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The effects of externalities and framing on bribery in a petty corruption 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 high and the game is presented as a petty corruption scenario instead of in abstract terms bribes are less likely to be offered. Higher negative externalities are also associated with less bribe acceptance. However, framing has no effect on bribe acceptance, suggesting that the issue of artificiality first raised by Bardsley (2005) may be of particular importance in bribery experiments.

Key Words: Corruption; Economic experiment; Social preferences.

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

Externality and framing effects in a bribery experiment

1. Introduction

This paper revisits two *null* findings reported by Klaus Abbink and his coauthors in a series of experiments designed to explore bribery. These findings are important for two reasons. First, they have implications relating to what types of anticorruption policies might usefully be pursued. And second, emerging so early in the experimental analysis of corrupt behavior, they could significantly influence future decisions by researchers about which avenues to pursue.

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 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 others and to society as a whole, and (3) that those engaging in such exchanges, if caught, may be severely punished. Their experiment involved a repeated, two-player, sequential game between a potential briber and bribee. 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 him a higher payoff (simulating the provision of the corrupt service) 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 were offered and higher payoffs granted, it was taken as evidence that trust and reciprocity were 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 in the same experimental session incurred a loss, and this negative externality was greater than the sum of the briber and bribee's private gains. If less bribery

and less granting of higher payoffs was observed under this second as compared to the first treatment, it could 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 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 could 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 found no negative externality effect, i.e., no evidence that individuals take account of the harm corrupt exchanges caused to others when deciding how to act.[1]

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 with corruption explicit. AHS repeated the same experiment presenting the game framed. A firm was applying for permission to run a factory that would pollute the environment and had to decide whether to offer the presiding public official a bribe. In turn, the public official had to decide whether to accept or reject the bribe (if one was offered) and whether to grant the permission. Drawing on the discussions of Eckel and Grossman (1996) and Loomes (1999) AHS argued that by comparing behavior across the framed and unframed versions of the game they could 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 engage in bribery. However, they found no significant effect.[2]

We are interested in re-examining these two null findings because they pertain to a particular question about the causes of corruption and to the corresponding policy debate: does corruption occur whenever the extrinsic incentives are insufficient to keep individuals honest or do intrinsic motivations also play a determining role?

One form of intrinsic motivation, namely the tendency to reciprocate, received considerable attention in the work of Abbink and his coauthors: positive reciprocity within briber-bribee pairs was found to support corrupt-like exchanges, while negative reciprocity between pairs could explain why they observed no externality effect – why abstain from causing harm to others if you think that they are going to cause harm to you? However, social preferences that lead to dissatisfaction in the form of guilt when individuals view their own actions as immoral or as leading to reduced welfare for others may not have been given sufficient opportunity to surface in the AIR design. The comparison of their first and second treatments is a test for the existence of a preference not to do harm to others, but that test is confounded by the negative reciprocity effect described above. And AHS's experiment may be viewed as a test for the existence of a preference against acting immorally. However, if the frame they applied appeared 'artificial' to their subjects, in accordance with Bardsley (2005), it may have induced role play rather than triggering their intrinsic desire to abstain from an immoral, corrupt-like act.

With these concerns in mind, we designed a simple, one-shot bribery game in which a private agent has to decide whether and how much to offer a 'public official' as a bribe in

[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.

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 our game, a 'public official' who accepts a bribe automatically supplies the corrupt service. Thus, corruption does not depend on trust, reciprocity, and repeated interaction between briber and bribee.[3] Also, in our game those to whom harm is done when a bribe changes hands are passive victims, so negative reciprocity does not come into play either.[4] Further, the frame we applied was designed to ensure that it would not seem artificial to the subjects assuming, at least, the briber role in the experiment.

These design modifications render our experiment a poor analogy to the corruption scenario envisaged by AIR and AHS: for businesses in contexts where bribery is a consideration, reciprocal negative externalities undoubtedly exist, and delays, uncertainties, and ambiguities relating to the delivery of the corrupt services they require often render trust, reciprocity and repeated exchange between bribers and bribees important.

