



**Corrupt Reciprocity
- an Experiment**

Johann Graf Lambsdorff

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Diskussionsbeitrag Nr. V-51-07

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Adresse der Autoren:

<p>Professor Dr. Johann Graf Lambsdorff Wirtschaftswissenschaftliche Fakultät Universität Passau 94030 Passau jlambsd@uni-passau.de</p>	<p>Prof. Dr. Björn Frank Institut für Wirtschaftswissenschaft Technische Universität Clausthal Julius-Albert-Str. 2 38678 Clausthal-Zellerfeld bjoern.frank@tu-clausthal.de</p>
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Corrupt Reciprocity – an Experiment

Johann Graf Lambsdorff

Björn Frank

Abstract

We let students play a corruption game, embedded into a variant of the ultimatum game. Those allotted the role of public servants chose between whistleblowing, opportunism and reciprocity by delivery (of a contract) and those acting as businesspeople chose how to frame the game and whether to blow the whistle. While opportunism and abstaining from whistleblowing is the Nash equilibrium, another likely outcome was that businesspeople allocate resources to punishing public servants for non-delivery, exhibiting a preference for negative reciprocity. Anticipating this, public servants might tend to reciprocate or blow the whistle upfront. Female public servants were more inclined to behave opportunistically; female businesspeople were less engaged in negative reciprocity. This corroborates a favorable role of women in anticorruption. Businesspeople who strongly preferred a corrupt framing of the game and obtained a form with corrupt wording were more willing to punish non-delivering public servants. This operates against camouflaging a bribe as a gift, because gifts fail to signal negative reciprocity.

JEL Classification: D73, K42, C72, C91

Keywords: Corruption, ultimatum game, whistleblowing, gender, signaling, trust

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1 Introduction

At a recent trial in Munich, Germany, Holger Pfahls has been charged with accepting bribes during his time as state secretary for defense under former Chancellor Helmut Kohl from 1989 to 1992. He is accused of accepting the equivalent of almost €2 million (\$2.6 million) from German-Canadian businessman Karlheinz Schreiber to push through a deal to deliver 36 Fuchs armored vehicles to Saudi Arabia. In court Mr Pfahls is quoted as giving the following description of the alleged briber (own translation): “Schreiber told me that I was just one out of many who receives bribes. When Schreiber hates someone, his hatred is so profound that he wants to destroy him, *even if that involves his own demise*. On the other hand, he is a real buddy, highly talented in creating a pleasant atmosphere.”¹ This concise description of a briber, hinting at several variants of reciprocity, is at the heart of this paper.

Partners in a corrupt transaction may cheat each other. They may renege on their promises or report to prosecutors or superiors before or after a deal has been finalized. Corrupt actors operate outside the law and, if they feel that they are being treated unfairly by their corrupt counterpart, cannot refer to the law’s protection. This suggests that private ordering is standard in corrupt transactions. Betrayal among corrupt partners is a good thing from the point of view of society at large. It ensures that corruption is a troublesome business and induces potential participants to refrain from getting involved in corrupt arrangements. Given that private ordering tends to be imperfect, the risk of opportunism and leakage of information to prosecutors emerges as a key deterrent against individual involvement in corrupt transactions, (della Porta and Vanucci 1999; Rose-Ackerman 1999: 91-110; Lambsdorff 2002; Lambsdorff, Schramm and Taube 2005; Ogilvie 2004; Kingston 2007).

This approach has recently gained attention in the literature, providing avenues for reform, (Lambsdorff 2007). The uncertainties surrounding corrupt transactions and the doubtful enforcement of such agreements can be amplified by designing criminal sanctions in a strategic way, aimed at enhancing opportunism. Lambsdorff and Nell (2007) make suggestions for criminal codes, based on a game theoretic framework.

Acts of opportunism and (self-) reporting are not uncommon. In fact, insiders are often a vital source of information for the prosecuting authorities, (Anderson 1995; Rose-Ackerman 1999: 53). For those who decide to expose a deal there are various motivations. Monetary inducements by prosecutors or the media may render whistleblowing a profitable strategy. However, such instances seem to be the exception. Mostly, whistleblowers face retribution and sometimes a miserable life. Altruism and a sense for public interests may contribute. On the other hand, a less altruistic motive may contribute: negative reciprocity. Actors who were cheated by corrupt counterparts may retaliate by blowing the whistle. This would be a less favorable type of whistleblowing that has received little attention in the literature. This is at the core of our game, which is motivated in more detail in section 3, following the literature overview in the next section. Section 4 presents our hypotheses, section 5 gives details of our experimental design and data. Section 6 presents our findings. To what extent these findings may relate to behavior outside the laboratory is discussed in section 7.

¹ Süddeutsche Zeitung, June 21, 2007, “Holgart und andere ‘dumme Tarnnamen’” (italics ours).

