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MANUSCRIPT

Intermediaries in corruption: an experiment

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Abstract Anecdotal evidence suggests that intermediaries are ubiquitous in corrupt activities; however, empirical evidence on their role as facilitators of corrupt transactions is scarce. This paper asks whether intermediaries facilitate corruption by reducing the moral or psychological costs of possible bribers and bribees. We designed bribery lab experiment that simulates petty corruption transactions between private citizens and public officials. The experimental data confirm that intermediaries lower the moral costs of citizens and officials and, thus, increase corruption. Our results

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have implications with respect to possible anti-corruption policies targeting the legitimacy of the use of intermediaries for the provision of government services.

Keywords Intermediaries · Bribery · Experiment · Moral cost

JEL Classification C91 · D73 · Z19

1 Introduction

An intermediary is "an economic agent that purchases from suppliers for resale to buyers or that helps buyers and sellers meet and transact" (Spulber 1996). Intermediaries facilitate the exchange between buyers and sellers by getting expertise in sellers' goods and buyers' needs, thus reducing search and bargaining costs while building a reputation for credibility and trustworthiness. Intermediation activities are an important part of the economy. Spulber (1996) computes that in the United States intermediation activities such as retail and wholesale trade, finance and insurance contribute about 28 percent of the GDP.

In illegal activities we should expect even more intermediation than in legal ones, due to the higher transaction costs generated by the need for secrecy and the lack of legal contract enforcement. Indeed, anecdotal evidence suggests that intermediaries are ubiquitous in corrupt activities. Bertrand et al. (2007) find that in India while most applicants pay bribes to get a drivers' license, "there is no evidence of direct bribes to bureaucrats ... The extralegal payments are mainly fees to "agents", professionals who "assist" individuals in the process of obtaining their driver's licenses. ... multiple pieces of evidence suggest that agents institutionalize corruption" (p. 1641). Oldenburg (1987) reports that in the land consolidation process in India in the early 1980s intermediaries were necessary due to their "special knowledge of the procedures, access to officials, time to spend, and dirty hands" (p. 527). Fjeldstad (2003) explains the failure of the anti-corruption reform first implemented by the Tanzanian tax authority in 1996 as a result of the fact that many corrupt officers who had been fired either got employed by firms as "tax experts" or set up their own agencies, and, thus, became "facilitators" of corruption. In a similar study conducted in Uganda Fjeldstad (2006) reaches similar conclusions. In Latin America, "coyotes" or "tramitadores" are often found next to government buildings ready to "help" individuals applying for licenses, permits or documents (see Lambsdorff 2002). In several recent cases of corruption involving large firms bribing public officials in foreign countries, such as the BAE and Chrysler cases, the use of intermediaries is routinely mentioned.[1]

The economic literature on intermediaries in corruption is surprisingly small. The latest survey book on corruption by Rose-Ackerman (1999) does not cover the problem of intermediation in corrupt exchanges. The recent review of corruption research

[1] A recent survey of Norwegian exporting firms (Søreide 2006) shows widespread use of intermediaries to by-pass anti-corruption regulations; when asked about the most important quality of an intermediary, 50 % of the firms pointed at the intermediary's ties with relevant decision makers. For a legal perspective on the issue of intermediaries used by firms in foreign countries, and related case studies, see Bray (2004).

of Banerjee et al. (2012) highlights that while there exists evidence of the use of agents to intermediate bribe-taking, "the theory of how the use of agents alters the nature of corruption is yet to be developed . . . " (p. 29). The studies discussed above and a few theoretical investigations (Bose and Gangopadhyay 2009; Bjorvatn et al. 2005; Hasker and Okten 2008) suggest that middlemen are employed in corrupt transactions because they eliminate uncertainty with respect to whom and how much to bribe, guarantee the enforcement of the illegal "contract" and reduce the risk of detection of both briber and bribee. This is due to the intermediary's expertise and knowledge of both the organization of the corrupt system and the people that ought to be involved in the process. The risk of detection of the client may be further lowered because, even if the intermediary is found guilty of bribery, the client may keep his or her anonymity, or, if exposed, could deny responsibility, arguing the intermediary bribed on his own initiative.

In this paper, we focus on an additional channel through which intermediaries may increase corruption. We ask whether intermediaries facilitate corruption by lowering the moral or psychological cost that potential bribers and bribees might suffer when engaging in corruption. Indeed, by acting as professionals with superior information and expertise, and by charging fees—rather than bribes—in exchange for their services, intermediaries might generate the belief that the services in question are neither illegal, nor socially condemned. Such belief may be reinforced by the fact that, by going through an intermediary, the client does not interact with the bureaucrat, and therefore at no time does he or she actively engage in bribery.

As observed by Oldenburg (1987), the intermediary in corrupt transactions "... lets it be known that he is willing to dirty his hands: not only is he experienced (knows the subtle hints, knows the techniques of passing money), but making use of him also allows the briber to distance himself from the transaction" (p. 527). As a consequence, intermediaries may decrease the moral or psychological costs that potential bribers may suffer from engaging in corruption. Indeed, evidence from specially designed lab experiments (Hamman et al. 2010; Bartling and Fischbacher 2012; Coffman 2011) suggests that individuals behave significantly more selfishly and they are less likely to be reprimanded when they delegate others to carry on their decisions. Besides creating psychological distance from the corrupt act, the presence of an intermediary, as suggested by Bertrand et al. (2007), may reduce moral or psychological costs of the parties involved by institutionalizing corruption, i.e. by inducing people to see bribery exchanges as ordinary business transactions.

There are no theoretical or empirical studies, to the best of our knowledge, exploring whether intermediaries may increase corruption further by lowering the moral or psychological costs that potential bribers and bribees may suffer when engaging in corruption.

Given the behavioral nature of our research question, it would be impossible to address it in the field. We use data generated by a specifically designed laboratory experiment that simulates corrupt transactions between "private citizens" and "public officials". While the transaction benefits a citizen-official pair, it generates negative externalities on an "other member of society". By conducting different versions of the game, in which we alter the degree of uncertainty and/or the presence of the intermediary, we are able to isolate the moral cost-reducing role that intermediaries may play in corruption exchanges.

Our results confirm that the presence of the intermediary significantly increases corruption. While we find evidence that this increase is partly driven by the elimination of uncertainty, there is more to the role of the intermediary. In particular, our data suggest that the presence of the intermediary leads to a reduction in the moral or psychological costs of both private citizens and public officials, and thus further increases corruption.

