement based on how they felt at that moment.

There were no significant differences between the eyes condition (n_{eye} = 28) and control condition ($n_{control}$ = 27) on surroundings self-awareness ($M_{age} \pm SD$ = 3.94 ± 1.22, $M_{control} \pm SD$ = 4.45 ± 1.16, $t(53)$ = -1.61, p = .114, private self-awareness ($M_{age} \pm SD$ = 4.50 ± 0.97, $M_{control} \pm SD$ = 4.72 ± 0.75, $t(53)$ = -0.98, p = .332) or public self-awareness ($M_{age} \pm SD$ = 4.74 ± 1.03, $M_{control} \pm SD$ = 4.80 ± 0.95, $t(53)$ = -0.24, p = .811). Correlations among the three subscales and the over-reporting of correct answers (reported number minus the actual number that participants solved) were also non-significant (ps > .188). These results indicated that an image of watching eyes (i.e., an implicit reputational cue) did not influence self-awareness or decrease dishonest behavior. Therefore, we decided to eliminate the SSAS from the protocol to ease the burden on participants.

A one-sample t-test showed that the tendency to over-report the number of correct answers ($M_{eye} \pm SD = 0.98 \pm 1.54$, $t(65) = 5.18$, $p < .001$, Cohen's $d = 0.90$; $M_{control} \pm SD = 0.92 \pm 1.37$, $t(64) = 5.42$, $p < .001$, Cohen's $d = 0.95$) was statistically significantly different from zero in the two conditions. Clopper & Pearson (1934) and Soper (2014) also found the percentage of people who over-reported their performance ($n_{eye} = 30$, percent = 45.5%, 95%CI [0.33, 0.58]; $n_{control} = 31$, percent = 47.7%, 95%CI [0.35, 0.60]) was significantly larger than zero in the two conditions. Thus, the results of Experiment 1 suggested that the task and the experimental situation were appropriate.

Chi-square tests showed that there was no significant difference in the number of people who were dishonest between the two conditions ($n_{eye} = 30$, percent = 45.5%, $n_{control} = 31$, percent = 47.7%, Chi-square = 0.07, $p = .797$), and *t*-tests revealed that the difference in the over-reporting of correct answers (reported number minus the actual number that participants solved) between the two conditions was not significant ($M_{eye} \pm SD = 0.98 \pm 1.54$, $M_{control} \pm SD = 0.92 \pm 1.37$, $t(129) = 0.24$, $p = .809$, Cohen's $d = 0.04$). Furthermore, a t-test revealed that the actual number of matrices solved by the participants was not significantly different between the two conditions ($M_{eye} \pm SD = 9.21 \pm 3.90$, $M_{control} \pm SD = 10.22 \pm 3.55$, $t(129) = -1.54$, $p = .126$, Cohen's $d = -0.27$).

The results indicated that the association between the presence of the image of watching eyes and dishonest behaviors was not significant. However, this matrices task was limited by its inclusion of two motivations for dishonesty, the first of which was economic motivation. If individuals lied and reported more matrices solved than they actually solved, they would receive more money, which contradicts social norms and would decrease the individuals' social reputations. Another motivation for over-reporting was to appear intelligent. The apparent purpose of the matrices task was to search and count as quickly as possible, so if participants lied and reported more solved matrices, they would look more intelligent than others because they had "solved" more matrices. Appearing intelligent would increase the individuals' social reputations. The presence of images of watching eyes may promote this form of motivation. Accordingly, Experiment 2 (in

which the motivation was more money) and Experiment 3 (in which the motivation was to appear more intelligent) were designed to separate the potential confounding effects of the two motivations. We hypothesized that, regardless of motivation, there would be a null effect of the image of watching eyes on dishonesty.

4. Experiment 2

Although the results of Experiment 1 supported our hypothesis that the image of watching eyes did not decrease dishonest behaviors, Experiment 2 was designed to isolate the economic motivation from the motivation of appearing intelligent. In Experiment 2, participants had to judge which side had more dots as quickly as possible, but the final payments they received depended on the number of times they chose the right-hand side of the square rather than the side with more dots (this task was modified from Gino & Ariely, 2012; Gino, Norton, & Ariely, 2010). Thus, the conflict in this task was between providing an accurate answer and obtaining more profit, and the extent of dishonesty was measured by the ratio of the number people who chose the right-hand side relative to the amount. The task required the participants to judge and click buttons, which was a simple task for adults and was not regarded as a reflection of intelligence in a pretest. This experimental design helped to exclude the influence of the motivation to appear intelligent.