2 Previous experimental literature

That opportunism represents a substantial threat to informal contracting has recently been corroborated by laboratory experiments. These experiments build on regular (non-corrupt) games of reciprocity. Drawing on the gift-exchange literature, Abbink et al (2000) let two participants hope for reciprocity when exchanging gifts. In case of defection, one of them can spend resources on punishment. Game theory would predict that such punishment would not be carried out because it does not increase the punisher's income. Expecting that sanctions will not be imposed, the other player would have no incentive to return a gift. This suggests that none of the participants would hand out gifts in the first place. However, contrary to game-theoretical predictions, retribution is found to be quite common. Hostile actions tend to be punished (negative reciprocity) while the friendly ones are rewarded (positive reciprocity). Even when this runs counter to payoff maximization, players do bad to those who did them bad and good to those who did them good.

Experimental investigations on corruption represent a rather novel area of research, see Abbink (2006), Andvig (2005) and Dušek et al (2004) for reviews. In one of the first investigations, Frank and Schulze (2000) focused on individual tendencies to engage in corruption in procurement and whether economists are more likely to accept bribes. In a later contribution, Schulze and Frank (2003) extended their analysis to state how intrinsic motivations are affected by threats of penalties.

Subsequent studies focused on the interaction between businesspersons and public servants. One starting point for modeling interaction is the classical ultimatum game. For a review of experimental findings on ultimatum games see Camerer (2003: 48-83). In these games a first mover can propose a division of a cake and a second mover can accept or reject, inducing a zero-payoff for both. Preferences for fairness and reciprocity motivate players to deviate from the payoff-maximizing Nash equilibrium. A second mover may reject, either because he dislikes inequality or because of negative reciprocity, that is, the willingness to retaliate. First movers may share fairly with second movers, either because they anticipate the second mover's willingness to reject or because they themselves dislike inequality.

While preferences for fairness and reciprocity operate hand in hand in regular ultimatum games, they are conflicting in corruption games. Reciprocity is a force that induces players to share with each other, even involving the allotment of illegal earnings. This is no longer the case for fairness, which may also involve sentiments of civic-mindedness and altruism. It may go along with preferences for sharing with third parties. Corrupt actions are known to be unfair to the population at large, inducing fair actors to refrain from participating. This suggests that a corrupt framing of an ultimatum game may impact on the outcome.

Slightly different from corruption experiments based on the ultimatum game are those that are essentially trust (or gift-exchange) games. Abbink and Hennig-Schmidt (2002) design a game where players can jointly profit by exhibiting trust and sending money to each other. Every time money changes hands the payoffs to third players are reduced, resembling the negative externality of corruption. The authors find no effect of the size of this externality on the way the game is played. The corrupt externality thus seems to have no impact. Abbink (2004) extends this game to investigate the effect of staff rotation. Jacquemet (2005) shows that a third party (a principal) can lower the willingness to engage in corruption by deliberately choosing a higher wage for the agent. Unfortunately, his investigation disregards the enforcement problem between briber and public servant, thus pushing aside the risk of opportunistic bribe taking.

Camerer (2003: 87) speculates that cross-country differences in levels of trust might be related to a country's overall level of corruption. This idea is picked up by Cameron et al (2005) who investigate a game where a third party that suffers from corrupt externalities can devote resources to punish corrupt firms and public servants. The authors find differences between treatments with locals in India, Indonesia, Australia and Singapore. But these differences do not correlate with these countries' perceived levels of corruption. The finding suggests that more analysis is needed and that country-specific differences in overall levels of corruption cannot easily be traced to differences in individual attitudes.

3 Experimental design

We extend previous laboratory experiments in various respects. We embed a gift-exchange game in a corrupt context with negative externalities. For this purpose we utilize a simple mini-ultimatum-game with only three pre-determined alternative choices for the public servant (blow the whistle, behave opportunistically, reciprocate). This simple structure allowed us to focus our attention on questions as to who might be more willing to reciprocate and who may prefer opportunism. The businessperson acted as a responder with the opportunity to blow the whistle (nullify the corrupt deal) or stay quiet. A formal treatment of the game can be found in Lambsdorff and Nell (2007).

Some games tend to use neutral language in order to avoid suggesting the 'right' answer. But it was criticized that such approaches might 'neutralize away' important aspects of behavior, (Abbink 2006: 425). In reality public servants will operate in a context where the behavior is morally loaded, thus it appears reasonable to replicate such descriptions experimentally. This is done by Abbink and Hennig-Schmidt (2002), who use morally loaded terms that relate to corruption in the (rather complicated) instructions of a game, but find no impact on the results. We extend this analysis by endogenizing the choice of the frame. Businesspeople were allowed to choose between a corrupt instruction and a less offensive instruction, where gifts were exchanged with a public servant without explicit requests for reciprocity (gift-framing). Thus, there is an endogenous determination of the frame, which allows an investigation of how behavior in the game is related to the choice of the frame. The less offensive frame emulates the fact that in reality a briber may camouflage a bribe as a gift. We expected our participants to strictly prefer this camouflaged version, but were surprised by a considerable number of our participants.

