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The Effect of Communication on the Usefulness of the
Four-Eyes Principle in Reducing Corruption:
An Experimental Analysis

Seminar Paper
Lab and Field Experiments:
Corruption, Conflict and Cooperation
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Abstract

The aim of the present paper is to answer the question whether communication has a negative impact on the usefulness of the four-eyes principle by increasing corruption. Therefore, an experimental investigation of group decision making with and without communication in a corruption experiment was conducted. The groups consisted of two potential bribe-takers who interacted with one potential briber. Results imply that communication does not have a significant effect on bribe-takers' individual propensity to accept a bribe. Moreover, communication is negatively related to the rate of bribes offered by potential bribers. However, overall bribes accepted by both bribe-takers, and thus also the negative impact on society, increase significantly with communication.

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1. Introduction

Corruption is commonly defined as the misuse of public or private office for personal gain (Treisman 2000). Generally, a corrupt transaction is illegal and has a negative external effect on others, which is usually larger than the benefits to the people involved. The World Bank Group considers corruption a major challenge to its goals to fight extreme poverty and promote prosperity. It is largely recognized that most of the Sustainable Development Goals cannot be achieved without seriously tackling corruption (World Bank 2017). Therefore, means to combat corruption are of big interest.

One of those means people put hope in is the “four-eyes principle”, the mechanism that a certain activity, i.e. a decision, transaction, etc., must be approved by at least two people. Having a second, independent person monitor a decision is seen as an insurance against corruption as a control mechanism is in place. Successfully bribing two, it is generally assumed, is more difficult and less likely than bribing one person (Six et al. 2012). Despite this idea appearing most intuitive, it can be called into question as several corruption cases have been reported in which whole groups of decision makers have been bribed (Frank et al. 2015). Therefore, several laboratory experiments have been conducted to analyse the effectiveness of the four-eyes principle (subsequently referred to as “4EP”) in reducing corruption. However, these experiments came to varying conclusions. Two of those experiments, which will be presented in the next section, saw the 4EP to even increase corruption, while one experimental study found it to reduce corrupt transactions (Schikora 2011; Frank et al. 2015; Bodenschatz and Irlenbusch 2018). But these experiments do not only vary in their results but also in their methods. Those experiments which find the 4EP to increase corruption allow for communication between the potential bribers or bribe-takers while the study with contrasting results does not. Hence, the aim of the present study is to analyse whether communication has a negative impact on the usefulness of the 4EP by increasing corruption.

2. Related Literature

The experimental bribery game by Abbink et al. (2002) serves as a basis for the present experiment. These authors were the first to experimentally reconstruct the bribers’ and bribe-takers’ decision in a simple sequential game. One player can transfer money to a second

player (the public official) in order to induce a decision advantageous for him. The second player then decides on whether to accept the monetary transfer or not. Accepting it, however, induces a negative externality to other individuals. The present study adopts the main idea of this experiment and adds a second public official to introduce the 4EP into the game.

Schikora (2011) conducted one of the experiments examining the usefulness of the 4EP previously referred to. He compares one treatment played among individuals to a treatment where public officials decide in groups of two. Only if both agree, the bribe will be accepted. Here, officials are allowed to communicate with each other on condition that they do not directly take the same decision concerning the acceptance of the bribe. Schikora (2011) finds bribery to increase in the group version compared to the single version which casts doubt on the usefulness of the 4EP. Frank et al. (2015) conduct a similar experiment comparing group decisions to individual decisions in China and Germany. In this case the roles of the briber as well as the bribee are taken by three persons in the group treatment. Within the groups subjects need to agree on one decision for the bribe to be offered or accepted and are again allowed to communicate with each other. The 4EP in this study also fails to reduce corruption. The first experimental study which supports the usefulness of the 4EP was conducted by Bodenschatz and Irlenbusch (2018). In the group treatment of this experiment two potential bribers decide on whether to pay a bribe to a public official or not. Again, both bribers need to decide to do so for the bribe to be paid but in contrast to the other studies they cannot communicate. The authors find a reduction of bribes in the group treatment compared to the single treatment with only one single briber.

As those studies obviously differ not only in their results but also in their application of the 4EP with communication versus without communication, the present study investigates this difference. In order to see whether communication has an impact on the usefulness of the 4EP a similar experiment was conducted while, in contrast to the presented ones, two treatments both including the 4EP were compared while one includes communication and one does not.

3. Experimental Design

The design of the experiment builds on the experimental bribery game in Abbink et al. (2002) and on the previously presented related papers which introduced the 4EP into the bribery game. The experiment was conducted over five periods without any practice rounds.

It was played over several periods and not as a one-shot game to make it comparable to the related studies that were previously presented, in which the authors also conducted their experiments over several periods. Subjects were matched into groups of three and either assigned the role of a firm, an official A or an official B. Subjects were randomly rematched into groups for each period whereas their role stayed the same. All subjects received equal information on the game: In each period firms received an initial endowment of 6€ while officials A and B received 2€, respectively. To obtain an undue advantage, the firm could decide in each period on whether or not to offer a bribe of 4€ to the two officials so that each one would get 2€. If no bribe was offered, all subjects received their initial endowment and the respective period was ended.