However, corrupt exchanges do not only take place between public officials and businesses. Indeed, especially in less developed countries, many corrupt transactions take place between public officials or public service providers and ordinary citizens endeavoring to avoid fines and court summonses, jump queues, ascend waiting lists, and secure better services. And the characteristics of exchanges such as these are somewhat different. Often both sides of the exchange are executed more or less simultaneously rendering trust, reciprocity and repetition unnecessary.[5] Further, the reason why such corrupt exchanges, while being labeled 'petty', nevertheless remain a cause for concern among policy-makers

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

[3] Levitt and List (2006) noted that one-shot games "can parse the 'social preference reciprocity' explanation from the 'repeated game reciprocity' explanation" (pp. 21).

[4] In 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.

[5] Consider, for example, the case where a hospital patient requires a change of linen and offers a bribe to a nurse in exchange for having it done immediately.

is that they often cause harm to others who are unable to engage in bribery themselves.[6] In developing countries both poverty and petty corruption are widespread and concerns over the resulting inequities are fuelling a wide range of policy initiatives, many being designed with reference to theory as there is very little empirical evidence relating to how the decision to bribe might be influenced (Svensson, 2005).

The resulting experiment provides evidence of both an externality and a framing effect and, thereby, suggests that intrinsic motivations do play a determining role in corruption. However, in accordance with Bardsley's (2005) artificiality hypothesis, the effect of framing is seen only among subjects in the 'private citizen' role: the role of 'Public servant', it seems, remains too artificial despite the focus on a corruption scenario that at least some of our subjects are likely to have experienced either directly or indirectly.

The paper has five sections. Following this introduction, in section 2, we describe our experimental design and explain one further deviation from AHS and AIR. Then, we present a number of behavioral predictions relating to different assumptions about intrinsic motivations or social preferences and, with reference to these predictions and to Bardsley's (2005) artificiality hypothesis, explain the treatments we apply. In section 3, we introduce our participants, and in section 4 we present our results. In section 5, we review our findings, paying particular attention to the points are which they differ from those of AHS and AIR, and draw some tentative conclusions.

[6] Building on the example just presented, a poor patient who cannot afford the bribe may be left in unchanged linen longer as a result of another patient bribing and thereby jumping the queue. See Transparency International (2006) for more examples.

2. Experimental Design, Predictions and Treatments

2.1 A 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.[7] So, the 'private citizen's' final payoff 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 efforts made to reduce the likelihood of capture.[8] So, the 'public official's' final payoff 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, Y_o, and for every bribe offered and accepted he incurs a cost, h. So, each 'other member of society's' final payoff 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.

[7] We chose to make this cost deterministic rather than stochastic in order to reduce the potential impact of risk preferences on observed behavior. As with reciprocity, minimizing the role played by risk attitudes increases the likelihood of identifying preferences against immoral acts and doing harm to others. In another experiment, not reported here, we introduce two different treatments involving probabilistic punishment.

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 $b=K$; 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.[9]

Note that, in addition to being one shot, having an SMME in which everyone is corrupt, and including passive victims, this game deviates from AIR' and AHS's in one last detail. We do not triple the bribes offered by the bribers before passing them on to the bribees. AIR' and AHS's rationale for this multiplication was that the marginal utility of any given bribe was likely to be greater for a public official than for a business person, due to the latter being richer. Given that our game is more analogous to acts of petty corruption, this rationale does not apply as there is little evidence to suggest that public service providers are significantly poorer than service recipients in developing countries. So, we leave bribes unaltered when passing them between bribers and bribees.

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, $M_p=M_p(h,s)$

[8] Again, we chose to make this cost deterministic rather than stochastic in order to reduce the potential impact of risk preferences on observed behavior.

[9] 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

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 following an increase in either h or *s,* or *both*.

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 $d\hat{M}_p/ds = 0$ (a reasonable assumptions that would apply in the case of most common probability distributions), an increase in either h or *s,* or *both,* will also lead to an increase in the proportion of 'private citizens' who choose not to bribe.

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the minimum (zero) nor the maximum possible amount, we reduce the likelihood of our findings being spurious, i.e., based on participant errors alone.

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, or *both,* 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, approximately $0.35 at the time of the experiment), 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 the magnitude of h, the negative externality caused by a bribe being offered and accepted, setting it 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. This contrasts with AIR who compared a treatment involving Pareto-worsening negative externalities with

a control in which there was no externality at all. Arguably, *ceteris paribus*, a significant externality effect is less likely to be observed within our experiment as a result.

To perturb *s*, the likelihood that bribery within the experiment was perceived as immoral, like AHS, we applied a frame. However, taking heed of Bardsley (2005), we applied a frame in which the proposed corrupt exchange was between a citizen and a public official rather than a business and a public official. 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'.