In our game, the public servant takes the role of a proposer by deciding whether to allocate a contract to the briber or to behave opportunistically. The businessperson responds by staying calm or blowing the whistle, resulting in both players receiving nothing.

The main difference between a standard ultimatum game or gift exchange game and any reasonable corruption experiment is that in the latter case, "successful" bilateral negotiations should impose an externality on a third party. Abbink et al. (2002) designed this externality as a certain amount subtracted from the payoff of all other participants in the experiment who played the same game at the same time. However, a kind of reciprocity might be an issue here: If a subject expects other participants to opt for the corrupt action, this might provoke, or justify, his or her decision to do the same.

This possible effect is avoided if the externality is imposed on parties not involved at all in the experiment. This corresponds better with real cases of corruption, where bribers and officials do harm to people who will never get the chance to pay them out in their own coin.

In our case, the third party is *Médecins Sans Frontières*, a well-known non-profit organization, the donation to which would depend on the subjects' behavior.²

4 Hypotheses

For the ultimatum game and its variants, relying on the subgame perfect equilibrium leads to notoriously bad predictions of outcomes. Hence, in order to formulate our hypotheses, and to calibrate our experiment, we had rather to observe what happened in related experiments. Most important for us is a mini-ultimatum game suggested by Falk et al. (2003). In one version of their game, a proposer can offer either (8, 2) or (2, 8) with the first figure denoting the proposer's payoff and the second figure denoting the responder's payoff. The authors observe that 73% of proposers chose (8, 2), the rest proposed the outcome that is less favorable to themselves, (2, 8). 26.7% of responders rejected when they were confronted with (8, 2). Thus while a "80 percent for me"-offer may fail to maximize the proposer's expected profits in a normal ultimatum game, that might be different if only a limited set of actions is available to the proposer.³ In this respect, our game is similar to the mini-ultimatum game invented by Falk et al. (2003),⁴ hence we expect the following:

Hypothesis 1a: Some business people punish opportunistic behavior instead of maximizing their payoff.

Hypothesis 1b: Some public servants deliver (reciprocate), either because they fear negative reciprocity or because they prefer to do those good who did them good.

Hypothesis 1c: On average opportunistic behavior - i.e., taking the bribe but not helping the briber - will be payoff maximizing.

Some evidence, both from the field and from the laboratory, has already been found for a different inclination of women and men to engage in corrupt behavior. In our setup, this would mean:

Hypothesis 2a: Female "public servants" are more likely to blow the whistle.

Hypothesis 2b: Female "public servants" are less likely than male agents to reciprocate.

Hypothesis 2c: Female "businesspeople" are more likely to report on bribe-taking.

Offering a gift instead of a monetary bribe might be considered as desirable, as the moral connotations are possibly less negative. We did expect this all the more as our subjects did not have a choice whether to offer something or not; even the most scrupulous ones could only choose between offering a gift and a bribe and should opt for the gift as the morally less

² As mentioned above, Jacquemet (2005) designs his experiment with a more explicit principal-agent relationship where the official harms another player, his principal, when taking bribes.

³ In three other treatments (that were also played by all players) different alternative outcomes, i.e. (5, 5), (10, 0) and (8, 2), could be proposed instead of the (2, 8) mentioned above.

⁴ Our game differs from the one by Falk et al because our subjects played only once. We felt that this might reduce rejection rates because players cannot hope to recap their lost payoff elsewhere. We intentionally increased the attractiveness of reciprocity on corrupt promises by doubling the players payoff relative to the payoff in case of opportunism. But this was offset by promising a donation to a charity as long as the businessperson would not obtain the contract. Apparently, these changes disallow a comparison of our results to those by Falk et al. (2003). Still, our guess was that our results should be fairly similar to theirs.

controversial alternative. Furthermore, those indifferent to possible moral connotations between the two framings might still expect the agent not to be indifferent.

Hypothesis 3a: The gift framing is preferred by “businesspeople”.

Hypothesis 3b: The gift framing leads to a lower amount of whistleblowing by “public servants”.

While these were our a-priori hypotheses, more hypotheses and results were produced in the course of our investigation. These will be explained subsequently.

5 Details of the corruption experiment and data

Participants taking the businesspeople's part in the experiment were recruited at the Clausthal University of Technology, from lectures in introductory economics (first year students of business economics and engineering economics) and microeconomics (second or third year students of business economics and engineering economics). The experiment took part in the classrooms (or rather lecture halls), but participation was voluntary - students knew the experiment would take place and be played anonymously, hence they could easily stay away. Altogether, 192 students took part in the first round of the experiment, 12 of them were excluded from the data set due to incompleteness of the questionnaires or a mistake in a control question.

