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Putting a price tag on others' perceptions of us

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Abstract Standard economic theories assume that people are self-interested and their wellbeing solely dependent on their own material gains or losses. Unless they have an impact on monetary payoffs, the perceptions of anonymous individuals are irrelevant to people's decision making. However, a large body of research in sociology and social psychology demonstrates that self-identity is developed through one's understanding of how one is perceived by others. Using (Cooley's, Human nature and the social order, 1964) concept of the "looking-glass self" as a framework, we evaluate experimentally whether or not people care about the imputed judgment of anonymous others arising from their imagination of their perceptions. We implemented variants of the Becker–DeGroot–Marschak mechanism to elicit the monetary value attached to the perceptions by participants. In one variant, only nonnegative bids were allowed, while in another, negative bids were allowed. We show that in an environment in which the perceptions of others are only conveyed to participants anonymously and privately, self-interested individuals exhibited strong negative perception avoidance even though the perceptions have no impact on their monetary payoff. The participants were willing to spend a

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significant amount in order to avoid confirming the supposedly negative perception. Thus, for them, ignorance was truly bliss. We also show that, in the absence of the audience effect, the fair-minded participants adopted a neutral attitude towards the perception of them as fair.

Keywords Social image · The value of other's perceptions · Pay to reveal · Pay to conceal · Dictator game

JEL Classification C91 · D64 · Z13

1 Introduction

Standard theories in economics assume that people are self-interested and their wellbeing is solely dependent on their own material gains or losses. Accordingly, without exerting any impact on monetary payoffs, the perceptions of anonymous individuals will be irrelevant to one's decision making. Recent developments in behavioral economics, however, show that it may not be the case. Recognizing that people are social beings who seek to maintain a positive image in front of others (Goffman 1959), concern for social image could drive people's behaviors away from *homo economicus* predictions toward behaviors that are seemingly altruistic, as shown in a laboratory setting by Andreoni and Bernheim (2009) and in the field by Ariely et al. (2009), DellaVigna et al. (2012) and Lacetera and Macis (2010).

Beyond a concern for maintaining a social image, others' perceptions can be crucial. Indeed, our self-identity is developed through our understanding of how others perceive us (Cooley 1964). The sociology and social psychology literature call this the "looking-glass self" metaphor, which comprises three sequential components (Shaffer 2005). Firstly, we envision how we appear to others. Secondly, we imagine what others are thinking about our appearance. Thirdly, we develop feelings about ourselves such as pride or shame based on what we believe these perceived judgments by others to be. Evidence from psychology studies has shown that this socio-psychological process begins at an early age and develops throughout one's life (Beaman et al. 1979). Because the process shapes the way we see ourselves, it also affects our judgment of others' views of us and, consequently, our relationships with others as well as a raft of socioeconomic decisions (Wallace and Tice 2012; Yeung and Martin 2003).

Using this metaphor of the looking-glass self as a background, this paper experimentally evaluates whether people inherently care about an imputed judgment of anonymous others arising from an imagined perception of the self by others. Our vehicle is a two-stage modified dictator game. In the first stage of the experiment, each dictator was firstly asked to choose one of two dividing rules—(S$7, S$7) or (S$10, S$2)—to split money between him/herself and the matched recipient. The former rule is fair and welfare maximizing, whereas the latter benefits the dictator more than the recipient and results in lower welfare overall. The choice of only these two dividing rules sorted the dictators into two contrasting types: fair-minded and selfish. The availability of the rules was common knowledge to both dictator

and the recipient before the game was played. On knowing the outcome of the allocation decision, the recipients were asked to write a short message giving their opinion of the dictator. However, the dictator was only told about the existence of the written message after the allocation decision had been made.

This experimental design captures Cooley's three sequential components. Firstly, because the link between the dividing rule choice and the payoff outcome between the parties was made clear before the dictator chose the rule, the process of envisioning the recipient's perception will have started to develop when the dictator was just about to make the choice (Dana et al. 2007). This constitutes the first component of the looking-glass self. Subsequent to the allocation decision, the dictator was informed that the recipient would write a message about the dictator commenting on his/her choice. This would induce the dictator to imagine how the recipient might construct a judgment about his/her character consistent with the dictator's envisioned belief. This captures the second component. Finally, the dictator's perceptions of the recipient's judgment would induce a feeling of pride or shame in a manner consistent with the third component of the looking-glass self.

It should be noted that none of the dictators knew the detailed content of the message before the subsequent bidding process started. Without actually seeing the message, the dictators' reflected appraisal would depend solely on their envisioned belief about the recipient's view of them. If the dictators cared about it sufficiently, they would be willing to put a price tag on this socio-psychological factor.

To verify this, in stage two of the experiment, the dictators were asked to express the maximum they were willing to pay to reveal or conceal the written message from the recipient through a Becker–DeGroot–Marschak (BDM) bidding mechanism (Becker et al. 1964; Kahneman et al. 1990; Rutström 1998; Shogren et al. 2001). For this purpose, we conducted two experimental treatments. In the *pay-to-conceal* (PTC) treatment, by default, the message was privately passed on to the dictator. The dictator was then given an opportunity to pay to prevent the message from being passed to him/her. In the *pay-to-reveal* (PTR) treatment, by default, the message was not given to the dictator. The dictator was required to bid to obtain it. For both treatments, the minimum bid allowed is S$0.