Our findings have implications with respect to possible policies concerning the legitimacy of the use of intermediation for the provision of government goods or services. Whether the services provided by intermediaries should be prohibited is an open question. Lambsdorff (2011) rightly argues that prohibiting the use of intermediation would eliminate the benefits provided by *honest intermediaries*, i.e., intermediaries that do not engage in corruption; moreover, it is likely that intermediaries would keep operating informally and illegally. On the other hand, our findings suggest that rendering the use of intermediaries for the provision of government services illegal would eliminate one of the channels through which corrupt intermediaries seem to operate, i.e. the reduction of the moral costs associated with corruption of potential bribers and bribees, and therefore could reduce the demand for corrupt intermediaries. Indeed, if the use of intermediaries for the provision of government services is made illegal, the reduction in the moral costs caused by increased psychological distance might be outweighed by the moral cost generated by the awareness that hiring an intermediary is also illegal. We conclude that a thorough examination of the advantages and disadvantages of prohibiting the use of intermediaries for the provision of public services is needed.

The paper is organized as follows. Section 2 reviews the related experimental literature on delegation and bribery. Section 3 describes our bribery experiment; Section 4 presents our theoretical framework and predictions. Section 5 describes the parameterization and implementation of the experiment, while Section 6 presents our results. Finally, Section 7 concludes.

2 Related literature

2.1 Experimental studies of delegation

Recent work in experimental economics highlights the psychological effect of delegation in non-strategic situations. Hamman et al. (2010) find that delegating decisions that involve fairness concerns, in the context of a repeated dictator game, leads to significant reductions in fair behavior. The amounts given by "dictators" to recipients was significantly less when an agent was used (in some cases, giving was reduced to zero). Hamman et al. (2010) also find that principals who delegate these decisions do not feel responsible for the outcome. Bartling and Fischbacher (2012) study responsibility and punishment employing a one-shot dictator game played by a dictator, a delegee and two recipients. They find that delegating unfair actions leads to less responsibility attribution by recipients towards principals (or dictators) and, therefore, recipients punish principals less often when they delegate, even when this delegation

directly leads to an unfair outcome.[2] Evidence from experiments in moral psychology (Paharia et al. 2009; Royzman and Baron 2002) also show that unethical or harmful actions carried out indirectly rather than directly are judged less unethical than direct actions.

2.2 Experimental studies of bribery and moral costs

Experimental studies of corruption represent a growing field of study. In the last decade, the application of experimental methodologies to bribery has provided novel evidence on the impact of top-down (Abbink et al. 2002) and bottom-up (Banuri and Eckel 2011; Cameron et al. 2009; Serra 2012) enforcement systems on bribery, the effectiveness of different monetary incentives (Armantier and Boly 2012), as well as the relationship between gender (Alatas et al. 2009a, 2009b; Rivas 2008) and culture (Armantier and Boly 2012; Banuri and Eckel 2011; Barr and Serra 2010; Cameron et al. 2009) on both engagement in and punishment of bribery.[3]

Given our main research question, the experimental evidence on the role that moral costs, or more generally intrinsic, non-monetary motivations, may play in corruption decision-making is of particularly interest. We know of three experimental studies directly aimed at testing whether non-monetary costs generated by the awareness that corruption generates negative externalities to other, or is simply immoral, affect the decision to engage in bribery. Abbink et al. (2002) test for negative externalities effects in the context of a repeated game involving trust and reciprocation between briber-bribee pairs. Abbink and Hennig-Schmidt (2006) conduct a variant of the same game where they present the game as a specific bribery situation rather than using abstract terms. If less bribery was observed when the game was presented as bribery rather than in abstract terms, it could be taken as evidence that the intrinsic motivations associated with rule-breaking behavior have a significant effect on corruption decision-making. Abbink et al. (2002) and Abbink and Hennig-Schmidt (2006) found no evidence of, respectively, externality and framing effects in their repeated bribery game.

Barr and Serra (2009) test for externality and framing effects using a simpler bribery game aimed to simulate one-shot, rather than repeated, petty corruption transactions. The new design had the objective to isolate moral costs associated with harming others or with doing something framed as rule-breaking, from other motives, such as individuals' desire to build trust in repeated interactions and negative reciprocity. Barr and Serra (2009) found evidence of both externality effects and framing effects, suggesting that moral or psychological costs from harming others and/or breaking a rule/social norm do have a significant effect on bribery decision-making, at least in the context of every-day life petty corruption transactions between citizens and officials, which may harm innocent others (rather than one's competitors) and where trust and reciprocity do not play a role.

[2] Coffman (2011) finds similar results using a standard (i.e. non-binary choice) dictator game, where the dictator could choose how much to allocate to the recipient or "sell" the decision right to a delegee.

[3] See Abbink and Serra (2012) for the latest survey of experimental studies on corruption that have clear policy implications.

It is these one-shot petty corruption transactions that we investigate in the present study. Indeed, the functions of the intermediaries appear to be especially desirable when the relationships between potential bribers and public officials are sporadic and fragmentary.

3 The bribery experiment

Given our main interest in the impact that intermediaries have on corruption by reducing moral costs, we employ a bribery experiment that builds on the design of Barr and Serra (2009), i.e. simulates a one-shot interaction between a briber and an official generating negative externalities on passive players, and presented using corruption-loaded language. In particular, the game simulates a petty corruption exchange in which a private citizen must decide whether and how much to offer a public official as a bribe in exchange for a corrupt service, such as a reduction in tax, preferential treatment in a court hearing, or speedier admission to hospital. In turn, the public official has to decide whether, and how much, to accept as a bribe. If a bribe is offered and accepted, the briber-bribee pair benefits, while an "other member of society" (OMS) incurs a cost. The game therefore involves citizen-official-OMS triples. Roles and group-matching are randomly assigned and play is anonymous and one-shot.[4] Given our primary objective to investigate non-monetary costs associated with corruption, we do not introduce any risk of external detection and punishment in the game. The game simulates a petty corruption scenario in which both sides of a petty corruption exchange tend to be executed more or less simultaneously. These exchanges, while referred to as 'petty', are nevertheless a cause for concern as they harm others who are unable to engage in bribery themselves.

We conducted three versions, or treatments, of the basic bribery game: (1) an Uncertainty treatment; (2) an Intermediary treatment; and (3) a No Uncertainty treatment. In the Uncertainty treatment, the private citizen has to decide whether and how much to offer as a bribe to the matched public official without knowing the minimum bribe that the matched public official is willing to accept. Therefore, it is possible that a citizen is willing to engage in bribery but the bribe offered ends up being too low for the matched official. It is also possible that a corruptible official is matched with a citizen who is unwilling to engage in corruption, or vice versa. As a result, corruption may not take place, despite the willingness to engage in corruption of either one or both the parties involved in the exchange.