The completed forms were then sent to Passau University, where participants took the role of the public servants. 176 students were recruited for this purpose from a course in macroeconomics (third year students of business administration and economics as well as governance and public policy). Four forms from the 180 received from Clausthal were left over and filled out by the instructors. The completed forms were then sent back to Clausthal, where 152 of the valid 180 first round participants showed up to play round three. Afterwards, 25 forms (i.e. 50 participants) were randomly chosen, and participants could get their payments either in Clausthal or Passau from a secretary in a separate room, their decisions remaining hidden from the other participants and from the experimenters.

The round 1 participants in Clausthal received four sheets (see Appendix): The third and fourth were two forms, identical apart from the framing. Either of the words “bribe” or “gift” was used and in the former case there was an explicit request to award the contract in exchange for the bribe. On the second sheet, personal data such as nationality and gender were asked for, and participants could bid to secure their preferred framing, instead of a random assignment with a 50 percent probability for each framing. The first sheet contained the main instructions.

During round 1, in each of the two lectures in Clausthal 12 “rights to choose the preferred framing” were auctioned in a simple multi-unit Vickrey auction (which gets complicated when participants can bid for more than one unit; that was not the case here.) This method implied that the price of a preferred frame was determined by the 13th highest bid, the first one that remained unsuccessful. To introduce participants to the Vickrey auction, the sessions started with the second-price sealed-bid auctioning of a CD, which we used to demonstrate the incentive compatibility of the mechanism.

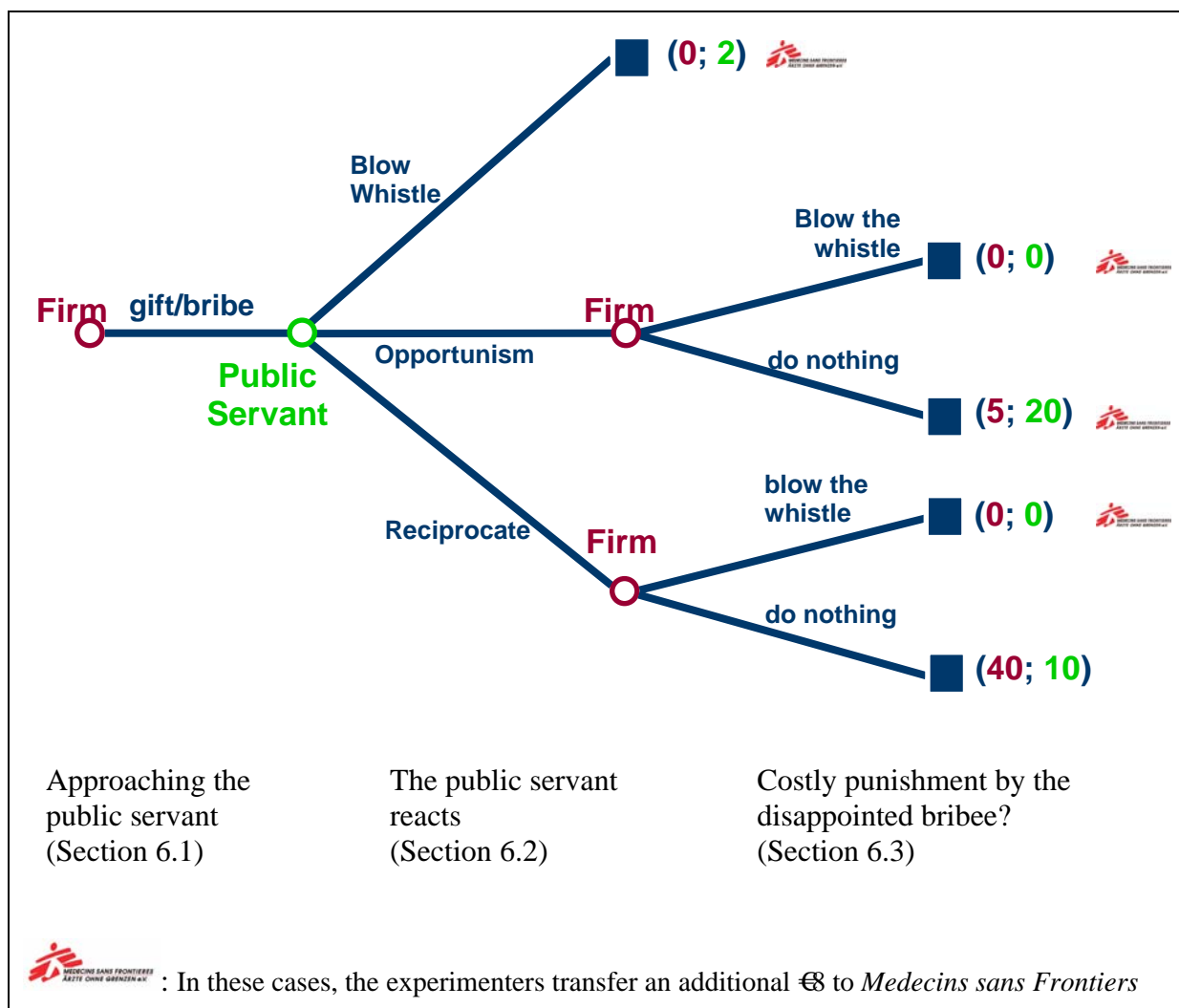
Participants were placed at an appropriate distance from one another and communication between them was not allowed as long as they had the forms. The first round was short and consisted of

- deciding between framings
- bidding for a framing (zero bid or no bids were allowed, however)
- indicating nationality, gender and a nickname plus two-digit code number, ensuring anonymous payment.