When the minimum bid price is bounded by S$0, one problem that may arise is that subjects might feel compelled to bid strictly more than S$0 in the BDM procedure. Thus, the elicitation procedure itself might push the bid up from S$0. As a robustness check, we conducted an additional treatment, which we labeled as the *modified pay-to-reveal* (MPTR) treatment. Compared to the previous design, the main difference is that *negative prices* were allowed in the BDM procedure. Essentially, bidding a negative price in order to reveal the message would indicate that the bidder required monetary compensation from the experimenter in order to be willing to take the message. It will be seen that this is also equivalent to bidding a positive amount to avoid the message[1]

Canonical economic theories predict that no dictator would be willing to put any price tag on the message written by the recipient. Consequently, all dictators would

[1] We thank one of our anonymous referees for his/her excellent suggestion to conduct this additional treatment.

bid zero in the stage-two decision. The theory of social image concern, however, posits that people care about how they are perceived by others such that they take actions to influence the formation of others' perceptions of them. In our experimental setup, however, the dictator's image as perceived by the recipient had been developed before the bidding started in stage two. Since the price submitted in the bidding process would not alter this perceived image, we thus do not know whether the recipients' perception would still matter to the dictators. Consequently, we also do not know if the dictators would be willing to sacrifice personal benefits in order to conceal or reveal the written messages.

According to the looking-glass self theory, the dictators would seek to understand themselves by inferring how they were being perceived by the recipients. In particular, the knowledge that the recipients had expressed personal opinions about them would remind the dictators to reconsider the latter's positions. When the dictators chose the self-interested dividing rule, this may have caused them to feel shame or guilt about the possible psychological cost they may have inflicted on the recipient. If the dictators have an incentive to lessen the negative impact on them, they would attempt to act ignorant about the message. Such behavior would indicate that when people envision and anticipate receiving a negative judgment about themselves from others, it is in their best interests to hide behind a veil of ignorance by avoiding confirmation of whether such a judgment of their character has been vindicated.

If, instead, the fair dividing rule was chosen by the dictators, knowing that the recipient could express an opinion about them would induce the dictators to imagine that recipient having a happy or satisfied reaction. This would elicit a feeling of pride in some of the dictators, and if pride has value for them, they would probably want to know the content of the message to confirm whether the other person's judgment of their character had been vindicated. Our experimental results show that in an environment in which perception of others is only conveyed to participants anonymously and privately, self-interested dictators exhibited strong negative perception avoidance even though the perception had no impact on their monetary payoff. In both the PTC and the MPTR treatments, the dictators were willing to spend significant monetary amounts in order to avoid confirming the imagined negative perception of them. Thus, for them, ignorance is bliss. When the bid was bounded below by S$0 in the PTR treatment, we found that the fair-minded dictators were willing to spend a significant monetary amount in order to confirm the imagined positive perception of themselves. When this lower bound was shifted down to −S$10 in the MPTR treatment, interestingly, the willingness to pay dropped significantly. This suggests that the fair-minded dictators adopted a neutral attitude towards fairness perception. This is possibly because having acted fairly by choosing the fair dividing rule, they may feel confident that the recipient would not have any ill-feeling towards them, and so they may not feel important to confirm whether the recipient's judgment of their character had been vindicated.

Our results thus provide further laboratory evidence for the theories of social image concern (Bernheim 1994; Ireland 1994; Bagwell and Bernheim 1996; Glazer and Konrad 1996; Ellingsen and Johannesson 2008a; Tadelis 2007; Andreoni and Bernheim 2009). One fundamental assumption that underpins these theories is that

people like to be seen as fair (Andreoni and Bernheim 2009). In our paper, the observed price paid by the self-interested dictators in the PTC and the MPTR treatments is a reflection of dictators' social image concern. That is, they do not wish to be seen as unfair and selfish.

This research is closely related to two other studies that explore the use of anticipated written feedback from a recipient as a nonmonetary sanction on selfish behavior in the dictator game (Ellingsen and Johannesson 2008b; Xiao and Houser 2009). Both studies report a rise in giving from the dictator when the feedback from recipients was anticipated before the allocation decision took place. One can argue that the increase in the amount of giving to the recipients due to such anticipation is equivalent to the price the dictators are willing to pay in order to either avoid getting negative messages or to induce positive messages from the recipients. Unfortunately, it is difficult to disentangle the two motives using the experimental design in these studies. In contrast, in our design, the dictators are only told about the existence of the written communication after the allocation decision has been made, so they cannot respond strategically by altering the amount given to the recipients. By evaluating the dictators' bidding decisions, we can evaluate how important the feeling of pride or guilt avoidance is as a motivator.

The rest of this paper is organized as follows. Section 2 discusses our experimental design and procedures, and Sect. 3 presents our experimental results. Section 4 discusses the findings from the post experimental survey, and discussion of the results and conclusions follows in Sect. 5.

2 Experimental design and procedures

The participants in our experiment were undergraduate students at the Singapore Institute of Management and came from various academic majors such as business, information technology, arts and social sciences. The experiment was conducted manually using paper and pen. In total, there were 424 participants.

Upon arriving at the experimental site, participants were randomly directed to two separate rooms. Because the rooms were situated next to each other, participants were fully aware that they were being divided into two separate groups. Once all the participants had arrived at the experimental site, the experimenter randomly assigned the role of dictators to all participants in one of the two rooms and the role of recipients to all participants in the other. There were equal numbers of participants in each room. Once all participants were in their respective rooms, the experimenter then read out the experimental instructions to them and checked that they all understood the game. Any question raised was answered individually in private. The experiment only commenced once all the participants had understood the game.