As students are citizens, this frame is not inviting them to role play and abrogate responsibility for offering a bribe by arguing, to themselves at least, that they were simply doing what a business person would do. Rather, this frame invites them to think about whether they themselves would engage in bribery. Of course, this frame does not solve the artificiality problem applying to those in the 'public servant' role and, this being the case, if Bardsley's (2005) artificiality argument applies, we should expect the effect of framing on 'public servants' behavior to be less marked than the effect of framing on 'private citizen' behavior. Thus, our experiment provides a partial test of whether Bardsley's theory applies to bribery experiments.[10]

2.4 Practical details

We conducted 13 experimental sessions each involving 15 participants. Table 1 shows the distribution of sessions with respect to *h* and *s*. 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.[11]

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.[12]

3. Experimental participants

Our 195 participants were all students at the University of Oxford. Some signed up 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 activity-based groups. The remainder contacted us having seen promotional posters and leaflets advertising the study or having received e-mails through their departmental or college mailing lists.

Table 2 describes our participant sample. 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

[10] A complete test would also investigate the effect of framing on the behavior of real public servants when placed in the experimental role of 'public servant'.
[11] The students in the role of "other members of society" simply waited while the 'citizens' and 'officials' made their decisions.
[12] The experimental scripts, visual aids, questionnaires and forms designed for and used during the experiment are available from the authors.

under one third were studying economics. Despite the random assignment, the participants under the high externality treatment were marginally but significantly older (24.40 as compared to 23.22 years). According to Chi-squared and t-tests, none of the other characteristics vary significantly across assigned roles.

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 for the continuous variable, age, are reported in parentheses.

4. Results

The data generated by our experiment is presented in Figures 1 to 6 and Tables 3 and 4. 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.

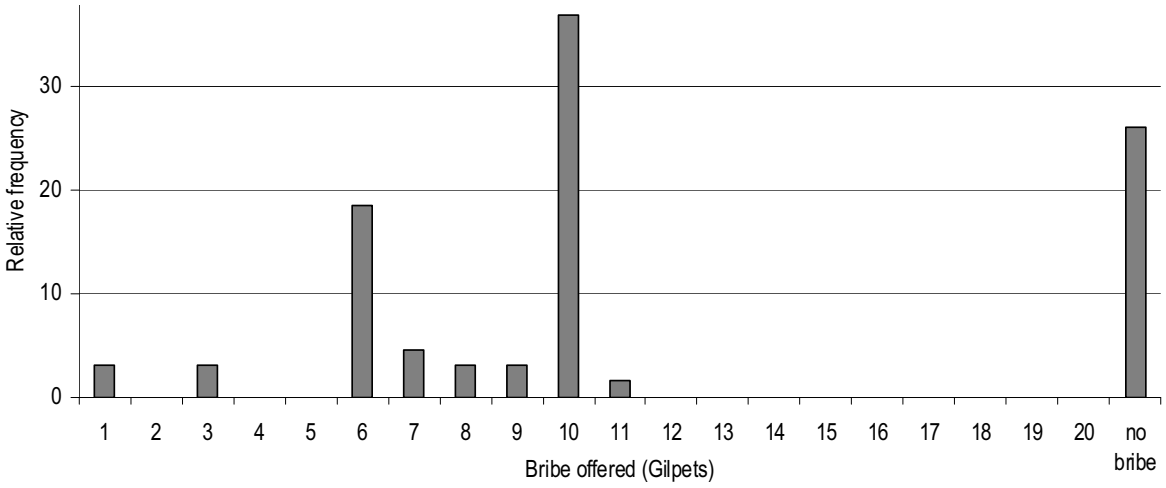

Figure 1: Bribes offered by 'private citizens' in the bribery game

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 offered no bribe; 37 percent offered a bribe of G10; 1 percent offered of G11; and 10 percent offered between G6 and G10. Only 6 percent offered below the SMME, possibly in error.