In the Intermediary treatment, we introduce a fourth player: the intermediary. Therefore the game is played by four players: a private citizen, a public official, an intermediary and an OMS. The intermediary has information about the lowest bribe that the official is willing to accept, if any, and communicates this information to the matched citizen. Therefore, in this case, the citizen has to decide not if and how much

[4] Although repeated corrupt exchanges relying on trust and reciprocation, and usually taking place between public officials and businesses, are certainly important, many corrupt transactions take place only once between public officials and ordinary citizens. For an example of experimental studies of repeated corrupt transaction relying on trust and reciprocity see Abbink et al. (2002).

to offer as a bribe, but whether or not to pay a fee that would allow the intermediary to offer the lowest bribe that the official would be willing to accept. We do not allow the intermediary to participate in the determination of the bribe or the fee, or to refuse to participate in the transaction. We also do not allow the citizen to bribe the official directly. Moreover, we provide the citizen with complete information with respect to how the fee paid to the intermediary is determined and how it would be used to bribe the official. Therefore, similarly to Paharia et al. (2009) we render the intermediary a "transparent instrument" of the public official, and, contrary to Hamman et al. (2010), Bartling and Fischbacher (2012) and Coffman (2011) we exclude diffusion of responsibility from the possible reasons why the presence of the intermediary may lower individuals' psychological costs. It could be argued that in reality the intermediary has an active role in determining the fee demanded from private citizens, and therefore "diffusion of responsibility" may further lower the moral or psychological costs of potential bribees. These observations make our design and results conservative.

In order to isolate the effect that the intermediary may have on corruption through the reduction in moral costs, in the third treatment we do not have an intermediary but we eliminate uncertainty by providing each citizen with information about the minimum acceptable bribe (MAB) of the matched official. Therefore, in this case, similarly to the case with intermediary, the citizen has to decide not whether and how much to offer as a bribe, but whether to pay or not the official's MAB.

While proving the external validity of our design is virtually impossible, some conclusions can be drawn from the study of Barr and Serra (2010), which relies on a bribery game similar to the one used in this paper and on a sample of students coming from over 40 countries characterized by markedly different levels of corruption. Barr and Serra (2010) show that behavior of the undergraduate students in the game could be predicted by the level of corruption in the students' home countries, as proxied by Transparency International's Corruption Perception Index. This suggests that the way participants played the bribery game reflected the anti-corruption social norms and values that they internalized in the countries where they grew up.[5]

4 Theoretical framework

Here we present a theoretical framework that allows us to formally investigate the impact that the presence of the intermediary might have on individuals' propensities to engage in bribery, as well as the size of the bribe, if we assume that the intermediary eliminates uncertainty and decreases the moral costs of those involved in corruption. Note that here we do not aim to build a general model of intermediaries in corruption,

[5] Armantier and Boly (2012) show that corruption "can be studied in the lab" by comparing individuals' behavior and responses to incentives in a bribery experiment and in an actual field experiment, in which participants, unaware of being part of a study on corruption, had to decide whether or not to engage in bribery. Both experiments were conducted in Burkina Faso. The results show that individuals' propensities to engage in bribery were virtually identical in the lab and in the field, when controlling for individual characteristics.

but rather provide a simple illustrative theoretical framework that is as close as possible to the experimental treatments that we run, and therefore allows us to generate clear predictions on individuals' behavior in the game.

Citizens and officials play in pairs. Each private citizen receives an initial endowment, Y_c, and may offer to pay a bribe, b, in exchange for a corrupt service, the value of which to him is v. The initial endowment could also interpreted as the "legal outside option". Engaging in corruption generates a moral cost m_c if he offers a bribe (even if the corrupt transaction does not eventually take place). The moral cost could be generated by the awareness that offering a bribe is illegal, and/or that if corruption takes place other people might suffer from it.

The private citizens' final payoff then equals: Y_c if he does not offer a bribe, $Y_c - m_c$ if he offers a bribe that is rejected and $Y_c + v - b - m_c$ if he offers a bribe that is accepted.[6] The moral cost m_c is distributed uniformly on $[0, \overline{m}_c]$, $\overline{m}_c \geq v$.[7,8]

Each public official receives an initial endowment of Y_p. If the corrupt transaction takes place, he suffers a moral cost m_p. Again, this non-monetary cost could be the result of the knowledge that accepting a bribe is illegal and/or that corruption will generate negative externalities on others. The public official's final payoff is: Y_p if he is not offered a bribe or he is offered but does not accept it and $Y_p + b - m_p$ if he accepts the bribe. The moral cost m_p is distributed uniformly on $[0, \overline{m}_p]$, $\overline{m}_p \geq v$.

Uncertainty Under Uncertainty, each private citizen (public official) knows his own moral cost, but does not observe the moral cost of the public official (private citizen); he only knows that it is distributed uniformly on $[0, \overline{m}_p]$ ($[0, \overline{m}_c]$), with $\overline{m}_p \geq v$ ($\overline{m}_c \geq v$).

In this setting, if the private citizen decides to offer the bribe, he solves the problem $\max_b (v - b) \Pr\{b - m_p > 0\}$. The optimal bribe is equal to $\frac{v}{2}$ and his payoff is $(v - \frac{v}{2})\frac{v}{2\overline{m}_p} - m_c = \frac{v^2}{4\overline{m}_p} - m_c$. He decides to bribe if this payoff is greater than 0, that is, if $m_c < \frac{v^2}{4\overline{m}_p}$ which happens with probability $\frac{v^2}{4\overline{m}_p\overline{m}_c}$. The probability with which the public official is willing to receive some bribe is that of m_p being lower than v (the highest possible bribe), that is, $\frac{v}{\overline{m}_p}$. He accepts the bribe $\frac{v}{2}$ if his moral cost m_p is lower which happens with probability $\frac{v}{2\overline{m}_p}$. The probability that both the private citizen and the public official are willing to engage in corruption is $\frac{v^3}{4\overline{m}_p^2\overline{m}_c}$ and the probability that the corrupt transaction will be successful is $\frac{v^3}{8\overline{m}_p^2\overline{m}_c}$.

No Uncertainty Now, the private citizen decides whether to offer or not a bribe knowing the moral cost of the official m_p. Thus, he offers a bribe exactly equal to

[6] We assume here and implement in the experiment that the official cannot accept the bribe but not deliver the service. If this were possible, the intermediary would then have another role of ensuring the delivery of the service as mentioned in the introduction.