4.1. Methods

4.1.1. Participants and Design

A total of 88 paid undergraduates participated in the study (27 females; age $M \pm SD = 20.85 \pm 2.59$; six people were excluded because they were suspicious of the purpose of the study). This sample size exceeded Cohen's (1992) recommendation for finding a moderate effect at .80 power ($\alpha = .05$). The study design was the same as that in Experiment 1.

4.1.2. Procedure and Materials

The participants were asked to engage in a perceptual task (modified from Gino & Ariely, 2012; Gino et al., 2010). In this task, each participant was presented a square divided in half by a diagonal line. The square contained 20 dots, with varying numbers of dots being assigned to the left and right sides. Each stimulus was only presented for 500 ms, and the participants were asked to judge which side had more dots and click the corresponding button as quickly and accurately as possible. The payout was determined by the following rules in each trial: each participant earned 0.005 *yuan* for each left-click response and 0.05 *yuan* for each right-click response.

Before the experimental phase, participants completed a practice phase of the perceptual task. The practice phase included 50 trials, and participants received feedback, but no actual money for this phase. The feedback included a description of how many times they clicked on the left or right side and how much money they would have received if the trials were not a practice round. The participants were then given a 40-s break before beginning the experimental phase. In the experimental phase, participants were presented with 200 trials divided into four blocks of 50 trials each. In each block, approximately nine trials (1/6 of 50 trials) had clearly more dots on the right. All of the participants chose the correct side when more dots were clearly on the right side; this result was the same in the condition including the image of watching eyes and in the condition with the neutral image. Therefore, the more dots on the right trials were excluded from the following analysis. In approximately 17 trials (1/3 of 50 trials), there were clearly more dots on the left, and in the remaining trials (approximately 1/2 of 50 trials), the dots were nearly equal on both sides. After each block, participants received feedback as in the practice phase, but they earned actual money during this round, and took a 30-s break between blocks. After they completed the entire task, the computer showed the total amount of money earned by the participant.

Watching eyes image manipulation. An image of eyes or a neutral image was shown on the screen during the break after the practice phase and between each block in the experimental phase, and feedback was provided as described above (in the same layout as the *before decision screen* in

Figure 1). The participants in the eyes condition always saw the eyes image during the experiment, whereas participants in the control condition always saw the neutral image. The images were 249 mm × 89 mm in size and presented on a 17" color monitor.

Manipulation check. After finishing the entire experiment, participants completed a demographic questionnaire and were presented with the eyes and the neutral images and instructed to choose which image they had been shown in the experiment. All of the participants chose the picture they were assigned to see. Lastly, the participants were given payment depending on their performance; the maximum payment was 10 *yuan*.

4.2. Results and Discussion

First, a paired-samples t-test was used to examine whether participants purposely chose the right button regardless of the number of dots in experimental phase. The money participants reported earning at the end of the trial ($M \pm SD = 6.01 \pm 0.92$) was significantly higher than what they should have earned if they had been honest ($M \pm SD = 4.75 \pm 0.12$, $t(87) = 12.98$, $p < .001$, Cohen's $d = 1.92$). This result implied that the participants lied to receive greater amounts of money in Experiment 2.

Repeated measures analysis of variance was used to examine the extent of dishonesty between the two conditions, with the trial block being the within-subjects factor. When there were clearly more dots on the left, there was no significant difference between the ratios of the number people who chose the right side relative to the two conditions ($M_{eye} \pm SD = 0.07 \pm 0.14$, $M_{control} \pm SD = 0.08 \pm 0.14$) after controlling for the mean of reaction time and demographical variables $F(1, 83) = 0.24$, $p = .624$, $\eta^2_p = 0.003$) or among the four blocks, $F(3, 249) = 0.22$, $p = .836$, $\eta^2_p = 0.003$. The interaction between the block and condition was not significant, $F(3, 249) = 0.69$, $p = .528$, $\eta^2_p = 0.008$.