The strong mode at G10 is worthy of note. A bribe of G10, if accepted, leads to equivalent final payoffs for the 'private citizen' and 'public official' or, put another way, it divides the net return to corruption equally between the two parties. Referring back to the simple model described above, offering a bribe of G10 is consistent with the 'private citizens' believing that the 'public officials' need G4 to compensate them for the psychological costs associated with engaging in bribery. That 37 percent of the private citizens should share this belief seems unrealistic. More realistic is the possibility that 'private citizens', perceiving no real difference between themselves and the 'public officials' from which their partner is to be drawn, believe that both of them are equally deserving of compensation. For 'private citizens' engaging in this type of thought process Prediction 4 does not apply and this will reduce any observed effect of a higher *s* and *h* on the bribes offered by the bribing sample as a whole. Note, however, that Prediction 3 remains just as salient for 'private citizens' engaging in this type of thought process.

In Figure 2 and Table 3 we investigate the effects of changing the magnitude of the negative externality on bribe offering. The graphs are based on the full sample, pooled across the abstract and framed treatments. In Table 3 we present tests based on both the pooled sample and the abstract and framed samples separately. In accordance with Prediction 3 (section 2.2 above), in the pooled sample 'Private citizens' were significantly (5% level) less likely to offer bribes when the externality was high, i.e., when bribery caused greater harm to the 'other members of society'.

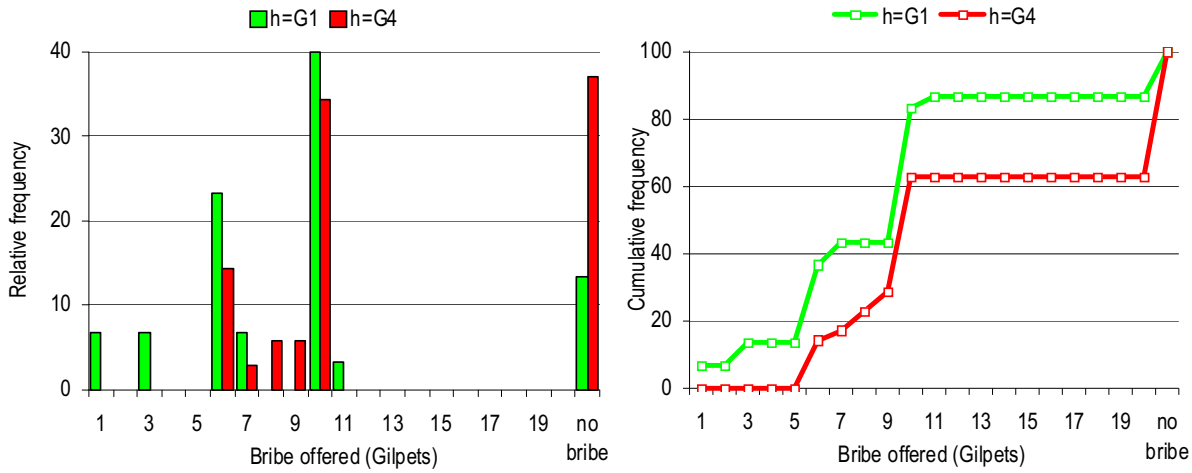

Figure 2: The effect of negative externalities on bribes offered

In accordance with Prediction 4, we also see an increase in the mean bribe offered, conditional on offering a bribe at all, when the negative externality was increased. However, this increase 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.

In columns 4 and 5 of Table 3 we conduct the same series of tests for the sample who played the game in abstract form, while in columns 6 and 7 we conduct them for the sample who played the game under the corruption frame. The results in columns 4 and 5 show that, when the game was presented in abstract form, the increase in the negative externality induced 'private citizens' to offer larger bribes. However, the resulting intrinsic

moral costs were not large enough to induce significantly 'more citizens' to abstain from bribery. In contrast, columns 6 and 7 show that, when the game was framed, the increase in the negative externality was sufficient to reduce the proportion of 'private citizens' who chose to engage in bribery. However, those who chose to bribe nevertheless did not offer higher bribes, possibly because of a selection effect; those who choose to bribe when both *h* and *s* were high were more likely to be selfish money maximizers**.**

Table 3: Externality effects on 'private citizen' behavior in the bribery game

		Full Sample		**Abstract Form**		**Corruption Frame**	
	Full sample	Low externality	High externality	Low externality	High externality	Low externality	High externality
		H=G1	h=G4	h=G1, s=sL	h=G4, s=sL	h=G1, s=sH	h=G4, s=sH
'Private Citizens'							
Offered no bribe	26.15%	13.33%	37.14%	6.67%	13.33%	20.00%	55.00%
Observations	65	30	35	15	15	15	20
Chi-squared tests p-values		**0.029**		0.543		**0.036**	
Mean bribe offered	8.04	7.5	8.68	6.5	8.85	8.67	8.44
Observations	48	26	22	14	13	12	9
t-tests (one tailed) p-values		**0.055**		**0.008**		0.415	
Rank-sum tests (two-tailed) p-values		0.332		**0.032**		0.304	

In Figure 3 and Table 4 we investigate the effects of framing the game on bribe offering. The graphs are based on the full sample, pooled across the low and high externality treatments. In Table 4 we present tests based on both the pooled sample and the low and high externality samples separately. In accordance with Prediction 3, in the pooled sample '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 high.