The experiment consisted of two stages. Before stage one began, the dictator was informed that he/she would be asked to make two decisions and that one of the decisions would be randomly chosen by the experimenter to calculate the dictator's earnings for the experiment. However, the dictator was also informed that the

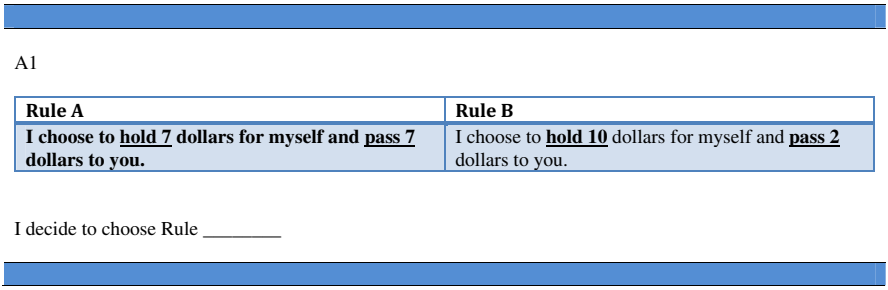
format of the second decision would be revealed only after all the dictators had completed the first decision.

At the beginning of stage one, each dictator was asked to choose one of two dividing rules—(S$7, S$7) or (S$10, S$2)—to split the money (in Singapore dollars) between themselves and the matched recipient. The dictator was also told that the matched recipient had been informed about the game and the dividing rules available to him/her. Once all the dictators understood the game, each then privately indicated his/her chosen allocation decision on an allocation decision sheet (see Fig. 1). Each dictator was then asked to insert the decision sheet into an envelope and to drop the envelope into a box placed in a corner of the room. Both the decision sheet and the envelope were marked with the dictator's identity number. Except for the experimenter, no one knew which identity number was matched with which participant.

Once all the dictators had completed the allocation decision, the experimenter collected the envelopes and placed them visibly in a corner of the room. Based on the allocation decision made, payments to recipients, together with the dictators' allocation decision sheets, were inserted into their respective envelopes. These envelopes were then taken to the recipients' room, and the dictators were told of this.

The recipients were asked to pick one envelope randomly, verify the monetary amount against the allocation decision made, and then take the money. Thereafter, they were asked to write a short message stating their personal opinion of their matched dictator on the reverse of the allocation decision sheet. Other than the exclusion of threatening or foul language, no restriction was imposed on the content of the message that the recipient could write. Once the recipient had written the message, he/she then inserted it into the same envelope and dropped it back into an open box for the experimenter to collect. The envelopes were then taken to the dictators' room. This completed stage one of the experiment.

In stage two, the dictator was told that his/her matched recipient had received payment. Based on the allocation decision, the recipient had also written a short message giving a personal opinion of the dictator. The second decision required the dictator to express his/her maximum willingness to pay to reveal or to conceal the written message from the recipient through a BDM mechanism.



A1

Rule A	Rule B
I choose to hold 7 dollars for myself and pass 7 dollars to you.	I choose to **hold 10** dollars for myself and **pass 2** dollars to you.

I decide to choose Rule _____

Fig. 1 Allocation decision sheet

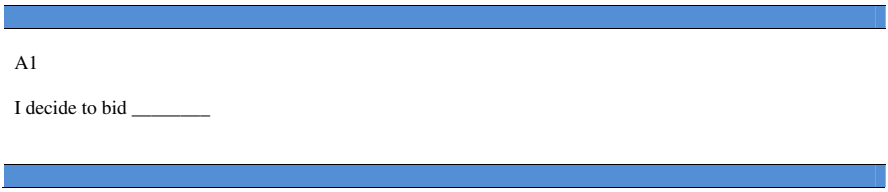


Fig. 2 Bidding decision sheet

It should be noted that the experimental instructions for the dictators were split into two parts. The first gave general instructions and explained how to make the allocation decision. The second outlined the instructions for the BDM mechanism. The latter was given to the dictators only after stage one of the experiment had been completed. As such, the allocation decision was free from any influence based on the communication from the recipient and/or the BDM mechanism.

Each dictator was given a S$10 endowment in order to participate in the bidding process. We implemented three experimental treatments as outlined above: PTC, PTR, and MPTR. In the PTC treatment, by default, the written message from the recipient was given to the dictator. The dictator could bid to avoid receiving it. In the PTR and the MPTR treatments, by default, the written message was not given to the dictator. The dictator could bid to obtain it.

Through the BDM mechanism, we firstly asked the dictator to indicate on a bidding decision sheet the maximum bid price he/she was willing to pay to either conceal or reveal the message (see Fig. 2). The sheet was marked with the dictator's identity number. The permitted bids ranged from S$0 to S$10 with increments of S$1 in the PTC and PTR treatments. In the MPTR treatment, the permitted bids ranged from –S$10 to S$10. A detailed description of the bidding process was given in the experimental instructions. Once all the dictators had decided on their bids, they dropped the decision sheets into a box located in the corner of the room for the experimenter to collect. Based on the identity number, the experimenter then matched the bidding decision sheet with the corresponding dictator's envelope.

Once all the dictators had submitted bids, the experimenter then drew a random price ranging from either S$1 to S$10 in the PTC and PTR treatments, or from -S$9 to S$10 in the MPTR treatment, using a random number generator. If the bid submitted by a dictator was larger than or equal to the random price, the bid was considered to be successful and the dictator was allowed to either conceal or reveal the message. The earnings from stage two were the difference between the S$10 endowment and the random price.[2] If the submitted bid was less than the random price, the bid was considered to be unsuccessful and the dictator's earnings from stage two were equal to the S$10 endowment.

Immediately after the bidding process had been completed, the experimenter randomly chose one of the two decisions—allocation or bidding—to determine the dictator's final earnings. According to the decision made, a monetary payment to

[2] Note that if the successful bid was below S$0 in the MPTR treatment, this essentially implies the dictator would receive a payment from the experimenter in order to reveal the message.

dictator was then inserted into his/her envelope. However, before the envelopes were passed to the dictators, the written messages were removed from the envelopes of those who had succeeded (failed) in the BDM mechanism in the PTC (PTR and MPTR) treatments. All the envelopes were then placed inside a box located in a corner of the room. The dictators were asked to collect their envelopes based on their identity numbers. Before the dictators were allowed to leave the room, each was given 2 min to read the message in private. Thereafter, they took the monetary payment and were invited to participate in the post-experimental survey.

