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Externality and framing effects in a bribery experiment

by

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Abstract

Using a simple one-shot bribery game, we find evidence of a negative externality effect and a framing effect. When the losses suffered by third parties due to a bribe being offered and accepted are increased bribes are less likely to be offered and accepted. And when the game is presented as a bribery scenario instead of in abstract terms bribes are less likely to be offered and accepted. We discuss two possible reasons as to why our experiment leads to the identification of these effects while previous experiments did not.

Key Words: Corruption; Economic experiment; Social preferences.

JEL classification: D73 – Corruption; C91 - Laboratory, Individual Behavior; Z13 - Social Norms.

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1. Introduction

This paper revisits two of the findings, or more specifically *null* findings, reported by Klaus Abbink and his coauthors in a series of experiments designed to explore bribery. Like the researchers themselves, we were surprised by these null findings and considered them worthy of further investigation.

In 2002, Klaus Abbink, Bernd Irlenbusch, and Elke Renner (AIR below) conducted an experiment designed to explore the effects of three aspects of the environment in which bribes may be offered and accepted on such corrupt behavior. Those three aspects were (1) the fact that illegal agreements are not enforced by the rule of law, (2) that the exchange of bribes for corrupt services may be harmful to third parties or to society as a whole, and (3) that those engaged in such exchanges, if caught, may be severely punished. Their experiment involved a two-player, sequential game between a potential briber and bribee or 'public official'. Under the first of three treatments, the briber had to decide whether and how much to offer as a bribe without knowing whether the bribee would be willing to grant the briber a higher payoff (simulating the provision of the corrupt service being requested) in return and the bribee was free to reject the bribe, accept and grant the higher payoff, or accept but not grant the higher payoff. If bribes are offered and higher payoffs granted, it can be taken as evidence that trust and reciprocity are sufficient to support such exchanges. Under the second treatment, whenever a bribe was offered and a higher payoff granted by a briber-bribee pair all the other briber-bribee pairs attending the same experimental session incurred a loss, and the total loss incurred by all was greater than the sum of the briber and bribee's private gains. If less bribery and less granting of higher payoffs is observed under this second as compared to the first treatment, it can be taken as evidence that individuals take account of the harm corrupt exchanges cause to others when deciding how to act. Finally, under the third treatment briber-bribee pairs engaging in corrupt exchanges faced a very small probability of loosing all their winnings from the experiment and being excluded from subsequent play. If there was less bribery and less granting of higher payoffs under this third as compared to the second treatment, it can be taken as evidence that individuals are deterred by punishment when contemplating bribery.

AIR found evidence of trust and reciprocity between briber-bribee pairs and that the threat of punishment significantly reduced the incidence of corrupt exchanges. However, they were surprised to find no evidence that individuals take account of the harm corrupt exchanges cause to others when deciding how to act.[1]

In the same year and as part of the same series of experiments Abbink and Heike Hennig-Schmidt (AHS below) investigated the possible impact of one further factor on briber and bribee behavior within the context of this game. AIR presented their games to their subjects in abstract form, being careful to never make the link between the experiment and corruption explicit. AHS repeated the same experiment except this time they presented the game as one in which a firm is applying for permission to run a factory that will pollute the environment and is deciding whether to offer the presiding public official a bribe. In turn, the public official must decide whether to accept or reject the bribe (if one is offered) and whether to grant the permission. Drawing on the discussions of Eckel and Grossman (1996) and Loomes (1999) AHS argued that 'neutral instructions may distort the interpretability of experimental results with respect to the real-life situations researchers are interested in' (AHS, p. 104) and suggested that by comparing behavior across the framed and unframed versions of the game we can identify the role played by 'social and psychological factors' (AHS, p. 104). They hypothesized that, as corruption is illegal and generally viewed as immoral, subjects receiving the framed presentation of the game would be less likely to offer and accept bribes and supply the corrupt service. However, they were surprised to find no significant effect.[2]

We are interested in re-examining these two null findings because, while one relates to a substantive treatment difference and the other to a methodological difference, both pertain to a particular question about the causes of corruption and to the corresponding policy debate. That question is as follows: does corruption occur whenever the extrinsic incentives are insufficient to keep individuals honest or do intrinsic motivations also play a determining role? Intrinsic motivations can take many forms. However, in the context of corruption the most apposite would be social preferences that lead to dissatisfaction in the form of guilt when individuals view their own actions as leading to reduced welfare for others or simply as immoral. The comparison of AIR's first and second treatments can be seen as a direct test for the existence of the first of these two types of social preference,

[1] Related null findings are reported in, as yet, unpublished papers. Abbink (2005) found no impact when reducing the relative initial endowments of innocent third parties who suffered losses when bribes were offered and accepted. And in a similar game applied to non-student subjects Cameron, Chaudhuri, Erkal, and Gangadharan (2005) found no impact when increasing the amount of harm caused to a third party when a bribe was offered and accepted.

[2] Subsequent bribery experiments have been framed with no attempts to investigate framing effects (see, for example, Cameron et al. (2005), Bilotkach (2006))

while AHS's experiment can be seen as a direct test for the existence of the second.

Rather than replicating the experiments of AIR and AHS, we test for externality and framing effects using a much simpler bribery game. In our game, as in AIR’ and AHS's, a private agent has to decide whether and how much to offer a 'public official' as a bribe in exchange for a corrupt service (a higher payoff in the game) and in turn the 'public official' has to decide whether and how much to accept. However, in contrast to AIR and AHS, if a bribe is accepted the private agent automatically gets the corrupt service. Also in contrast to AIR and AHS but more in line with Abbink (2005) and Cameron et al. (2005), it is not other briber-bribee pairs that suffer a loss whenever a bribe is offered and accepted but a number of 'other members of society', i.e., other subjects who do not have the option to engage in bribery themselves. Further, in none of our treatments do corrupt pairs face a small probability of incurring a severe punishment. Instead, engaging in corruption is associated with a fixed cost representing the expected cost of being caught and punished plus, in the case of the 'public official', the cost of providing the service. Finally, we make two further simplifications and two other alterations for reasons that will become clear below: the bribe is not tripled before being passed on to the 'public official'; the game is one-shot not repeated; in the framed version of the game, the private agent is a ‘private citizen’ not a firm; and we apply the strategy method to the ‘public official’, asking would they accept or reject each of the possible bribes the ‘private citizen’ might offer.