If the firm decided to offer the bribe, each official had to decide on whether to accept or to reject it. Meanwhile, firms that offered a bribe were asked whether they expected both officials to accept the bribe or whether they thought that one or both officials would reject it. Just like in the related experiments both officials needed to accept the bribe in order to make the firm get the undue advantage and thus a payoff of 12€. The officials then each received the bribe and their payoff for the period was 4€. A bribe that was accepted by both officials will subsequently be referred to as “double accepted bribe”. When one or both officials rejected the bribe, the firm did not get the undue advantage and all subjects only received their initial endowment. At the end of each period payoffs were displayed to the participants and at the end of the fifth period, accumulated payoffs were displayed as final payoff.

The experiment included two treatments. In the decision stage of the officials the difference between the two treatments was implemented. In the baseline treatment officials had to decide whether to accept or reject the bribe without communicating with each other, knowing that they would only get the bribe when both officials of a group accept it. In the communication treatment official A and B of a group had the possibility to chat with each other through a chat window for 30 seconds before deciding on whether to accept or reject the bribe.

Possible decisions and resulting payoffs can be seen in Figure 1 which was also shown to the participants. As can be seen from the last row of Figure 1, a bribe which was accepted by both officials had a negative impact on society. In the experiment this negative impact was considered as one blank piece of paper which was torn. Thus, the experimenter counted

the number of bribes that were accepted by both officials and tore the respective number of pieces of paper at the end of each session. Furthermore, participants of groups in which the bribe was accepted by both officials faced the risk of being detected in the respective period. When a bribe had been offered and accepted by both officials, a lottery was played out, and with very low probability the activity was discovered. As in Abbink et al. (2002) the probability of being detected was 0.3 percent. When a group was detected all three participants were excluded from the rest of the experiment and their payoff was 0€¹.

Figure 1: Decisions and payoffs

Decisions			Payoffs (firm, official A, official B)
firm:	no bribe		(6, 2, 2)
firm:	bribe		(6, 2, 2)
official A:	accept		
official B:	reject		
firm:	bribe		(6, 2, 2)
official A:	reject		
official B:	accept		
firm:	bribe		(6, 2, 2)
official A:	reject		
official B:	reject		
firm:	bribe		(12, 4, 4)
official A:	accept		 negative impact on society
official B:	accept		 risk of being detected (p=0,3 percent)

The unique subgame perfect equilibrium implies that all firms offer the bribe, as a payoff-maximizing official should accept the bribe and a rational firm should anticipate this. However, the efficient outcome which maximizes joint payoffs would require the participants to accept the negative impact on society arising out of their actions. Thus, no bribes or rejected bribes can be attributed to moral concerns of the subjects. Furthermore, some subjects might be afraid of being detected and therefore pay no bribe or reject it.

¹ The low detection probability of 0.003 together with the high potential penalty was chosen to ensure that only very risk averse individuals would refrain from corrupt transactions because of their fear of being excluded.

4. Procedures

Twelve Sessions of the experiment were conducted together with another experiment as part of a seminar at the University of Passau over a period of four days in June 2018. The software z-Tree: Zurich toolbox for ready-made economic experiments (Fischbacher, 2007) was used to program and run the experiment. To ensure double blindness, the experiment was conducted in one of the computer laboratories at the University of Passau where the participants were separated from each other through screens and the experimenter was ignorant of the individuals' choices. To make meaningful causal inferences, the different roles and treatments were randomly allocated to the participants in each session. Moreover, a between-subject design was used so that a participant's decision was not influenced by previous treatments.

The experiments had been advertised in lectures, seminars, social media and with posters beforehand, however, the major part of players participated spontaneously after being asked just before the start of each session. Altogether, 177 people participated in this experiment. Approximately 60% of participants were female, and the age ranged between 18 and 54 years with an average age of 22 years. More than one third (37%) of the participants were students of economics or business studies and another 25% studied European Studies or Governance and Public Policy. The other participants were students of law, media, literature or teaching or university staff. Seldom other experimenters from the seminar had to take part in the experiment, when not enough participants were found, but those observations were excluded from the sample.

Between 9 and 18 players participated in each session which took between 20 to 30 minutes. In every session a player took place in two consecutive experiments - one for the present study and one for another study of a fellow student. The experiments were conducted straight after each other and the order of the experiments was alternated in each session. In the beginning of a session, general instructions (no communication among participants, no monetary payoffs etc.) were read to the participants, where after the experiments started. All instructions specific to the experiment were given in written form on the PC. Instructions can be found in appendix A. At the end of each session participants answered a questionnaire with demographic questions including questions regarding their age, gender and field of studies (see appendix B). As the experiments were conducted by students, payoffs were not

paid out in Euros, but participants received free snacks and drinks as incentive and recognition for their time.