[7] The uniform distribution is assumed only to obtain simple closed-form solutions. None of the results qualitatively depends on this assumption.

[8] This assumption (and analogous assumptions further) ensures that the probability of corruption is always less than one which simplifies expressions without any qualitative effects.

m_p if his resulting payoff is positive, that is, if $m_c < v - m_p$. The average bribe in this case is $E[m_p \mid m_c + m_p \leq v] = \frac{v}{3}$.[9] Since the private citizen now responds to a given m_p, a refusal to pay this bribe means either that he is corruptible but the bribe is too high or that he is not corruptible. The probability that corruption happens is equal to the probability that the citizen pays the bribe, which is $\Pr\{m_c + m_p \leq v\} = \frac{v^2}{2\overline{m}_c\overline{m}_p}$. The probability that the public official is willing to receive some bribe is that of m_p being lower than v, that is, $\frac{v}{\overline{m}_p}$.

Intermediary Here we introduce a third player: the intermediary, whose role is to observe the bribe that the public official would accept (which is equal to his moral cost) and communicate it to the private citizen. However, we also assume that, in addition to providing information to the private citizen, the intermediary lowers the moral costs of private citizen and public officials. In other words, we assume that in the presence of intermediary the moral cost of the private citizen becomes αm_c, $\alpha \in (0, 1)$ and the moral cost of the public official becomes βm_p, $\beta \in (0, 1)$. Then, the moral cost of the private citizen is distributed uniformly on $[0, \alpha\overline{m}_c]$ and the moral cost of the public official is distributed uniformly on $[0, \beta\overline{m}_p]$. Assume that $\alpha\overline{m}_c > v$, that is, some citizens do not want to engage in corruption even at zero bribe.

The intermediary informs the private citizen of the moral cost of the official m_p. Thus, the private citizen now offers a bribe equal to m_p if his resulting payoff is positive, that is, if $m_c < v - m_p$. The decrease in the moral cost of public officials has two opposite effects on the average minimum bribe that they are willing to accept. First, it lowers the bribe demanded by the public officials who were already corruptible in the absence of the intermediary. Second, it induces some previously incorruptible public officials to become corruptible and since they have a relatively high moral cost, the bribe they demand is relatively high. If $\beta\overline{m}_p < v$, that is, all public officials are now corruptible, the latter effect is smaller, and, as a result, the average bribe is $\frac{v\frac{\beta\overline{m}_p}{2} - \frac{(\beta\overline{m}_p)^2}{3}}{v - \frac{\beta\overline{m}_p}{2}}$ which is lower than $\frac{v}{3}$. If instead $\beta\overline{m}_p \geq v$, the two effects cancel out and the average bribe is $E[m_p \mid m_c + m_p \leq v] = \frac{v}{3}$, which is the same as under No Uncertainty.[10]

If $\beta\overline{m}_p < v$, the probability that the public official is willing to receive some bribe is that of m_p being lower than v, that is, 1. The probability that corruption happens is equal to the probability that the citizen pays the bribe. This probability is equal to $\Pr\{m_c + m_p \leq v\} = \frac{v - \frac{\beta\overline{m}_p}{2}}{\alpha\overline{m}_c}$ (and it is $\frac{v^2}{2\alpha\overline{m}_c\beta\overline{m}_p}$ if $\beta\overline{m}_p \geq v$).

[9] To see that, compute first the probability that corruption takes place: $\Pr\{m_c + m_p \leq v\} = \int_0^v \frac{1}{\overline{m}_p}\int_0^{v-m_p}\frac{1}{\overline{m}_c}dm_c dm_p = \frac{v^2/2}{\overline{m}_p\overline{m}_c}$. Then, the probability density function of $m_p \mid m_c \leq v - m_p$ is $\frac{\Pr\{m_p \mid m_c \leq v - m_p\}}{\Pr\{m_c + m_p \leq v\}} = \frac{\frac{1}{\overline{m}_p}\frac{v-m_p}{\overline{m}_c}}{\frac{v^2/2}{\overline{m}_p\overline{m}_c}} = \frac{v-m_p}{v^2/2}$. Finally, $E[m_p \mid m_c + m_p \leq v] = \int_0^v m_p \frac{v-m_p}{v^2/2}dm_p = \frac{v}{3}$.

[10] This result relies on the distribution being uniform and the effect of the intermediary being proportionate.

4.1 Predictions

Assuming that, as modelled above, the intermediary both eliminates uncertainty and reduces the moral costs of private citizens and public officials, and that the official's stated minimum acceptable bribe (MAB) reflects his moral cost associated with corruption, we can make the following predictions:

Prediction 1: *Bribing citizens* The proportion of citizens paying a bribe[11]—which also indicates the proportion of corrupt pairs, i.e., the occurrence of corruption—is lowest under Uncertainty and highest in the presence of the Intermediary.

Prediction 2: *Corruptible officials* The proportion of public officials willing to accept a bribe is the same under Uncertainty and under No Uncertainty; it is higher in the presence of the intermediary. The higher proportion of corruptible officials in the presence of the intermediary is due to a reduction in the officials' moral costs.

Prediction 3: *MAB* The average MAB is the same under Uncertainty and under No Uncertainty. The presence of the Intermediary can make the average MAB lower or higher; however, if most officials are corruptible even without the intermediary, the presence of the intermediary is likely to decrease the average MAB.

Prediction 4: *Bribe* The bribe paid in the case of a corrupt agreement is on average higher under Uncertainty than under No Uncertainty and in the presence of the Intermediary since the citizen does not know the official's MAB and is afraid of offering a too low bribe. Comparing the average bribes paid under No Uncertainty and in the presence of the Intermediary follows from comparing the average MABs (see Prediction 1). If most officials are corrupt even without the intermediary, the average bribe is likely to be lower in the presence of the intermediary.

Since the presence of the intermediary increases the number of interacting subjects, it is the case that the sign of the comparative statics we observe between treatments is also consistent with the predictions generated by the Equity-Reciprocity-Competition (ERC) model of Bolton and Ockenfels (2000). However, the ERC model is not consistent with the magnitude of the behavioral change that we observe in the presence of the intermediary.[12]

5 Parameterization and implementation

We conducted the experiment using Experimental Currency Units, or ECU, where 1 ECU equaled 0.25 USD. We set each player's endowment $Y_c = Y_p = Y_{OMS} = 35$,

[11] In the Uncertainty treatment these are the citizens who offered a bribe that was accepted by the matched officials. In the No Uncertainty Intermediary treatments these are the citizens who paid a bribe equal to the MAB of the matched officials.