All participants in Clausthal and in Passau were shown figure 1, revealing the payoffs that were identical for both framings. Starting from an endowment of €25, the businessperson gives €20 (as a gift or bribe) to the public servant, resulting in an initial endowment of €5. He or she would win a further €35 as a profit from the contract in case of reciprocity and lose €5 if someone blows the whistle. The public servant obtains a payoff of €20 (gift or bribe) from the businessperson. He would have to pass on €10 for arranging the awarding of the contract (reciprocity). Upfront whistleblowing induces confiscation of the gift or bribe but a bonus of €2. If the contract is not given to the businessperson in Clausthal (either due to opportunism or whistleblowing) no damage is imposed, resulting in a €8 donation to *Medecins sans Frontiers*.

Figure 1: The game in extensive form.

Numbers in parenthesis indicate payoffs (businessperson; public servant) excluding show-up fee



In Clausthal, the experiment lasted about an hour. The hourly earnings for those who were drawn and paid was about €18 including a €10 show-up fee.

At Passau University the sheets (either bribe or gift) were distributed in a sealed envelope among the participating students. The rules of the game were explained in neutral wording and no hint was given that two alternative forms would be distributed. Envelopes were then opened and the game was played. On a second sheet, personal data such as nationality and gender was asked for. The game in Passau lasted 30 minutes.

6 Results

6.1 Approaching the agent

In our experiment, firms did not have the option to refrain completely from making a transfer to the agent. Their chance to display anti-corrupt behavior was, however, only postponed. The only choice they had to make in the first stage of the experiment was *how* to approach the agent. Table 1 shows participants' preferences for the two framings. If participants voiced no preference for any of the framings each of them was assigned with a 50 percent probability. A bid that was sufficiently high would secure a framing with certainty, thus increasing the probability by 50 percent.

We expected our participants to prefer the form where an exchange is described as a gift rather than the more offensive version where the payment was described as a bribe. However, we felt that the more direct request for reciprocity in the corrupt form may also be considered to be advantageous by players in the role of businesspeople. Indeed, we observed that some businesspeople preferred the corrupt framing and were willing to place substantial bids to obtain this form, table 1.

Table 1: Gender and preference for gifts or bribes

	Women bidding for corrupt framing	Women bidding zero	Women bidding for gift framing
Number of bids	12	27	29
average bid	1.85	0	3.49
median bid	1.83	0	3.00
Playing with corrupt/gift framing	6/6	16/11	15/14

	Men bidding for corrupt framing	Men bidding zero	Men bidding for gift framing
Number of bids	27	40	45
average bid	4.62	0	4.48
median bid	4.57	0	3.02
Playing with corrupt/gift framing	24/3	21/19	11/34

Women and men appear not to be different with respect to their preferences for the framings. Taking both sexes together, 22 percent expressed willingness to pay (WTP) for the corrupt framing, 41 percent for the gift framing, and 37 percent did not show a preference for one of

the framings that would have translated into a positive bid. However, among those who bid for a corrupt framing, men have a significantly higher WTP than women (at a 1 percent level of significance using a Mann-Whitney-U-test). With hindsight, those who bid zero had a correct guess of the true difference in the value of the framings, as will be shown in the next section.

The number of bribe framings handed out is slightly higher than the number of gift framings. This was a purely random effect, because only few sheets were tendered while the rest was assigned with a 50% probability.

6.2 The public servant reacts

49 participants out of 176 in Passau preferred to blow the whistle upfront.⁵ This appears to be a strong framing effect. Whistleblowing might already be motivated by the externality (the donation). However, the high degree of whistleblowing cannot be explained by the externality alone. Students in Passau may have a preference for donating €8 to *Médecins Sans Frontières*. Still, whistleblowing is dominated by both alternatives. To reciprocate (i.e., deliver) allows the prospect of obtaining €10. Donating €8 and keeping €2 would replicate the outcome of the whistleblower. In addition, reciprocating retains the liberty to donate more or less. Choosing the opportunistic action would even provide the prospect of collecting €20 and donating even more. While these considerations suggest the existence of a framing-effect, we contend that a fully-fledged proof requires a control experiment with neutral wording.

There is no direct framing effect in the sense that the choice of the framing would have a significant impact on the agents' decision making, table 2.

