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University of Nottingham

Essays on Corruption and Responsibility

Yuliet Verbel Bustamante

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General Introduction

Corruption is a pervasive issue affecting countries worldwide, and its impact on economic growth and development cannot be overstated. *Transparency International* defines corruption as a phenomenon in which individuals or institutions misuse their entrusted power for private gain, and it takes many forms, such as bribery, embezzlement of public funds, extortion, and fraud, among others (Transparency-International, 2023). Corruption undermines public trust, reduces efficiency, and affects the provision of public goods (Mauro, 1995, 1998). While the consequences of corruption are often felt most severely by the most vulnerable members of society, corruption also has significant negative effects on aggregate levels, such as international trade and political stability.

Due to the substantial influence of corruption on our society, understanding the underlying drivers and consequences of corrupt behavior is paramount. As a result, a growing body of research examines corruption's root causes and impacts and identifies potential solutions to this longstanding problem (Fisman & Gatti, 2002; Uslaner & Rothstein, 2016; Reinikka & Svensson, 2005; Olken, 2007). Over the past few decades, economic research has significantly advanced our understanding of corruption. The study of corruption has yielded valuable insights into the incentives that drive corrupt behavior, the mechanisms that perpetuate corruption, and its effect on various economic outcomes. This research has helped to comprehend the dynamics surrounding this phenomenon and to design more effective policy responses to it.

Despite the many advances in understanding corruption, it remains very rooted in our societies, and there is still much to discover. Therefore, this thesis seeks to contribute to the current literature on corruption by examining the role of responsibility as a determinant of corrupt behavior. Responsibility is the instance of being accountable for something that has occurred. It is an essential aspect of decision-making and determines the attribution of blame for positive and negative actions (Cambridge-Dictionary, 2023). Following this concept, I investigate how responsibility influences decisions related to bribery and embezzlement and how individuals assign responsibility to those who engage in these corrupt acts. Given this, I aim to provide a comprehensive understanding of a key factor driving corruption, which

can then inform the development of more effective strategies for combatting it.

Since this research involves decisions that people make in private and strive to hide, I use laboratory and online experiments to empirically test the theoretical predictions derived from behavioral models that allow me to identify mechanisms underlying corrupt behavior in a controlled way.

In Chapter 1, *Easier Together: Shared Responsibility and Corruption*, I investigate the role of responsibility in decisions of corruption by comparing people's willingness to engage in a situation of bribery with a bilateral and sequential decision-making setup to a situation of embezzlement with a unilateral decision-making setup. I present a theoretical model where individuals' utility depends upon the fraction of responsibility they bear when making a decision of corruption, and this fraction decreases when they decide together with other individuals to reach a corrupt agreement. Through a laboratory experiment, I am able to observe individual decision-making in outcome equivalent games of bribery and embezzlement that only differ in the fraction of responsibility the decision-maker bears for the outcome of corruption. The results from the experiment show that participants are more willing to accept a bribe than to embezzle, implying that shared responsibility leads to more corrupt decisions. Moreover, I also conduct an online experiment to elicit social norms toward bribery and embezzlement. I find that the social appropriateness ratings for each type of corruption are not significantly different from each other. However, these corruption situations are generally perceived as very socially inappropriate, suggesting that a norm of no-corruption exists.

In Chapter 2, *The More the Merrier? The Effect of Diffusion of Externality and Shared Responsibility on Corruption*, I expand on the initial situation of embezzlement that I study in Chapter 1, where the decision of corruption is made by one individual only and with only one victim. In this second paper, I consider a situation where one or more people decide to embezzle together and where there are one or more victims. In particular, I ask if individuals are more or less likely to embezzle when they can share responsibility with others and when the externality of corruption is spread between more or fewer victims. I build on the theoretical model of Chapter 1 to inform the hypotheses I test for in an online experiment. In this experiment, participants decide whether to embezzle a certain amount at the expense of the victims. Two experimental conditions vary the decision-making setup: the size of the group of decision-makers and the size of the group of victims. The results show that the willingness to embezzle is only significantly affected by whether the externality is concentrated or diffused and not by whether the responsibility is shared or concentrated. This no-effect from the variation in decision-makers' group size over decisions of embezzlement further contributes to the understanding of responsibility. While in Chapter 1, shared responsibility is given in a sequential

decision-making setup, here, in Chapter 2, it is presented in a non-sequential one. The differences in the setups and findings from these two chapters help us understand that responsibility is not only determined by the number of decision-makers but also by the dynamics surrounding the decision, like the timing in which all people involved decide.

Chapter 3, *Exploring Attribution of Responsibility in Corrupt Decisions*, is coauthored with my supervisors Maria Montero and Alex Possajennikov, and we continue in the line of research on corruption. In this chapter, we turn the focus from how responsibility influences decisions of corruption to how victims and bystanders of corruption attribute responsibility to the decision-makers involved in situations of collusive bribery. In an online experiment, one participant, either under the role of an official or citizen, can propose a bribe agreement, and another participant decides whether to accept it. We ask victims and bystanders of this corruption situation to judge the decisions of proposing and accepting a bribe agreement, and we use their judgments as a proxy for responsibility assignment. We find that the person accepting a bribe agreement is regarded as more responsible for corruption than the person proposing it when accepting the bribe is a decision taken by officials. In line with this, officials, compared to citizens, are regarded as more responsible for corruption. Additionally, we observe that victims do not assign responsibility consistently more than bystanders do. We also conduct outcome-equivalent treatments with a neutral framework where participants, instead of being under corruption labels (i.e., citizen, official), are under neutral labels (i.e., participant A, participant B). In this neutral context, we find that significantly more responsibility is attributed to responders than proposers, and victims' judgments drive this result. We also identify that victims react more strongly to the corrupt outcome than bystanders by judging the decision-makers more severely.

I conclude this thesis by summarizing the key takeaways from Chapters 1, 2, and 3 and proposing future research avenues.

Chapter 1

Easier Together: Shared Responsibility and Corruption

Abstract

Are people more willing to accept a bribe or to embezzle money? Situations of bribery and embezzlement usually differ in the number of decision-makers involved and, with this, in the level of responsibility that each one entails. I study the willingness to engage in these two types of corruption through the implementation of outcome-equivalent games that only differ in the level of responsibility they entail for the decision-maker. I find that the willingness to engage in corruption is higher in bribery than in embezzlement situations, implying that sharing the responsibility for the outcome leads to a higher willingness to engage in corruption. In an additional experiment eliciting the social norms around bribery and embezzlement, I find that the social appropriateness ratings for each type of corruption are not significantly different from each other; however, a norm of no-corruption exists in both cases. My findings suggest that anti-corruption efforts should account for factors that facilitate rule-breaking behavior, such as shared responsibility.

Keywords: Bribery, Experiment, Embezzlement, Corruption.

JEL Codes: C90, D73, K42

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1.1 Introduction

Corruption is considered one of the greatest obstacles to economic and social development. Empirical evidence indicates that corruption has negative consequences on economic development and growth. This is a result of its damaging effects on various aspects, including the government's expenditure, the provision of public goods, firms' efficiency, and their competitive behavior (Mauro, 1995, 1998; Ades & Di Tella, 1999; Reinikka & Svensson, 2004; Bhargava, 2005; Fisman & Svensson, 2007; Reinikka & Svensson, 2011). Corruption takes many forms that can differ in the number of people involved. Depending on the specific context, decision-makers might be less or more responsible for their actions, which can facilitate corrupt decisions. Therefore, a key question is whether there are situations of corruption that are easier to be involved in than others. If yes, this can have significant implications on the way anti-corruption policies should be targeted.

In this chapter, I advance the literature by studying the difference in people's willingness to engage in situations of bribery and embezzlement, the two most common types of corruption. A key difference between the two, which I show in this chapter is crucial for corrupt decisions, is the level of responsibility. To illustrate what I mean by responsibility in these two types of corruption, imagine a transit official whose job is to verify the driving licenses of the drivers on the street. A citizen without valid documentation can bribe the transit official to avoid a fine. In another scenario, an official's job is to transfer aid donations to recipients, and he can embezzle part of the funds before transferring them. Taking any of these corruption opportunities might depend on several factors, such as how big the associated gains are, how easy it is to take it, and the number of people involved. This chapter focuses on the latter. The people involved in a corrupt agreement are responsible for the outcome and the negative externalities the decision imposes. The more people involved, the less responsibility each of them bears. In bribery, the responsibility is shared between the citizen who proposes the bribe and the official who accepts it. In contrast, in the embezzlement situation, the responsibility for the outcome is concentrated solely on the public official.

Herein, I investigate the role of responsibility in decisions of corruption by comparing people's willingness to engage in situations of bribery and embezzlement. For this purpose, I implement a laboratory experiment where participants can act corruptly in three welfare equivalent situations that allow me to isolate the effect of shared responsibility on decisions of corruption. The first situation is a bribery game, in which the corruption outcome depends on the agreement between a citizen and a public official, and they both benefit from corruption while a third party suffers the negative externality that corruption generates. The second one is a pure embezzle-

ment game in which the outcome only depends on the public official's decision, and this decision benefits the public official while imposing a negative externality on two third parties. While previous papers have investigated bribery and embezzlement experimentally, this chapter introduces a novel modified embezzlement game, as the third situation, that allows making comparisons between both scenarios. Crucially, this novel embezzlement game is outcome-equivalent to the bribery game. In the modified embezzlement game, even though the outcome only depends on the public official's decision, both the public official and the citizen benefit from corruption while a third party suffers the negative externality. The benefits for the public official and the aggregated cost of corruption are constant across the games, allowing for direct comparability of the public official's decisions while all else is equal.

The main finding is that the degree of responsibility plays a crucial role in the propensity to engage in corruption. Individuals engage more in corruption when the responsibility for the outcome is shared than when it is concentrated. A public official is 9 percentage points more likely to engage in bribery than a public official is to be corrupt in an outcome-equivalent embezzlement situation.

I conduct an additional experiment with a fresh set of participants to gain a better understanding of the subjects' behavior in the corruption games of the main experiment. I investigate whether the decisions in the corruption games align with perceptions of social appropriateness regarding situations of bribery and embezzlement. I elicit the social norms surrounding this situations by adapting Krupka & Weber (2013)'s procedure to the corruption games. Here, I observe that a large majority judges engaging in corruption as very socially inappropriate, indicating a norm of no-corruption. However, this does not necessarily imply that the latter will be followed. While the variation in the propensities to engage in corrupt decisions by game aligns with the variation in the ratings of social appropriateness, the difference in ratings is not statistically significant. Interestingly, I find that an official accepting a bribe is perceived as significantly more inappropriate than a citizen offering it. This is in line with the evidence from the bribery game, where a citizen is more willing to be corrupt than an official, suggesting that a citizen is not perceived as equally responsible for corruption as the public official.

The main contribution of this chapter is to provide further evidence on the determinants of corruption. Previous literature has shown that both bribery and embezzlement decisions are influenced by trust and reciprocity (Abbink et al., 2002), cultural background (Fisman & Miguel, 2007; Barr & Serra, 2010), the possibility of detection (Abbink et al., 2014; Christöfl et al., 2017), and the threat of punishment (Azfar & Nelson, 2007; Barr et al., 2009). However, the question of which type of corruption is easier for a public official to engage in still needs to be answered. I contribute to this literature by showing that individuals are more willing to engage

in bribery agreements than in embezzlement. While the bribery situation involves two decision-makers, the embezzlement situation involves only one, suggesting that the level of responsibility is a crucial determinant of decisions of corruption.