For the unclear stimulus, there was no significant difference between the ratios in the two conditions ($M_{eye} \pm SD = 0.719 \pm 0.12$, $M_{control} \pm SD = 0.75 \pm 0.12$) after controlling for the mean

reaction time and demographical variables, $F(1, 83)= 1.11$, $p = .295$, $\eta^2_p = 0.013$, or among the four blocks, $F(3, 249)= 1.15$, $p = .327$, $\eta^2_p = 0.014$. The interaction between the block and condition was not significant, $F(3, 249)= 0.29$, $p = .793$, $\eta^2_p = 0.004$.

In Experiment 2, the results supported our hypothesis that the image of watching eyes would not decrease dishonesty. The participants' different performances for clearly more dots on the left and clearly more dots on the right indicated that they preferred to click on the right side to earn more money, and the lack of significant difference between conditions indicated that the implicit reputation cue did not inhibit this preference. However, the effect of the image of watching eyes on dishonest behaviors was still unknown for the motivation of appearing to be intelligent. Therefore, we conducted a third experiment in which all participants received an equivalent payment, but differing levels of approval regarding their abilities.

5. Experiment 3

To test the effect of an image of watching eyes on dishonest behaviors under the motivation of appearing intelligent, a modified matrices task was used in Experiment 3. The payment of Experiment 3 remained fixed and did not depend on the individuals' reported results. Participants were recruited to measure their ability to search for a target, and they could receive a certification of their *target searching ability* as a part of their reward. Additionally, participants' moral identities were measured as a potentially confounding factor.

5.1. Methods

5.1.1. Participants and Design

A total of 130 undergraduates participated in the study for 5 *yuan* and a certification of their ability (26 males; age $M \pm SD = 21.19 \pm 2.18$). This sample size exceeded Cohen's (1992)

recommendation for finding a moderate effect at .80 power (α = .05). No selection criteria were used. The study design and the size of images were the same as in Experiment 1.

5.1.2. Procedure and Materials

The experiment was similar to Experiment 1 with two exceptions. First, all participants received the same payment. Second, when the allotted time was up, each participant received an information sheet about the student norms for target searching abilities in their university. Based on this norm, participants could easily determine their *target searching ability* relative to the whole student body at their university. The norms were based on the number of solved matrices that individuals reported on the collection slip in Experiment 1, not on the actual number of solved matrices. None of the participants suspected the reality of this norm. Next, the participants were required to fill out their own certification according to the norms and were then given this certification as a part of their reward. To receive the certification, participants were required to fill in their number of solved matrices and their ability level relative to the whole university student population.

Subsequently, the participants completed five items in a questionnaire on moral identity internalization on a 7-point continuum (1 = *strongly disagree*, 7 = *strongly agree*). This subscale measures the degree to which a person's moral identity is a core component of his or her sense of self (modified from Aquino & Reed, 2002; DeCelles, DeRue, Margolis, & Ceranic, 2012). In this study, Cronbach's α was .74. Finally, they completed a demographic questionnaire and were debriefed and paid by the experimenter.

5.2. Results and Discussion

A one-sample t-test showed that the tendency to over-report the number of correct answers ($M_{eye} \pm SD = 0.69 \pm 2.25$, $t(63) = 2.44$, $p = .017$, Cohen's $d = 0.43$; $M_{control} \pm SD = 0.73 \pm 1.33$, $t(65) = 4.44$, $p < .001$, Cohen's $d = 0.77$) was statistically significantly different from zero in the two

conditions. Clopper & Pearson (1934) and Soper (2014) also found the percentage of people who over-reported their performance (n_{eye} = 18, percent = 28%, 95%CI [0.18, 0.41]; $n_{control}$ = 22, percent = 33.3%, 95%CI [0.22, 0.46]) was significantly larger than zero in the two conditions. These findings suggested that the task and the experimental situation were appropriate.