[12] The additional subject in the intermediary treatment makes the average payoff higher; therefore, any gain generated by a corrupt transaction represents a smaller deviation from the average payoff, making both citizen and official more willing to engage in corruption. However, the ERC model would not predict the size of the behavioral change that we observe in the presence of the intermediary. Indeed, given our parameterization, discussed in the next session, the difference in average payoffs between the treatments with and without intermediary is very small and is equal to 0.42 ECU or $0.10, which is a 1 % shift in the average. Therefore, any increase in corrupt behavior that we observe in the presence of the intermediary is unlikely to be driven by such a small difference in average payoffs.

and the value of the corrupt service to the citizen v equal to 16. In the experiment, we also assumed that in order to provide a corrupt service the official has to sustain cost K, which we set equal to 5. 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. We chose to make this cost deterministic rather than stochastic in order to reduce the potential impact of risk preferences on observed behavior. We also assumed that the citizen has to sustain a small cost, E, when offering a bribe, no matter whether the bribe is accepted or rejected. In the Intermediary treatment E is the commission to be paid to the intermediary in order to use the intermediation service. In order to keep the monetary incentives constant across treatments, we set E equal to 1 in all the treatments. In the Intermediary treatment, the intermediary is given an endowment, Y_i, which we also set equal to 35. Therefore, if corruption does not take place, the intermediary earns 35; if corruption takes place the intermediary earns 36.[13]

If citizen and official engage in corruption, the matched OMS suffers a loss of 15 and therefore ends up with 20. Our design and parametrization imply that corruption is inefficient; indeed, the occurrence of corruption always generates a net loss of 5 ECU, no matter the treatment.

In the Uncertainty treatment private citizens could choose to offer any bribe $b \in \{1, 2, 3, \ldots, 20\}$. In all the treatments, public officials, instead of responding only to the particular bribe offered to them, had to state whether they would accept or reject each of the possible bribes, $b \in \{1, 2, 3, \ldots, 20\}$, 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—i.e., the "incorruptible" officials—and the minimum acceptable bribe (MAB) for the others. Put another way, the application of the strategy elicitation improved comparability as it ensured that each individual placed in the public official role responded to the same set of possible stimuli. Had their responses been directly elicited, the actual stimulus applied to each public official would have varied in accordance with the bribe offer made by his or her briber.[14]

In the No Uncertainty treatment, citizens were informed of the MAB of their matched officials, and had to decide whether or not to pay a bribe equal to the MAB. In the Intermediary treatment, citizens were also informed of the MAB of their matched officials, and had to decide whether to commission the intermediary to pay a bribe equal to the MAB to the official or not; they could not pay the bribe without the intermediary. Thus, while the bribe offered by a citizen in the baseline, if any,

[13] For simplicity we did not include K and E in our theoretical framework. Their inclusion does not alter the comparative statics and our general predictions.

[14] Whether and to what extent the strategy elicitation affects observed behavior is the subject of an ongoing debate. The empirical evidence is mixed. Güth et al. (2001), Schotter et al. (1994) and Brosig et al. (2003) find that the strategy elicitation induces a significantly different behavior as compared to the direct elicitation. Using different experimental designs, Cason and Mui (1998), Brandts and Charness (2000) and Oxoby and McLeish (2004) find no differences. The complexity of the experiment may be a crucial factor: the difference increases with the complexity of the game (Brandts and Charness 2000). Our game is simple so any effect is likely to be small. For a recent survey of experimental comparisons of strategy versus direct-response method, see Brandts and Charness (2011).

could be either accepted or rejected by the matched official, the bribe paid by a citizen in the No Uncertainty and Intermediary treatments was automatically accepted by the official.

Note that in the Intermediary and in the No Uncertainty treatments, if the official knew that his MAB would determine the exact bribe that would be paid by a (compliant) citizen, the official would probably overstate his MAB, affecting in this way the probability that corrupt exchange takes place. As a result, we would not be able to treat the stated MAB as a proxy of the official's moral cost and could not test Prediction 3. Moreover, if the official knew that his stated MAB would determine bribe payments, the official would become effectively the first-mover in the game, compromising comparability between the No Uncertainty and Intermediary treatments and the Uncertainty treatment and, hence, our ability to test all of our theoretical predictions. In order to preserve comparability across treatments and be able to treat the officials' revealed MABs as proxies for their moral costs in all the treatments, we did not inform the official of the fact that his stated MAB would be communicated to the citizen.

Finally, note that while we did withhold information about the fact that the minimum acceptable bribe (MAB) of the official would be communicated to the citizen before the citizen would make his or her own decision, we did not provide the experimental participants with false information at any time. In the public official's decision screen, we informed the public official that his or her earnings would be calculated by matching their decisions with those of the Private Citizen and Intermediary with whom they were matched. This is exactly what we did.[15] By preventing participants in the role of public officials from behaving strategically by reporting a false MAB, our design induced truthful rather untruthful play.[16]

At the end of the session, after each player received information about the final outcome of the corruption transaction, we administered a brief questionnaire. We employed a between-subject design and corruption-framed instructions. We conducted 18 experimental sessions, involving a total of 409 students at Florida State University, of which 45 per cent were female, and 10 per cent were economics major. We found no statistically significant differences in age, gender and major across treatments, showing that the randomization worked. We control for students' age, gender and whether they are economics majors in our empiricial analysis.[17]

[15] Withholding information is common practice in experimental economics and it is not considered deception. As stated by Hey (1998), "there is a world of difference between not telling subjects things and telling them the wrong things. The latter is deception, the former is not." This element of our design is similar in purpose to a block design seen in other experimental research. In these, subjects play several multi-period stages and learn the instructions for each stage only when the stage is reached. Examples include, but are not limited to, Brandts and Charness (2000) and Hamman et al. (2011).

[16] Of the many papers doing something similar to what we did, we can cite Ellingsen et al. (2010), which elicit recipient beliefs in a Dictator Game, a Trust game and a hidden action Trust game, and communicate these beliefs to the dictator/trustor before the dictator/trustor makes his or her allocation decision. In order to elicit truthful beliefs, Ellingsen et al. (2010) do not inform the recipients that their beliefs will be communicated to the dictator. Our design and purpose are very similar: in order to elicit MABs that reflect truthful moral costs associated with corruption (without confounds generated by strategic motives), we do not inform the public officials that their MABs will be communicated to the citizens.