5. Hypotheses

As has been shown in experimental economics literature, there are potential differences between individual and group decision-making (Kocher and Sutter 2005; Charness, Karni, et al. 2007; Babcock et al. 2011). After having examined several studies on this topic, Charness and Sutter (2012) conclude that groups are more likely to behave according to the principle of the homo oeconomicus than single deciders. Single deciders in turn tend to be influenced by biases, cognitive limitations, and social considerations. When officials A and B are allowed to communicate with each other and afterwards make their decision on whether to accept or reject the firm's bribe, they act as a group, whereas they make individual decisions when they cannot communicate. If the officials act rationally they will accept a bribe as the payoff of 4€ is higher than the one when they do not accept (2€). Therefore, I expect officials in the communication treatment to be more likely to accept a bribe offered by the firm.

***Hypothesis 1a:** Communication is positively related to the officials' individual propensity to accept a bribe.*

Second, communication could not only influence the individual propensity to accept bribes but might also have an effect on coordination between the two officials. Several studies find that group decision-making helps to achieve efficient coordination, thus increasing individual's payoffs (Charness, Rigotti, et al. 2007; Feri et al. 2010). Hence, when officials A and B are able to communicate with each other, they should coordinate their decisions, and both accept the bribe so that their payoffs are maximized. Single deciders' decisions in turn are more often driven by moral concerns and social considerations (Charness and Sutter 2012). In the experiment single deciders might be afraid of being judged by the other players when they decide for accepting the bribe which has a negative effect on society. Furthermore, they might be more likely to consider this negative impact than those officials acting as a group and therefore decide for rejecting the bribe. Thus, I expect the share of bribes being accepted by both officials to be higher when officials are allowed to communicate.

Hypothesis 1b: *Communication is positively related to the proportion of bribes that are accepted by both officials.*

When firms anticipate that the officials' individual propensity to accept is higher with communication and that it is more likely that bribes are accepted by both officials when they communicate, this probably influences their expectation. Hence, I expect that firms will expect their bribes to be more often double accepted when communication between the officials is possible.

Hypothesis 2: *Communication is positively related to firms' expectations of bribes being accepted by both officials.*

6. Results

In this section the results of the experiment will be analysed. Figure 2 provides an overview over the mean outcomes regarding the participant's decisions over the whole sample. The results deviate strongly from game theoretic predictions. On average 60% of firms offered a bribe to the officials in their group. More than half (51%) of the officials that were offered a bribe accepted it. 43% of firms that offered a bribe expected both officials in their group to accept it, while approximately one third (32%) of bribes were in fact accepted by both officials. Overall, 57 of 178 bribes were accepted by both officials over the course of twelve sessions, thus 57 pieces of blank paper were torn. None of the groups were detected, which is probably due to the fact that the probability of detection was low and the sample relatively small.

Figure 2: Participants' decisions

<i>Subjects</i>	<i>Bribing firms</i>	<i>Accepting officials</i>	<i>Firm expects acceptance</i>	<i>Double accepted bribes</i>
177	60%	51%	43%	32%

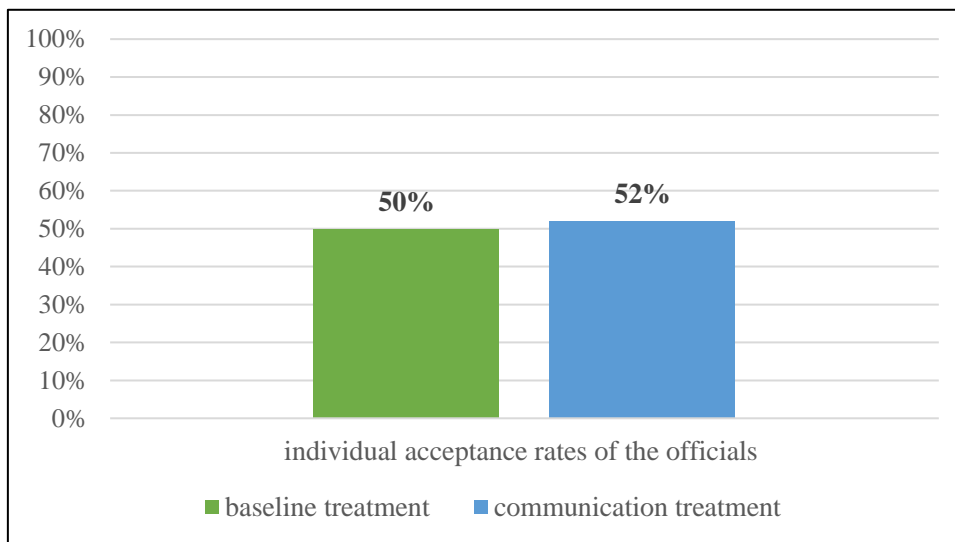
6.1. Individual Propensity to Accept

It was hypothesized in Hypothesis 1a that, on average, officials in the communication treatment would have a higher individual tendency to accept bribes than those who were not able to communicate. Figure 3 illustrates mean acceptance rates by officials A and B in the baseline treatment and the communication treatment. The blue bar in Figure 2 representing