Chi-square tests showed that there was no significant difference in the number of people who were dishonest (n_{eye} = 18, percent = 28%; $n_{control}$ = 22, percent = 33.3%, Chi-square = 0.41, p = .520) between the eyes and neutral conditions. Furthermore, t-tests revealed that there was no significant difference in moral identity ($M_{eye} \pm SD$ = 6.31 ± 0.72, $M_{control} \pm SD$ = 6.29 ± 0.75, $t(128)$ = 0.19, p = .849), in gender or age ($p > .850$) between the two conditions. The difference in over-reported numbers (reported number minus actual number solved on the worksheet) between the two conditions was not significant ($M_{eye} \pm SD$ = 0.69 ± 2.25, $M_{control} \pm SD$ = 0.73 ± 1.33, $t(128)$ = -0.12, p = .902, Cohen's d = -0.02), even after controlling for moral identity, t = -0.08, p = .933, $\Delta R^2 < 0.01$. On the contrary, after controlling for the condition and demographical variables, there was a partial negative correlation between moral identity and the over-reported numbers, partial r = -.25, t = -2.93, p = .004, $\Delta R^2 = 0.06$.

In Experiment 3, we still found a null effect of the image of watching eyes on dishonesty under the motivation of appearing intelligent. In addition, we measured the participants' moral identities and found that a higher moral identity predicted less dishonesty. This result indicated that although dishonesty was not easily inhibited by external implicit reputation cues, increasing internal moral identity might be an effective method of improving honesty.

6. General Discussion

To the best of our knowledge, this is the first study to explore the effect of an image of watching eyes only on dishonest behaviors in an experimental laboratory setting. The three experiments reported herein involved a total sample of 349 people and pre-planned analysis methods. We primarily found that the image of watching eyes without any verbal message did not

influence dishonest behaviors in the laboratory. Moreover, the trait of a higher moral identity predicted less dishonesty.

The present study presents some theoretical contributions to the literature describing the effect of an image of watching eyes on dishonesty. We focused on dishonest behaviors and expanded upon previous studies that described the effect of an image of watching eyes on cooperative behaviors (e.g., Bateson, Nettle, & Roberts, 2006) and those studying the effects of an image of watching eyes accompanied by verbal messages (Nettle et al., 2012); therefore, boundaries of the effect of an image of watching eyes only were defined. In addition, these findings have practical interest for those wishing to minimize the costs and maximize the benefits of honesty-based systems. Although the image of watching eyes is an inexpensive and simple intervention that can increase positive public behavior such as generosity, our results indicate that it is not as effective for dishonest behaviors. Explicit reputation cues (e.g., verbal messages, cameras) and increasing individuals' moral identities may be a better way of preventing dishonesty.

Why might an image of watching eyes motivate cooperative behaviors but have no effect on dishonest behaviors? First, according to the anonymity of dishonesty, there might be a conflict between the anonymity of a situation and the propensity of observation, which is represented by the image of watching eyes. This conflict would not exist in prosocial behaviors because individuals desire that others know about their good acts. Based on current findings, the conflict existed between the image of eyes, which made people felt less anonymous than a neutral image, and the situation, which was so anonymous that participants could behave dishonestly in the experiments. Thus, this conflict may be responsible for the null effect of the image of watching eyes. Second, some argue that prosocial behaviors have evolved into an essential part of human society, even among unrelated strangers in large groups who will never meet again (Fehr & Gachter, 2002). It seems that prosocial values and norms (such as "to be an honest man") are internalized, which means they can be easily and naturally motivated in prosocial conditions by subtle and implicit reputation cues, such as an image of eyes. However, while dishonest behaviors contradict public

expectations, they are associated with many benefits for the individual, which make it more difficult and unnatural to inhibit dishonesty because it requires significantly more of the individual's cognitive resources to reject self-benefit. Third, deterring dishonest behavior requires a higher capacity for moral control and clear rules and regulations. For individuals who have internalized the norms and values of their society, being dishonest contradicts their self-perceptions (Mazar et al., 2008), but not *other people's* perceptions of them. Based on the current findings, the image of watching eyes might not activate one's self-awareness or moral standards, nor change the nature of the existing stimulus, which two are primary mechanisms for maintaining a positive self-perception. Therefore, the image of watching eyes as an implicit reputation cue may work only in conditions in which individuals seek approval from others and not in a dishonesty condition, which requires self-approval.

Recently, Sparks and Barclay (2013) suggested that prolonged exposure to the eyes image (e.g., "eyes image was visible on the computer screen for several minutes prior to the task") would undermine its effect on prosocial behaviors. However, this cannot explain why there was no significant effect of the eyes image in the present study. Based on Sparks and Barclay's (2013) criterion regarding the exposure time, the exposure time of the eyes image in the present study is classified as short. In Experiment 1 and Experiment 3, participants only saw the eyes image before completing the collection slip. In Experiment 2, the eyes image was only exposed for 30 s before each phase of the task. Therefore, the non-significant effect of the watching eyes image on dishonest behaviors would not result from the longer exposure time of the eyes image.