[17] Even though demographics are balanced across treatments, we include them in our empirical specifications because they might affect individuals' propensities to engage in corruption differently in the different

Table 1 Experimental treatments

	N. of sessions	Citizens	Officials	OMS	Intermediaries	Total
Treatment						
Uncertainty	5	39	39	39	0	117
No Uncertainty	6	44	44	44	0	132
Intermediary	7	40	40	40	40	160
Total	18	123	123	123	40	409

Table 1 displays the distribution of sessions across the three treatments, and the total number of participants in the roles of citizen, official, OMS and intermediary. All sessions were conducted at the xs/fs lab at Florida State University. The software used for this experiment was programmed in Z-Tree (Fischbacher 2007). Each session lasted about 50 minutes and average earnings were 19 USD, which included a 10 USD participation fee.

6 Results

Table 2 provides a first comparison of individuals' decisions to engage in bribery under Uncertainty, No Uncertainty and in the presence of the Intermediary.

The first panel of Table 2 suggests that, in accordance with Prediction 1, the presence of the Intermediary significantly increases the proportion of citizens paying a bribe, which also indicates the occurrence of corruption. Indeed, while under uncertainty only 51 % of citizens offer a bribe that is accepted by the matched official, in the presence of the intermediary the percentage of citizens willing to pay a bribe equal to the official's MAB rises to 97.50 %. As predicted, the elimination of uncertainty per se also increases corruption, but not as much as the introduction of the intermediary.

Note that the 51 % of corrupt pairs under uncertainty does not reflect the proportion of citizens who attempted to engage in corruption by offering a bribe since some were unsuccessful, that is, offered a too low bribe. It does not reflect the proportion of corruptible officials either since some were matched with citizens who offered a too low bribe or none at all. The proportion of pairs "willing to engage in corruption" under uncertainty, i.e., the pairs where the citizen offered a bribe and the official was willing to accept a bribe, no matter whether the corruption exchange actually took place, was 79.49 % . Our design does not allow comparing the pairs "willing to engage in bribery" across treatments, since in the no uncertainty treatments we can only observe the proportion of officials willing to engage in bribery and the proportion of

treatments. In other words, demographics might interact with our treatments when determining individuals' willingness to bribe or accept a bribe. For instance, in our sample we find that under Uncertainty the propensity to offer a bribe increases with age; however, age has no effect on bribery under No Uncertainty, and it actually decreases individuals' propensity to bribe in the Intermediary treatment.

Table 2 Individuals' decisions to engage in corruption

	Uncertainty	No Uncertainty	Intermediary
% citizens paying a bribe (*% corrupt pairs*)	51.28 %	88.64 %	97.50 %
p-value (Chi-Square): Uncertainty vs. Intermediary	0.000***		
p-value (Chi-Square): Uncertainty vs. No Uncertainty	0.000***		
p-value (Chi-Square): Intermediary vs. No Uncertainty	0.115		
% officials willing to be bribed	92.31 %	95.45 %	100 %
p-value (Chi-Square): Uncertainty vs. Intermediary	0.074*		
p-value (Chi-Square): Uncertainty vs. No Uncertainty	0.548		
p-value (Chi-Square): Intermediary vs. No Uncertainty	0.172		
MAB of corruptible officials	8.14	7.63	6.68
p-value from ttest (one-tailed): Uncertainty vs. Intermediary [*p-value from two-tailed rank-sum test*]	0.009*** [0.030**]		
p-value from ttest (one-tailed): Uncertainty vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.232 [0.493]		
p-value from ttest (one-tailed) Intermediary vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.030** [0.139]		
Bribe paid	8.84	7.43	6.72
p-value from ttest (one-tailed): Uncertainty vs. Intermediary [*p-value from two-tailed rank-sum test*]	0.000*** [0.000***]		
p-value from ttest (one-tailed): Uncertainty vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.010** [0.024**]		
p-value from ttest (one-tailed) Intermediary vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.068* [0.230]		

Note: In the first row, for the Uncertainty treatment we report the percentage of citizens who offered a bribe that was accepted by the matched Official. In the Uncertainty treatment, 87 % of the citizens offered a bribe, but only 51 % had the bribe accepted by the official. 11 % of the Officials mistakenly stated that the minimum bribe they would be willing to accept was lower than 5 (but greater than 0). When reporting the average MABs in the third panel and the average bribes in the fourth panel of the table we exclude these mistakes. See Tables 6 and 7 in the Appendix for robustness checks. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

matched citizens willing to pay the specific MAB. Therefore, by looking at the proportion of corrupt pairs in the no uncertainty and in the intermediary treatments we might be under-reporting the proportion of pairs willing to engage in bribery. Nevertheless, the proportion of corrupt pairs in the presence of the intermediary (97.50 %) is significantly higher (with a p-value of 0.000) than the proportion of pairs willing to engage in bribery under uncertainty.

The second panel of Table 2 indicates that the presence of the intermediary, but not the mere elimination of uncertainty, significantly increases the percentage of corruptible officials; such percentage rises to 100 % when the Intermediary facilitates corrupt transactions. This is exactly what we would expect if the presence of the intermediary reduces the moral costs of the public official (see Prediction 2). In the third panel of Table 2, we see that as expected the official's average MABs under Uncertainty and under No Uncertainty are statistically the same. On the other hand, the officials'

MAB in the presence of the intermediary is significantly lower, which is what we would expect if the intermediary lowers the moral cost of the officials *and* most officials were corrupt even without the intermediary (see Prediction 3).[18] Finally, the fourth panel of Table 2 compares the average bribes paid by the citizens; therefore, under uncertainty the average is computed only for the bribes that were offered by the citizens and accepted by the matched officials.[19] In accordance to Prediction 4, we find that the bribe paid by the citizen is on average the highest under uncertainty, and the lowest in the presence of the intermediary, which is, once again, what we would expect given that most officials are corrupt even without the intermediary. Note that 11 % of the Officials mistakenly stated that the minimum bribe they would be willing to accept was lower than 5 (but greater than 0). When reporting the average MABs in the third panel and the average bribes in the fourth panel of the table we exclude these mistakes. See Tables 6 and 7 in the Appendix for robustness checks.

In Table 3 we conduct four regression analyses to investigate respectively: (1) the occurrence of corruption; (2) citizens' willingness to bribe; (3) officials' willingness to accept a bribe; and (4) individuals' (both citizens' and officials') willingness to engage in corruption. In all regressions we control for participants' demographics and report robust standard errors.