While AHS and AIR see their experiments as simulating corrupt exchanges between firms and public officials, ours is better viewed as simulating the corrupt exchanges that, in some countries, regularly take place between public officials and ordinary citizens endeavoring to avoid fines and court summonses, jump queues, or ascend waiting lists. In other words, it better simulates situations in which there is no reason to expect the bribers to be significantly richer than the bribees, the exchanges are one-shot or, at least, perceived as such by both bribers and bribees, and both sides of the exchanges are executed pretty much at the same time. Such exchanges are often referred to as 'petty corruption' suggesting that they may be of less importance than the type of corrupt exchanges to which AIR and AHS allude. However, we would argue that their relative importance depends not only on the magnitude of the benefits and costs involved but also on the frequency with which each type of exchange occurs and on how and whether they impact on the likelihood of other corrupt exchanges occurring or going unpunished. And, as long as these values, frequencies, and wider effects are unknown it is best to retain an open mind and an interest in research that might help identify ways of combating all types of corruption.

Our experiment provides evidence of both externality and framing effects and, thereby, suggests that intrinsic motivations do play a determining role in corruption.

The paper has five sections. Following this introduction, in section 2, we describe our experimental design, present a number of behavioral predictions relating to different assumptions about intrinsic motivations or social preferences, and, with reference to these predictions, explain the treatments we apply. In section 3, we introduce our participants, and in section 4 we present our results. In section 5, we discuss our findings and provide some possible explanations as to why we have succeeded in identifying the two effects that AIR and AHS did not identify. Finally and briefly, in section 6, we conclude.

2. Methodology

2.1 The simple bribery game

Each 'private citizen' receives an initial endowment, Y_c, and may offer a 'bribe', b, in exchange for a corrupt service, the value of which to him is V. If he offers a bribe, regardless of its magnitude and whether it is accepted or rejected by the 'public official', he incurs a cost E. This represents the expected cost of being caught and punished. We chose to make this cost deterministic rather than stochastic in order to reduce the potential impact of risk preferences on observed behavior. So, the 'private citizen's' final payoff from the game is:-

$F_c = Y_c$ if he chooses not to offer a bribe;

$= Y_c - E + V - b$ if he offers a bribe and the bribe is accepted; and

$= Y_c - E$ if he offers a bribe and the bribe is rejected.

Each 'public official' receives an initial endowment of Y_p. If he accepts a bribe he automatically has to supply the corrupt service and incur a cost, K. This represents the sum of the expected cost of being caught and punished, the cost of supplying the service, and the cost of any efforts made to reduce the likelihood of capture. Again, we chose to make this cost deterministic rather than stochastic in order to reduce the potential impact of risk preferences on observed behavior. So, the 'public official's' final payoff from the game is:-

$F_p = Y_p$ if he is not offered a bribe;

$= Y_p$ if he is offered but does not accept a bribe; and

$= Y_p - K + b$ if he accepts a bribe.

Finally, each 'other member of society' receives an initial endowment of Y_o and for every bribe offered by a ‘private citizen’ and accepted by a ‘public official’ he incurs a cost, h. So, each ‘other member of society’s’ final payoff from the game is $F_o = Y_o - N_c h$, where $N_c \in \{1, 2, 3, 4, 5\}$ is the number of ‘private citizen’-‘public official’ pairs who offer and accept bribes.

If all ‘public officials’ and ‘private citizens’ are selfish money-maximizers, and we treat play as sequential, this game has the following sub-game perfect equilibrium: each ‘public official’ will accept any bribe that leaves him better off, i.e., he will accept any $b>K$, and will be indifferent between accepting and rejecting when $b=K$; assuming ‘private citizens’ know this, they will all offer bribes of $K+\mu$, where μ is a small positive amount; and all bribes ($=K+\mu$) will be accepted, so each ‘other member of society’ will suffer the maximum possible negative externality of $5h$. We will refer to this as the selfish money maximizing equilibrium or SMME below.[3]

2.2 Predicting externality and framing effects with reference to social preferences

One way of modeling the impact on behavior of social preferences of the type we described in the introduction is to assume that a ‘public official’ who causes harm to others or engages in an act that she perceives as immoral suffers a psychological cost, $M_p=M_p(h,s)$ with $M_p>0$ if $h>0$, $dM_p/dh>0$, $dM_p/ds>0$, and where s captures the degree to which the act is perceived as immoral. Similarly, a ‘private citizen’ who causes harm to others or engages in an act that she perceives as immoral suffers a psychological cost, $M_c=M_c(h,s)$ with $M_c>0$ if $h>0$, $dM_c/dh>0$, $dM_c/ds>0$. Now, leaving all other aspects of the game unchanged and assuming no other social preferences, we can make a number of predictions.

Prediction 1. ‘Public officials’ will now only accept $b>K+M_p(h,s)$. So, an increase in either h or s will lead to an increase in ‘public officials’ minimum acceptable bribes.

Prediction 2. Any ‘public official’ for whom $M_p(h,s)>b_{max}-K$, where b_{max} is the maximum possible bribe in the game, will always reject. So, if $M_p \sim F(.)$, over some range of h and s, the proportion of ‘public officials’ who reject all possible bribes, $1-F(b_{max}-K)$, will increase

[3] Note that in AIR’ and AHS’s experiments the SMME involved no bribery because trust was a prerequisite to offering a bribe. In Cameron et al (2005) the SMME involved the maximum possible bribe because the value of the corrupt service increased proportionately with the bribe offered. By setting the SMME bribe at neither the minimum (zero) nor the maximum possible amount, we reduce the likelihood of our findings being spurious – based on participant errors alone.

following an increase in either h or s.