We conducted nine experimental sessions with three sessions in each treatment. Each session lasted for approximately 45 min. Including the S$5 attendance fee, participants' final earnings ranged from S$7 to S$19. Of the 424 participants, half assumed the role of dictators, and the other half the role of recipients. About 82 % of the participants assuming the role of dictator were Singaporean students, and the remainder were from other Asian countries such as Malaysia and Indonesia. The participants did not know each other before the experiment. None had previously participated in a similar experiment.

3 Experimental results

Table 1 summarizes the descriptive statistics. Out of 62 dictators in the PTC treatment, 59.68 % chose (S$7, S$7) and 40.32 % of them chose (S$10, S$2). There were 65 dictators in the PTR treatment, of whom 72.31 % chose (S$7, S$7) and 27.69 % chose (S$10, S$2). In the MPTR treatment, the corresponding proportions were 55.29 and 44.71 %.

Figure 3 presents box plots of the bid prices submitted by the fair-minded and the self-interested dictators, respectively, in the PTC and the PTR treatments. The boxes and whiskers show the shape of the distribution, the central value, and the variability of bids from each type of dictator in each treatment.

As shown in Fig. 3, a large majority of the self-interested dictators in the PTC treatment submitted positive bids. The distribution function of the bid prices submitted by these dictators appears to be symmetric, with the mean bid being slightly more than S$3. This indicates that the self-interested dictators showed a significant desire to conceal the message. However, the distribution function of the bid prices submitted by the fair-minded dictators is skewed to the right, indicating that the majority has less incentive to pay to conceal the written messages received from their matched recipients.

In the PTC treatment specifically, 59.46 % of the fair-minded dictators bid zero to conceal the message, whereas only 24 % of the self-interested dictators did so. A Pearson Chi squared test shows that the association between the allocation decision and the decision to either bid zero or a positive price was statistically significant ($\chi^2(1) = 7.5746$, p value $= 0.006$). Thus, the dictators' choice to conceal the message depended significantly on the type of dividing rule they had selected in

Table 1 Summary of the descriptive statistics

Data	PTC treatment		PTR treatment		MPTR treatment	
Number of allocators	62		65		85	
Number of recipients	62		65		85	
Total	124		130		170	
Gender						
Male	19		25		36	
Female	43		40		49	
Allocation						
Rules	(7, 7)	(10, 2)	(7, 7)	(10, 2)	(7, 7)	(10, 2)
Observation	37	25	47	18	47	38
Bid						
Mean	1.27	3.28	3.04	1.61	−0.5	−2.82
Median	0	3	2	1	0	−1.5
SD	1.90	2.74	3.09	2.03	3.36	3.17

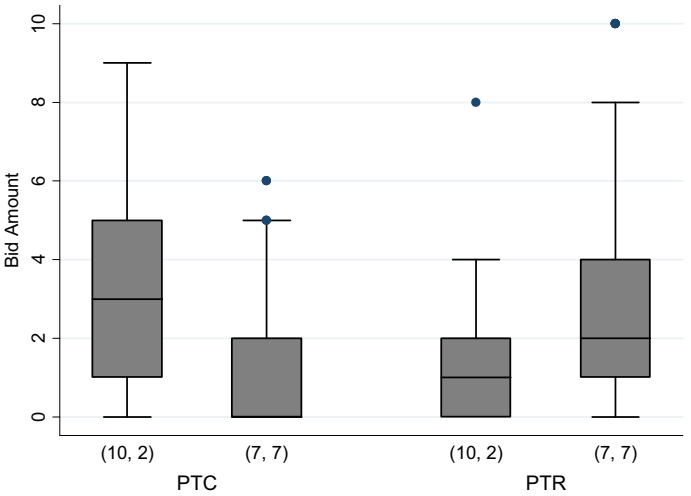


Fig. 3 *Box plots* of the bid prices under PTC and PTR treatments

stage one. The mean bid from the self-interested dictators was S$3.28 and the median was S$3. For the fair-minded dictators, the mean and median bids were, respectively, S$1.27 and S$0. The two median bids were significantly different from zero (Wilcoxon signed-rank: p value = 0.0001 and p value = 0.0000).

Comparatively, on average the self-interested dictators bid higher than the fair-minded dictators by a factor of approximately 2.6. Both the mean and median bids

of the former were significantly higher than those of the latter (Mann–Whitney test: $z = -3.110$, p value $= 0.0019$; k-sample median test: $\chi^2(1) = 9.3528$, p value $= 0.002$). From the observed submitted bids, it is apparent that the self-interested dictators exhibited a strong willingness to sacrifice their own monetary benefit in order to conceal the expected negative messages from the matched recipients.

Studies in psychology demonstrate that the mere imagination of another person's emotional state may automatically trigger a representation of that state in the observer's mind (Preston and de Waal 2002). Experimental studies in economics also show that a subject's ability to show empathy toward others is positively correlated with his/her prosocial behaviors (Ben-Ner et al. 2004; Ben-Ner and Halldorsson 2010). Anticipation of receiving a message expressing anger and disappointment toward the self-interested dictators may induce them to reconsider the recipient's position. This may cause them to feel shame or guilt about the possible psychological cost they have inflicted on the recipient. Nevertheless, the option to conceal the message gives them an opportunity to reduce the potential damage from the feeling of shame or guilt, albeit at the expense of a lower monetary payoff. In this regard, the price paid to conceal the expected message may be interpreted as a measurement of the degree of shame or the guilt aversion exhibited by the self-interested dictator.