This chapter contributes to the literature on group decision-making and highlights its significance in the context of corruption. Previous research has shown that people tend to exhibit more selfish behavior towards outsiders when making decisions in groups instead of individually (for a review, see Charness & Sutter (2012) and Kugler et al. (2012)). Possible explanations for this finding include a diffusion of the pivotality for the outcome (Falk & Szech, 2013; Bartling et al., 2015), a decreased level of perceived responsibility and guilt for the outcome (Battigalli & Dufwenberg, 2007; Rothenhäusler et al., 2015), and a large normative acceptance of the selfish actions (Behnk et al., 2022).

While the evidence for more selfish behavior is very robust for other types of decisions, previous evidence in the domain of corruption is mixed. Schikora (2011) finds that corrupt transactions increase when a group of two bribees decides whether to accept or reject a bribe compared to a single bribee. In line with this, Frank et al. (2015) use groups of three for both the roles of briber and bribee and find that deciding in groups instead of individually increases the bribes paid and the likelihood of accepting them. By contrast, Bodenschatz & Irlenbusch (2019) implement groups of two bribers and find no effect of group decision-making on corruption in one-shot interactions and even a reduction of bribes when interactions are repeated. While this current study adds to the literature by providing further evidence that group decisions lead to more corrupt behavior, it is important to note that the underlying definition of a group decision differs from previous studies. While previous studies understand a group decision as multiple people deciding whether to offer or accept a bribe, here, a group decision is an agreement between two parties where each party exerts a different action (either offer or accept a bribe), and the agreement leads with certainty to corruption. I thus identify the differences in willingness to engage in two types of corruption that, by definition, require a different decision-making dynamic and go beyond the analysis of group size.

The rest of the chapter is structured in the following way: Section 1.2 outlines the experiment and its implementation, followed by the results reported in Section 1.3. Section 1.4 covers the implementation and results of the norm-elicitation experiment. Finally, Section 1.5, discusses the findings and concludes the chapter.

1.2 Experimental Design

I investigate the role of responsibility on decisions of corruption by comparing people's willingness to engage in situations of bribery and embezzlement. To this end,

I implement a within-subjects design with three framed, one-shot corruption games that simulate scenarios of bribery, embezzlement, and a modified embezzlement situation.

In order to focus on the distributive effects of corruption and in the comparability of the games, I refrain from introducing efficiency concerns or costs associated to the decisions of corruption. I also keep both the total welfare and the benefit of behaving corruptly constant across games. Three subjects are involved in each corruption game. In the bribery game, there is a citizen, a public official, and another member of society with both the citizen and the public official making a decision. In the embezzlement games, by contrast, there is a public official and two other members of society, with only the public official making a decision. The other members of society are always passive players. Each corruption game consists of an endowment-earning stage and a decision-making stage. In the endowment-earning stage, all subjects perform a set of real-effort tasks to earn an initial endowment that is equal among the players and fixed to the value of 100 Experimental Currency Units (ECUs). The tasks are based on Niederle et al. (2013), Benndorf et al. (2014), and Abeler et al. (2011)'s real effort tasks.[1] In the decision-making stage, all subjects decide whether to engage in decisions of corruption, where they can benefit themselves at a cost to someone else. In the bribery game, they decide whether to offer a bribe under the role of a citizen and whether to accept a bribe, if offered, under the role of an official. The order in which they make these two decisions is randomized. In the embezzlement games, they make a single decision of whether to embezzle. Subjects are informed that later on, they will randomly form groups of three, and roles will be randomly assigned. Hence subjects face role uncertainty.[2]

Following Salmon & Serra (2013)'s strategy of introducing distractor tasks in between rule-breaking games, I use two filler games in between the corruption games. The filler games are a modification of the elicitation of risk preferences MPL method by Holt & Laury (2002) and the acquiring a company game by Charness & Levin (2009). In addition, I refrain from offering any feedback between the corruption games to prevent the outcomes of one game from influencing the decisions made in the following game. Moreover, I implement three different orders for presenting the

[1] A sense of entitlement for the endowment is crucial when implementing corruption games as it helps in building the perception that a decision of corruption implies taking away from what belongs to others and not just from what was given to others (as it would be in the case of rainfall endowment). The tasks were: one sum of five numbers of two digits (Niederle et al., 2013), encrypt one combination of three letters (words) into three-digit numbers (Benndorf et al., 2014) and count the number of zeros in a grid full of numbers (Abeler et al., 2011).

[2] I acknowledge that introducing role uncertainty could alter subjects' decisions. Although Engelmann & Strobel (2004) found non-significant differences between treatments with and without role uncertainty in their allocation games, Iriberri & Rey-Biel (2011) suggest that the use of this method could underestimate subjects' selfish preferences. Therefore, any corrupt/selfish behavior observed in the experiment should be considered a lower bound.

corruption games, and in each order, one out of the three games is played first, while the order in which the filler games and the real effort tasks are presented remains unchanged.

1.2.1 Corruption Games

Bribery Game (BG)

I implement a three-player game based on Salmon & Serra (2017)'s bribery game in which corruption is the result of a bribe being offered and accepted. Having two decision-makers implies that the responsibility for the externality generated by corruption is shared since the agreement depends on both of them. In this game, a citizen decides whether to offer a bribe of 20 ECUs and the public official decides whether to accept the bribe if offered. If a bribe is offered and accepted, the benefit for the citizen is 40 ECUs, minus the bribe, consisting of a net earning of 20 ECUs. The official receives the 20 ECUs bribe with no cost, and the other member of society suffers a loss of 40 ECUs representing the externality generated by the corrupt agreement. Corruption, in this case, is thus neither Pareto improving nor Pareto worsening.

Figure 1.1 shows the sequential representation of the game. The first payoff refers to the citizen, the second to the official, and the third one to the other member of society.

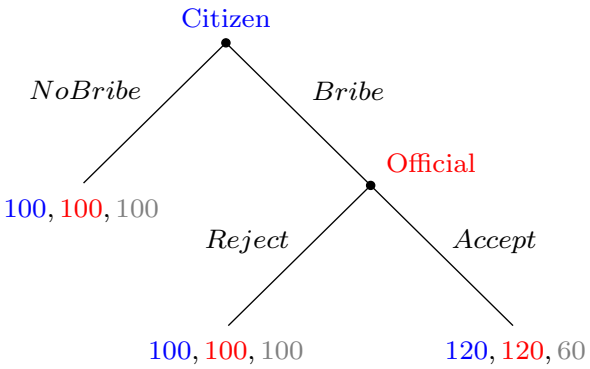


Figure 1.1: Bribery Game

Pure Embezzlement Game (PEG)

This game is essentially a modified three-player dictator game that resembles a standard embezzlement situation where public officials can benefit themselves to the detriment of all other members of society. The public official decides whether to embezzle 20 ECUs with no cost from a shared account that holds the initial endowment of the three players. If the public officials decide to embezzle, they leave the other two members of society worse off, suffering a loss of 10 ECUs each. (See Figure 1.2)

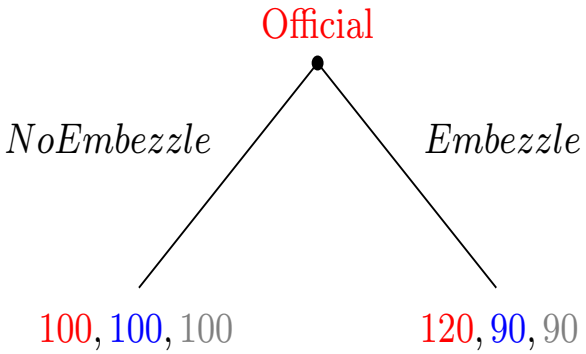


Figure 1.2: Pure Embezzlement Game

This PEG differs from the BG with respect to the responsibility for the outcome of corruption. It is now concentrated solely on the public official instead of being shared with someone else. However, the two games also differ in a second dimension. While the size of the externality in the BG is 40 ECUs, it is only 20 ECUs in the PEG. This difference results from keeping the benefit to the public official (20 ECUs) and the total welfare (300 ECUs) constant.

As there is more than one difference between the PEG and the BG, a clean identification of the effect of shared responsibility on the decisions of corruption in both games is not possible. Therefore, I design a novel modified version of the PEG that neutralizes one of the differences, specifically, the one of the size of the externality. This allows me to isolate the effect of shared responsibility in decisions of corruption.

Modified Embezzlement Game (MEG)

This game is a modification of the PEG that helps make the embezzlement setting comparable to the bribery setting by recreating a situation of embezzlement that leads to the same outcomes as the BG. Therefore, in this MEG, if public officials decide to embezzle, they leave the first other member of society better off by the same amount he embezzles, 20 ECUs, and the second other member of society worse off suffering a loss of 40 ECUs.

The only difference between this MEG and the BG is that, as an embezzlement situation has only one decision-maker, the responsibility for the externality generated by the corrupt decision is concentrated on the public official and not shared as in the BG.[3] Figure 1.3 shows the graphic representation of the game.

[3]Unlike Salmon & Serra (2017), I abstain from introducing a cost of offering a bribe in the BG as this would compromise the outcome equivalence between the BG and the MEG. In the latter the decision of not embezzling, that is equivalent to the decision of rejecting a bribe if offered, would impose an inexplicable cost on the first other member of society.

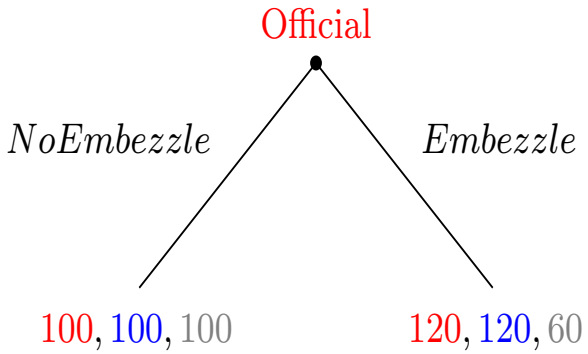


Figure 1.3: Modified Embezzlement Game

1.2.2 Procedures

The experiment consisted of six sessions, each with 24-30 participants, totaling 174 subjects, as presented in Table 1.1. To ensure clarity in the corruption situations, the roles were labeled as citizen, official, and other members of society. Moreover, the terminology I used for referring to the actions in the experiment was "bribing" and "embezzling" to create clear corruption contexts, rather than using neutral frames. Furthermore, to maintain anonymity, all interactions were anonymous.

In total, subjects play five different one-shot games (three corruption games, two filler games, and the SVO test) and one out of the six games is randomly selected at the end for determining the payments. If one of the corruption games is selected for payment, groups of three are formed and each subject is assigned to either the role of citizen, public official, or other member of society. The decisions made under the roles of decision-makers (citizen and public official for the bribery game, and public official for the embezzlement games) are implemented for payments. This procedure is communicated to all subjects before they make decisions in the games.

After the corruption games, I conduct the Social Value Orientation (SVO) test by Murphy et al. (2011). This test consists of six allocation decisions between a sender and receiver calibrated to classify subjects into altruistic, prosocial, individualistic and competitive. I use this test as a complementary measure for the weight participants attach to the welfare of others relative to their own and to test how this correlates to decisions of corruption. Finally, subjects fill in a simple demographic questionnaire. The experimental instructions are available in Section A.3 of Appendix A.

My sample comprises students at the University of Nottingham, UK. I conducted the experiment at the CeDEx Laboratory using software programmed in z-Tree (Fischbacher, 2007), with subjects recruited using ORSEE, (Greiner, 2015). Each session lasted approximately one hour and the exchange rate used in the experiment was 100 ECU = £10 with a participation fee of £2 and an average payment per

subject of £12.