Prediction 3. A 'private citizen' who believes $M_p \sim \hat{F}(.)$ will offer no bribe if the net total private value of the corrupt service is insufficient to cover the sum of his own and his best guess of the 'public official's' psychological costs, i.e., if $M_c(h,s)+\hat{M}_p(h,s) > V - K - E$, where $\hat{M}_p$ satisfies the first order condition $V - K - \hat{M}_p = \hat{F}(\hat{M}_p)/\hat{f}(\hat{M}_p)$. So, as long as $d\hat{M}_p/dh = 0$ and $d\hat{M}_p/ds = 0$ (reasonable assumptions that would apply in the case of most common probability distributions), an increase in either h or s will also lead to an increase in the proportion of 'private citizens' who choose not to bribe.

Prediction 4. If $M_c(h,s)+\hat{M}_p < V\text{-}K\text{-}E$, the 'private citizen' will offer a bribe of $K+\hat{M}_p$. So, if we assume that $d\hat{M}_p/dh > 0$ and $d\hat{M}_p/ds > 0$, an increase in h or s will lead to an increase in the bribes offered by 'private citizens'.

2.3 Parameterization and treatments

In our experiment we used a fictitious currency called a Gilpet (G1 = £0.20 ˜ $0.35), set $Y_c = Y_p$=G35, Y_o=G25, V=G16, E=G1, K=G5, and, for reasons that will be explained below, set h equal to either G1 or G4. 'Private citizens' could choose any $b \in$ {G1, G2, G3,…G20} and recall that 'public officials', instead of responding only to the particular bribe offered to them by the 'private citizen' with whom they were paired, had to state whether they would accept or reject each of the possible bribes, $b \in$ {G1, G2, G3,…G20}, while knowing that whichever one of their responses turned out to be pertinent would determine their earnings. This full strategy elicitation enabled us to identify 'public officials' who would reject any possible bribe and the minimum acceptable bribe for each of the others.

Table 1: Experimental Design: Sessions and Treatments

	$s=s_L$ (abstract frame)	$s=s_H$ (corruption frame)
$h=h_L$=G1 (negative externalities low)	3 sessions (45 participants, 15 in each role)	3 sessions (45 participants, 15 in each role)
$h=h_H$=G4 (negative externalities high)	3 sessions (45 participants, 15 in each role)	4 sessions (60 participants, 20 in each role)

We varied both the magnitude of *h*, the negative externality caused by a bribe being offered and accepted, and, through framing, the likelihood that the acts of offering and accepting would be perceived as immoral, *s,* across experimental sessions. *h* was set either low, $h=h_L$=G1, in which case bribery was Pareto-improving, or high, $h=h_H$=G4, in which case bribery was Pareto-worsening. To set $s=s_L$ the game was explained in abstract terms: those taking the 'private citizen' role were referred to as 'Player As', those taking the 'public official' role were referred to as 'Player Bs', 'other members of society' were referred to as 'Player Cs', bribes were simply referred to as 'offers', and no mention was made of corrupt services. And to set $s=s_H > s_L$ the game was described using the labels 'private citizen', 'public official', 'other members of society', and 'bribe'.

We conducted 13 experimental sessions each involving 15 participants. Table 1 shows the distribution of sessions with respect to *h* and *s*.

2.4 Practical details

All the experimental sessions took place during the final quarter of 2005 in seminar rooms in the Department of Economics, Oxford University. In every session the participants were seated at well spaced desks. The game was explained verbally by one of the authors (the same one in all sessions) following a predefined script and using visual aids in the form of overhead projector slides. Each participant received two tables showing how various possible decision combinations lead to particular final payoffs for each player-type. The participants expressed their decisions on specially designed forms which they completed behind privacy screens to ensure that they were not overlooked. No talking was allowed. Once the game was completed, the participants' payoffs were calculated at the front of the seminar room and a show-up fee of £3 ($5.29) was added. In the meantime, the participants filled out a questionnaire. The experimental scripts can be found in Appendix 1. (All the visual aids, tables, and forms designed for and used during the experiment are available from the authors.)

3. Experimental participants

Our 195 participants were all students at the University of Oxford. Some signed up for the study at a stall set up by us at the Annual Freshers' Fare, an event at the start of each academic year designed to facilitate recruitment by student societies and other activitybased groups. The remainder contacted us by e-mail having seen promotional posters and leaflets advertising the study or received an e-mail through their departmental or college mailing lists.

Table 2 describes our participant sample, focusing on a few characteristics that have been found to be significant in previous analyses of other regarding behavior. Ages ranged from 18 to 44 years, with the average age being just under 24 years. Just over half of the students were female. All the major world religions were represented in the sample, although less than one third of the participants described themselves as religious. Fifteen percent were only children. Just under one third were studying economics. According to Chi-squared and t-tests, none of the characteristics vary significantly across assigned roles. However, despite the random assignment of participants, the participants under the high externality treatment were marginally but significantly older (24.40 as compared to 23.22 years).

Table 2: Participant characteristics

	All participants	'Private citizens'	'Public officials'	'Other members of society'
Average age in years	23.86	24.22	23.86	23.49
	(4.46)	(4.72)	(4.33)	(4.35)
Female	51.28%	49.23%	50.77%	53.85%
Described self as religious	29.74%	32.31%	33.85%	23.08%
An only child	15.38%	10.77%	20.00%	15.38%
Studying economics	28.21%	32.31%	33.85%	18.46%
Number of observations	195	65	65	65

Note: The standard deviations relating to the one continuous variable, age, are reported in parentheses.

4. Results

The data generated by our experiment is presented in Figures 1 to 6 and Table 3. All the figures contain histograms showing, in the case of ‘private citizens’, the frequencies with which each of the possible bribes was offered and, in the case of ‘public officials’, the frequencies with which each of the possible minimum acceptable bribes was observed. Note that those offering or accepting no bribe have been placed at the right- rather than the left-hand end of their respective histograms. For ‘public officials’ this is because, given the math of the game, accepting no bribe implies a minimum acceptable bribe of 21 or more. So, by placing ‘no bribe’ on the right, we ensure that the total psychological cost implied by each possible decision increases as we move rightwards on the graph. We do the same for bribes offered in order to be consistent.