Given the purpose of our study, there are some limitations that are worth noting. First, why the underlying mechanism of the implicit reputation cue does not work in the context of dishonest behaviors is still unknown. Further studies demonstrating a decrease in dishonest behaviors by another manipulation would enhance our understanding of this issue. Second, there is another explanation about the null effect of watching eyes on dishonest behavior. Given the results of the third experiment on relationship of dishonesty and higher moral identity and Diener and Wallbom's

(1976) work on the mirror, the image of watching eyes in this study may lack an effect on moral identity, while the mirror can activate one's inner moral identity through self-awareness, therefore, decrease dishonesty. More research is required on these interesting topics. Third, the way in which the image of watching eyes and verbal messages work together remains unclear. Although previous research found that the effect of watching eyes on cooperative behaviors was significant with an unassociated verbal message (Ernest-Jones, Nettleb, & Bateson, 2011), our results suggest that an image of watching eyes without words may not inhibit dishonesty. Therefore, future studies are required to shed light on the relationship between an image of watching eyes and an accompanying verbal message.

Despite these limitations, the present findings provide empirical evidence that the implicit reputation cue (i.e., an image of watching eyes) did not affect dishonest behaviors. These results provide direction for future studies, further understanding of the evolution of implicit reputation cues and dishonest behaviors and avoiding inefficient measures for the reduction of dishonest behaviors.

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References

Allingham, M. G. and Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics, 1*, 323–338.

Aquino, K., & Reed, A. (2002). The self-importance of moral identity. *Journal of Personality and Social Psychology, 83*(6), 1423-1440. doi: 10.1037//0022-3514.83.6.1423

Bateson, M., Nettle, D., & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology letters, 2*(3), 412-414. doi: 10.1098/rsbl.2006.0509

Becker, G. S. (1968). Crime and punishment: An economic approach. *Journal of Political Economy, 76* (2), 169–217.

Becker, G. S. (1993). Nobel lecture: The economic way of looking at behavior. *Journal of Political Economy, 101*(3), 385-409.

Burnham, T.C. (2003). Engineering altruism: A theoretical and experimental investigation of anonymity and gift giving. *Journal of Economic Behavior & Organization, 50*(1), 133-144. doi: 10.1016/S0167-2681(02)00044-6

Burnham, T. C., & Hare, B. (2007). Engineering human cooperation. *Human Nature, 18*(2), 88-108. doi: 10.1007/s12110-007-9012-2

Buss, D.M. (1999). *Evolutionary psychology: The new science of the mind*. Needham Heights, MA, US: Allyn & Bacon.

Clopper, C. & Pearson, E.S. (1934). The use of confidence or fiducial limits illustrated in the case of the binomial. *Biometrika, 26*, 404-413.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159. doi: 10.1037/0033-2909.112.1.155

DeCelles, K.A., DeRue, D.S., Margolis, J.D., & Ceranic, T.L. (2012). Does power corrupt or enable? When and why power facilitates self-interested behavior. *Journal of Applied Psychology, 97*(3), 681-689. doi: 10.1037/a0026811

Diener, E., & Wallbom, M. (1976). Effects of self-awareness on antinormative behavior. *Journal of Research in Personality, 10*(1), 107-111. doi: 10.1016/0092-6566(76)90088-X

Ernest-Jones, M., Nettleb, D., & Bateson, M. (2011). Effects of eye images on everyday cooperative behavior: A field experiment. *Evolution and Human Behavior, 32*, 172-178. doi: 10.1016/j.evolhumbehav.2010.10.006

Fehr, E., & Gachter, S. (2002). Altruistic punishment in humans. *Nature, 415*, 137-140. doi: 10.1038/415137a

Fehr, E., & Schneider, F. (2010). Eyes are on us, but nobody cares: Are eye cues relevant for strong reciprocity? *Proceeding of the Royal Society B, 277*, 1315–1323. doi: 10.1098/rspb.2009.1900