the communication treatment suggests a slight tendency to higher acceptance rates when communication is possible. 50% of officials accepted an offered bribe in the baseline treatment while 52% of officials did so when communication was possible. A Fisher's exact test was conducted in order to test whether the difference between the treatments is statistically significant. The p-value obtained for this test equals 0.764 and therefore the conventional significance-level of 5% is not met. Hence Hypothesis 1a cannot be confirmed, meaning that communication has no significant influence on the officials' individual tendency to accept a bribe.

Result 1a: *Communication has no effect on officials' individual propensity to accept bribes.*

Figure 3: Individual acceptance rate of the officials by treatment

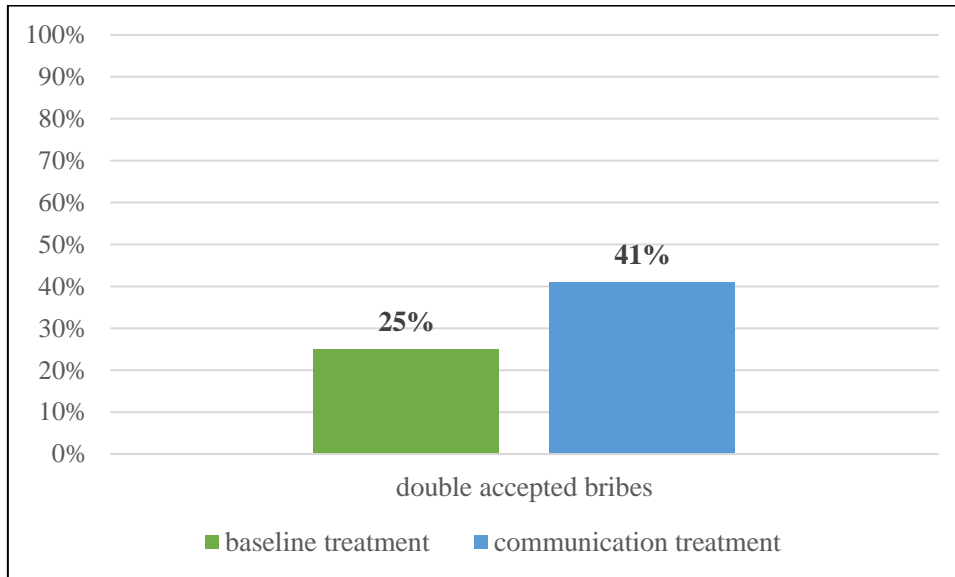


6.2. Double Accepted Bribes and Coordination

The possibility of communication between officials does not seem to have an influence on their individual acceptance rate of bribes, but it affects the proportion of double accepted bribes. Those bribes which are accepted by official A and B of a group are the ones which result in the firm getting an undue advantage and thus in the negative impact on society. It was hypothesized in Hypothesis 1b that the share of double accepted bribes would be higher when the officials communicated. Figure 4 illustrates the percentage of bribes offered that were accepted by both officials. The comparison of the two bars shows a clear tendency of the share of double accepted bribes being higher when officials communicate. In the communication treatment 41% of all bribes were double accepted while without communication

the share was only 25% high. This difference turns out to be statistically significant at the 5% level as the p-value obtained in the Fisher's exact test equals 0.025. This confirms Hypothesis 1b that communication is positively related to the share of double accepted bribes.