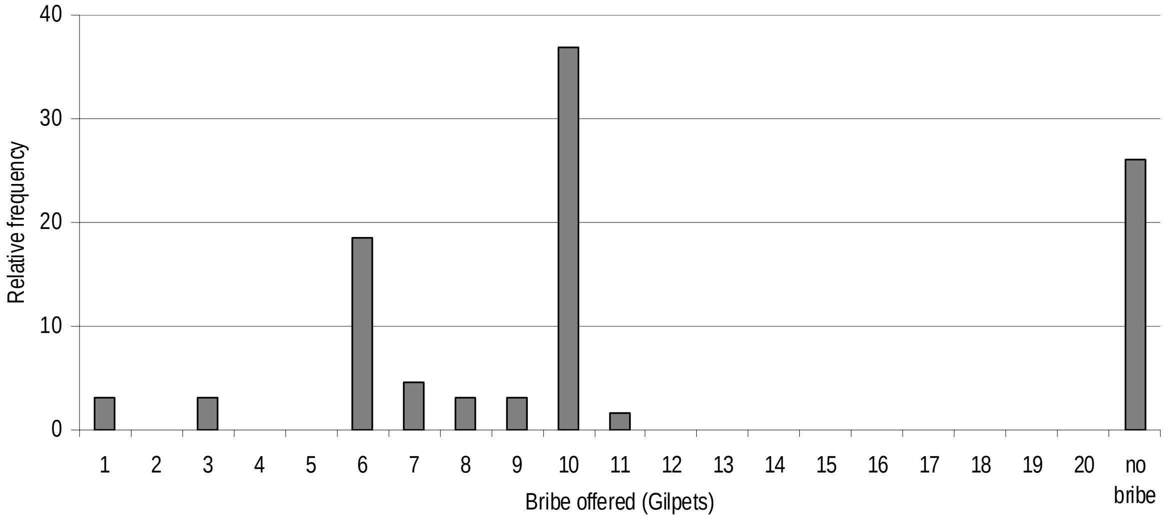


Figure 1: Bribes offered by ‘private citizens’ in the bribery game

Figure 1 shows that of the ‘private citizens’ only 18 percent offered the SMME bribe of G6, while 76 percent offered a higher bribe or no bribe at all: 26 percent chose not to offer a bribe; 37 percent offered a bribe of G10, thereby dividing the net total private return to corruption equally between themselves and the ‘public official’; 1 percent made an offer of G11; and 10 percent made offers between G6 and G10. Only 6 percent made offers below the SMME, possibly in error. The strong mode at G10 is worthy of note: it is reminiscent of the oft seen modal offer of 50 percent in Ultimatum Games and suggests that preferences relating to fairness or reciprocal kindness may have affected the ‘private citizens’ behavior towards the ‘public officials’. While interesting, this pattern in the data cannot be taken as evidence of social preferences relating to engaging in acts that are immoral or cause harm to others. For that we must turn to the comparisons across treatments.

Table 3: Treatment effects in the bribery game

	Full sample	Low externality h=G1	High externality h=G4	Abstract frame $s=s_L$	Corruption frame $s=s_H$
'Private Citizens'					
Offered no bribe	26.15%	13.33%	37.14%	10.00%	40.00%
Observations	65	30	35	30	35
Chi-squared tests p-values		0.029		0.006	
Mean bribe offered	8.04	7.50	8.68	7.62	8.57
Observations	48	26	22	27	21
t-tests (one tailed) p-values		0.055		0.104	
rank-sum tests (two-tailed) p-values		0.332		0.151	
'Public Servants'					
Accepted no bribe	18.46%	6.67%	28.57%	10.00%	25.71%
Observations	65	30	35	30	35
Chi-squared tests p-values		0.023		0.104	
Mean minimum acceptable bribe	7.54	7.39	7.72	7.74	7.34
Observations	53	28	25	27	26
t-tests (one tailed) p-values		0.330		0.703	
rank-sum tests (two-tailed) p-values		0.909		0.372	

In Figure 2 and the second and third columns of Table 3 the data on bribe offering has been separated according to the magnitude of the prevailing negative externality. In accordance with Prediction 3 (section 2.2 above), 'Private citizens' were significantly (5% level) less likely to offer bribes when the externality was high, i.e., when greater harm was done to the 'other members of society' when bribes were offered and accepted.

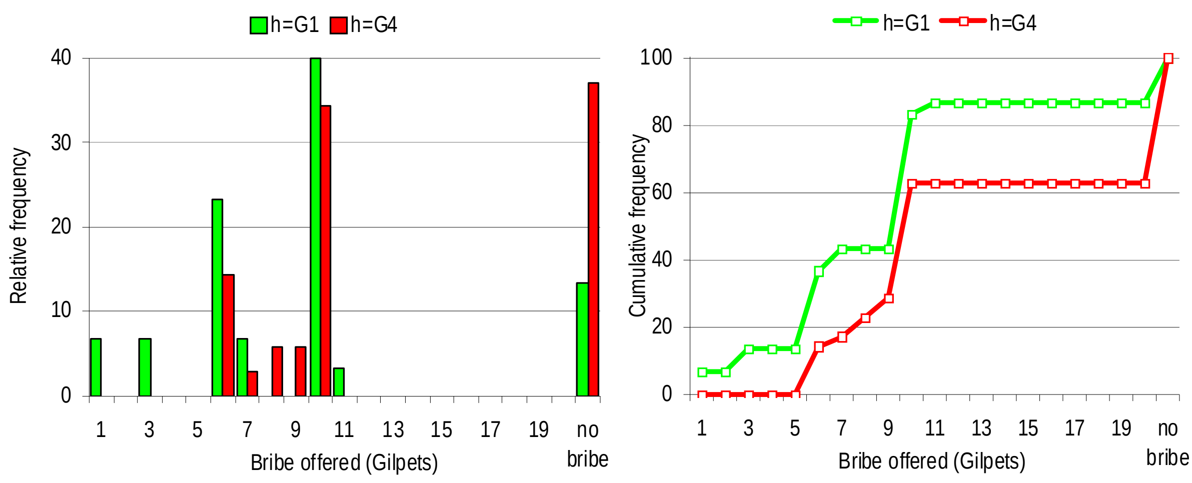


Figure 2: The effect of negative externalities on bribes offered

We also see an increase in the mean bribe offered, conditional on offering a bribe at all, when the negative externality was increased. This increase concurs with Prediction 4. However, it is only significant (10% level) according to a one tailed t-test, the power of which may be questionable given the non-normality of our data, and is not significant according to a non-parametric, rank-sum test.