Table 1.1: Summary of experiment design

	Session	# Subjects
Order 1 (PEG-BG-MEG)	2 sessions/60 subjects	60
Order 2 (MEG-PEG-BG)	2 sessions/54 subjects	54
Order 3 (BG-MEG-PEG)	2 sessions/60 subjects	60
# Subjects		174

1.2.3 Theorethical Framework and Hypotheses

My main interest is to identify how people behave in outcome-equivalent situations of corruption that only differ in the level of responsibility faced by the decision-makers. I adapt and extend the theory presented in Salmon & Serra (2017), that is based on Cox et al. (2007)'s approximation of other-regarding preferences, to develop a baseline model of behavior that informs the hypotheses for this experiment.

I assume that the decision-makers both care about their own and others' payoffs with a utility function of the form $u(x, y) = x^{\alpha} + \theta(y_1^{\alpha} + y_2^{\alpha})$ where x as the material payoff of the decision-maker and y_1, y_2 is the material payoff of the other players. The parameter α measures the preference for a more equal distribution of wealth, and θ represents the weight placed on the welfare of the others. Crucially, I assume it varies with the degree of responsibility a decision-maker bears for the outcome. The parameter θ can then be written as $\theta = \theta_0 + vr$ where $-1 \leq \theta_0 \leq 1$ is the base degree of caring about the welfare of the others and $0 \leq v \leq 1$ is the responsibility sensitivity. The weight individuals put in others' payoffs thus varies with the fraction of responsibility $0 < r \leq 1$ borne by the decision-maker when making a decision of corruption.

Given that the bribery game has two decision-makers and the embezzlement games have only one, r will be relatively larger in the latter. The fraction of responsibility for the outcome that corresponds to a public official is r_{BG} in the BG and r_{EG} in the EG, with $r_{BG} < r_{EG}$. The complete theoretical analysis is available in Section A.1 of Appendix A.

Let me first compare how the difference in r will affect the prevalence of corrupt behavior between the BG and the MEG. Under the assumption that the sensitivity to the responsibility for the outcome is positive ($v > 0$), the weight a decision-maker will place on the welfare of the other member of the society (θ) will be increasing in the fraction of the responsibility that the decision-maker bears for the negative externality that a corrupt decision imposes over society. Prior literature shows that people behave more strategically and selfishly when deciding in groups compared

to individual decision-making (e.g. (Dana et al., 2007), (Luhan et al., 2009), or (Panchanathan et al., 2013)), indicating that the weight on others' payoff could vary with whether the responsibility is shared or not.

Intuitively, the bribery game yields more corrupt behavior than the modified embezzlement game because group decisions facilitate individuals to opt for a selfish option as they can share the responsibility for a single decision, reducing the feeling of guilt (Rothenhäusler et al., 2015).

Hypothesis 1. *The propensity to accept a bribe in the bribery game is higher than the propensity to embezzle in the modified embezzlement game.*

Next, I compare the MEG to the PEG, which have the same level of r. However, the model still predicts differences in the propensity to engage in corrupt behavior due to distributive concerns. In line with previous literature (Cox et al., 2007), I assume that the parameter that measures the preference for a more equal distribution of wealth, α, is $\alpha < 1$. In the pure embezzlement game both other members of society are worse off by the same proportion after corruption whereas in the modified embezzlement game one of them is better off while the other one is worse off. This implies a more equal distribution of wealth in the former; therefore a higher propensity to engage in corruption is expected.

Hypothesis 2. *The propensity to engage in corruption is higher in the pure embezzlement game than in the modified embezzlement game.*

Finally, I explore whether the type of preferences revealed by the individuals in the SVO test correlate with the degree to which they engage in corrupt behavior. As the SVO test measures how much a decision-maker is willing to sacrifice in order to make another individual better or worse off, I expect that individuals that are classified as *individualistic* or *competitive* will care less about others' payoff. Consequently, they might engage more in corruption compared to individuals classified as *prosocial* or *altruistic*.

Hypothesis 3. *Prosocial or altruistic individuals (as measured by the SVO test) are less likely to engage in corruption than individualistic or competitive individuals.*

1.3 Results

1.3.1 Differences between Games

Before diving into the differences between games, in Table 1.2, I show how participants are inclined to behave corruptly in each game. The results indicate that the

likelihood of engaging in corrupt behavior is greater in the bribery game and the pure embezzlement game compared to the modified embezzlement game.

Table 1.2: The propensity to act corruptly by game

The propensity to act corruptly by game.	
Bribe Offer	0.61
Bribe Accept	0.59
Embezzle in MEG	0.50
Embezzle in PEG	0.60

I focus on the willingness to be corrupt under the role of public official, therefore, I compare three decisions: to accept a bribe if offered (BG-Accept), to embezzle when leaving one of the other two subjects involved better off and the other one worse off (MEG), and to embezzle when leaving the other two subjects involved worse off (PEG). Figure 1.4 reports the means of these three decisions. In line with *Hypothesis 1*, a non-parametric test performed on the average corruption rate on BG-Accept compared to MEG confirms that a subject is more likely to engage in corruption by accepting a bribe offer than by embezzling in an outcome-equivalent situation (Wilcoxon signed rank-sum test, $p < 0.05$). Moreover, when comparing the average corruption rate in the MEG and the PEG, the test shows that a subject is more likely to engage in corruption by embezzling when the outcome of the decision provides a more equal distribution of wealth as in the PEG compared to the outcome of the MEG (Wilcoxon signed rank-sum test, $p < 0.01$), confirming *Hypothesis 2*.

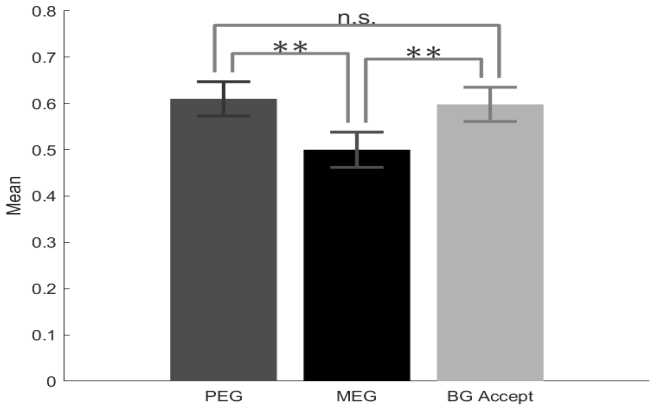


Figure 1.4: Means of decisions of corruption from the Public Officials

These results are also confirmed in a regression analysis. Table 1.3 shows esti-

mates from OLS regressions of the decision to act corruptly on treatment indicators with MEG as the baseline (column I). The findings suggest that the likelihood of participating in corrupt behavior increases by approximately 9 percentage points when the responsibility for the outcome is shared. I control for the order in which the games were played (column II), SVO type and demographic characteristics (column III), and for the order in which decisions were made in the BG along with the decision under the role of citizen (column IV). It thus seems that individuals treat a negative externality imposed on another player differently depending on whether the responsibility for the outcome is shared or not with another person.

Result 1. *Subjects are* 9*pp more likely to engage in corruption in a bribery game compared to the modified embezzlement game implying that sharing the responsibility for the outcome leads to more corruption.*

The regression also confirms the differences in the propensities to engage in corruption between the MEG and PEG. Although subjects are the single decision-maker in both cases and receive the same benefit from deciding corruptly, individuals in the PEG are about 10 percentage points more likely to engage in corruption. In line with *Hypothesis 2*, this shows that corruption is more likely if it leads to a more equal distribution of wealth.

Result 2. *Subjects are* 10*pp more likely to engage in corruption in the modified embezzlement game compared to the pure embezzlement game implying that an outcome with a more equal distribution of wealth leads to more corruption.*

Table 1.3: Linear probability model for the decision to act corruptly (PO)

	I	II	III	IV
BG Accept	0.098***	0.098***	0.098***	0.098***
	(0.036)	(0.036)	(0.036)	(0.036)
PEG	0.109***	0.109***	0.109***	0.109***
	(0.039)	(0.039)	(0.039)	(0.039)
BG First		-0.033	-0.051	-0.051
		(0.073)	(0.070)	(0.070)
PEG First		-0.089	-0.067	-0.067
		(0.076)	(0.074)	(0.074)
Individualist			0.316***	0.316***
			(0.058)	(0.058)
Constant	0.500***	0.542***	0.414	0.414
	(0.038)	(0.055)	(0.251)	(0.253)
Order of Games	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes
Order in BG Controls	No	No	No	Yes
N Observations	522	522	522	522
N Clusters	174	174	174	174
R-squared	0.010	0.015	0.130	0.130

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors (in parentheses) are clustered at the individual level. Note: The dependent variable is binary and takes the value of 1 if an individual acts corruptly where the baseline is the MEG. Demographic controls include the corruption index of the country of origin, age, and gender. Order in BG controls accounts for making a decision under the role of citizen first in the BG and 0 otherwise.

1.3.2 SVO test and Decision of Corruption

Although the SVO test allows to classify subjects into altruistic, prosocial, individualistic, or competitive types, my sample exhibits only two types: prosocial and individualistic, in almost equal proportions as Figure 1.5 shows.

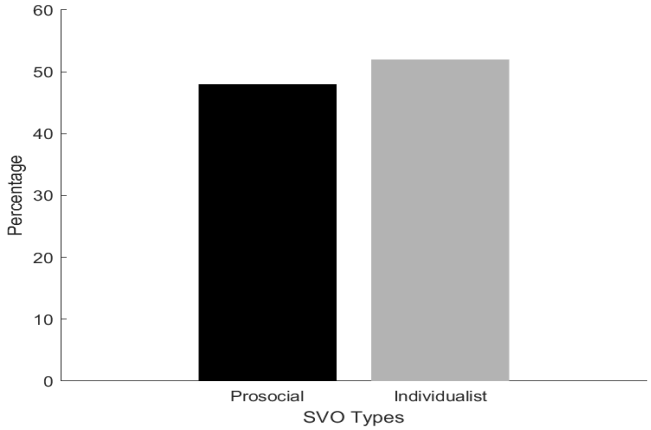


Figure 1.5: SVO Types

I then analyze the relationship between the number of corrupt decisions made

and prosocialness by creating an index of corrupt decisions. As subjects face four decisions of corruption (two in the BG, one in the MEG, and one in the PEG), the index increases by one unit with each decision to be corrupt. Therefore the index can take values from zero to four. Table 1.4 shows the results of a regression of the number of decisions of corruption on SVO types, confirming a negative and statistically significant relationship between prosocial types and engaging in corrupt behavior (see *Hypothesis 3*).