Our estimates confirm the results obtained in the two top panels of Table 2. We find that the presence of the Intermediary induced significantly more citizen-official pair to engage in corruption, as compared to the case with Uncertainty. Eliminating uncertainty also increases corruption; however, in accordance with Prediction 1, the effect of the Intermediary on corruption is significantly larger (the p-value corresponding to a post-estimation test of equality of the two estimated coefficients is equal to 0.003). In the second column of Table 3 we see that citizens were more likely to pay a bribe in the presence of the Intermediary than to offer a bribe under Uncertainty. In contrast, the mere elimination of uncertainty did not lead to a significant increase in the proportions of bribers. In column 3 we look at the officials' willingness to accept a bribe. In this case, since all officials were corruptible in the Intermediary treatment, the Intermediary dummy and corresponding observations are dropped from the regression. Being an economic major also perfectly predicts bribe acceptance; consequently, the corresponding observations (9 in total) are dropped. The estimates in column 3 show that, as expected (see Prediction 2), merely eliminating uncertainty did not increase the proportion of corruptible officials. Finally, in column 4 we pool the decisions of citizens and officials, while controlling for a public official dummy. The results confirm that the presence of the intermediary, and not just the elimination of uncertainty, increased individuals' willingness to engage in corruption.

It is possible that the increased propensities of citizens to bribe in the presence of the Intermediary is simply the result of the lower amount of money they are required to pay as a bribe (see bottom panels of Table 2). In order to further investigate whether intermediaries induce more bribe-paying also through the reduction in citizens' non-monetary costs, in Table 4 we restrict the sample to the No Uncertainty

[18] This is exactly what we observe in panel 2 of Table 2.

[19] The average bribe offered under Uncertainty by all citizens, including those whose bribes were rejected, is 8.75.

Table 3 The effect of the intermediary on corruption

	Dependent variable: Dummy equal to 1 if corruption took place	Dependent variable: Dummy equal to 1 if citizen bribed	Dependent variable: Dummy equal to 1 if official was willing to accept a bribe	Dependent variable: Dummy equal to 1 if individual was willing to act corruptly
	Probit	Probit	Probit	Probit
	(1)	(2)	(3)	(3)
No Uncertainty	0.21***	0.01	0.04	0.01
	(0.000)	(0.846)	(0.462)	(0.733)
Intermediary	0.35***	0.11***		0.08***
	(0.000)	(0.001)		(0.005)
Age	−0.03	−0.01	0.00	−0.00
	(0.135)	(0.716)	(0.632)	(0.833)
Female	−0.11*	−0.07*	−0.04	−0.05*
	(0.066)	(0.096)	(0.383)	(0.052)
Econ Major	−0.13	−0.08		−0.01
	(0.205)	(0.334)		(0.816)
Public Official				0.04
				(0.144)
Observations	123	123	74	246
Pseudo R2	0.289	0.099	0.035	0.112
Wald-Chi2	36.80	21.50	1.09	23.23

Note: Robust p-values in parentheses. We report the effect of a change from 0 to 1 for all dichotomous explanatory variables; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The coefficients of the No Uncertainty and the Intermediary dummies in columns 1, 2 and 4 are statistically different at the 1 per cent level

and Intermediary treatments. In this way, we are able to control for the MAB of the public official with whom each citizen was matched, which was known to the citizens in the two treatments under study.

The estimates in the first column of Table 4 confirm that the presence of the intermediary significantly increased the likelihood that citizens paid a bribe. In column 2 we control for the official's MAB. The estimates show that, as expected, the citizen's propensity to engage in bribery is lower if the MAB of the official is higher. Although the coefficient of the intermediary treatment dummy gets lower in magnitude when controlling for the MAB, it stays significant at the 5 % confidence level, suggesting that the citizens' higher propensity to bribe in the presence of the intermediary was only partially driven by the lower bribe demanded by the officials. Hence, we can conclude that the intermediary induced more citizens to pay a bribe also by reducing their moral or psychological costs associated with corruption.

In Table 5 we turn to the effect of the Intermediary on the MAB of corruptible officials and the bribe paid when corruption took place. 11 % of the corruptible officials mistakenly stated that they would be willing to accept a bribe lower than 5, i.e., a bribe that would give them a lower payoff than abstaining from corruption. Similarly, 15 % of the citizens in the Uncertainty treatment offered a bribe lower than 5 to their matched official. Since these mistakes signal a clear misunderstanding of the

Table 4 The effect of the intermediary on the decision to pay a bribe (The Uncertainty treatment is excluded from the analysis)

	Dependent variable: Citizen's decision to pay the requested bribe	Dependent variable: Citizen's decision to pay the requested bribe
	Probit	Probit
	(1)	(2)
Intermediary	0.12***	0.05***
	(0.000)	(0.004)
Official's MAB		−0.01***
		(0.002)
Age	−0.02*	−0.02*
	(0.076)	(0.052)
Female	−0.00	−0.02
	(0.978)	(0.360)
Econ Major	−0.03	0.02
	(0.646)	(0.172)
Observations	84	84
Psuedo R2	0.13	0.40
Wald-Chi2	22.93***	36.36***

Note: Robust p-values in parentheses. We report marginal effects of continuous variables and the effect of a change from 0 to 1 for dichotomous variables; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

rules of the games, in columns 1 and 3 of Table 5 we exclude the corresponding observations from the analysis, whereas in columns 2 and 4, as a robustness check, we replace the mistakes with the minimum bribe that would leave the official indifferent between honesty and corruption, i.e. a bribe equal to 5.

The results in column 1 suggest that the Intermediary reduced the MAB of the corruptible public officials; however this result is not robust to including the mistaken MABs into the analyses. In accordance with Prediction 3, the mere elimination of uncertainty does not have a significant effect on the MAB. Columns 3 and 4 of Table 5 provide support for Prediction 4. Both eliminating uncertainty and having an intermediary reduce the bribe exchanged when corruption takes place.