Interestingly, subsequent to giving the recipient a fair amount, some of the fair-minded dictators also showed some incentive to conceal the message. There are two possible reasons for this. Firstly, these fair-minded dictators may want to delay the resolution of the uncertainty about the expected positive message from the recipient. If the fair-minded dictators savor the uncertainty about the expected good news, concealing the message would be a rational decision because it allows them to tap into this potentially utility-enhancing expectation indefinitely (Chew and Ho 1994; Loewenstein 1987; Lovallo and Kahneman 2000). Secondly, this could also be attributed to the experimenter demand effect (Zizzo 2010), something that is not unique to this setting. However, given that the average bid submitted by the self-interested dictators was significantly higher than that submitted by the fair-minded dictators, the incentive of the former to bid was apparently not due merely to the experimenter demand effect.

We now look at the PTR treatment. As shown in Fig. 3, the distribution function of the bid prices submitted by the self-interested dictators is skewed to the right, indicating that a majority of the self-interested dictators did not want to reveal the written message received from their matched recipients. Also, the distribution function of the bid prices submitted by the fair-minded dictators appears to be less asymmetric than for the self-interested dictators. Despite the difference in their shapes, the two distribution functions were not significantly different (two-sample Kolmogorov–Smirnov test: p value $= 0.259$).

In the PTR treatment, 78.72 % of the dictators who chose (S$7, S$7) submitted positive bids in an attempt to reveal the message. Interestingly, 66.67 % of the dictators who chose (S$10, S$2) did the same. The Pearson Chi squared test shows that the association between the allocation decision and the decision to either bid zero or a positive price was not statistically significant ($\chi^2(1) = 1.0196$, p value $= 0.313$). The mean bid from the fair-minded dictators was S$3.04 and

that from the self-interested dictators was S$1.61. The median bids were S$2 and S$1, respectively. Both median bids were statistically different from zero (Wilcoxon signed-rank: p value = 0.000 and p value = 0.0008). In addition, the mean bid of the fair-minded dictators was slightly, but significantly, higher than that of the self-interested dictators (Mann–Whitney test: $z = 1.854$, p value = 0.0637). However, the difference in the median bids was statistically significant at the 5 % level (k-sample median test: $\chi^2(1) = 4.3858$, p value = 0.036).

The expectation of receiving a negative message from the recipient did not prevent some self-interested dictators from bidding to reveal it. One possible explanation is that when the dictator believed that the recipient had expected him/her to choose the self-interested rule, bidding to reveal the message would allow the dictator to confirm this expectation should the bid be successful (Murnighan et al. 2001). However, the same explanation may also apply to the fair-minded dictator. Given that the average bid submitted by the fair-minded dictators in the PTR treatment was significantly higher than that submitted by the self-interested dictators, the incentive of the former to bid was apparently not due solely to the confirmation of expectations. Based on the data from the PTR treatment, the submitted bids seem to suggest that fairness perception was sought among fair-minded participants even in the absence of the audience effect. However, as shown later in the MPTR treatment, this observation could also be an artifact of the S$0 lower bound in the BDM procedure.

Because all subjects participated in only one treatment and the permitted bids were the same for the PTC and PTR treatments, the between-treatment comparison in bid prices may also help to shed light on the importance of recipients' views. Conditional on choosing the self-interested dividing rule, the mean and median bids from the dictators in the PTC treatment were significantly higher than those in the PTR treatment (Mann–Whitney test: $z = 2.077$, p value = 0.0378; k-sample median test: $\chi^2(1) = 7.0984$, p value = 0.008). Thus, after making a self-interested allocation, the dictators exhibited a stronger incentive to avoid the expected negative message than to affirm it. Conditional on choosing the fair and welfare-maximizing choice, the mean and median bids from the dictators in the PTR treatment were significantly higher than those in the PTC treatment (Mann–Whitney test: $z = -3.210$, p value = 0.0013; k-sample median test: $\chi^2(1) = 6.7730$, p value = 0.009). Thus, after choosing the fair and welfare-maximizing allocation decision, the incentive to reveal the expected positive message was stronger than the incentive to avoid it.

We also ran a series of ordinary least squares (OLS) and Tobit regressions. The dependent variable was the bid price, and the independent variables were $Treatment_i$, an indicator variable with the value of 1 if the subject was in the PTR treatment and 0 in the PTC treatment; $Allocation_i$, an indicator variable with the value of 1 if the subject chose (7, 7) and 0 if the subject chose (10, 2); $TreatAllo_i$, an interactive dummy variable between *Treatment* and *Allocation*; and $Male_i$, a dummy variable with the value of 0 if the subject was female and 1 if the subject was male. Table 2 summarizes the regression results.

As shown in Table 2, the treatment dummy was statistically significant in all the regressions. That is, the dictators bid significantly higher in the PTC than in the PTR

Table 2 OLS and tobit regressions of the bid prices

Dep. var.: bid	OLS		Tobit	
	(1)	(2)	(3)	(4)
Constant (β_0)	3.28*** (0.5166)	3.2695*** (0.6512)	2.7559*** (0.7745)	2.7747*** (0.9956)
Treatment (β_1)	−1.6689** (0.7984)	−1.6649** (0.8152)	−2.0628* (1.2139)	−2.0320* (1.2350)
Allocation (β_2)	−2.0097*** (0.6687)	−2.0074*** (0.6771)	−3.4150*** (1.0564)	−3.3943*** (1.0672)
Treatment × allocation (β_3)	3.4411*** (0.9796)	3.4367*** (0.9976)	5.4501*** (1.5277)	5.4158*** (1.5482)
Male (β_4)		−0.0131 (0.4923)		−0.1034 (0.7634)
R-squared	0.1058	0.1058		
Adj R-squared	0.0840	0.0765	0.0325	0.0325
Pseudo R-squared				
Observations	127	127	127	127

Standard errors are in parentheses

* Significant at 10 % level; ** significant at 5 % level; *** significant at 1 % level

treatment. The allocation dummy was also statistically significant in all regressions, indicating that the self-interested dictators bid significantly higher than the fair-minded dictators. However, the impact of gender on bid price was not statistically significant.