Table 1.4: OLS regression for the relationship between SVO types and Index of decisions of corruption

	Index
Prosocial	-1.237***
	(0.224)
Constant	2.912***
	(0.144)
Observations	174
R-squared	0.152

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Standard errors (in parentheses) at the individual level

Result 3. *Subjects classified as prosocial engage less in corruption compared to the ones classified as individualistic.*

1.3.3 Consistency of behavior

I investigate the consistency of behavior across situations of corruption. Consistency is based on the notion of *stable preferences* as defined in Section A.1 of Appendix A. That is, I assume that the preference parameters of individuals are fixed, and this determines their choices in different situations. The colored regions in Figure 1.6 show the combination of preference parameters for which an individual is predicted to be corrupt in different games. The graph is defined on the space of preference parameters. The base degree of caring about the welfare of the other player θ_0 is on the y-axis while the shared responsibility sensitivity v is on the x-axis.[4]

[4]Figure 1.6 is defined in the area $\theta_0 + vr \leq 1$ and shows the sets of pairs (θ_0, v) where corruption is predicted by the model (assuming $\alpha = 0.075$, $r = 1$ for both MEG and PEG and $r = 0.5$ for the BG). I retrieve the value of α from the parameters estimation by Cox et al. (2007). Regarding r, recall that $0 < r \leq 1$ implying that when the responsibility is concentrated, $r = 1$ and when it is shared, $r < 1$, which allows for the responsibility to be either evenly or unevenly shared. For the

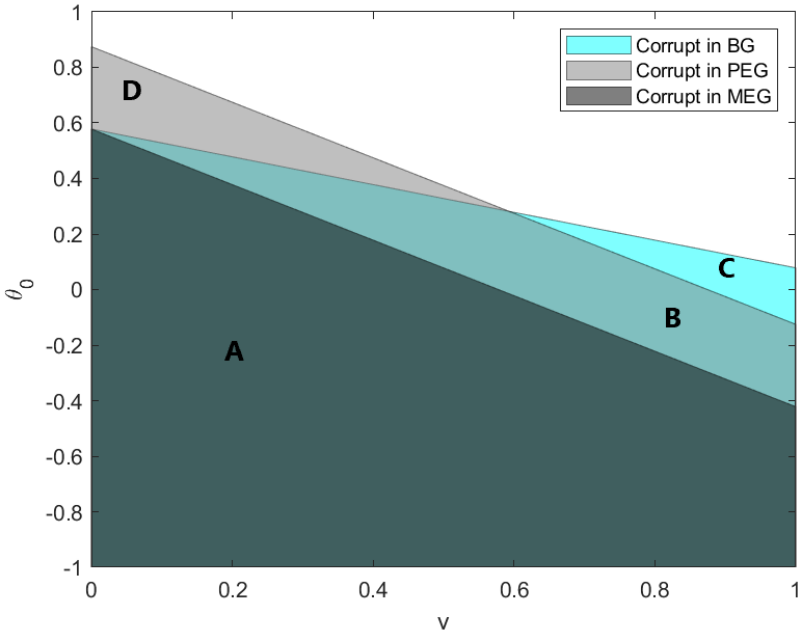


Figure 1.6: Corrupt behavior in BG-PEG-MEG

Table 1.5 classifies the regions that correspond to the five combinations of decisions in the different corruption games that the model rationalizes and shows the percentage of the exhibited behavior in the experiment that corresponds to each of these regions.

Table 1.5: Decisions explained by the model

Region	**BG**	**PEG**	**MEG**	**Total**
A	✓	✓	✓	34.5%
B	✓	✓		10.9%
C	✓			3.4%
D		✓		4%
White				23.6%
Total				**76.4%**

One pattern of behavior can be identified from Region A. The pattern is that for a subject to be corrupt in the MEG, they must also be corrupt in the other two games: BG and PEG. The decision to embezzle in the MEG can be seen as a more *difficult* decision compared to the decisions in the BG and the PEG, as it implies both a concentrated level of responsibility and an outcome of a more unequal distribution of wealth. In contrast, the other two games only imply one of the two. Therefore, if someone is willing to be corrupt in the MEG, it follows that they

purpose of this graphical representation, I let $r = 0.5$ in the BG as if the responsibility was evenly shared between the citizen and the public official.

should be willing to be corrupt in the BG and PEG. Regions B, C, and D show that subjects can be willing to be corrupt in the BG and PEG in conjunction and also separately.

Accounting for all regions, including the White Region that corresponds to no corruption decisions, the model can rationalize 76.4% of the exhibited behavior in the experiment. The remaining 23.6% of the individual decisions are from subjects who exhibited corrupt behavior to some extent, but their choices do not match the model's specifications. The largest share is subjects who decide corruptly in only one of the two decisions of the BG (13.2%), regardless of the decisions in the PEG and MEG. The two decisions involved in the BG are symmetric under the assumption that the perception of responsibility is equal for both citizen and public official $r = 0.5$, which implies that offering a bribe under the role of citizen and not accepting the bribe under the role of public official, and vice versa, is not consistent with the decisions that the model can explain. One possible explanation for this feature in the data is that the perception of responsibility for some subjects is asymmetric between the two decisions in the BG. It might be the case that subjects perceive the responsibility for the outcome to be greater under the role of public official, given that 5.7% decided to accept a bribe but not to offer it, than under the role of citizen, where 7.5% decided to offer a bribe but not to accept it.

Result 4. *Individuals are consistent in their behavior when facing different situations of corruption. My model can explain 76.4% of the exhibited behavior.*

1.4 Norm Elicitation Experiment

Following Guerra & Zhuravleva (2021)'s approach of conducting a norm elicitation experiment after their corruption experiment, I conduct a follow-up study to investigate if social norms align with the behavior exhibited in the corruption games from my main experiment. More specifically, I examine how individuals perceive the social appropriateness of corrupt decisions. I use a norm-elicitation experiment with a new group of participants to conduct this analysis, employing Krupka & Weber (2013)'s methodology.

I elicit social norms towards the decisions of bribery and embezzlement involved in the corruption games and ask subjects to evaluate each of the actions that players can take in the bribery game (BG), the modified embezzlement game (MEG), and the pure embezzlement game (PEG). For each game, I elicit judgments about the appropriateness of the actions available: a citizen's decision to offer a bribe to a public official (OfferBribe), and the official's decision to accept the bribe (AcceptBribe) for the BG; the official's decision to embezzle in the MEG (Embezzle), and the official's decision to embezzle in the PEG (Embezzle). For every game, participants

are required to evaluate the social appropriateness of every action using a rating system consisting of four points: 'very socially inappropriate,' 'somewhat socially inappropriate,' 'somewhat socially appropriate,' and 'very socially appropriate'.

This experiment follows a within-subject design where participants evaluate all available actions in each of the three games in random order. Subjects are required to select the rating of social appropriateness that they think the other participants in the experiment would assign to an action for each of the actions in the games. I implement a payment procedure following Krupka & Weber (2013) that incentivizes subjects to disclose what they think is socially seen as appropriate instead of their own personal perception of appropriateness. In particular, subjects earn an extra fee (additional to the participation fee) if they match the modal rating of a randomly selected action.

My sample comprises 45 students at the University of Nottingham, UK, recruited using ORSEE (Greiner, 2015). The experiment was conducted online with the CeDEx Laboratory and programmed in Lioness (Giamattei et al., 2020). Subjects could participate anytime at their best convenience in a window of 1 hour. It took them about 15 minutes to complete the experiment, and the average payment was £3. They were paid via PayPal. The experimental instructions are available in Section A.4 of Appendix A.

1.4.1 Norm Elicitation Results

As in Krupka & Weber (2013), I normalize participants' social norm ratings between -1 and 1, where a more positive (negative) score implies that a given action is seen as more acceptable (unacceptable). Therefore, a rating of 'very socially inappropriate' results in a score of -1, 'somewhat socially inappropriate' in a score of $-1/3$, 'somewhat socially appropriate' in a score of $1/3$, and 'very socially appropriate' in a score of 1.

Table 1.6 presents the ratings of social appropriateness given by participants for each action in all three games, including the complete distribution of responses, mean, and standard deviation. The most common ratings (shown in bold) are highly similar across all games, indicating that most of the subjects consider as very socially inappropriate the actions of offering and accepting bribes (which is consistent with previous literature (d'Adda et al., 2016; Guerra & Zhuravleva, 2021)) and embezzling in both MEG and PEG. Therefore, this norm-elicitation experiment indicates that a norm of no-corruption exists; however, this does not necessarily imply that it will be followed, as can be seen from the main experiment.

When comparing the average rating for each game, I observe that the situation considered least inappropriate is the BG, followed by the PEG, and the MEG.

However, the variations in the ratings of social appropriateness between corruption games are non-significant. An interesting pattern emerges when observing the BG in isolation. The actions of OfferBribe and AcceptBribe are judged differently. AcceptBribe is perceived as significantly more inappropriate than OfferBribe (Wilcoxon signed rank-sum test, $p < 0.05$), suggesting that sealing a deal of corruption under the role of public official is judged harder than offering the deal under the role of citizen. This is in line with the behavior observed in the main experiment, where more participants were willing to offer a bribe than to accept one.

Table 1.6: Appropriateness ratings

Action	- -	-	+	++	Mean	Std. Dev.
Bribery Game						
OfferBribe	**53.33%**	42.22%	2.22%	2.22%	-0.644	0.44
NoOfferBribe	0%	4.44%	22.22%	**73.33%**	0.792	0.371
AcceptBribe	**75.56%**	20%	0%	4.44%	-0.777	0.471
RejectBribe	0%	0%	15.56%	**84.44%**	0.896	0.244
Pure Embezzlement Game						
Embezzle	**77.78%**	20%	2.22%	0%	-0.837	0.322
NoEmbezzle	0%	2.22%	22.22%	**75.56%**	0.822	0.33
Modified Embezzlement Game						
Embezzle	**80%**	18%	2.22%	0%	-0.851	0.314
NoEmbezzle	0%	0%	24.44%	**75.56%**	0.837	0.289

Note: Responses are 'Very Socially Inappropriate' $(--) = 1$; 'Somewhat Socially Inappropriate' $(-) = 1/3$; 'Somewhat Socially Appropriate' $(+) = 1/3$; 'Very Socially Appropriate' $(++) = 1$. Modal responses are in bold.

Result 5a. *There are non-significant variations between the social appropriateness rating of the corruption games.*

Result 5b. *Individuals perceive the act of offering a bribe differently from the act of accepting a bribe. The former is rated as less socially inappropriate than the latter.*

1.5 Conclusion

This chapter contrasts the propensity to engage in bribery and embezzlement by exploiting the dimension of responsibility that by nature differs between these two situations of corruption. Bribery is a situation that involves two decision-makers (citizen and public official) that share the responsibility for the outcome whereas embezzlement involves only one decision-maker (public official) who bears full responsibility for the outcome.

I design three games to test the effect of shared responsibility: a bribery game, a pure embezzlement game, and a modified embezzlement game that takes features from the two previous games. The modified embezzlement game is a situation that involves only one decision-maker, as the pure embezzlement game, but is outcome-equivalent to the bribery game. This novel design feature allows me to isolate the effect of shared responsibility on corruption.

My main finding is that sharing the responsibility for the outcome leads to more corruption. Subjects are 9pp more likely to engage in corruption in a bribery game compared to the modified embezzlement game. This is consistent with the literature on group-decision making (Dana et al. (2007); Luhan et al. (2009); Panchanathan et al. (2013)) and group-decision making related to corruption (Schikora (2011); Frank et al. (2015)) that records more selfish behavior for groups. This is particularly relevant when it comes to policy design. My findings suggest that anti-corruption efforts should account for factors that facilitate rule-breaking, such as shared responsibility.

I moreover show that the behavior is consistent with a theoretical model based on other-regarding preferences. The model is able to rationalize 76.4% of the observed behavior. For matching the decisions in the bribery game to the model, I assume that the weight placed on other players' welfare by the decision-maker is the same regardless of roles (i.e., citizen, public official). However, I find some evidence suggesting the contrary. Around 13.2% of subjects behave differently when deciding under the role of citizen or public official. Specifically, 5.7% decide to accept a bribe but not to offer it, and 7.5% decide to offer a bribe but not to accept it, suggesting a higher perception of responsibility under the role of public official. This finding is in line with the ratings of social appropriateness from the norm-elicitation experiment, where the action of accepting a bribe is considered more socially inappropriate than offering a bribe.