7 Discussion and conclusions

In the last two decades, the problem of corruption has received increasing attention among academics and practitioners around the world. Theoretical and empirical investigations into its causes and consequences have rapidly proliferated. Since the seminal work of Shleifer and Vishny (1993), how corruption is "organized" has been recognized as an important determinant of both the existing level of corruption and how damaging corruption is to a country's economy and to society as a whole. This paper focused on one aspect of the organization of corruption that has received little attention in the literature: the presence of agents that act as intermediaries between

Table 5 The effect of the Intermediary on the MAB and the bribe paid

	Dependent variable: Official's MAB (excluding mistakes, i.e. MAB < 5)	Dependent variable: Official's MAB (replacing MAB < 5 with MAB = 5)	Dependent variable: Bribe paid (excluding mistakes, i.e. bribe < 5)	Dependent variable: Bribe paid (replacing bribe < 5 with bribe = 5)
	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
No Uncertainty	−0.46	0.01	−1.28**	−1.30**
	(0.520)	(0.991)	(0.035)	(0.028)
Intermediary	−1.42**	−0.87	−1.83***	−1.67***
	(0.039)	(0.150)	(0.003)	(0.006)
Constant	6.38***	5.46***	13.11***	13.74***
	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.08*	0.10**	−0.21	−0.25*
	(0.089)	(0.038)	(0.133)	(0.064)
Female	0.12	−0.10	−0.23	−0.32
	(0.820)	(0.824)	(0.616)	(0.457)
Econ Major	0.19	−0.13	−0.19	−0.41
	(0.805)	(0.849)	(0.818)	(0.543)
Observations	116	131	90	98
R2	0.062	0.043	0.171	0.171
F-Stat	2.59**	2.60**	4.45***	4.87***

Note: Robust p-values in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

potential bribers and public officials. Anecdotal evidence on the activities of intermediaries in corruption abounds in current news, yet empirical investigations into the channels through which intermediaries may facilitate corruption are scarce.

Recent theoretical studies suggest that intermediaries increase corruption by reducing uncertainty with respect to whom and how much a potential briber should bribe. This paper proposed an additional overlooked channel through which intermediaries may increase corruption: they might reduce the moral or psychological costs of the citizens and the officials possibly involved in corruption deals. This is due to the fact that, by rendering the act of bribing an indirect action, intermediaries may create psychological distance between the briber and the illegal activity. Moreover, the presence of intermediaries may act as a signal that corruption is institutionalized, i.e. is just an ordinary way of doing business. There are no theoretical or empirical studies, to the best of our knowledge, investigating this issue.

From a policy viewpoint, reforms targeting the use of intermediaries in corrupt activities are also missing. The 1997 OECD Anti-bribery Convention states that "enterprises should not, directly or *indirectly*, offer, promise, give, or demand a bribe or other undue advantage to obtain or retain business or other improper advantage"; therefore, bribers are considered liable for corrupt exchanges even if such exchanges take place indirectly, through intermediaries. However, the Convention does not establish whether, in order to prevent corruption, intermediation should be prohibited or somehow regulated. This is indeed an important open question. Lambsdorff (2011)

discusses a number of interesting case-studies involving intermediaries engaging in corruption in international business transactions. He ultimately argues in favor of regulating intermediary operations—for example by requiring registration at the national level and accountability standards—and against the prohibition of such operations, which would preclude the reduction in transaction costs provided by "honest" intermediaries, i.e. intermediaries that do not engage in corrupt transactions. However, if one of the channels through which "corrupt" intermediaries operate is the reduction of the moral or psychological costs associated with corruption, making the use of intermediaries for the provision of government services illegal could eliminate this channel.

While the experimental literature on corruption is rapidly increasing, there are no studies where the interaction between a briber and a bribee is mediated by a third party. We designed such an experiment. In particular, we conducted different versions of a one-shot petty bribery game, in which we altered the degree of uncertainty and/or the presence of the intermediary. Our design allowed us to isolate the effect that the presence of the intermediaries had on the private citizens' and public officials' moral or psychological costs associated with corruption. Our experimental data confirmed that the proportion of corrupt citizen-official pairs significantly increases in the presence of intermediaries. In accordance with our theoretical predictions, we found that, besides eliminating uncertainty, intermediaries facilitate corruption by reducing the moral or psychological costs of both private citizens and public officials.[20]

Our findings suggest that a thorough examination of the advantages and disadvantages of prohibiting the use of intermediaries for the provision of government services is needed. In particular, while rendering intermediation activities illegal would eliminate the benefits provided by intermediaries that do not engage in corruption, it would also eliminate one of the channels through which *corrupt intermediaries* seem to operate, i.e. the reduction of the moral costs associated with corruption of potential bribers and bribees, which could, in turn, lower the demand for corrupt intermediation services.

The present study represents the first step of a broader program of research on the role that intermediaries might play in corrupt exchanges. Future experimental research should allow for a more active role of the intermediary, as well as for repeated corrupt exchanges.

[20]We also administered a post-experiment questionnaire asking participants to rate the fairness of their own actions and that of other roles. We found that citizens (but not officials) who acted corruptly in the game were significantly more likely to see their decisions as fair in the presence of the intermediary than in both the Uncertainty and No Uncertainty treatments. This reinforces our argument that intermediation lessens the psychological cost of corrupt behavior. Interestingly, OMS participants also judged corrupt citizens significantly less harshly when an intermediary was used.

Appendix

Table 6 Including the mistakes (MAB < 5 and bribe < 5)

	Uncertainty	No Uncertainty	Intermediary
Including MAB < 5			
MAB of corruptible officials	6.72	7.12	6.25
p-value from ttest (one-tailed): Uncertainty vs. Intermediary [*p-value from two-tailed rank-sum test*]	0.257 [0.569]		
p-value from ttest (one-tailed): Uncertainty vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.696 [0.617]		
p-value from ttest (one-tailed) Intermediary vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.067* [0.251]		
Including bribe < 5			
Bribe paid	8.50	6.90	6.28
p-value from ttest (one-tailed): Uncertainty vs. Intermediary [*p-value from two-tailed rank-sum test*]	0.000*** [0.000]		
p-value from ttest (one-tailed): Uncertainty vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.013** [0.021]		
p-value from ttest (one-tailed) Intermediary vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.137 [0.391]		

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7 Setting the mistakes equal to 5

	Uncertainty	No Uncertainty	Intermediary
Replacing MAB < 5 *with MAB* = 5			
MAB of corruptible officials	7.44	7.38	6.55
p-value from ttest (one-tailed): Uncertainty vs. Intermediary [*p-value from two-tailed rank-sum test*]	0.057* [0.392]		
p-value from ttest (one-tailed): Uncertainty vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.46 [0.79]		
p-value from ttest (one-tailed) Intermediary vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.043** [0.233]		
Replacing bribe < 5 *with bribe* = 5			
Bribe paid	8.65	7.18	6.59
p-value from ttest (one-tailed): Uncertainty vs. Intermediary [*p-value from two-tailed rank-sum test*]	0.000*** [0.000]		
p-value from ttest (one-tailed): Uncertainty vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.008*** [0.020]		
p-value from ttest (one-tailed) Intermediary vs. No Uncertainty [*p-value from two-tailed rank-sum test*]	0.096* [0.368]		

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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