Table 2: Public servants response to different frames

		framing		Fishers' exact probability test (one-sided): Probability of distribution within row not being different to rest of matrix
		gift	bribe	
Public servant's reaction	whistle	24 (29%)	25 (27%)	0.45
	opportunism	48 (58%)	53 (57%)	0.52
	reciprocate	11 (13%)	15 (16%)	0.37
		83 (100%)	93 (100%)	

We observe a considerable number of public servants reciprocating the bribe, alongside our hypothesis 1b. Apart from that, we cannot find evidence in favor of hypothesis 3b, i.e. less whistleblowing in case of gifts as opposed to bribes. Overall, we do not find differences in how the two forms were dealt with by the public servants in Passau. There was neither more whistleblowing on the corrupt form, nor was there more reciprocity. Overall, the choice of the frame remained without an impact on the public servant. This failure may also relate to the little emphasis given in Passau to differences in framing. The payoffs were explained to students without mentioning that two alternative forms existed. Given this lack of knowledge, they also could not recognize that the form was explicitly chosen by

⁵ As mentioned before, 4 sheets were filled out by the instructor. These are of course not counted here.

businessmen in Clausthal. This lack of emphasis is a likely reason why the forms that were so important to students in Clausthal were accorded little attention in Passau. We purposely did not mention differences explicitly to avoid overshadowing the written forms by morally loaded explanations of the game. In future research this restriction may be relaxed to observe whether public servants react differently to gifts or bribes.

There were remarkable differences in gender, as revealed in table 3. For statistical analysis we use Fisher's exact probability test. In a 2x2-matrix this test determines the probability that both columns follow a joint distribution (the null hypothesis), where differences arise only randomly. Fisher's test would then determine the likelihood that the observed or even more unequal results arise at random. Low values thus indicate a low probability that the observations randomly emerged under the constraints of the null hypothesis.

Table 3: Gender matters; public servant's reaction

		public servant's gender		Fishers' exact probability test (one-sided): Probability of distribution within row not being different to rest of matrix
		male	female	
Public servant's reaction	whistle	19 (24%)	29 (30%)	0.23
	opportunism	39 (49%)	62 (65%)	0.03
	reciprocate	21 (27%)	5 (5%)	0.00
		79 (100%)	96 (100%)	

As shown in table 3, women are only insignificantly more likely to blow the whistle. Comparing the 29 whistleblowing women (out of 96) with the 19 whistleblowing men (out of 79) we observe a Fisher's exact probability of 0.23 (one-sided). We are thus not able to confirm hypothesis 2a. However, at a 5-percent error level women are markedly more likely to behave opportunistically.⁶ 65% of them keep the bribe without doing for the briber what she or he hopes for, in contrast to 49% of the male participants. More drastically, 27% of the men, but only 5% of the women reciprocate. This is strong evidence in favor of hypothesis 2c.

While women are sometimes found and sometimes not found to be more cooperative than men in laboratory experiments, here they appear to be significantly less cooperative, but the situation is special since it is a briber, a corrupt person, with whom they very likely decline to cooperate. Yet this does not necessarily mean that women's moral predisposition is different, it might simply be strategic considerations: If women do not expect negative reciprocity among businesspeople they might guess that opportunism is the most profitable strategy. We will turn to this in the next section.

6.3 Costly punishment by the disappointed bribee?

As shown in table 4, there is considerable deviation from payoff-maximization, as suggested in hypothesis 1a. Furthermore, men are much more likely than women to punish

⁶ Replicating the design of Abbink, Irlenbusch and Renner (2002), but focusing on gender effects, Rivas (2006, p.14-15) found a similar result.

opportunistic behavior.⁷ This is strong evidence against hypothesis 2c. Our presumption that female businesspeople tend to blow the whistle has been misguided. One explanation for the contrary finding may relate to feelings of negative reciprocity being felt more by men and that these male feelings less require a common good as a motivating cause. If the subjects presume that the average participant in the game is no different from themselves in this respect, this might have been a reason for male agents to refrain from opportunistic behavior with a higher likelihood than female agents.

Table 4: Punishment of opportunistic behavior, by gender

		businessperson's gender	
		Male	female
businessperson's reaction to opportunistic behavior	whistle (punish)	16 (31%)	5 (16%)
	not whistle	35 (69%)	27 (84%)
		51 (100%)	32 (100%)

Fisher's exact probability test: $p = 0.087$ (one-sided)

Nevertheless, even if all firms' decisions had been made by men, opportunistic behavior would have led to a higher expected payoff than to deliver. While "deliver" leads to a sure payoff of 10, opportunistic behavior leads to a payoff of 20 if successful, the probability of success being $35/51=0.69$ and the expected payoff being 13.73 in the case of male firm decision makers. This supports hypothesis 1c.