Chapter 2

The more, the merrier? The effect of diffusion of externality and shared responsibility on corruption

Abstract

This chapter studies the effect of different levels of responsibility and externality in decisions of corruption. Using an experiment, I contrast people's willingness to embezzle money in situations that differ in two aspects. The first aspect is the fraction of responsibility (i.e., concentrated or shared) decision-makers bear for the outcome of their decisions. The second aspect is the scope of the externality (i.e., concentrated or diffused) that a decision of embezzlement imposes on a third party. I also compare whether one of these two factors dominates the other. I find that the willingness to embezzle is only significantly affected by whether the externality is concentrated or diffused and not by whether the responsibility is shared or concentrated. A more diffused externality leads to more decisions of corruption. Given this, it follows that changes in the scope of the externality dominate changes in the fraction of responsibility when comparing their effect on corruption. These results shed light on the relevance of a decision's impact and its scope in determining corrupt behavior.

Keywords: Experiment, Embezzlement, Corruption.

JEL Codes: C90, D73, K42

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2.1 Introduction

Opportunities for corruption take place in scenarios that differ in many aspects. They differ in how large the gains are for the corrupt actor and how extensive is the damage that corruption causes in society. They differ in how easy it is for a corrupt actor to be caught and how severe are the sanctions he could face. And they also differ in the number of people involved in the decision of corruption and suffering the consequences of it. This chapter focuses on the latter aspect. I study how the number of people involved in a situation of corruption shapes corrupt behavior.

The number of people involved in a situation of corruption refers to two groups: the individual(s) involved in the decision that leads to the corrupt outcome and the potential victims this decision of corruption impacts. There can be scenarios with only one corrupt actor and one victim, scenarios with more than one corrupt actor and several more victims, and scenarios with other combinations of corrupt actors and victims. The interesting feature about the varying numbers of people involved in a situation of corruption is that with the number of corrupt actors, the fraction of responsibility that each of them bears for a decision of corruption also changes. In the same way, with the number of victims, the fraction of the externality that each of them endures as a consequence of corruption also changes.

In this chapter, I investigate how changes in the fraction of responsibility, from being very concentrated in one corrupt actor to being shared among many, affect the willingness to engage in corruption and how changes in the scope of the externality of corruption, from being concentrated in one victim to be diffused among many, shapes also that willingness to be corrupt. I do this by making use of an experiment in which I compare corrupt behavior in scenarios that differ in the levels of responsibility and externality. I focus on one specific type of corruption, which is embezzlement.

In the experiment, I implement a standard embezzlement game where a group of public officials can embezzle to benefit themselves at the detriment of citizens. The embezzlement game can vary whether the decision of one public official determines if a group of public officials benefit from embezzlement (concentrated responsibility) at the expense of the citizens or whether the decisions of all public officials in a group determine if embezzlement happens (shared responsibility). The game can also vary in the number of citizens matched to a group of officials and affected by the externality of corruption. The group of officials can be matched with one citizen (concentrated externality) or with many citizens (diffused externality). From these variations, four embezzlement games emerge: one embezzlement game with diffused externality and shared responsibility (DE&SR), one with diffused externality and concentrated responsibility (DE&CR), one with concentrated externality and shared responsibility (CE&SR), and one with concentrated externality and concentrated

responsibility (CE&CR). The individual benefits for each public official and the aggregated earnings are constant across games, allowing for direct comparability of the public officials' willingness to embezzle across games while all else is equal. With this, I can identify the effect of shared responsibility and diffusion of externality on the willingness to engage in corruption, and I can also compare whether these two factors are equally regarded by the corrupt actors when making a decision of corruption.

I find that public officials are significantly more likely to embezzle when the externality of their decision is diffused instead of concentrated. The positive effect of the diffusion of externality on the willingness to embezzle is present in scenarios where the decision of one single public official determines that externality and also in scenarios where the decisions of many public officials determine the outcome of corruption. Regarding the effect of shared responsibility on the willingness to embezzle, I find that subjects are not more likely to embezzle when the responsibility for their decision is shared instead of concentrated. Public officials do not differentially react to distinct levels of responsibility, neither in scenarios where the externality of the decision is concentrated in one citizen nor in scenarios where the externality is diffused among many citizens. From these two main findings, the third one follows. As I observe a positive effect of diffusion of externality and a null effect of shared responsibility, when I compare these two factors, I find that a more diffused impact makes public officials engage more in decisions of embezzlement compared to a condition of more shared responsibility for the outcome.

This chapter contributes to the literature by analyzing the factors of shared responsibility and diffused externality simultaneously and systematically in embezzlement games. Previous literature has primarily focused on analyzing these factors independently using neutral context games. The impact of shared responsibility has been investigated through studies on individual versus group decision-making, revealing that individuals tend to behave more selfishly when deciding with others, particularly towards outsiders (for a review, see Charness & Sutter (2012) and Kugler et al. (2012)). This behavior is influenced by several factors, such as the diffusion of the pivotality for the outcome (Falk & Szech, 2013; Bartling et al., 2015), a decreased level of perceived responsibility and guilt for the outcome (Battigalli & Dufwenberg, 2007; Rothenhäusler et al., 2015), and normative acceptance of selfish actions (Behnk et al., 2022). In contrast, studies on diffused externality have shown that decision-makers tend to be less concerned about negative externalities when their impact is spread out among a larger group of people. These studies have varied the impact of externality by changing the per-capita cost imposed on third parties (Andreoni, 2007; Schumacher et al., 2017; Bartling et al., 2017). Overall, this chapter adds valuable insights to the understanding of embezzlement situations

and highlights the importance of diffusion of externality and shared responsibility in corruption-related decision-making scenarios.

My chapter also builds on the literature studying the determinants of corruption. In this literature, the evidence regarding the impact of group-decision making has focused on the study of bribery games where a briber offers a bribe to a bribee who then decides whether to reject or accept the bribe. In these games, the feature of shared responsibility emerges when the decision-makers go from being one briber and one bribee to a group of bribers and(or) a group of bribees, and the findings are mixed. Corrupt transactions increase when group decisions are implemented for both bribers and bribees (Schikora, 2011; Li et al., 2015). However, when the group feature only applies to bribers and not to bribees, corruption tends to decrease (Bodenschatz & Irlenbusch, 2019). Regarding the study of the effect of diffusion of externality, no evidence, to the best of my knowledge, has yet been advanced in the context of corruption. I contribute to the literature on corruption in two ways. The first one is that I provide novel evidence on the effects of diffusion of externality on decisions of embezzlement. The second one is that I add further evidence of the role of group decision-making in corruption decisions by studying situations of embezzlement: a type of corruption where this feature has not been widely studied yet.

To the best of my knowledge, the closest paper to my approach is Chiang & Hsu (2019). The authors study whether the number of givers and recipients in a group influences altruistic giving decisions. For this purpose, they compare giving decisions in several cases where the group composition varies. In contrast, my approach is to analyze taking decisions in groups of different compositions under the context of corruption. The decision-makers action direction is one of the main differences between their study and mine. Giving and taking actions differ not only in that one is about adding and the other is about subtracting to the recipient's income and the different psychological costs that these actions trigger; but also differ in the sense of entitlement. In Chiang & Hsu (2019)'s setup, the decision is about sharing what one has, while in the setup that I propose, the decision is about taking from public funds that result in a reduction of the income that someone else already has. Chiang & Hsu (2019)'s main findings are that when people decide in groups, in comparison to individually, they tend to give less to the recipients, and they tend to give more when the number of recipients increases. My work complements theirs by providing evidence on how *taking* decisions are shaped by the number of decision-makers and the number of people affected by the decisions.

The rest of the chapter is structured in the following way: in Section 2.2, I outline the experiment and its implementation. I report the results in Section 2.3, and Section 2.4, summarizes the findings and concludes the chapter.

2.2 Experimental Design

In a within-subjects design, I implement four variations of a standard embezzlement game, where public officials can embezzle to benefit themselves to the detriment of the citizens. I want to evaluate how the scope of a negative externality and the responsibility for the outcome affect the decision to be corrupt in a society. For this purpose, I vary the levels of externality and responsibility in the embezzlement games I implement. The externality from a corrupt decision can be either concentrated (CE) in one citizen or diffused (DE) among many citizens, and the responsibility for the outcome of a decision of corruption can be either concentrated (CR) in one public official or shared (SR) among many public officials. Table 2.1 shows the 2x2 experimental design that includes the combinations of the levels of externality and responsibility. From these combinations, I derive the conditions for the four embezzlement games in this experiment. The first one is an embezzlement game with concentrated externality and concentrated responsibility (CE&CR), the second one combines a concentrated externality with shared responsibility (CE&SR), the third one has a diffused externality and concentrated responsibility (DE&CR), and the fourth one combines the levels of diffused externality with shared responsibility (DE&SR).

Table 2.1: 2x2 Design

	Concentrated Responsibility (CR)	Shared Responsibility (SR)
Concentrated Externality (CE)	CE&CR	CE&SR
Diffused Externality (DE)	DE&CR	DE&SR

In the games, subjects are part of a society with 24 people, where 12 of them are public officials, and the other 12 are citizens. The size of the society is fixed, while the way in which public officials are matched with citizens changes across games. The initial endowment of all subjects is obtained after the completion of a real effort task, equal among them, and fixed to the value of w. In all games, the decision of each public official is whether to embezzle x from the citizen(s) in his group without facing any cost. Also common to all games, each of the public officials benefits by x if embezzlement occurs.

I achieve the variations in the levels of externality and responsibility by varying the composition of the groups and the number of decision-makers in each game. The variation in the levels of externality comes from the compositions of the groups: groups are formed by n public officials matched with one or n citizens. In the games with concentrated externality, a group includes n public officials and one citizen. In contrast, in the games with diffused externality, a group includes n public officials and n citizens. As all groups include n public officials and each of them benefits by

x if embezzlement occurs, the size of the aggregate externality is always nx. This implies that diffusion of externality here is about how spread the externality is (i.e., among how many citizens it is distributed), which refers to the per-capita cost of corruption and not about the aggregate cost of corruption that is constant across games.

Regarding responsibility levels, the variation comes from the number of decision-makers within a group. As all groups include n public officials, in the games with concentrated responsibility, only the decision of one public official from the group counts for the outcome.[1] If that public official decides to embezzle, he leaves the citizen(s) in his group worse off and the public officials better off. Still, if he decides not to embezzle, all final payoffs equal the initial endowment, w. In the games with shared responsibility, the decisions of all the public officials in the group count for the outcome. If they all decide to embezzle, they leave the citizen(s) in their group worse off and benefit from their decision. If at least one of the officials in a group decides not to embezzle, no embezzlement occurs, and all final payoffs are equal to the initial endowment, w. This implies that unanimity has to be achieved for embezzlement to happen in the games with shared responsibility.

Table 2.2 shows, for each embezzlement game, the payoff parameters, the number of officials that are decision-makers, the number of officials that benefit from the decision to embezzle, and the number of citizens affected by the embezzlement decision. Incentives are aligned in a way that ensures no possibility of negative payoffs for the citizens in the games with concentrated externality (CE&SR and CE&CR). The individual gains for each public official and the total earnings in the society are kept constant across games. With this, I ensure that the games are directly comparable among them as they only differ in the dimensions of interest: responsibility and externality.[2]

[1] All public officials in a group make a decision of embezzlement being aware that only the decision of one of them will determine whether embezzlement occurs. This single public official who is the final decision-maker is selected at random, and this procedure is common knowledge.