Figure 4: Double accepted bribes as a share of bribes offered

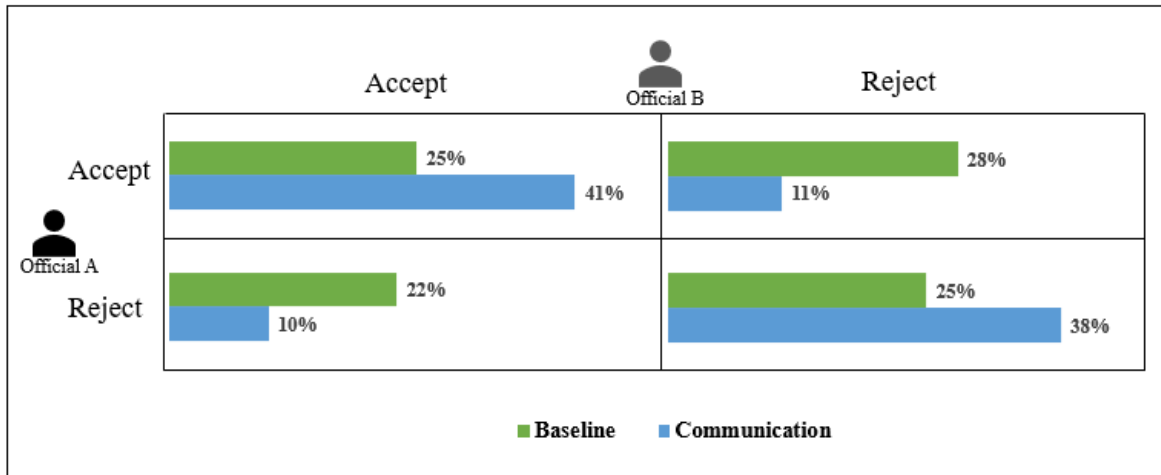


As the percentage of double accepted bribes increased, coordination between the officials seems to matter. Coordination in this context means that officials coordinate on the same decision, i.e. either both accept the bribe or both reject it. Figure 5 illustrates the proportion of officials A and B either making the same or different decisions within one group respectively in both treatments. In the baseline treatment 25% of bribes were accepted by both officials and 25% were rejected by both. In 28% of cases official A accepted the bribe while official B rejected it and the remaining 22% refer to cases where official A rejected the bribe while official B accepted it. Thus, the proportion of coordination between the officials in the baseline treatment was 50%.

Results are different for the communication treatment. As the blue bars show, in this treatment 41% of bribes were accepted by both officials and 38% were rejected by both. In only 11% of cases official A accepted the bribe while the other official rejected it and 10% of bribes were rejected by official A but accepted by official B. Hence, the proportion of coordination in the communication treatment was 79% and therefore much higher than when communication was not possible. A Fisher's exact test reveals that average coordination is significantly higher when officials communicated compared to when did not ($p=0.024$). This finding is significant at the 5% level.

Result 1b: Communication is positively related to the acceptance rate by both officials and to coordination between the officials.

Figure 5: Decisions of officials A and officials B



In order to isolate the effects of communication between the officials, four logit regressions were run which are illustrated in Figure 6. The dependant variables are double accepted bribes and coordination between two officials. Both dependant variables are binary variables. Double accepted bribe takes the value of 1 when a bribe is accepted by both officials and 0 otherwise. Coordination between two officials takes the value of 1 if either both officials accept the bribe or both officials reject it. In regression (2) and (4) control variables taken from the post experimental questionnaire were included: the age of participants, whether they are male or female (1: male; 0: female), and the number of semesters participants spent at university. Furthermore, the expectation of the firm concerning the acceptance of the bribe was included as a control variable (1: firm expects double acceptance; 0: otherwise). Standard errors in the regressions were adjusted for clusters at the individual level.

First of all, the evidence found with the Fisher’s exact test concerning the significance of the communication treatment is supported by all regressions. The coefficient for the communication treatment in regression (1) is positive and significant at the 5% level. This means that the probability of a bribe being accepted by both officials increases when they communicate with each other, which supports the previously presented results. As can be seen in regression (3) the likelihood of the officials coordinating on the same decision increases highly significantly when communication is possible. In this regression, the coefficient for the communication treatment is again positive and significant at the 1% level.

Figure 6: Results of the regression analyses

	(1) Double accepted bribe	(2) Double accepted bribe	(3) Coordination of the officials	(4) Coordination of the officials
Communication treatment	0.756** (0.336)	0.792** (0.343)	1.420*** (0.333)	1.485*** (0.334)
Age		0.127** (0.056)		0.022 (0.076)
Male		-0.586 (0.398)		-0.394 (0.318)
Semester		-0.032 (0.041)		-0.038 (0.048)
Expectation of firm	0.141 (0.376)	0.115 (0.380)	0.274 (0.346)	0.372 (0.365)
Constant	-1.058** (0.539)	-3.567*** (1.211)	0.124 (0.528)	-0.161 (1.573)
N	178	178	178	178
Pseudo R ²	0.0385	0.0632	0.1130	0.1197
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Regressions (2) and (4) show that the results are robust to the inclusion of demographic controls. The coefficients reveal that age is related to a higher proportion of double accepted bribes. The other coefficients turn out to be insignificant.

The chat content was analysed to examine how participants coordinated. Messages sent were typically very short, mainly stating whether one accepts or not, or asking the other official about his intentions. Participants who stated that they would accept the bribe sometimes referred to the low probability of detection. Subjects who did not want to accept it seldom referred to the negative impact on society or to a question of honesty forbidding them to accept. However, mostly participants limited their communication to trying to agree on the same decision regarding the bribe.