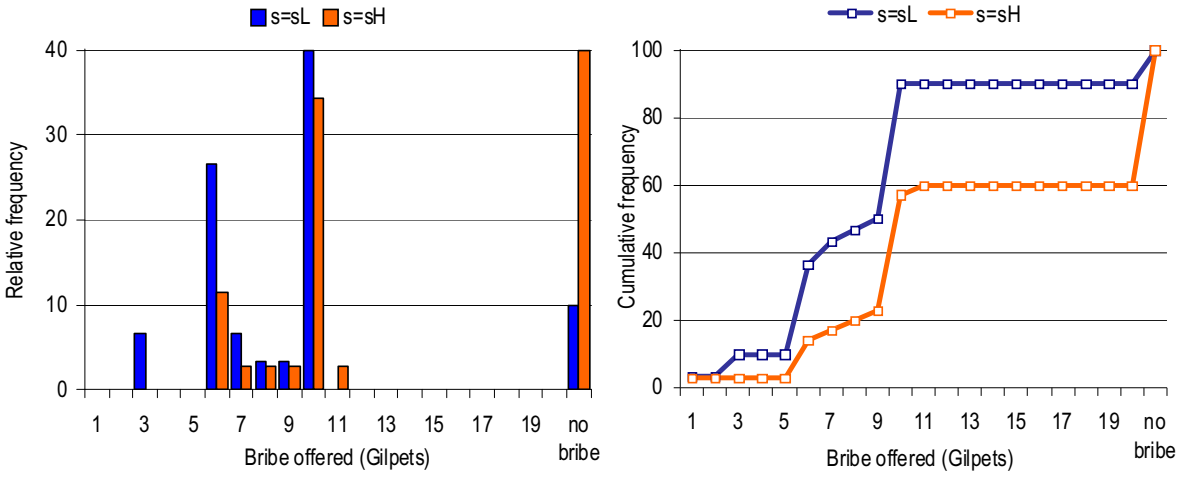

Figure 3: The effect of framing on bribes offered

In accordance with Prediction 4, conditional on offering a bribe at all, a higher mean bribe was offered when the game was framed. However, this effect is insignificant according both the rank-sum and the one tailed t-test.

In Columns 4 and 5 of Table 4 we conduct the same series of tests for the sample who played the game involving the low negative externality, while in columns 6 and 7 we conduct them for the sample who played the game involving the high negative externality. The results in columns 4 and 5 show that, when the externality was low, framing the game induced 'private citizens' to offer larger bribes. However, the resulting moral costs were not large enough to induce significantly more to abstain from corruption. In contrast, columns 6 and 7 show that, when the externality was high, framing the game was sufficient to reduce the proportion of 'private citizens' who chose to engage in bribery. However, those who chose to bribe nevertheless did not increase the bribes they offered, again, possibly because of a selection effect.[13]

[13] To check the robustness of these results, we conducted Probit analyses taking bribe offering as the dependent variable and treatment dummies and their interaction and the individual characteristics presented in Table 2 as independent variables. Controlling for individual characteristics leaves all the findings reported above unaltered.

Table 4: Framing effects on 'private citizen' behavior in the bribery game

		Full Sample		Under Low externalities		Under High Externalities	
	Full sample	Abstract frame	Corruption frame	Abstract frame	Corruption frame	Abstract frame	Corruption frame
		s=sL	s=sH	s=sL, h=G1	s=sH, h=G1	s=sL, h=G4	s=sH, h=G4
'Private Citizens'							
Offered no bribe	26.15%	10.00%	40.00%	6.67%	20.00%	13.33%	55.00%
Observations	65	30	35	15	15	15	20
Chi-squared tests p-values		**0.006**		0.283		**0.012**	
Mean bribe offered	8.04	7.62	8.57	6.3	8.67	8.84	8.44
Observations	48	27	21	14	12	13	9
t-tests (one tailed) p-values		0.104		**0.034**		0.300	
rank-sum tests (two-tailed) p-values		0.151		**0.04**		0.532	