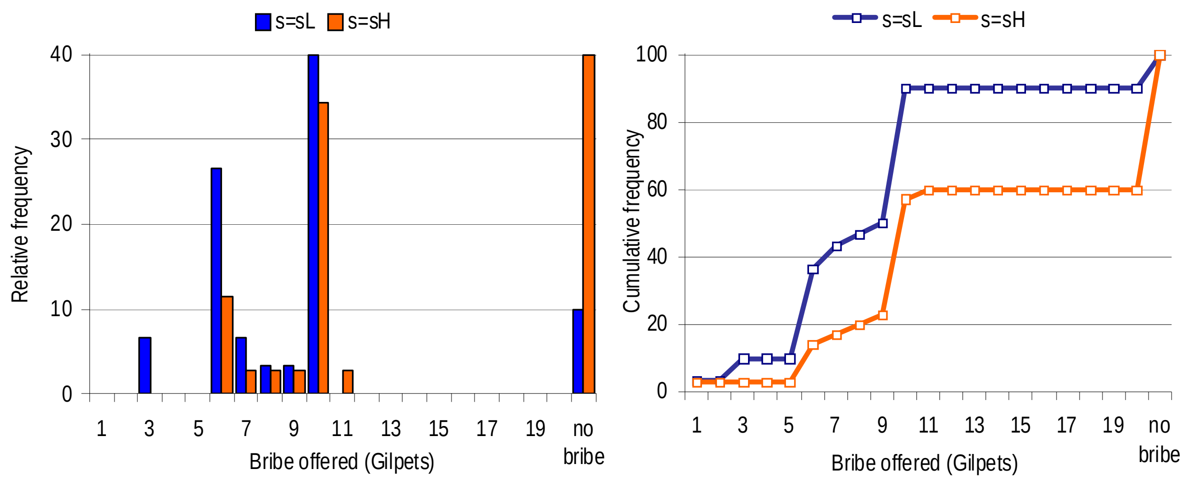


Figure 3: The effect of framing on bribes offered

In Figure 3 and the fourth and fifth columns of Table 3 the data on bribe offering has been separated according to whether the game was presented in abstract form ($s=s_L$) or framed as a corrupt transaction ($s=s_H$). Again, in accordance with Prediction 3, 'private citizens' were significantly (1% level) less likely to offer bribes when the corruption frame was applied, i.e., when the likelihood of the 'private citizens' perceiving the act they were contemplating as immoral was at its highest.

The increase in the mean bribe offered, conditional on offering a bribe at all, when the game was framed as a corrupt exchange concurs with Prediction 4. However, it is only borderline significant (10.4% level) according to a one tailed t-test and is not significant according to a non-parametric, rank-sum test.

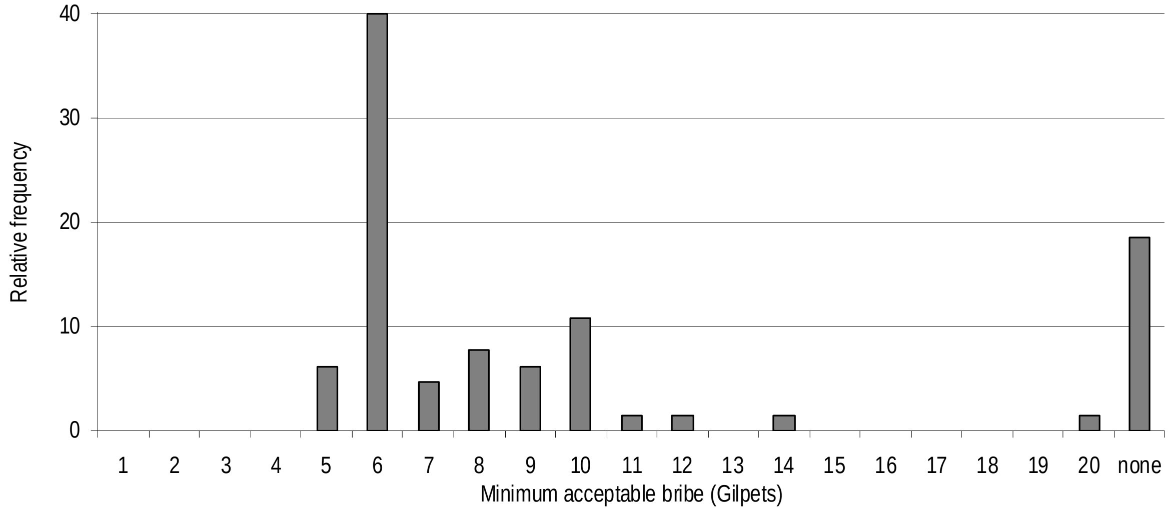


Figure 4: 'Public officials' minimum acceptable bribes in the bribery game

Figure 4 presents a histogram of the 'public officials' minimum acceptable bribes (MABs). Forty percent of the 'public officials' would have accepted the SMME bribe of G6 and a further 6 percent would have accepted the break-even bribe of G5. In disagreement with the SMME, 18 percent would not accept any bribe, 11 percent chose a MAB of G10, 6 percent indicated MABs above G10, and 18 percent chose MABs between G6 and G10. Here, compared with the data on bribes offered, we see a weaker mode at the equitable division bribe of G10. This should come as no surprise to those familiar with Ultimatum Game experiments and does not rule out the possibility that some 'public officials' also preferred equitable final payoffs. Neither does it indicate anything about the impact of social preferences relating to engaging in acts that are immoral or harmful to others. For that we must again turn to the comparisons across treatments.