Gino, F., & Ariely, D. (2012). The dark side of creativity: Original thinkers can be more dishonest. *Journal of personality and social psychology, 102*(3), 445-459. doi: 10.1037/a0026406

Gino, F., Ayal, S., & Ariely, D. (2009). Contagion and differentiation in unethical behavior: The effect of one bad apple on the barrel. *Psychological Science, 20*(3), 393-398. doi: 10.1111/j.1467-9280.2009.02306.x

Gino, F., Norton, M.I., & Ariely, D. (2010). The counterfeit self the deceptive costs of faking it. *Psychological Science, 21*(5), 712-720. doi: 10.1177/0956797610366545

Gneezy, U. (2005). Deception: The role of consequences. *American Economic Review*, *95*(1), 384-394.

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*, 245–256. doi: 10.1016/j.evolhumbehav.2005.01.002

Hechter, M. (1990). The attainment of solidarity in intentional communities. *Rationality and Society, 2* (2), 142–155. doi: 10.1177/1043463190002002004

Izuma, K. (2012). The social neuroscience of reputation. *Neuroscience Research, 72*(4), 283-288. doi: 10.1016/j.neures.2012.01.003

Lamba, S., & Mace, R. (2010). People recognise when they are really anonymous in an economic game. *Evolution and Human Behavior, 31*(4), 271-278. doi: 10.1016/j.evolhumbehav.2010.02.002

Maynard Smith, J., & Price, G.R. (1973). The logic of animal conflict. *Nature, 246*, 15-18. doi: 10.1038/246015a0

Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of marketing research, 45*(6), 633-644. doi: 10.1509/jmkr.45.6.633

McNees, M.P., Egli, D.S., Marshall, R.S., Schnelle, J.F., & Risley, T.R. (1976). Shoplifting prevention: Providing information through signs. *Journal of Applied Behavior Analysis, 9*(4), 399-405. doi: 10.1901/jaba.1976.9-399

Mifune, N., Hashimoto, H., & Yamagishi, T. (2010). Altruism toward in-group members as a reputation mechanism. *Evolution and Human Behavior, 31*(2), 109-117. doi: 10.1016/j.evolhumbehav.2009.09.004

Nettle, D., Harper, Z., Kidson, A., Stone, R., Penton-Voak, I.S., & Bateson, M. (2013). The watching eyes effect in the dictator game: It's not how much you give, it's being seen to give something. *Evolution and Human Behavior, 34*, 35-40. doi: 10.1016/j.evolhumbehav.2012.08.004

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), e51738. doi: 10.1371/journal.pone.0051738

Oda, R., Niwa, Y., Honma, A., & Hiraishi, K. (2011). An eye-like painting enhances the expectation of a good reputation. *Evolution and Human Behavior, 32*(3), 166-171. doi: 10.1016/j.evolhumbehav.2010.11.002

Raihani, N.J., & Bshary, R. (2012). A positive effect of flowers rather than eye images in a large-scale, cross-cultural dictator game. *Proceedings of the Royal Society B: Biological Sciences, 279*(1742), 3556-3564. doi: 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. doi: 10.1016/j.joep.2009.02.002

Shu, L.L., Mazar, N., Gino, F., Ariely, D., & Bazerman, M.H. (2012). Signing at the beginning makes ethics salient and decreases dishonest self-reports in comparison to signing at the end. *PNAS, 109*(38), 15197-15200. doi: 10.1073/pnas.1209746109

Soper, D.S. (2014). Binomial Probability Confidence Interval Calculator [Software]. Available from http://www.danielsoper.com/statcalc

Sparks, A., & Barclay, P. (2013). Eye images increase generosity, but not for long: The limited effect of a false cue. *Evolution and Human Behavior*. doi: 10.1016/j.evolhumbehav.2013.05.001

Tane, K., & Takezawa, M. (2011). Perception of human face does not induce cooperation in darkness. *Letters on Evolutionary Behavioral Science, 2*(2), 24-27. doi: 10.5178/lebs.2011.15

Wedekind, C., & Milinski, M. (2000). Cooperation through image scoring in humans. *Science, 288*, 850-852. doi: 10.1126/science.288.5467.850