We now turn to the 'public official'. Figure 4 presents a histogram of the 'public officials' minimum acceptable bribes (MABs) pooled across all treatments. Forty percent of the 'public officials' would have accepted bribes equal to the SMME of G6 or more and 6 percent would have accepted the break-even bribe of G5 or more. However, 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 much weaker mode at the equitable division bribe of G10.[14] This mode, weak as it is, indicates that the equitable division between briber and bribee could have been a reference point for some 'public officials'. However, focusing on the MAB derived from data elicited using the strategy method reduces the likelihood of this compromising our ability to test Prediction 1.

[14] This should come as no surprise to those familiar with Ultimatum Games in which the strategy method is applied to the responder. There a strong mode is usually seen at the equitable offer, while minimum acceptable offers vary substantially.

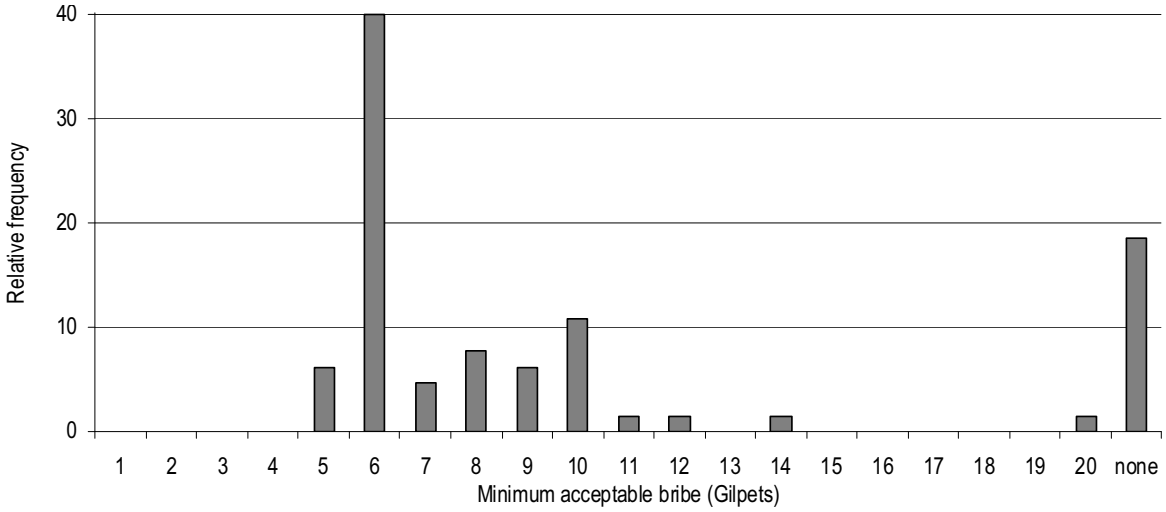

Figure 4: 'Public officials' minimum acceptable bribes in the bribery game

In Figure 5 and Table 5 we investigate the effects of changing the magnitude of the negative externality on bribe acceptance. The graphs are based on the full sample, pooled across the abstract and framed treatments. In Table 5 we present tests based on both the pooled sample and the abstract and framed samples separately. In accordance with Prediction 2, in the pooled sample 'public officials' were significantly (5% level) more likely to reject all 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 1, but is not statistically significant.