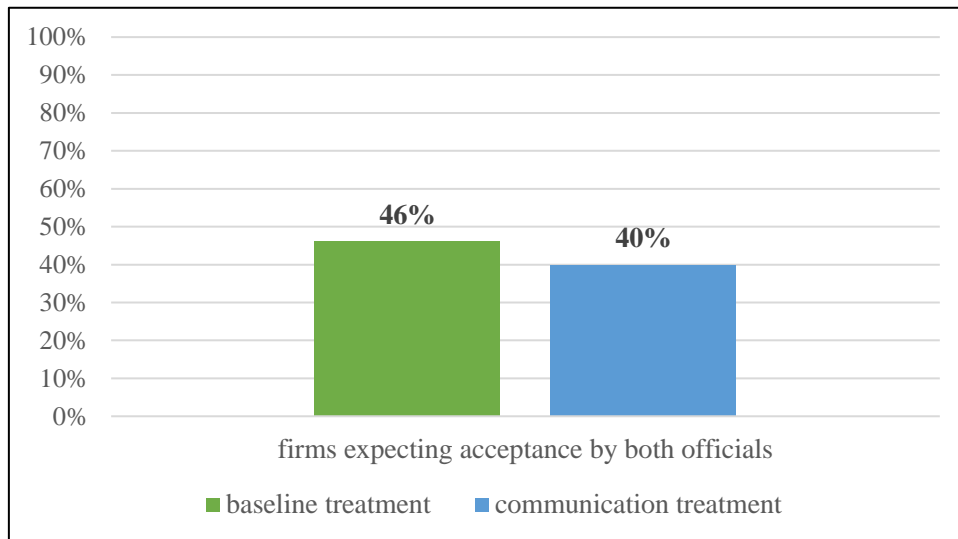
6.3. Expected Acceptance

In Hypothesis 2 it was hypothesized that firms would be more likely to expect both officials in their group to accept a bribe when the officials were able to communicate with

each other. Figure 7 shows the percentage of bribing firms that expected their bribe to be accepted by both officials. The blue bar shows that firms tended to expect an acceptance by both officials less often when communication was possible. 46% of bribing firms expected their bribe to be accepted in the baseline treatment while only 40% did so in the communication treatment. This stands in contrast to Hypothesis 2, but the difference is not statistically significant (Fisher's exact test, $p=0.367$). Thus Hypothesis 2 cannot be confirmed which means that the officials' possibility to communicate does not affect the firms' expectations regarding the acceptance of their bribe.

Result 2: *Communication has no effect on the expectation of firms regarding the acceptance of their bribe.*

Figure 7: Percentage of firms expecting their bribe to be accepted by both officials



6.4. Impact on Society

Double accepted bribes lead to a negative impact on society. The previously analysed share was defined as those bribes accepted by both officials as a part of offered bribes. To analyse this negative impact, we also need to consider differences in rates of offered bribes. In the baseline treatment, 67% of firms offered a bribe, while it were 54% in the communication treatment which constitutes a significant difference ($p=0.024$). Opposing effects seem to occur. In the communication treatment less bribes were offered but, as previously described, more of them were double accepted (and vice versa in the baseline treatment). However, when double accepted bribes as a share of all potential bribes are considered, the higher proportion of double accepted bribes dominates. With communication, 33 out of 150 (22%)

potential bribes were double accepted, thus 33 pieces of blank paper were torn, while it were 24 out of 145 (17%) in the baseline. Hence, the possibility to communicate had a larger negative impact on society although less bribes were offered.

7. Discussion

Communication in this experiment does not seem to have an effect on the officials' individual propensity to accept. Hence, communication apparently does not make subjects act more rationally and profit maximizing which contradicts the finding in Charness and Sutter (2012) that the behaviour of subjects is affected when a sense of group membership is present. Nevertheless, when looking at the aggregate behaviour of communicating officials, they do seem to act more rationally as the share of double accepted bribes and thus payoffs rise with communication. Since this cannot be traced back to a higher individual propensity to accept, it probably is the result of increased coordination which can be confirmed by the experiment's results. Related research finds communication to facilitate coordination especially in games where participants have common interests (Cooper et al. 1992; Ellingsen and Östling 2010; Cason et al. 2012). As in the present experiment the only party which would not have an interest in a double accepted bribe is society, which is not involved in the game, the results are in line with the related studies. Nevertheless, it needs to be mentioned that officials did not only better coordinate on double acceptance but also on double rejection, but as the former dominated the latter double accepted bribes were still more likely in the communication treatment.

Furthermore, the analysis of the chat content also supports the thesis that the higher share of double accepted bribes results from better coordination. Moral concerns and risk aversion played a minor role in chat messages whereas the coordination of decisions made up a large proportion of communication. In the study by Frank et al. (2015) the participants which were most active in the chat were the most corrupt ones. If this was also the case in the present study, more corrupt individuals might have convinced others to accept bribes which would explain the high share of double accepted bribes.

In contrast to the actual share of double accepted bribes, firms' expectations concerning these bribes do not vary with the treatment. This can either be explained by firms not anticipating the positive relationship between communication and coordination or by firms

thinking that coordination increases but not only concerning double acceptance but also regarding double rejection. If these effects offset each other expectations should not change.