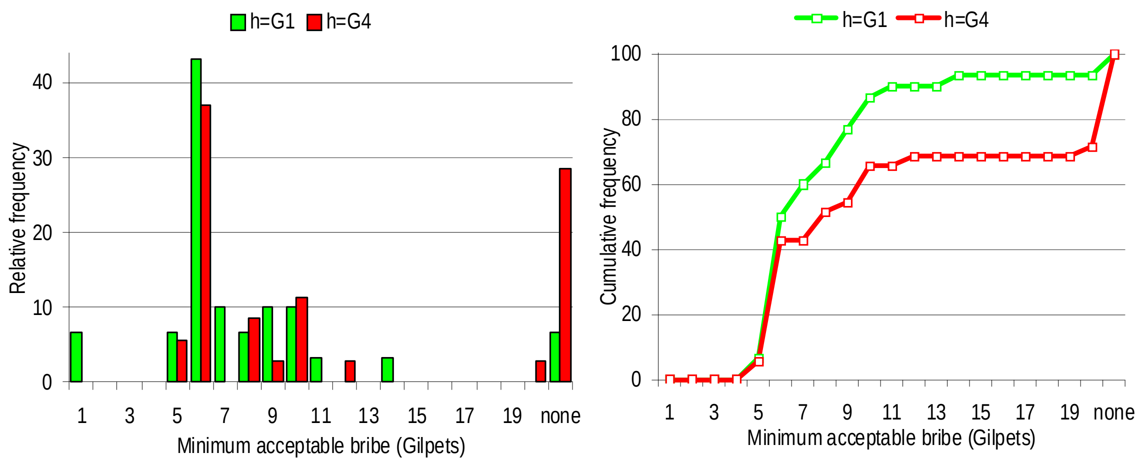
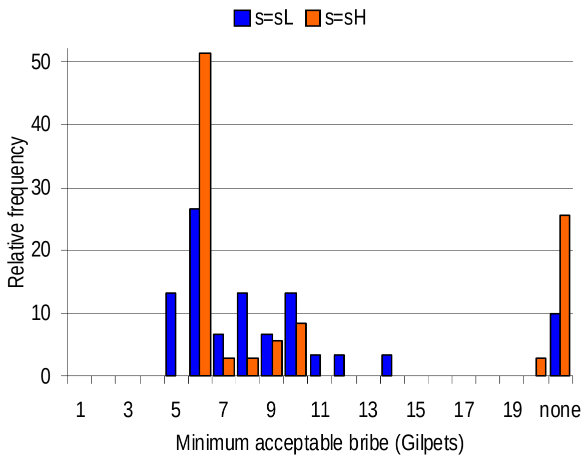


Figure 5: The effect of negative externalities on minimum acceptable bribes

In Figure 5 and the second and third columns of Table 3 the data on MABs has been divided into two sub-samples according to the magnitude of the prevailing negative externality. Consistent with Prediction 1 (section 2.2 above), 'Public officials' were significantly (5% level) more likely to reject all possible bribes when the externality was high, i.e., when greater harm was done to 'other members of society' when bribes were offered and accepted. The increase in the mean MAB, conditional on accepting at least one of the possible bribes, when the negative externality was increased concurs with Prediction 2, but is not statistically significant.



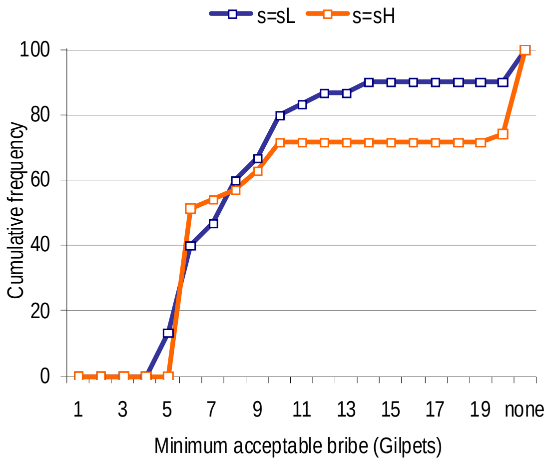


Figure 6: The effect of framing on minimum acceptable bribes

In Figure 6 and the fourth and fifth columns of Table 3 the data on MABs has been separated according to whether the game was presented in abstract form ($s=s_L$) or framed as a corrupt transaction ($s=s_H$). The figures indicate that, in accordance with Prediction 1, 'Public officials' were more likely to reject all bribes when the corruption frame was applied, i.e., when they were more likely to perceive the act they were contemplating as immoral. However, this result is only borderline significant (at 10.4%). Finally, the decline in the mean MAB, conditional on accepting at least the highest possible bribe, as we move from the abstract to the corruption frame, does not concur with Prediction 2, but is also not statistically significant.

To check the robustness of our results, we conducted Probit analyses taking bribe offering and acceptance as the dependent variables and treatment dummies and the individual characteristics presented in Table 2 as independent variables. Controlling for individual characteristics did not significantly alter any of the findings reported above. The analyses are presented in Appendix 2.

5. Discussion

In contrast to AIR, AHS, and indeed Cameron et al. (2005) and Abbink (2005), we find evidence of both an externality effect and a framing effect within the context of a bribery game. When each bribe offered and accepted does greater harm to a number of innocent third parties, subjects in the 'private citizen' role were significantly less likely to offer a bribe and subjects in the 'public official' role were significantly more likely to reject all possible bribes. And, when the game was framed as a situation in which a private citizen was considering offering a bribe to a public official in exchange for a corrupt service, subjects in the 'private citizen' role were, again, significantly less likely to offer a bribe and subjects in the 'public official' role were more likely to reject all possible bribes, although in this case the effect is only boarderline significant. These findings can be taken as evidence that intrinsic motivations, in the form of social preferences for not engaging in acts that cause harm to others or are perceived as immoral, may play a determining role in corruption.