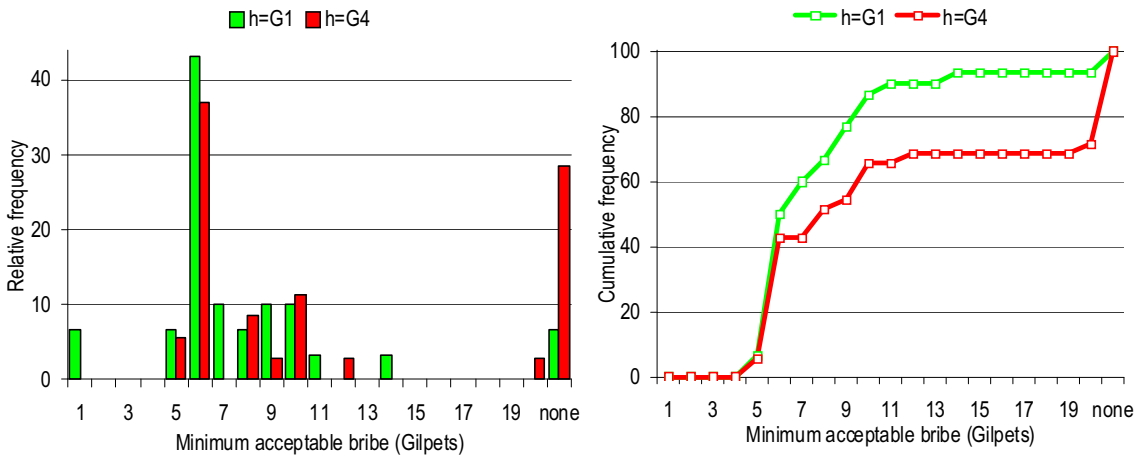

Figure 5: The effect of negative externalities on minimum acceptable bribes

In columns 4 and 5 of Table 5 we conduct the same series of tests for the sample who played the game in abstract form, while in columns 6 and 7 we conduct them for the sample who played the game under the corruption frame. The results in columns 4 and 5 show that, when the game was presented in abstract form, the increase in the externality induced a significantly (10% level) greater proportion of the 'public officials' to abstain from bribe acceptance. However, while the average MAB conditional on accepting some bribe is greater in the high externality treatment, it is not significantly so. Finally, in columns 6 and 7 we see that, under the corruption frame the higher externality was associated with neither a significant decline in the proportion of 'public officials' accepting a bribe nor a significant increase in the MAB.

Table 5: Externality effects on 'public official' behavior in the bribery game

		Full Sample		**Abstract Form**		**Corruption Frame**	
	Full sample	Low externality	High externality	Low externality	High externality	Low externality	High externality
		H=G1	h=G4	h=G1, s=sL	h=G4, s=sL	h=G1, s=sH	h=G4, s=sH
'Public Servants'							
Accepted no bribe	18.46%	6.67%	28.57%	0.00%	20.00%	13.33%	35.00%
Observations	65	30	35	15	15	15	20
Chi-squared tests p-values		**0.023**		**0.068**		0.147	
Mean minimum acceptable bribe	7.54	7.39	7.72	7.6	7.92	7.15	7.53
Observations	53	28	25	15	12	13	13
t-tests (one tailed) p-values		0.33		0.379		0.374	
Rank-sum tests (two-tailed) p-values		0.909		0.672		0.509	

In Figure 6 and Table 6 we investigate the effects of framing the game on bribe acceptance. The graphs are based on the full sample, pooled across the low and high externality treatments.

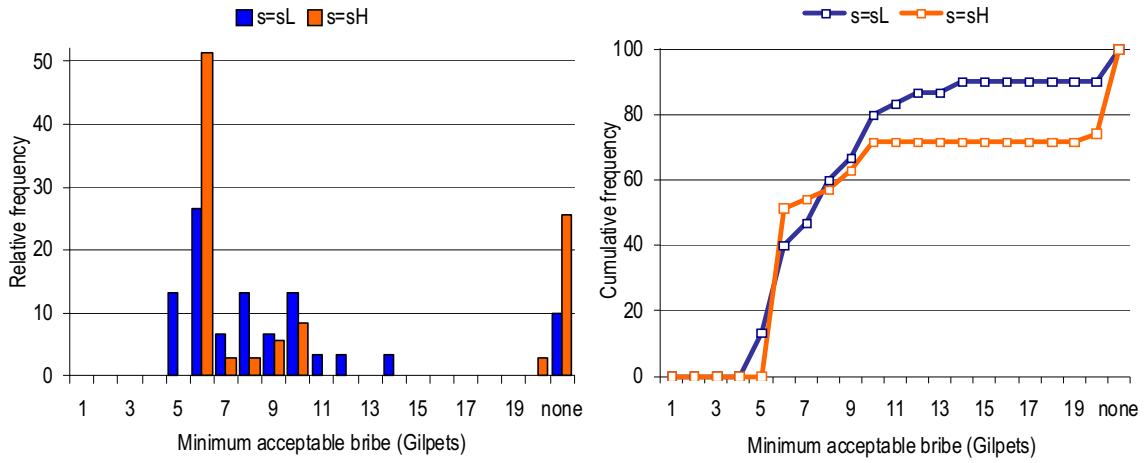

Figure 6: The effect of framing on minimum acceptable bribes

In Table 6 we present tests based on both the pooled sample and the low and high externality samples separately. Here, we see that in accordance with Prediction 2, the proportion of 'public servants' who reject all bribes is higher under the framed treatment. However, this effect is insignificant in both the pooled sample and each of the sub-samples. And finally, the effects of the frame on the MAB are both inconsistent with Prediction 1 and insignificant.[15]