Several limitations concerning the results need to be mentioned. The first important limitation to mention is the absence of monetary payoffs in this experiment. The experiment was conducted in the course of a seminar and sufficient research budget to pay out won payoffs was not available. This might have led to two forms of distortion. First, participants might have behaved more profit maximizing if there had been money to gain as an incentive. Second, the absence of money might have had an effect on the sample. As there were no monetary gains from taking part in the experiment, the main motivation to do so could have been just interest or doing a favour to fellow students. Thus, there might have been self-selection of a particular type of people into the experiment which would bias the results.

Furthermore, as already mentioned, every second session the experiment was conducted following another experiment, which might also change the results. This experiment was conducted in sessions together with a Public Goods Game which had nothing in common with this experiment. According to the results of several Fisher's exact tests the order of the experiments had no statistically significant effects on the variables of interest. Hence, results are not likely to be distorted.

8. Conclusion

The present study shows that communication does neither have an effect on official's individual propensity to accept nor on firm's expectations concerning double acceptance of their bribes. However, communication significantly increases the probability of double accepted bribes and thus of corrupt transactions, both as a share of bribes offered and as a share of potential bribes. These results might explain seemingly contradictory findings in previous literature. While the results in Schikora (2011) and Frank et al. (2015) do not confirm the idea that the 4EP can serve as a mean to reduce corruption, Bodenschatz and Irlenbusch (2018) find participant's behaviour to support the hypothesis. The present experiment in turn shows that communication within the 4EP increases corruption. The first two studies mentioned allow potential corrupt individuals to communicate while the last one does not. Hence, an explanation for the first two studies not finding a corruption reducing effect of the 4EP might be that communication curbs or undermines its effect. Possibly the 4EP as control mechanism would have also led to reduced corrupt transactions in the first experiments but

communication had a countervailing effect. Future research could build on this hypothesis by conducting experiments which compare a treatment without the 4EP to one where the 4EP is applied with communication and a third treatment with the 4EP but without communication. In conclusion the results of the present experiment show that the 4EP should not be finally rejected as a mean to combat corruption but further research about how to effectively apply it is highly needed.

References

- Abbink, K. et al. 2002. An experimental bribery game. *Journal of Law, economics, and organization* 18(2), pp. 428–454.
- Babcock, P. et al. 2011. *Letting down the team? Evidence of social effects of team incentives*. National Bureau of Economic Research.
- Bodenschatz, A. and Irlenbusch, B. 2018. Do two bribe less than one? An experimental study on the four-eyes-principle. *Applied Economics Letters*, pp. 1–5.
- Cason, T.N. et al. 2012. Communication and efficiency in competitive coordination games. *Games and Economic Behavior* 76(1), pp. 26–43.
- Charness, G., Karni, E., et al. 2007. Individual and group decision making under risk: An experimental study of Bayesian updating and violations of first-order stochastic dominance. *Journal of Risk and uncertainty* 35(2), pp. 129–148.
- Charness, G., Rigotti, L., et al. 2007. Individual behavior and group membership. *American Economic Review* 97(4), pp. 1340–1352.
- Charness, G. and Sutter, M. 2012. Groups make better self-interested decisions. *Journal of Economic Perspectives* 26(3), pp. 157–76.
- World Bank 2017. Combating Corruption. Available at: <http://www.worldbank.org/en/topic/governance/brief/anti-corruption> [Accessed: 3 August 2018].
- Cooper, R. et al. 1992. Communication in coordination games. *The Quarterly Journal of Economics* 107(2), pp. 739–771.
- Ellingsen, T. and Östling, R. 2010. When does communication improve coordination? *American Economic Review* 100(4), pp. 1695–1724.
- Feri, F. et al. 2010. Efficiency gains from team-based coordination—large-scale experimental evidence. *American Economic Review* 100(4), pp. 1892–1912.
- Fischbacher, U. 2007. z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental economics* 10(2), pp. 171–178.
- Frank, B. et al. 2015. Group decision making in a corruption experiment: China and Germany compared. *Jahrbücher für Nationalökonomie und Statistik* 235(2), pp. 207–227.
- Kocher, M.G. and Sutter, M. 2005. The decision maker matters: Individual versus group behaviour in experimental beauty-contest games. *The Economic Journal* 115(500), pp. 200–223.
- Schikora, J. 2011. Bringing the four-eyes-principle to the lab. *Munich Discussion Paper* (No. 2011-3).

Six, F. et al. 2012. Conceptualizing integrity systems in governments and banking. *Public Integrity* 14(4), pp. 361–382.

Treisman, D. 2000. The causes of corruption: a cross-national study. *Journal of public economics* 76(3), pp. 399–457.

Appendix

A. Instructions

All participants:

Das Experiment besteht aus **5 Runden**. In jeder Runde haben Sie die gleiche Rolle und Ihnen werden zufällig zwei andere Teilnehmer zugeteilt, mit denen Sie eine Spielgruppe bilden. Das heißt Sie haben in jeder Runde die **gleiche** Rolle, aber spielen in jeder Runde mit **unterschiedlichen** Teilnehmern.