[2] I implement a fifth embezzlement game, the DE game, where I further explore the effect of diffusion of externality matching one official with n citizens. This game differs from the others in that the group only includes one official instead of n. Therefore that official's decision to embezzle only benefits himself instead of benefiting a group of officials as in the other four games. This also implies that the size of the externality in that group is only x instead of nx. All these differences make the DE game not comparable to the other games in the experimental design. Thus, I abstain from including it in the main analysis. I describe in more detail the DE game and subjects' decisions in it in Section B.3 of Appendix B.

Table 2.2: Payoffs Parameters

Embezzlement Game	# Decision Makers	# Officials Benefit	# Citizens Hurt	$Payoff_p$	$Payoff_c$
CE&SR	n	n	1	$w + x$ each	$w - nx$
CE&CR	1	n	1	$w + x$ each	$w - nx$
DE&SR	n	n	n	$w + x$ each	$w - x$ each
DE&CR	1	n	n	$w + x$ each	$w - x$ each

Although only one size of $n > 1$ will suffice for the comparison between concentrated and diffused externality and concentrated and shared responsibility, I implement the experiment with three sizes of n: $n \in [2, 4, 6]$. Including more than one size will allow me to explore how the effect of the diffusion of externality evolves the more the externality is diffused (when n increases). Conversely, by including more than one size of n, I can also explore the evolution of the effect of shared responsibility.

Each embezzlement game consists of two stages. In the first stage, all subjects go through a real effort task to earn the initial endowment. The task is based on Benndorf et al. (2014)'s letter-to-number task, and subjects have 2 minutes to decode 2 text sequences of 5 letters into numbers correctly. In the second stage, subjects participate in the embezzlement games. They face one game at a time, and they only know what the next game is about once they finish making a decision in the current game. The order in which they see the games is randomized at the subject level and there is no feedback between games. All subjects decide simultaneously and under the role of public official, which means they face role uncertainty.[3] It is common knowledge that, at the end of the experiment, some of them are randomly assigned to the role of citizen. Subjects in a session participate in all four games with a fixed size of $n \in [2, 4, 6]$. The initial endowment took the value of $w = 120$, and the amount to embezzle the value of $x = 20$, and, with this, $nx \leq w$.

After the embezzlement games, subjects go through a questionnaire of two parts. The first part is Cohen et al. (2011)'s Guilt and Shame Proneness scale (GASP) which measures individual differences in the propensity to experience guilt and shame across a range of personal transgressions. From the four subscales of the GASP I implement the Guilt-Negative-Behavior-Evaluation (Guilt-NBE) and the Shame-Negative-Self-Evaluation (Shame-NSE). These subscales consist of 8 daily

[3]Building on the comment in footnote 2 of Chapter 1 about the use of role uncertainty, there is no reason to expect this implementation procedure to bias the comparison between games.

life situations where subjects have to indicate the likelihood, on a seven-point scale from very unlikely to very likely, with which they would react as described in each situation.

The second part of the questionnaire consists of demographic questions about age, gender, country of origin, field of study, one question about the perception of the difficulty of the experiment, and one question about willingness to take risks.

2.2.1 Procedures

The sample comprises students registered with the CeDEx Laboratory at the University of Nottingham, UK. I conducted the experiment online using software programmed in Lioness (Giamattei et al., 2020), with subjects recruited using ORSEE (Greiner, 2015). The experiment was conducted asynchronously, all subjects invited to a session made decisions individually, and after the session was over one of the games was randomly selected for payment. Roles were assigned, subjects were matched, and the decisions made in the selected game were implemented for payment. Each session lasted 20 minutes on average, subjects were paid via PayPal and the exchange rate used in the experiment was 120 ECU = £3 with a participation fee of £1, and an average payment per subject of £4 (see Section B.5 of Appendix B for the experimental instructions). Table 2.3 summarizes the experimental sessions.

Table 2.3: Summary of experimental sessions

	Sessions	# Subjects
$n = 2$	4 sessions	132
$n = 4$	3 sessions	130
$n = 6$	3 sessions	129
# Subjects		391

2.2.2 Theoretical Analysis and Hypotheses

I investigate people's propensity to engage in situations of embezzlement that differ in the levels of responsibility that each decision-maker bears for the outcome of a decision of corruption and in the levels of externality that each victim of corruption suffers. In order to make conjectures about subjects' behavior in the experiment, I utilize the theory proposed by Cox et al. (2007) which accounts for state-dependent other-regarding preferences. According to this theory, an individual's concern for the welfare of others is contingent upon their emotional state.[4]

[4]The embezzlement games here are most similar to the dictator game analyzed in Cox et al. (2007). Therefore, I adopt the version of the model design to capture the dynamics in that specific

I assume that the decision-makers care about their own and others' payoffs with a utility function of the form $u(m, y) = m^{\alpha} + \theta \sum_{j=1, j \neq i}^{n} y_j^{\alpha}$, where m is the material payoff of player i, and y is the material payoff of the other players (j). The parameter α measures the preference for a more equal distribution of wealth, and θ is the weight placed on player j's payoff by player i. The parameter θ varies with the number of decision-makers as $\theta = \theta_0 + vr$, where θ_0 is the base degree of caring about player j's payoff, r is the fraction of responsibility the decision-maker bears for his decision, and v is the shared responsibility sensitivity.

In the context of this chapter, a decision-maker is a public official that makes an embezzlement decision that imposes an externality on a citizen. In the games with shared responsibility (SR), embezzlement happens only if each public official chooses to embezzle, thus the responsibility for the corrupt outcome is shared. Therefore, the fraction of responsibility that the decision-maker bears, r, is decreasing in the number of other public officials, n, involved in the decision. The weight individuals put on others' payoffs may vary with the degree of responsibility r they bear for the outcome. Furthermore, in the games with diffused externality (DE), the externality that an embezzlement decision generates can be concentrated in one citizen or diffused among n citizens and, as the utility of a decision-maker depends on others' payoffs, the utility of a public official depends on the citizens' payoffs that are diminished by the actions of corruption. Given that a public official cares about the fraction of responsibility he bears for the outcome of embezzlement and about the payoffs of others, I can evaluate the effects that sharing the responsibility and diffusing the externality have on the propensity to engage in situations of embezzlement. The complete theoretical derivation for the embezzlement games is contained in Section B.1 of Appendix B.

Let me first focus on the effect of diffusion of externality. In line with the findings of prior literature that shows that a more diffused impact decreases participants' concerns for negative externalities (Bartling et al., 2017), I expect public officials to be more likely to embezzle when the externality of corruption is diffused instead of concentrated. This expectation can be supported by the preference for a more equal distribution of wealth that the utility of the decision-makers accounts for. In the games with concentrated externality (CE&SR and CE&CR), a citizen is worse off by nx if corruption occurs. In contrast, in the games with diffused externality (DE&SR and DE&CR), citizens are each worse off only by x after corruption. As this implies a more equal distribution of wealth in the games with diffusion of externality compared to the games with concentrated externality, it makes sense to anticipate a higher propensity to engage in corruption in the former than in the latter. This

game.

is captured by $\alpha < 1$ in the theoretical model, as Cox et al. (2007) estimates.

Hypothesis 1. *More diffused impact makes subjects engage more in corruption. This means that the propensity to engage in corruption should be higher in the DE&SR and DE&CR games than in the CE&SR and CE&CR games.*

Next, I focus on the effect of shared responsibility. Here I compare how the difference in the fraction of responsibility for the outcome, r, affects the willingness to engage in corrupt behavior between the games with concentrated responsibility and the games with shared responsibility.

Under the assumption that the sensitivity of the responsibility for the outcome is positive ($v > 0$), the weight a decision-maker places on the payoffs of the others is increasing in the fraction of the responsibility that he bears for the outcome of his decision to embezzle. As the weight varies with the fraction of responsibility, I should observe a higher willingness to engage in corruption in the games with shared responsibility than in the games with concentrated responsibility. This expectation also follows from the findings of previous literature showing that people behave more strategically and selfishly when deciding in groups compared to individual decision-making (Charness & Sutter, 2012; Kugler et al., 2012).

Hypothesis 2. *More shared responsibility makes subjects engage more in corruption. This means that the propensity to engage in corruption should be higher in the DE&SR and CE&SR games than in the DE&CR and CE&CR games.*

Finally, I explore whether one of the factors (i.e., diffusion of externality and shared responsibility) has a larger impact on the willingness to act corruptly than the other. Although my theoretical analysis is inconclusive about whether one of the factors dominates the other one, it does indicate a clear direction of the effects of diffusion of externality and shared responsibility on decisions of embezzlement. As both factors are expected to increase the propensity to engage in corruption, a cautious anticipation would be that their effects are about the same in magnitude.

Hypothesis 3. *The propensity to engage in corruption is the same under shared responsibility as under diffusion of externality.*

2.3 Results

According to the theoretical predictions, I expect to see three main features in the data. First, I expect more decisions of embezzlement under diffusion of externality than under concentrated externality, regardless of whether the responsibility is shared or not. Second, I expect more decisions of embezzlement under shared

responsibility than under concentrated responsibility, regardless of whether the externality is diffused or not. And third, I expect that neither of the two factors (i.e., diffusion of externality and shared responsibility) dominates the other.

Before diving in into the analysis of the effects of shared responsibility and diffusion of externality, I show in Table 2.4 the mean propensity of subjects to embezzle by game in the pooled by n sample and in the groups with different sizes of n: $n = 2$, $n = 4$, and $n = 6$. In all groups of n, on average, subjects embezzle more often under the games of diffusion of externality compared to games of concentrated externality. Subjects also embezzle slightly more often in the games of shared responsibility than in the games of concentrated responsibility but this seems to be the case only under the condition of concentrated externality. The significance of these differences are determined by the non-parametric and parametric tests that I conduct next.

Table 2.4: The propensity to embezzle by game & size of n

	Pooled	$n = 2$	$n = 4$	$n = 6$
CE&SR	0.39	0.46	0.37	0.34
CE&CR	0.36	0.42	0.33	0.34
DE&SR	0.51	0.50	0.48	0.56
DE&CR	0.52	0.57	0.46	0.53

2.3.1 Diffusion of Externality

To evaluate whether a more spread impact increases people's propensity to engage in corruption, I implement embezzlement games in which I compare the decision to engage in corruption when the externality of corruption is concentrated in one citizen (i.e., CE&CR and CE&SR) to when it is diffused among many citizens (i.e., DE&CR and DE&SR). I start the analysis by comparing the means of the embezzlement rates in the games of diffusion of externality to games of concentrated externality without differentiating the condition of responsibility under which the decisions were made and without exploring this effect in each size of n. That is, I create a measure of the diffusion of externality pooling the embezzlement rates of the two games with diffusion of externality, obtaining a mean rate of embezzlement of $DE = 0.52$. I do the same with the two games with concentrated externality, resulting in a mean rate of $CE = 0.38$. With this aggregation, I show in Figure 2.1 a first glance at the general effect of diffusion of externality on decisions of corruption. A non-parametric test performed on the average embezzlement rates shows that the diffusion of externality

leads to significantly more corruption than the externality being concentrated (mean-comparison test p-value=0.0000).