But why have we succeeded in identifying these effects when Abbink and others failed? Our experiments were not designed to address this question. However, our data does provide two clues that might be worth pursuing in future research.

First, recall the strong mode in bribes offered at G10, the bribe that divides the net total private return to corruption equally between the briber and bribee. Had this mode been even stronger, it could have confounded our efforts to identify any of the effects of interest and would have indicated that concerns about acting fairly towards ones potential partner in crime were looming larger in the participants' minds than concerns about harming others or doing something immoral. But working in our favor was the fact that concerns about acting fairly towards one's partner in crime or having them act fairly towards oneself would have only affected the magnitude of the bribe offered or the minimum bribe accepted and not whether to offer or accept at least one of the possible bribes. Thus, our efforts to identify the predicted effects in the magnitudes of bribes offered and accepted may have been confounded, but our efforts to identify the predicted effects relating to the proportions of individuals engaging in bribery were not.

Now recall AIR's game in which trust and reciprocity between the briber and bribee were necessary preconditions to a corrupt exchange. Here, not only uncorrupt but also untrusting and untrustworthy individuals would be less likely to engage in bribery and this could have led to a confound if, as it would seem reasonable to hypothesize, untrusting and untrustworthy individuals are also *more* rather than less inclined to be corrupt.[4]

Second, recall that in our experiment the framing effect on bribe offering was significant, while the framing effect on bribe acceptance was on the boarderline of insignificance. One possible explanation for this is that our subjects identified more readily with the role of ‘private citizen’ than with that of ‘public official’ and this affected the degree to which they saw the acts they were being asked to contemplate within the context of the experiment as immoral. Put another way, a subject may have felt it more excusable to accept a bribe while in the role of ‘public official’ precisely because they were role playing, while they may have felt it less excusable to offer a bribe while in the role of ‘private citizen’ because this is their role in everyday life – they were playing themselves and therefore more responsible for their actions. If this is the case, then AHS’s null finding may have been due to their choice of a frame in which both roles would have appeared alien to their subjects.

6. Conclusion

In contrast to other studies, our results suggest that intrinsic motivations may play a determining role in corruption and that public awareness and educational programs should not be excluded from the policymakers’ toolbox.

Further, our findings lead us to concur with Eckel and Grossman (1996) and conclude that an experimental methodology can indeed be used to explore the role of context in determining behavior.

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[4] Other differences between the math of the two games that could have affected our relative success were (1) that AIR’ and AHS’s game was repeated between stable briber-bribee pairs while ours was one-shot and (2) that in AIR’ and AHS’s games it was other briber-bribee pairs and not third parties that suffered the negative externality. However, in both Abbink (2005) and Cameron et al (2005) it was third parties that suffered the externalities and, in the latter, play was one-shot and still neither study identified externality effects.

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Appendix 1: Experimental Scripts

Game description

The game you are each going to play involves 15 players, 5 Player As, 5 Player Bs, and 5 Player Cs. Each one of you will play this game in the role of either Player A, Player B or Player C, with 14 other students. Each Player A is randomly matched with a Player B. However, no one will know exactly who is playing with whom.

I'm going to provide each player A and each Player B with 35 gilpets, and each Player C with 25 gilpets *[put the transparency on]*. Remember that gilpets represent our money in the game. Every Player A is matched with a Player B. The game proceeds as follows. First, every Player A can, if they choose, send some money to the Player B with whom he/she is playing. He can decide to send either nothing or between 1 gilpet and 20 gilpets to Player B *[I'll point to the offer X on the transparency]*. Second, every Player B has to decide whether to accept or reject the amount sent (if any) by the Player A he/she is playing with *[I'll write "A" and "R" using different colors on the transparency in correspondence of the dot representing Player B]*. If Player A sends a positive amount and Player B rejects it *[I point to the "R"]*, Player A gets 34 gilpets, whereas Player B keeps the initial 35 gilpets *[I write 34 and 35 under the dots representing the 2 players using the same color I used for the letter "R"]*. The payoffs of the Player Cs are not affected.

However, if Player A decides to send a positive amount, X and the Player B he/she is matched with decides t accept, Player A gets (50-X) gilpets and Player B gets "30+X". Additionally, if a positive amount is sent and accepted, each Player C suffers a loss of 1 gilpet. If another Player A decides to send a positive amount, X and the Player B he/she is matched with decides t accept, *[I point to another dot on the transparency and draw an arrow towards his Pl. B with the same "acceptance color"]* each Player C suffers an additional loss of 1 gilpet *[I write "–1" near the dots representing each Player C, using the same "acceptance color]*. If all the player As decide to send a positive offer to their Player Bs, and all the Player Bs decide to accept *[I draw arrows from all Pl.As to all Pl.Bs]* each Player C suffers a total loss of 5 gilpet [I draw 3 more "-1" near the Pl.Cs dots]

So, each Player A has to decide whether or not to send a positive amount of money to their Player Bs *[I write "S or NS" at the bottom of the transparency, in correspondence of Player As]*. Each Player B has to decide whether to accept or reject a positive offer sent (if any) by their Player As *[I write "A or R" at the bottom of the transparency, in correspondence of Player Bs]*. Each Player C does nothing in this game, but he/she suffers a loss of 1 gilpet for any positive offer which is made by a Player A and accepted by the Player B he/she is matched with.

Now, we are going to work through some examples. Look at the Table 1 that you have been given. It is the same as the one here on the board. It is designed to help you to decide how to play the game.

[*Display the transparency of the table and, while talking through the examples, point to the relevant columns, rows, and cells in the table.*]

First, I am going to explain how you should read the table. The first column on the left of the table shows you all the possible amounts of money that a Player A could send to a Player B. So, in this top row Player A is sending zero gilpets to Player B, and in this bottom row Player A is sending 20 gilpets to Player B. And all the other possible divisions are listed in order in between.