Zu Beginn des Experiments wird Ihnen zufällig eine Rolle zugeordnet. Es gibt drei Rollen: **Firma, Beamter A** und **Beamter B**.

Die Firma hat in jeder Runde eine Anfangsausstattung von **6€**, die Beamten jeweils **2€**.

Im Experiment kann eine Firma ein **Bestechungsgeld** an zwei Beamte zahlen, um diese dazu zu bringen, ihr einen **unrechtmäßigen Vorteil** zu gewähren.

Am Ende der 5 Runden werden die jeweiligen Payoffs addiert und ausgezahlt. Wenn Sie diese Ausführungen verstanden haben, klicken Sie bitte auf "Weiter".

Baseline treatment:

Die Firma entscheidet, ob sie ein **Bestechungsgeld** von jeweils 2€ an die Beamten A und B zahlt, um einen unrechtmäßigen Vorteil zu erlangen. Entscheidet sie sich gegen Bestechung, ist die Runde beendet und der Payoff der Periode beträgt bei allen Spielern die Anfangsausstattung, also 6€ für die Firma und jeweils 2€ für die Beamten.

Entscheidet sich die Firma für Bestechung, entscheiden dann die beiden Beamten **gleichzeitig**, ob sie das Bestechungsgeld **annehmen** und der Firma den unrechtmäßigen Vorteil gewähren oder ob sie es **ablehnen**.

Entscheidet sich **mindestens einer** der Beamten gegen die Annahme des Bestechungsgeldes, wird dieses insgesamt **abgelehnt** und der Payoff der Periode ist wieder bei allen Spielern gleich der Anfangsausstattung.

Nur wenn sich beide Beamte **für** annehmen entscheiden, bekommt die Firma den unrechtmäßigen Vorteil und damit einen Payoff von 12€. Die Beamten bekommen dann jeweils ihre Anfangsausstattung plus das Bestechungsgeld von 2€. Ihr Payoff ist dann also jeweils 4€.

Wenn sich beide Beamte für die Annahme der Bestechung entscheiden, hat dies eine **negative Auswirkung auf die Gesellschaft**, da der Vorteil, den die Firma durch Bestechung erlangt, unrechtmäßig ist. Die negative Auswirkung zeigt sich in diesem Experiment dadurch, dass am Ende die Anzahl der erfolgreichen Bestechungszahlungen über alle Gruppen und Runden gezählt wird und dann für jede erfolgreiche Bestechungszahlung sichtbar ein **unbeschriebenes Blatt Papier zerrissen** wird.

Außerdem kann eine erfolgreiche Bestechungszahlung mit einer Wahrscheinlichkeit von 0,3 Prozent **entdeckt** werden. Ist dies der Fall, ist das Experiment für alle Teilnehmer der Spielgruppe beendet und sie bekommen eine Auszahlung von 0€.

Communication treatment:

Die Firma entscheidet, ob sie ein **Bestechungsgeld** von jeweils 2€ an die Beamten A und B zahlt, um einen unrechtmäßigen Vorteil zu erlangen. Entscheidet sie sich gegen Bestechung, ist die Runde beendet und der Payoff der Periode beträgt bei allen Spielern die Anfangsausstattung, also 6€ für die Firma und jeweils 2€ für die Beamten.

Entscheidet sich die Firma für Bestechung, können die beiden Beamten über einen Chat miteinander **kommunizieren** und sich über ihre Entscheidung austauschen. Dann entscheiden sie **gleichzeitig**, ob sie das Bestechungsgeld **annehmen** und der Firma den unrechtmäßigen Vorteil gewähren oder ob sie es **ablehnen**.

Entscheidet sich **mindestens einer** der Beamten gegen die Annahme des Bestechungsgeldes, wird dieses insgesamt **abgelehnt** und der Payoff der Periode ist wieder bei allen Spielern gleich der Anfangsausstattung.

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Außerdem kann eine erfolgreiche Bestechungszahlung mit einer Wahrscheinlichkeit von 0,3 Prozent **entdeckt** werden. Dann ist das Experiment für alle Teilnehmer der entdeckten Spielergruppe beendet und sie bekommen eine Auszahlung von 0€.

B. Questionnaire

Fragebogen

Bitte beantworten Sie zum Abschluss die nachfolgenden Fragen. Ihre Angaben werden anonym ausgewertet und haben keinen Einfluss auf das Ergebnis.

Geschlecht männlich
 weiblich

Alter

In welchem Hochschulsemerster studieren Sie?

Studiengang BWL/WWL/Lehramt mit Wirtschaftswissenschaften
 Kuwi
 European Studies
 Governance and Public Policy
 Medien und Kommunikation/Sprache und Text
 Informatik/Internet Computing
 Lehramt (ohne Wirtschaftswissenschaften)
 Rechtswissenschaft

Bitte geben Sie Ihre Platznummer ein.

Wenn Sie alle Fragen beantwortet haben, können Sie fortfahren, indem Sie auf 'Experiment beenden' klicken.

[Experiment beenden](#)