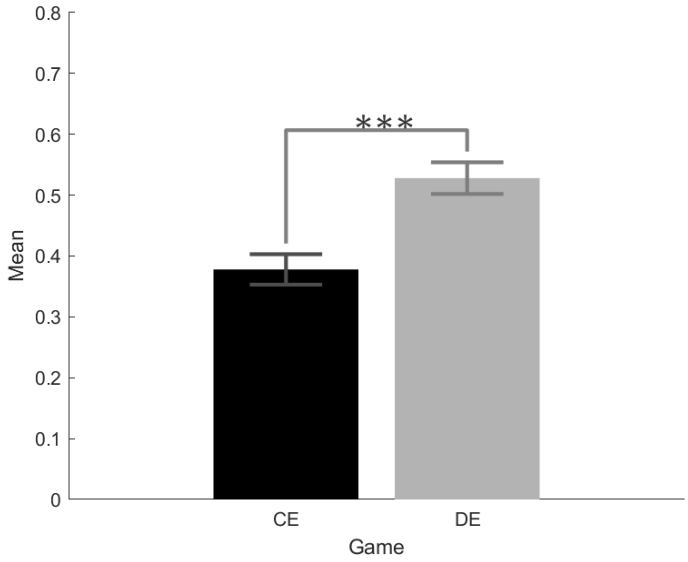


Figure 2.1: Means of Embezzle decision DE vs. CE with pooled sample

Result 1. *Subjects are more likely to embezzle when the externality of their decision is diffused instead of concentrated.*

I proceed to a more detailed analysis to further investigate the differences in the decisions of embezzlement under diffused/concentrated externality. For this, I check the effect of diffusion of externality under the two conditions of responsibility (shared/concentrated), also disaggregating the effect by each size of n.

I start by analyzing the effect of the diffusion of externality under shared responsibility. I conduct a regression analysis of subjects' decisions to embezzle (1 if they embezzled and 0 if not). The marginal effect estimates from a probit regression analysis with the decision to embezzle as the dependent variable are presented in Table 2.5. The base is the CE&SR game, and it is compared to the DE&SR game. The first two columns correspond to the estimation in the sample of $n = 2$, followed by $n = 4$ and $n = 6$. Odd columns include the variable measuring the effect of DE&SR compared to CE&SR and exogenous control that account for demographic characteristics like gender ($1 = male$) and age. Even columns show the same estimation including further endogenous controls that account for variables chosen by the subjects in the experiment like an Index variable that counts the decisions of embezzlement (0/1) in the three other games not included in this specification, the Guilt Negative Behavior evaluation and the Shame Negative Self-evaluation from the GASP questionnaire (Cohen et al., 2011), and risk aversion. The standard errors are clustered at the subject level, as each official is an independent unit of observation. This is because I do not provide feedback to officials between games,

and the order of the games is randomized at the subject level in the experiment.[5]

These specifications indicate that, under conditions of shared responsibility between the officials making a decision of corruption, subjects are significantly more likely to embezzle when the externality is diffused than when it is concentrated in the cases of $n = 4$ and $n = 6$ but not in $n = 2$. The variable Index has a positive and significant effect on decisions of embezzlement when the externality is diffused implying that officials who embezzle in at least one of the other three games are more likely to embezzle in the DE&SR game.

Table 2.5: Probit regression for the decision to embezzle in CE&SR and DE&SR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&SR	0.038	0.037	0.107**	0.111***	0.220***	0.218***
	(0.039)	(0.038)	(0.042)	(0.041)	(0.048)	(0.048)
Index		0.287***		0.268***		0.287***
		(0.013)		(0.022)		(0.023)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.002	0.325	0.031	0.292	0.052	0.279

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&SR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Result 1.1 *Under conditions of shared responsibility, subjects are more likely to embezzle when the impact of their decision is diffused among four or six citizens instead of concentrated in one single citizen.*

Next, I analyze the effect of the diffusion of externality under concentrated responsibility. The marginal effect estimates from a probit regression analysis with the decision to embezzle as the dependent variable are presented in Table 2.6. The base is the CE&CR game and it is compared to the DE&CR game. The statistically significant estimate of the DE&CR game coefficient suggests that the probability of the officials embezzling in the DE&CR game is significantly higher than in the CE&CR game for all sizes of n. The variable Index has a positive and significant effect on decisions of embezzlement when the externality is diffused, implying that officials who embezzle in at least one of the other three games are more likely to embezzle in the DE&CR game.

[5]All the other regressions throughout the chapter follow the same order in the columns and include the same controls. The only thing that changes is the variable of interest that is determined by the game of study. In Section B.4 of Appendix B, I report the regressions tables showing the coefficients of all controls. No control shows significance in a systematic way.

Table 2.6: Probit regression for the decision to embezzle in CE&CR and DE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&CR	0.150***	0.151***	0.122***	0.122***	0.190***	0.184***
	(0.041)	(0.040)	(0.041)	(0.040)	(0.046)	(0.045)
Index		0.271***		0.244***		0.300***
		(0.014)		(0.021)		(0.021)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.017	0.320	0.045	0.320	0.042	0.303

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&CR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Result 1.2 *Under conditions of concentrated responsibility, subjects are more likely to embezzle when the impact of their decision is diffused among two, four, or six citizens instead of concentrated in one single citizen.*

I also explore how the effect of the diffusion of externality, for which I find evidence here, evolves when n increases. Table 2.5 shows that, under shared responsibility, the coefficient (DE&SR) measuring the effect of diffusing of externality is larger the larger n is (even if it is not significant for $n = 2$). I confirm that the differences between these coefficients are significant with further estimations where I include interactions between the different sizes of n and DE&SR. The regressions tables for this are included in Section B.4 of Appendix B. I then conduct the same exercise under the condition of concentrated responsibility. Table 2.6 shows that the coefficient (DE&CR) measuring the effect of diffusing of externality decreases from $n = 2$ to $n = 4$ and increases from $n = 2$ to $n = 6$. I confirm that the differences between these coefficients are significant with further estimations where I include interactions between the different sizes of n and DE&CR. These regression tables are also included in Section B.4 of Appendix B. Given these findings, I infer that diffusing the externality leads to a higher willingness to embezzle than concentrating it, and this effect increases (in almost all cases) the more the externality is diffused.

2.3.2 Shared Responsibility

Now I turn the focus to the effect of shared responsibility. I evaluate whether sharing the responsibility for the impact of a decision of corruption with other decision-makers increases people's propensity to engage in corruption. I implement embezzlement games in which I compare the decision to engage in corruption when the responsibility for the outcome of corruption is concentrated in one official (i.e.,

CE&CR and DE&CR) to when it is shared among many officials (i.e., CE&SR and DE&SR). I start the analysis by comparing the means of the embezzlement rates in the games of shared responsibility to games of concentrated responsibility without differentiating the condition of externality under which the decisions were made and without exploring this effect in each size of n. That is, I create a measure of sharing the responsibility pooling the embezzlement rates of the two games with shared responsibility, obtaining a mean rate of embezzlement of $SR = 0.45$. I do the same with the two games with concentrated responsibility, resulting in a mean rate of $CR = 0.44$. With this aggregation, I show in Figure 2.2 a first glance at the general effect of shared responsibility on decisions of corruption. A non-parametric test performed on the average embezzlement rates shows that sharing the responsibility for the outcome does not lead to more corruption (mean-comparison test p-value=0.7222).

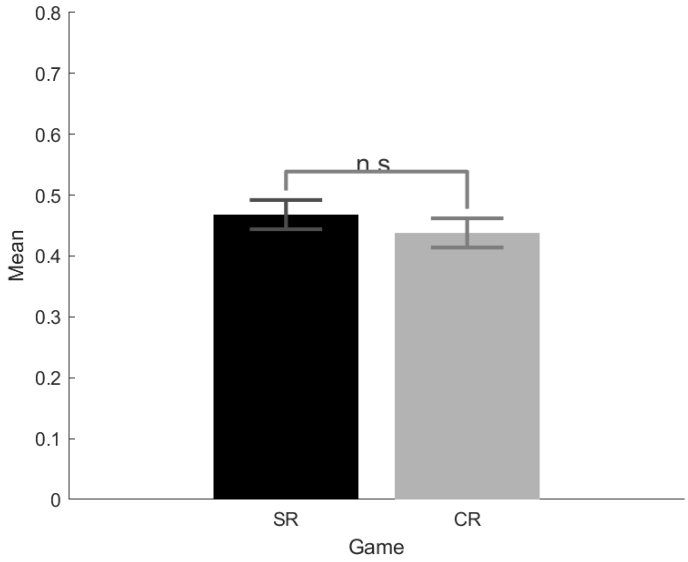


Figure 2.2: Means of Embezzle decision SR vs. CR with pooled sample

Result 2. *Subjects are not more likely to embezzle when the responsibility for their decision is shared instead of concentrated.*

I continue examining the effect of shared responsibility with more detail by checking the effect under the two conditions of externality (diffused/concentrated) and disaggregating it by each size of n.

First, I analyze the effect of shared responsibility under diffusion of externality. The marginal effect estimates from a probit regression analysis with the decision to embezzle as the dependent variable are presented in Table 2.7. The base is the DE&CR game, and it is compared to the DE&SR game. The main finding from these specifications is that, in the case of $n = 2$, sharing the responsibility for the outcome with another official leads to less embezzlement. This finding is robust to

the inclusion of controls but is not consistent across different sizes of n. I do not find significant differences in the propensities to engage in corruption in the DE&SR game compared to the DE&CR game for $n = 4$ or $n = 6$. The variable Index has a positive and significant effect on decisions of embezzlement when the externality is diffused, implying that officials who embezzle in at least one of the other three games are more likely to embezzle in the DE&SR game.

Table 2.7: Probit regression for the decision to embezzle in DE&SR and DE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&SR	-0.076*	-0.080**	0.023	0.028	0.031	0.031
	(0.039)	(0.038)	(0.040)	(0.039)	(0.041)	(0.041)
Index		0.267***		0.256***		0.207***
		(0.014)		(0.028)		(0.037)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.012	0.322	0.031	0.259	0.009	0.123

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the DE&CR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Result 2.1 *Under conditions of diffused externality, subjects are not more likely to embezzle when the responsibility for their decision is shared instead of concentrated.*

Next, I analyze the effect of shared responsibility under concentrated externality. The marginal effect estimates from a probit regression analysis with the decision to embezzle as the dependent variable are presented in Table 2.8. The base is the CE&CR game, and it is compared to the CE&SR game. I find that sharing the responsibility for the outcome instead of it being concentrated does not lead to more corruption in any size of n. The propensity to embezzle in the CE&SR game is not statistically significantly different from that in the CE&CR game. The variable Index has a positive and significant effect on decisions of embezzlement when the responsibility is shared, implying that officials who embezzle in at least one of the other three games are more likely to embezzle in the CE&SR game.

Table 2.8: Probit regression for the decision to embezzle in CE&SR and CE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
CE&SR	0.038	0.036	0.039	0.038	-0.001	-0.001
	(0.039)	(0.038)	(0.037)	(0.036)	(0.043)	(0.042)
Index		0.284***		0.227***		0.175***
		(0.015)		(0.021)		(0.032)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.001	0.293	0.041	0.280	0.022	0.131

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&CR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Result 2.2 *Under conditions of concentrated externality, subjects are not more likely to embezzle when the responsibility for their decision is shared instead of concentrated.*

2.3.3 Diffusion of Externality vs. Shared Responsibility

I have shown the effects of diffusion of externality and shared responsibility on decisions of embezzlement separately. The next step is to show whether one of these factors has a larger impact on the willingness to act corruptly than the other. For this, I have to compare decisions of embezzlement in scenarios with diffused externality (i.e., DE&CR or DE&SR) to scenarios with shared responsibility (i.e., CE&SR or DE&SR). As the CE&SR game captures decisions under shared responsibility at the minimum level of diffusion of externality, all the effect coming from this game can be attributed to shared responsibility. Conversely, as the DE&CR captures decisions under diffusion of externality at the minimum level of shared responsibility, all the effect coming from this game can be attributed to the diffusion of externality. Therefore, the cleanest way to compare the impact of these two factors is to compare the decisions in the CE&SR game to the decisions in the DE&CR.