Zhong, C.-B., Bohns, V.K., & Gino, F. (2010). Good lamps are the best police: Darkness increases dishonesty and self-interested behavior. *Psychological Science, 21*(3), 311-314. doi: 10.1177/0956797609360754

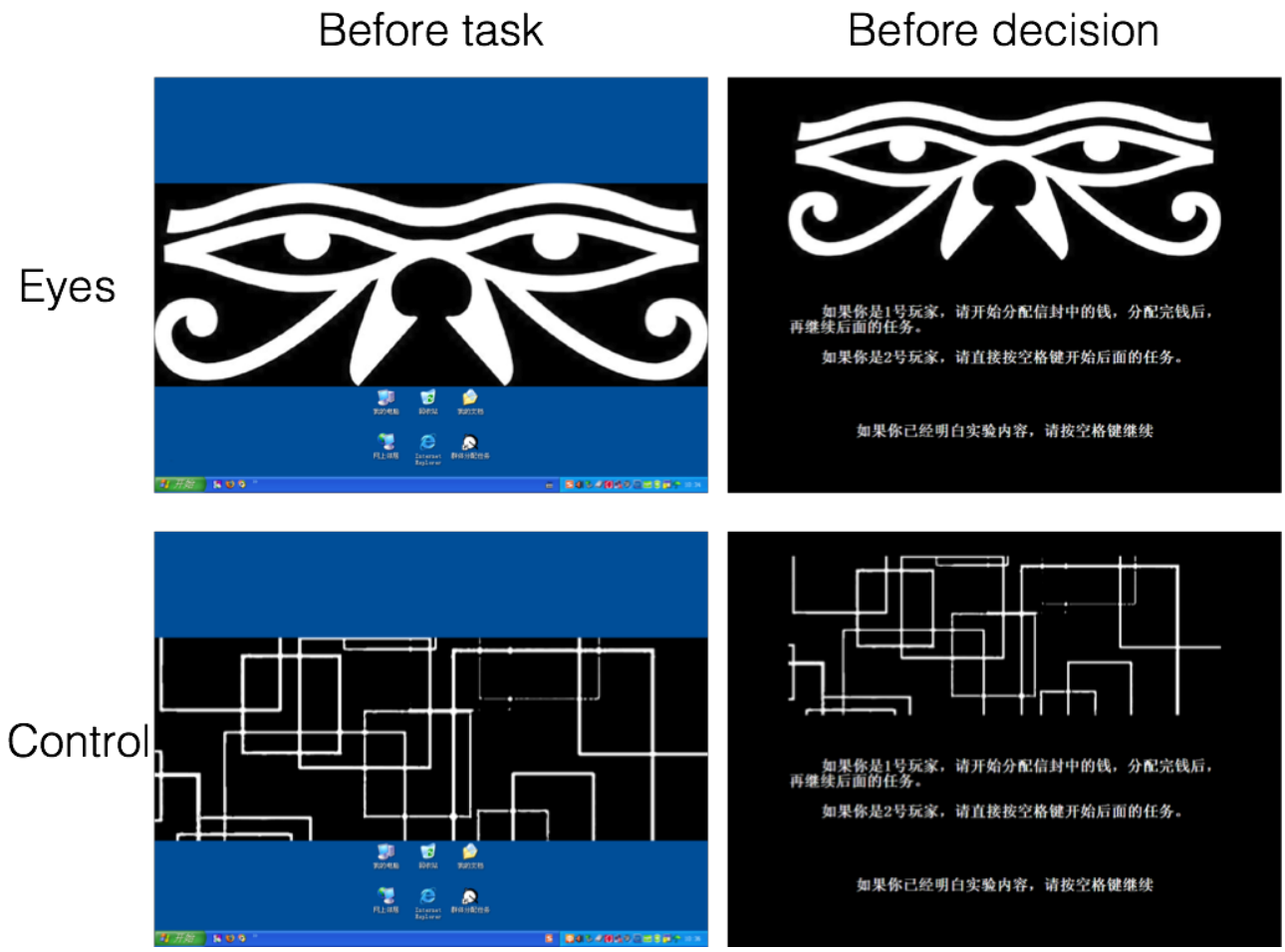

Figure 1. *Before task screen and before decision screen. Above is the image of watching eyes used in the eyes/experimental condition; below is the neutral image used in the control condition.*

EHB13-253_Supplementary Material_data

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