Table 6: Framing effects on 'public servant' behavior in the bribery game

		Full Sample		**Under Low externalities**		**Under High Externalities**	
	Full sample	Abstract frame	Corruption frame	Abstract frame	Corruption frame	Abstract frame	Corruption frame
		s=sL	s=sH	s=sL, h=G1	s=sH, h=G1	S=sL, h=G4	s=sH, h=G4
'Public Servants'							
Accepted no bribe	18.46%	10.00%	25.71%	0.00%	13.33%	20.00%	35.00%
Observations	65	30	35	15	15	15	20
Chi-squared tests p-values		0.104		0.143		0.331	
Mean minimum acceptable bribe	7.54	7.74	7.34	7.6	7.15	7.92	7.54
Observations	53	27	26	15	13	12	13
t-tests (one tailed) p-values		0.703		0.295		0.387	
rank-sum tests (two-tailed) p-values		0.372		0.789		0.362	

[15] To check the robustness of these results, we conducted Probit analyses based on the various sub-samples to which the Chi-squared tests are applied above, taking bribe acceptance as the dependent variable and treatment dummies and the individual characteristics presented in Table 2 as independent variables. Controlling for individual characteristics leaves all the findings reported above unaltered.

5. Summary and 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 the game was framed as a petty corruption scenario and the negative externalities suffered by innocent victims when bribes change hands were high, subjects in the 'private citizen' role were less likely to offer bribes, although when only one of these treatments was applied, they tended to raise the bribe they offered rather than choosing to abstain. When the game was presented in abstract form, increasing the negative externalities suffered by innocent victims also increased the likelihood that subjects in the 'public official' role would reject all bribes. However, framing did not affect 'public officials' behavior and also appeared to suppress the externality effect.

In general, the findings are consistent with a simple model of bribery in the presence of a preference for abstaining from actions that do harm to others and may be considered immoral, although the absence of a framing effect and, indeed, an externality effect in the presence of the frame for 'public officials' is worthy of note. These null findings suggest that the petty corruption frame that we applied, while serving its purpose well in the case of subjects placed in the role of 'private citizens', may have appeared artificial and thereby induced role play among the subjects placed in the role of 'public servants' in accordance with Bardsley (2005).

We assign our success relative to AHS in identifying a framing effect on briber behavior to the fact that our frame would have seemed less artificial to student subjects than AHS's. However, we note that our frame would not have been appropriate for the analysis of the corrupt scenario that AIR and AHS had in mind. Although, by the same token, AIR' and AHS's frame would not have been appropriate for the analysis of petty corruption. And we assign our success relative to AIR and AHS in identifying an externality effect to the

fact that our game design precluded any role for positive reciprocity *within* briber-bribee pairs and for negative reciprocity *between* briber-bribee pairs. However, we note that our game design would not have been appropriate for the analysis of the corruption scenario that AIR and AHS had in mind. Although, by the same token, AIR' and AHS's game design would not have been appropriate for the analysis of petty corruption. If one takes the appropriateness of the designs and frames to each of the scenarios under analysis as given and temporarily put aside concerns about artificiality, one could tentatively conclude that, while a preference for not doing harm to others might reduce a citizen's tendency to engage in petty corruption the same preference is unlikely to come into play when it is a business person contemplating bribery and when the others in question are his or her competitors. This seems entirely reasonable.

Finally, we wish to draw attention to an element of our design that may not accord with real instances of petty corruption: in the game our subjects knew exactly how much harm they were causing to others, while in real life it remains unclear whether and how much harm is caused to others by petty corruption and it is, therefore, all too easy for individuals, intent on improving their own lot, to turn a blind eye. Taking this observation in conjunction with our findings we can draw two tentative policy conclusions from our analysis. First, there is a need for more, scientific research into the externality effects associated with real petty corruption. And, second, assuming that this research found evidence of negative externalities, campaigns designed to raise awareness about the harm petty corruption causes others could reduce citizen engagement in petty corruption and, possibly, cause them to seek other ways to improve the public services they receive.

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