The chosen framing was important to the businesspeople in Clausthal when deciding on whether to blow the whistle. Those choosing the corrupt form in Clausthal were more willing to punish non-delivery, see table 5.⁸ A straightforward interpretation is that the corrupt form was chosen in order to signal negative reciprocity. The terms "bribe" and the request to deliver the contract were preferred as a signal that nonconforming behavior would be punished. The illegal nature of the corrupt form signals the players that "honor among thieves" necessitates private ordering of conflict. Even if punishment is costly, once signals of honor are delivered they may dominate payoff maximization. While this threat was certainly not subgame perfect for payoff-maximizing players it was played nonetheless, and more often by those with the corrupt framing. We did not hypothesize this behavior upfront because it came as a surprise to us, albeit one that makes much sense in retrospect.

Might this finding be explained by gender, that is, male bribers retaliating and female gift-givers not blowing the whistle? We are not aware of a standard test to answer this question and made use of a bootstrap-approach. Such an approach yields results that converge (with higher repetitions) towards the Fisher coefficient for all of the above tests and promises equal validity here. As reported in table 5, 2 women and 10 men were determined bribers. We randomly drew 2 women from the total sample of 32 women and noted how many of these blew the whistle, the likelihood being 16% according to table 4. Likewise we drew 10 men out of the total sample of 51, their likelihood of blowing the whistle being 31%. If a total of 6 or more from these two draws blow the whistle, we replicated our finding as a purely random result without determined bribers actually exhibiting a different behavior, which is our null.

⁷ Punishment that is costly not to the briber, but to a third party ("citizen"), is featured in a corruption experiment by Cameron et al. (2006).

⁸ As the actual price for receiving the money bribe framing for sure was higher than 1 euro, a small number of participants bid more than 1 euro and played with the gift framing. Including them in the group of "determined money bribers" slightly reduces the level of significance, but does not change the results qualitatively.

We ran 100000 repetitions of this algorithm and observed 6 or more whistleblowers only in 7.6%. This allows us to reject the null at the 10-percent error level. Thus, determined bribers are more likely to retaliate.

Table 5: Punishment of opportunistic behavior, by preference for framing

		type of businessperson			
		determined briber*		gift-giver or indifferent	
businessperson's reaction to opprtunistism	whistle (punish)	6 (50%)	[5, 1]	15 (21%)	[11, 4]
	not whistle	6 (50%)	[5, 1]	56 (79%)	[30, 26]
		12 (100%)		71 (100%)	

*A determined briber plays with the bribe frame and bid at least 1 €for this frame.

Details on gender [male, female] in brackets

Fisher's exact probability test: $p = 0.044$ (one-sided).

We checked whether this interpretation of the choice of frames was also intended by our players by distributing questionnaires at the end of the game in Clausthal. The choice of gifts was mostly motivated because the milder wording might less offend public servants in Passau, but also because businesspeople in Clausthal felt that they were acting less illegitimately themselves. Others mentioned a less apparent quid-pro-quo of gifts that appeared preferable to them. The choice of the bribery form was sometimes explained by the better fungibility of monetary payments as opposed to the in-kind character of gifts. Also, the game was considered to be better described as a game of bribes rather than gifts, the bribe-form thus having the advantage of clarity. Bribers also seemed to be risk-loving and curious about the public servant's reaction. Finally, in line with our results, we observed players preferring the bribery form because it entails a clearer quid-pro-quo and, even because the illegality may help avoid opportunism.

7 Policy implications and conclusion

Whether our results can be swiftly applied to the world outside the laboratory/classroom is a challenging question. Some participants may have felt that whistleblowing is the behavior expected from the lecturers due to their reputation of being engaged in anticorruption. The framing effect described above would then be related to such sentiments by students. Although we feel that university lectures are not considered to indoctrinate but to sharpen our thinking we contend that this argument is hard to dismiss outright.

A bigger concern may relate to stakes and repetition. Stakes in real corrupt transactions are much higher. List and Levitt (2007) cite evidence, although mixed, that in ultimatum games higher stakes bring outcomes closer to the Nash. This would indicate that opportunism is even a bigger risk in reality. On the other hand, some chance of repetition is commonly given in reality and it was ruled out in our game. However, participants in laboratories are sometimes suspected of playing as if repetition were possible, contrary to explicit instructions (List and Levitt 2007). The relevance of opportunism is also confirmed in a recent field study by Maréchal and Thöni (2007). They found that gifts given by sales representatives to business people result in higher sales revenues, but only if buyers and sellers are not interacting for the first time. Hence, overall we have little reason to assume that opportunism in one-shot interaction is less or more likely in reality.

A final concern might be that our results are valid only for sophomore students but not for practitioners. In July 2007 we also played the game at a summer school with 40 senior

prosecutors and fraud investigators from various continents and found results that are much along the lines of those reported here. While the sample was rather small, in discussion we also detected similar patterns of reasoning, confirming our overall findings.

Overall, we observe two different approaches to bribing public servants. While transferring a "gift" is preferred because it appears less offensive and demanding, a bribe is chosen precisely for the opposite reason: it is more demanding and clearer that reciprocity is expected, including the threat to retaliate in case of opportunistic behavior. We found empirical evidence on these differences.