We also performed a treatment effect analysis based on the OLS regression. Since the impact of gender on bid was not statistically significant, our treatment effect analysis was based on model (1). As structured by the model, the effect on the bid of (1) being a fair-minded dictator in the PTR treatment is captured by $(\beta_0 + \beta_1 + \beta_2 + \beta_3)$, (2) being a self-interested dictator in the PTR treatment is captured by $(\beta_0 + \beta_1)$, (3) being a fair-minded dictator in the PTC treatment is captured by $(\beta_0 + \beta_2)$, and (4) being a self-interested dictator in the PTC treatment is captured by β_0.

Conditional on being in the PTC treatment, β_2 captures the difference in bids between the self-interested and fair-minded dictators. Conditional on being in the PTR treatment, $(\beta_2 + \beta_3)$ captures the difference in bids between the two groups. Conditional on being a self-interested dictator, β_1 captures the difference in bids between the PTR and the PTC treatments. Finally, conditional on being a fair-minded dictator, $(\beta_1 + \beta_3)$ captures the difference in the bid between treatments.

Table 3 summarizes the results of the treatment effect analysis based on the OLS regression model (1) shown in Table 2. Conditional on the PTC treatment, the difference in the bid between the self-interested and the fair-minded dictators, captured by β_2, was statistically significant at the 1 % level. Thus, the self-interested dictators demonstrated a significantly stronger incentive to conceal the message from the recipients than did the fair-minded dictators. Conditional on the PTR

Table 3 The differences in the bid across treatments and allocations

	Allocation		
	(10, 2)	(7, 7)	Difference in Bid
Treatment			
PTC	β_0	$(\beta_0 + \beta_2)$	β_2
			−2.010***
			(0.668682)
PTR	$(\beta_0 + \beta_1)$	$(\beta_0 + \beta_1 + \beta_2 + \beta_3)$	$\beta_2 + \beta_3$
			1.4314**
			(0.7159)
Difference in Bid	β_1	$(\beta_1 + \beta_3)$	
	−1.6689**	1.7723***	
	(0.7984)	(0.5677)	

Standard errors are in parentheses

* Significant at 10 % level; ** significant at 5 % level; *** significant at 1 % level

treatment, the difference in bids between the self-interested and the fair-minded dictators, captured by $(\beta_2 + \beta_3)$, was statistically significant at the 5 % level. The fair-minded dictators exhibited a significantly stronger motive to reveal the message from the recipients than did the self-interested dictators.

Conditional on being a self-interested dictator, the difference in the bids between the PTC and the PTR treatments, captured by β_1, was statistically significant at the 5 % level. Thus, the self-interested dictators demonstrated a stronger incentive to conceal the messages written by the matched recipients than to reveal them. Finally, conditional on being a fair-minded dictator, the difference in the bids between the PTC and the PTR treatments, captured by $(\beta_1 + \beta_3)$, was statistically significant at the 1 % level. Thus, the fair-minded dictators showed a stronger incentive to reveal the messages written by the matched recipients than to conceal them.

We now look at the results from the MPTR treatment. In stage two, the dictators were asked to submit 1 bid price from a selection of 21 ranging from -S$10 to S$10. As S$0 is no longer the lower bound of the bid, this version of the BDM does not have the problem of pushing the bid up from zero. Given that the dictator bids a price B and the experimenter chooses a price R which is drawn randomly from −S$9 to S$10, the probability that $B \geq R$ will be $\frac{1}{20}(10 + B)$, and $\frac{1}{20}(10 - B)$ otherwise. Consequently, the dictator's expected payoff from the BDM procedure can be expressed as follows:

$$E(\Pi) = \sum_{B \geq R} \frac{1}{20}(10 - R) + \frac{(10 - B)}{20} 10$$

Note that the expected payoff under the new BDM procedure follows an inverted-U shape even though the probability of being successful in the bidding process is still

monotonically increasing in the bid price. This is in contrast to the earlier BDM procedure, where a tradeoff between a lower expected payoff and a higher probability of winning always applied to the entire range of bid prices. For both designs, however, the payoff maximizing bid is S$0. The detailed payoffs corresponding to every possible combination of bid and random price can be found in the experimental instructions.

For a self-interested dictator, the optimum choices that maximize the monetary payoffs from both decisions would involve firstly choosing the unfair rule in stage one and secondly submitting a bid price of either −S$1 or S$0 in the BDM process. If image matters to the self-interested dictator, he/she might want to bid low prices so as to lower the probability of receiving the message. Between the prices of −S$10 to −S$1, however, the expected payoff increases with the bid. The dictator would therefore need to balance the tradeoff between a lower probability of receiving the message and a higher expected payoff. While the self-interested dictator might develop feelings of embarrassment and regret as a result of choosing the unfair dividing rule, a fair-minded dictator who has given fairly and generously would not. Consequently, we should expect the fair-minded dictators to refrain from bidding highly negative prices.