To the right of this first column, you have two sets of three columns. The first set of three shows you what happens to the payoffs of Player A, Player B and each Player C, if Player B decides to accept the amount sent by Player A. The second set of three shows you what happens to the payoffs of Player A, Player B and each Player C, if Player B decides to reject the amount sent by Player A.

So, here are some examples [*point to relevant cells as you go*]:

1.1. Suppose Player A sends 1 gilpet to Player B. Then if Player B chooses to accept the offer, Player A will go home with 49 gilpets, Player B will go home with 31 gilpets, and the earnings of each Player C will be reduced by 1 gilpet. If, instead, Player B decides to reject the offer, Player A goes home with 34 gilpets, Player B goes home with 35 gilpets, and the earnings of each player C are not affected.

1.2. Here is another example. Suppose Player A sends 10 gilpets to Player B. Then if Player B chooses to accept the offer, Player A will go home with 25 gilpets, Player B will go home with 40 gilpets, and the earnings of each Player C will be reduced by 1 gilpet. If, instead, Player B decides to reject the offer, Player A goes home with 34 gilpets, Player B goes home with 35 gilpets, and the earnings of each player C are not affected.

Does everyone see how to read the table? Shall I go through a few more examples?

Let's now look at the payoffs of each Player C. Please look at the "Table 2" on your desk. The first row of the table indicates the payoffs of each and every Player C when no offer has been made and accepted. The second row indicates 1 offer has been sent by a Player A and has been accepted by a Player B. The third row indicates the payoffs of each Player C when 2 offers have been sent by 2 Player As and have been accepted by the player Bs they are playing with, and so on and so forth. Therefore each Player C can earn from the game a maximum of 25 gilpets, equal to their initial payoffs, if no offers have been made and accepted, and a minimum of 20 gilpets if 5 offers have been made and accepted.

So, to summarize [put back on the transparency with the diagram]:-

1) Each Player A is given 35 gilpet and has to decide whether or not to send or not to send any positive amount of money, ranging from 1 to 20 gilpets, to the Player B they have been matched with:

2) Each Player B is given 35 gilpet has to decide whether to accept or reject any positive amount of money they have been sent by the Player As they have been matching with.

3) Player Cs are given 25 gilpet each and they do not do anything during the game. However, each and every Player C can suffer a monetary loss ranging from 1 to 5 gilpet depending on the decisions made by each player A and each player B.

Remember, none of you will know whom you are playing with.

Instructions

Each one of you has now been given one or two white envelopes. Player As have been given two white envelopes stapled together, while Player Bs and Player Cs have been given one white envelope. I'm now going to explain first how Player As are going to play the game, secondly how Player Bs are going to play the game, and thirdly how Player Cs are going to play the game.

Player As, as you can see one of the envelopes has your player number written on it. The other has no number on it and is empty. When I say, you will open the <u>numbered</u> envelope and you will find your initial payoff, equal to 35 gilpets, in it. Now listen carefully Player As. If you wish to send any amount of money between zero and 20 gilpets to Player B, you must put the money into the envelope with no number on it, leaving the envelopes stapled together.

Now, Player Bs, you have received one white envelope. If you now open the envelope you will find a "Response Form" in the envelope. Put your name and player number on the top right corner of the form. Then answer every question on the form. Question 1 asks what you would do if Player A sends you 1 gilpet. Would you 'accept so that you get 31 gilpets, player A gets 49 gilpets and the payoff of each Player c is reduced by 1 gilpet"? Or would you reject so that you get 35 gilpets, Player A gets 34 gilpets and the payoff of each Player c is not reduced by 1? You have to tick the box next to the option you choose. Question 2 asks what you would do if Player A sends you 2 gilpets and again you have to tick the box next to the option you choose, and so on and so forth, until the last question which asks you what you would do if Player A sends you 20 gilpets.

One of the responses you put on this form will determine your earnings, so think carefully when completing the forms. Later I will match your form with the offer made by the Player A you are paired with and do as you have indicated on the form. When you are finished answering the questions, please put the form back in the white envelope.

Now, player Cs, you have been given one white envelope. When I say, you will open the envelope and you will find a piece of paper telling you the amount of gilpets you could earn from the game, depending of the actions of Player As and Player Bs. You are not going to be an active player in this game, but your earnings may be reduced, depending on the decisions made by Player As and Player Bs. You should put the piece of paper back in the envelope just as you found it.

So, is everyone clear? Does anyone have any questions? You can now open the white envelopes and play the game.

[T*he white envelopes are gathered back in*]

While you fill in the questionnaires I'm going to compute your earnings. I will randomly match the envelopes and forms. Do the calculations in gilpets and then convert into GB pounds. You will receive your earnings once you have completed the questionnaire. Please show me your player number when you come collect your earnings.

Does anyone have any questions?

Appendix 2: Probit analyses controlling for participant characteristics

In the Probit analyses the dependent variables indicate that a bribe was offered in the case of the 'private citizens' and that at least one of the possible bribes was accepted in the case of the 'public officials'.

Table A2.1: Probit analysis of bribe offering

Dependent variable=1 if participant offered a bribe		
	(1)	(2)
$h=h_h$ (high negative externality)	-0.22**	-0.23**
	[0.034]	[0.022]
$s=s_h$ (corruption frame)	-0.29**	-0.28**
	[0.015]	[0.022]
Age		-0.00
		[0.643]
Female		-0.17
		[0.252]
Religious person		-0.10
		[0.491]
Economics student		-0.06
		[0.583]
Only child		-0.12
		[0.350]
Observations	65	65

Robust p values in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%

Table A2.2: Probit analysis of bribe acceptance

Dependent variable=1 if participant accepted a bribe		
	(1)	(2)
$h=h_h$ (high negative externality)	-0.21***	-0.17**
	[0.002]	[0.040]
$s=s_h$ (corruption frame)	-0.15*	-0.16*
	[0.066]	[0.063]
Age		-0.01*
		[0.073]
Female		-0.03
		[0.700]
Religious person		-0.04
		[0.674]
Economic student		0.19*
		[0.082]
Only child		-0.04
		[0.725]
Observations	65	65

Robust p values in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%