Gender matters crucially in corrupt exchange. Although women have often been found to be less likely to engage in corruption, we did not find that women were more likely to blow the whistle. Instead, they were significantly engaged in opportunism, bribe taking without reciprocity. Men tend to engage in positive reciprocity, delivering to the briber, even if this behavior is at odds with moral considerations vis-à-vis society. Men were also more willing to play negative reciprocity: They more often blew the whistle when their bribe was not reciprocated. Reform should thus focus on a better involvement of women in the public and the private sector. Future research may deepen these insights by investigating group behavior and whether (and how many) female participants in teams would make a difference.

Given the high incentives for opportunism, corrupt actors in reality are desperate to find mechanisms to enforce their deal. This explains why one-shot games are rather seldom in reality and why repetition is so urgently needed for corrupt transactions. The more frequent repetition of corrupt transactions and the less opportunism is a natural reaction of the corrupt marketplace. The observation of repetition in reality does not contradict our paper, it rather supports our finding by pointing to the severe problems with enforcement in one-shot interaction.

Our experiment helps to sharpen our view on conditions that make one-shot corrupt contracts "enforceable" and on how to enhance opportunism. Clearly, as theoretically suggested by Lambsdorff and Nell (2005) as well as Buccirossi and Spagnolo (2005), whistleblowing may increase corruption rather than decreasing it when it is motivated by negative reciprocity rather than integrity. Reform must focus on improving incentives for the "good" whistleblowers (those who act upfront or after having completed a corrupt transaction) but on deterring the "bad" whistleblowers (who threaten to retaliate after being cheated).

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Appendix: Instructions and forms

(slightly abridged)

Cover sheets of instructions for all participants in Clausthal ("businesspeople")

Many thanks for participating in this experiment, which runs roughly as follows: You send a message to a student in Passau. You will not know who exactly that person is, and vice versa. After having received your message, your opponent makes one decision. Then both of you get paid, the amount depending on your final decision.

The game will be played only once. There are two variants, which do not differ in possible payments, but in the wording of your message.

[Some technical advice on choosing an alias and code number for claiming the payoffs, and on entering personal data, omitted]

Second page:

- Carefully read form A and form B. Decide for yourself with which form you would prefer to play.
- A random mechanism will determine whether you actually play with form A or form B.
- However, you have the chance to get one form for sure. 12 forms of every kind will be auctioned off; you will be asked to submit your bid. Most likely the price you have to pay will not equal your bid; the 12 participants with the highest bids will play with their favoured forms and pay a price that equals the 13th highest bid. If less than 13 bids for one forms are made, the price of that form is 0.

(control question omitted)

If you could, which form would you choose?

- Form A (gift for the agent)
- Form B (bribe for the agent)

What is your bid for the rights to choose the preferred form, instead of receiving one randomly?

€ __, __

Third page:

Sheet A

[Section to be filled out by agent:]

I am the public servant responsible for the awarding of the public contract.

Firm Alpha gave me a gift worth €20. Firm Beta, a competitor of Alpha, could carry out the contract better. If Beta got the contract, the general public would benefit to the tune of €8. That benefit is paid to *Médecins sans Frontières* by the experimenters.

I decide to take the following action (please mark with a cross):

Action 1	I report the acceptance of the gift to my agency. Though I may not keep the gift, I receive a €2 bonus. Firm Alpha has to pay a €5 penalty.	<input type="checkbox"/>
Action 2	I keep the gift, but I do not favor firm Alpha. Rather, I award the contract to the better firm Beta.	<input type="checkbox"/>
Action 3	I keep the gift and I give a part of it (€10) to my colleagues to ensure that firm Alpha really is awarded the contract. Firm Alpha then makes a profit of €35.	<input type="checkbox"/>

[Section to be filled out by firm:]

I am the owner of firm Alpha. From my initial endowment of €25 I used €20 to purchase a gift for a public servant. The public servant was responsible for awarding the contract that I was interested in. Now I see (on the upper half of the sheet) how the public servant dealt with the gift. I cannot react to Action 1. In response to Action 2 or 3 I decide to take the following action (please mark with a cross):

do nothing	<input type="checkbox"/>
blow the whistle	<input type="checkbox"/>

If I decide to “blow the whistle” this means that I report to the government agency that I paid a gift to the public servant. If I was awarded the contract, the contract would then be revoked. In any case I have to pay a €5 penalty. The gift is retained by the agency.

If I decide to “do nothing” I get

- nothing if the public servant took Action 1
- €5 if the public servant took Action 2
- €10 if the public servant took Action 3

[end of instructions]

Note that a figure similar to figure 1 was also shown to the participants.

In Sheet B on the fourth and final page of the instructions (corrupt framing), the wording was changed as follows:

gift → bribe;

purchase a gift → pay a bribe and in return requested me to award the contract;

report the gift to my agency → report the bribe to the public attorney;

the gift is retained by the agency → the bribe will be confiscated

...