Figure 4 presents box plots of the bid prices submitted by both types of dictators in the MPTR treatment. As shown in Fig. 4, the distribution function of the bid prices submitted by the self-interested dictators is heavily skewed to the left. Results from the Shapiro–Wilk W test for normality reject the hypothesis that the distribution of the bid prices was normal ($z = 1.666$; $p < 0.04781$). Specifically, 66 % of the self-interested dictators bid negative prices, 29 % of them bid S$0, and 5 % of them bid positive prices. The mean bid was −S$2.82 and the median −S$1.5. By bidding negative prices, the self-interested dictators demonstrated a preference to voluntarily lower their expected earnings in order to avoid receiving the message. These observations are consistent with our previous results obtained

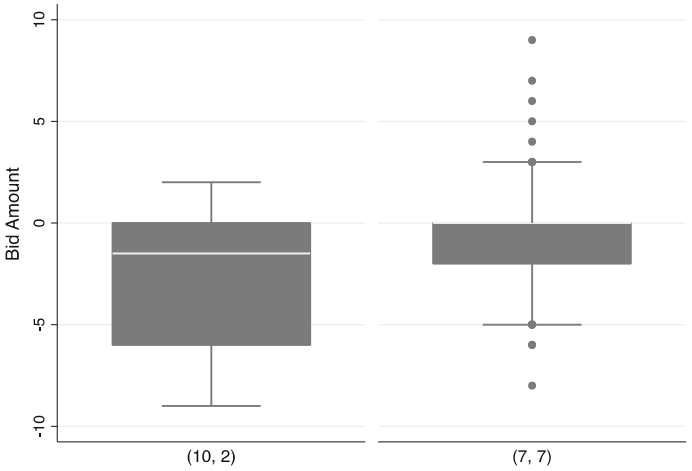


Fig. 4 *Box plots* of the bid prices under MPTR treatment

from the PTC treatment, where it was observed that the self-interest dictators spent S$3.28 on average in order to avoid receiving the message. Both sets of results thus confirm our hypothesis that the self-interested dictators exhibit a preference to avoid confronting a negative image of themselves even though it has no material impact on them.

Figure 4 also shows that the distribution function of the bid prices submitted by the fair-minded dictators was symmetric around −S$0.5. Results from the Shapiro–Wilk W test for normality cannot reject the hypothesis that the distribution of the bid prices was normal ($z = 0.747$; $p < 0.22750$). Specifically, 40 % of the fair-minded dictators bid S$0 and 11 % bid −S$1. The rest chose to bid either positive prices or less than −S$1. The mean bid was −$0.5 and the median S$0.

The observation that the majority of the fair-minded dictators chose payoff-maximizing bids indicates that they had adopted a neutral attitude towards the message. Since they had given fairly and generously, they did not feel morally deficient and, hence, had no particular urge to avoid the message. We also found that about 20 % of the fair-minded dictators bid positive prices. This suggests that positive image-seeking could be the reason behind some of these fair-minded dictators' bids. Another 30 % of the fair-minded dictators, however, bid prices lower than −S$1, suggesting that another possible reason for them to conceal the message could have been modesty. This result moderates substantially the previous result under the PTR treatment, where we showed that the fair-minded dictators wanted to confirm the supposedly nice message written by the recipient. It also implies that the previous result under the PTR treatment could be caused by the artifact of the BDM procedure we used in that treatment where the lower bound of bid was S$0. Subjects might feel compelled to bid strictly positive amount in such a setting.

It should be noted that both the mean and median bid prices submitted by the fair-minded dictators were still higher than those submitted by the self-interested dictators. The results from nonparametric tests show that the differences in the mean and median bids of each type of dictators were statistically significant (Mann–Whitney test: $z = -2.875$, p value $= 0.0040$; k-sample median test: $\chi^2(1) = 5.4137$, p value $= 0.020$). These observations are consistent with our previous results from the PTC and PTR treatments.

We also examined the content of some of the messages sent by recipients to both the selfish and fair-minded dictators. We can infer that the former were often negative and the latter were generally positive. For example, one recipient said to a selfish dictator "*Wow! You are selfish. If you don't feel you are selfish, then you are worse than selfish.*" Another said "*Money is the root of all evil, or greed. (You) should at least divide it equally to be fair. Oh well, GREEDY.*" In contrast, the messages sent to fair-minded dictators were generally pleasant, such as "*You are a good person,*" "*May God bless you,*" and even "*Marry me!*"[3]

[3] A better way of analyzing the messages would be to follow the procedure developed by Houser and Xiao (2010).

4 Survey results

One plausible explanation for these results could be the correlation between pro-sociality and the individual's attitude towards the perceptions of others'. That is, pro-social individuals may be inherently interested in knowing how others view them than self-interested individuals. One way to confirm this would be to check whether the two types of dictators exhibited significant differences in their attitudes toward others' perception based on their answers to the post experimental survey.

In the survey, the dictators were asked to indicate the level of importance of others' opinion or perception using a 5-point scale ranging from "Not at all important" to "Very important." If pro-sociality is indeed correlated with the desire to know others' perceptions, we should expect that the self-interested dictators to give such perceptions a significantly lower importance than the fair-minded ones. Based on the answers to the survey question, however, we found no such correlation.[4] The mean reported scales for both types were not significantly different from each other in the PTC (Mann–Whitney test: $z = -0.723$, p value $= 0.4694$), the PTR (Mann–Whitney test: $z = 1.400$, p value $= 0.1616$) and the MPTR treatments (Mann–Whitney test: $z = 1.091$, p value $= 0.2754$). Overall, the observed results do not seem to support the idea that pro-sociality is correlated with the desire to know others' perception of oneself.

In the survey, we also asked participants to choose a reason for submitting a bid out of out possible reasons. They are; *"Out of curiosity"*, *"I just want to try my luck"*, *"My matched Player Y's message is important to me"*, *"My matched Player Y's message is not important to me"*, *"I care about Player Y's personal feeling"*, and *"I don't care about Player Y's personal feeling"*. We also gave an opportunity for participants to write down their reasons if none of the given reasons explain their bidding behavior. The following were observed from the answers to the survey (Table 4).

On average, the most frequently cited reason was *"Out of curiosity. I just want to try my luck"*. This suggests that participants were concerned about the likelihood of success of their bids. Conditional on this reason, the observed bid prices within a treatment were different between the two types of dictators. In the PTC treatment, the mean bid price submitted by the fair minded dictators was smaller than that of the self-interested dictators. The pattern of the difference in bid prices was reversed in the PTR treatment and the MPTR treatment. This observation suggests that, beyond curiosity, the difference in bid prices could be caused by the self-interested dictator's motive to avoid confirming negative image.

Another commonly cited reason was *"My matched Player Y's message is not important to me"*. This reason was cited by more than a quarter of self-interested dictators. Not surprisingly, these self-interested dictators also submitted bids that were close to the payoff maximizing bids. Both their allocation decision and bidding decision are thus consistent with the reason cited. Notice that slightly less than a

[4] The answers given to the survey questions were not incentivized. In addition, participation in the survey was not compulsory, so the return rate was around 70 %. The results should therefore be interpreted with some caution.

Table 4 Post-experimental survey results

Reasons	(7, 7)			(10, 2)		
	Mean	SD	n/N (%)	Mean	SD	n/N
PTC						
Out of curiosity	2.88	0.85	22	4.14	0.91	28
Message is important to me	1.17	0.48	16	1.50	0.50	8
Message is not important to me	0.00	0.00	14	1.57	0.87	28
Care about Y's personal feeling	0.90	0.64	27	3.50	0.50	8
Don't care about Y's personal feeling	–	–	0	3.33	2.03	12
Other reasons	1.00	0.50	22	5.50	1.76	16
PTR						
Out of curiosity	3.94	0.78	38	2.78	0.76	50
Message is important to me	7.00	0	2	–	–	0
Message is not important to me	0.64	0.31	23	0.33	0.21	33
Care about Y's personal feeling	4.63	1.22	17	–	–	0
Don't care about Y's personal feeling	0.00	0.00	2	0.00	0.00	6
Other reasons	2.63	0.80	17	1.00	1.00	11
MPTR						
Out of curiosity	−0.22	12.00	23	−2.23	15.00	42
Message is important to me	2.00	2.00	8	−5.00	1.00	3
Message is not important to me	−1.21	14.00	35	−0.88	11.00	2
Care about Y's personal feeling	2.20	7.00	13	0.00	0.00	0
Don't care about Y's personal feeling	−2.50	2.00	5	−5.75	4.00	13
Other reasons	−1.00	9.00	18	−3.80	6.00	16

quarter of fair-minded dictators also cited this reason. Interestingly, the bids submitted by these fair-minded dictators were also close to the payoff maximizing bids. Even though both types of dictators cited the same reason and submitted similar amount of bid prices, the motives behind the bids were probably different. While ignorance was probably the motive behind the self-interested dictators' bid, the same motive probably does not apply to the fair-minded dictators. Dozens of fair-minded dictators indicated in their written answers to the questionnaires that they expected the recipient to write positive messages to them. Consequently, they submitted a payoff maximizing bid price because receiving the message or not is no longer important to them.

Also unsurprisingly, *"I care about Player Y's personal feeling"* was almost absent from the reason cited by the self-interested dictators. Likewise, *"I don't care about Player Y's personal feeling"* was only cited by few fair-minded dictators. Lastly, some participants preferred to write down the reasons behind their bids. The reasons given by these participants largely show justifications for their allocation decisions and the subsequent bidding decisions. For example, one fair-minded participant who bid S$0 in the PTR treatment wrote: *"I have chosen the one I feel*

will benefit both players the most. Thus, there is a high probability that the message will be a positive one. Thus, I feel little need for me to confirm the message." One self-interested dictator who bid \$3 in the PTC treatment wrote: *"Because I don't know who player Y is, my decision might change if I knew who I was deciding for."*

5 Conclusions

Canonical economic theories predict that others' perceptions of oneself would be irrelevant if they have no material impact. The literature in sociology and social psychology demonstrates that our self-identity is developed through our understanding of how others perceive us. Using the looking-glass self as a framework, we reconstructed Cooley's (1964) three sequential components inside an economic laboratory. We also implemented the BDM procedure (Becker et al. 1964) to elicit the monetary values that participants placed on how anonymous others perceived them.

We showed that self-interested dictators exhibited strong negative perception avoidance even in an environment in which all messages were conveyed to them anonymously and privately. People develop negative self-views when they realize that they have fallen short of their internal standards (Fejfar and Hoyle 2000; Moskalenko and Heine 2003). Often, avoidance is instinctively seen by self-perceived transgressors as a way to lessen the feelings of guilt resulting from being reminded of such discrepancies (Duval and Silvia 2002; Csikszentmihalyi and Figurski 1982). Hence, our results show that people may be willing to spend a significant amount to avoid confirming what they imagine to be others' negative perception of themselves. Thus, "where ignorance is bliss, 'tis folly to be wise" (Ode on a Distant Prospect of Eton College, Thomas Gray (1742)).

We also show that the fair-minded participants adopted a neutral attitude towards perceptions of fairness in the absence of the audience effect. Surprisingly, the anticipation of finding out about negative perceptions did not appear to deter some self-interested dictators from bidding to reveal the messages. This indicated the presence of heterogeneity among dictators in terms of the value of others' perception.

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