With this comparison, I show in Figure 2.3 a first glance at the differences between shared responsibility and diffusion of externality on decisions of corruption. A non-parametric test performed on the average embezzlement rates shows that the diffusion of externality leads to more corruption than sharing the responsibility for the outcome (Wilcoxon signed rank-sum test p-value=0.0000).

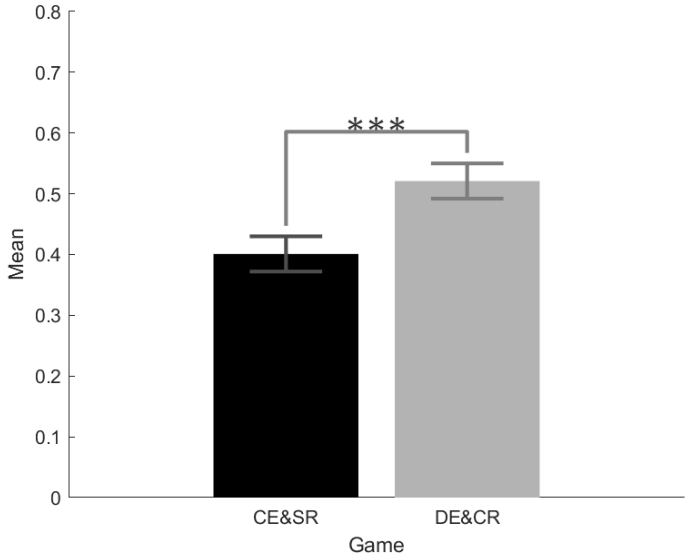


Figure 2.3: Means of Embezzle decision CE&SR vs. DE&CR with pooled sample

Result 3. *Subjects are 12pp more likely to embezzle under conditions of diffused externality than under conditions of shared responsibility.*

I confirm that this difference is present for any size of n with a regression analysis. The marginal effect estimates from a probit regression analysis with the decision to embezzle as the dependent variable are presented in Table 2.9. The base is the CE&SR game and it is compared to the DE&CR game. The statistically significant estimate of the DE&CR game coefficient suggests that the probability of the officials embezzling in the DE&CR game is significantly higher than in the CE&SR game for $n = 2$, $n = 4$, and $n = 6$. The variable Index has a positive and significant effect on decisions of embezzlement when the responsibility is shared, implying that officials who embezzle in at least one of the other three games are more likely to embezzle in the DE&CR game.

Table 2.9: Probit regression for the decision to embezzle in CE&SR and DE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&CR	0.113***	0.111***	0.084*	0.087*	0.191***	0.184***
	(0.042)	(0.041)	(0.047)	(0.046)	(0.044)	(0.043)
Index		0.315***		0.290***		0.290***
		(0.008)		(0.011)		(0.024)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.013	0.425	0.037	0.392	0.054	0.282

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&SR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Result 3.1 *A more diffused impact makes subjects engage more in decisions of embezzlement compared to a condition of more shared responsibility for the outcome under* $n = 2$, $n = 4$, *and* $n = 6$.

2.3.4 Consistency of behavior

I analyze the consistency of subjects' behavior by verifying how many of their decisions can be explained by my model. I show the combinations of decisions graphically on the space of the preference parameters.[6] From the predictions of my model, I observe two features: at least four combinations of decisions that fit in the range of the preferences parameters for each size of n, and a pattern of monotonicity that, if violated, a subject's behavior cannot be explained by my model.

The colored regions of Figure 2.4 show the combination of preference parameters for which an individual is predicted to be corrupt in each game in $n = 2$ (panel a), $n = 4$ (panel b), and $n = 6$ (panel c). Table 2.10 classifies these regions and shows the percentage of the exhibited behavior under each size of n that my model can explain.

Table 2.10: Decisions explained by the model

Region	DE&SR	DE&CR	CE&SR	CE&CR	$n = 2$	$n = 4$	$n = 6$
A	✓	✓	✓	✓	28.03%	20.76%	17.05%
B	✓	✓	✓		6.81%	4.61%	6.20%
C	✓		✓		2.27%	3.84%	
D	✓				3.03%	6.15%	8.52%
E	✓	✓			6.06%	7.69%	15.50%
White					30.30%	36.15%	27.13%
Total					**76.50%**	**79.20%**	**74.40%**

From the colored regions, I can also identify the monotonicity patterns. From Region A, the first pattern is that for a subject to be corrupt in CE&CR; he has to be corrupt as well in the other three games. The second pattern of monotonicity comes from Region C. For a subject to be corrupt in CE&SR, he must also be corrupt in DE&SR. This pattern relates to the dimension of shared responsibility. It shows how a preference for shared responsibility in the most harmful game for a citizen (CE&SR) should be followed by a decision of corruption in the game of shared responsibility that is less harmful to a citizen (DE&SR). A third pattern related to the diffusion of externality emerges from Region E. For a subject to be corrupt in DE&CR, he must also be corrupt in DE&SR. This pattern shows how a

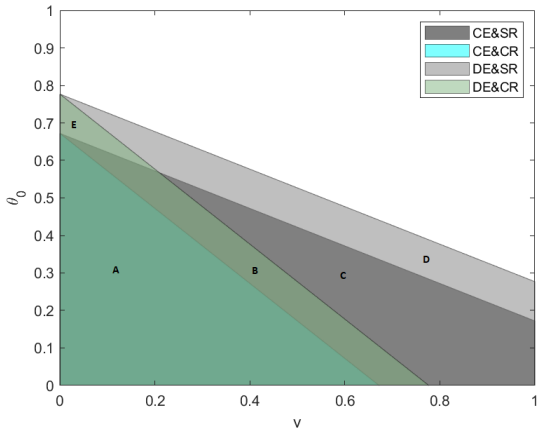
[6] The varying preference parameters are the base degree of caring about the welfare of the other player θ_0 (y-axis), and the shared responsibility sensitivity v (x-axis) assuming $\alpha = 0.2$.

preference for diffused externality in the game with the most responsibility for the official (DE&CR) should be followed by a decision of corruption in the game with a smaller share of responsibility for the (DE&SR).

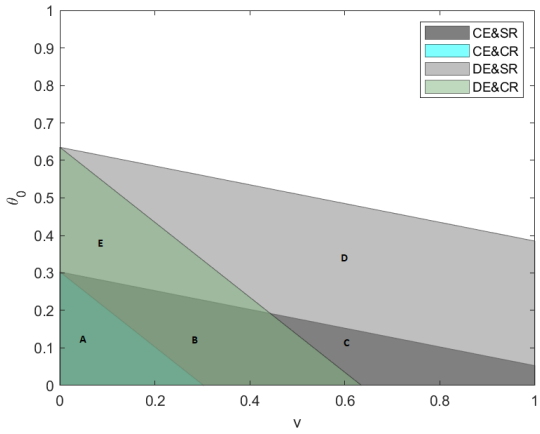
Furthermore, two more patterns emerge from the percentages of concentration of decisions per region in each size of n. In region A, the concentration decreases with n, implying that when more citizens or officials are involved in the situation of corruption, the corrupt decisions are less straightforward, and fewer people decide to be corrupt in all games. Then, in Regions D and E that represent the games with diffusion of externality, the concentration increases with n. This implies that the more diffused an externality is, the more people engage in corruption as I identified in Result 1. These patterns related to the concentration of decisions can also be identified graphically. The higher the concentration, the larger the colored region is in the Figures.

From the data, I observe violations to the patterns of monotonicity of 23.50% of the sample for $n = 2$, 20.80% for $n = 4$, and 25.60% for $n = 6$. This implies that my model can explain at most 76.50% of the sample for $n = 2$, 79.20% for $n = 4$, and 74.40% for $n = 6$ (final row in Table 2.10).

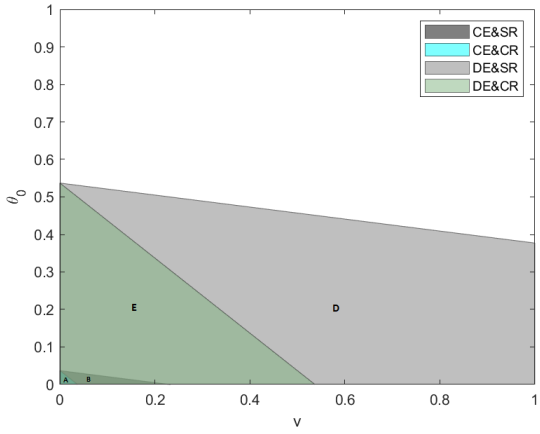
Result 4. *Evidence suggests that subjects are consistent in their behavior when facing different embezzlement situations. More specifically, the model I propose explains, on average, 76.70% of the exhibited behavior.*



(a) $n = 2$



(b) $n = 4$



(c) $n = 6$

Figure 2.4: Model Predictions for each n

Next, I analyze the decisions of subjects not predicted by the model. Table 2.11 shows the means in the decisions of embezzlement in the four games for each size of n for those subjects whose behavior cannot be explained with the model. I identify that these subjects generally exhibit a higher propensity to engage in

decisions of embezzlement in games under concentrated responsibility than those under shared responsibility. This evidence suggests that there might be subjects who prefer to bear the responsibility for the outcome, and this is a type of preference that my model does not consider. To address this possible scenario, I propose an extension to the model in Section B.2 in Appendix B, where I relax the assumption of $v > 0$, which allows me to take into consideration preferences for concentrated responsibility. With that extension to the model, I can explain an additional 11.23%, on average, of the exhibited behavior.

Table 2.11: The propensity to embezzle from Non-predicted observations

	$n = 2$		$n = 4$		$n = 6$	
	N	Mean	N	Mean	N	Mean
CESR	31	0.387	27	0.407	43	0.302
CECR	31	0.612	27	0.629	43	0.511
DESR	31	0.161	27	0.259	43	0.511
DECR	31	0.709	27	0.629	43	0.441

Result 5. *The behavior of subjects that the model cannot explain suggests that there might be a type of subject with a preference for individually bearing the responsibility for the outcome instead of sharing it.*

2.4 Conclusion

In this chapter, I study the factors of shared responsibility and diffused externality simultaneously and systematically in embezzlement games. More specifically, I focus on how changes in the fraction of responsibility that decision-makers bear for their decisions and changes in the scope of the externality their decisions impose on others shape the willingness to embezzle money. To this end, I design and conduct an experiment where I contrast corrupt behavior in situations that differ in the levels of responsibility (i.e., concentrated or shared) and externality (i.e., concentrated or diffused).

The experiment yields three main findings. First, the willingness to embezzle is larger in scenarios of diffused externality than in scenarios of concentrated externality, and this is consistent with the literature on diffusion of impact (Andreoni, 2007; Schumacher et al., 2017; Bartling et al., 2017). This effect is present both when decision-makers bear the responsibility solely themselves and when they share it with others.

Second, the willingness to embezzle in scenarios of concentrated responsibility is not different from scenarios with shared responsibility, regardless of whether the

externality is diffused or concentrated. This result is inconsistent with previous literature that finds people to behave more selfishly when deciding with others than when deciding individually (Charness & Sutter, 2012; Kugler et al., 2012). Although this no-effect from the variation in responsibility levels does not align with previous literature, it further contributes to the understanding of responsibility and its measurements. The studies from the literature that are closer to the experimental design of this chapter are those based on dictator games (Dana et al., 2007; Luhan et al., 2009; Panchanathan et al., 2013).[7] In these studies, the condition of concentrated responsibility refers to one dictator being the decision-maker with certainty. However, in this chapter, I design the condition of concentrated responsibility to be one public official who takes the role of decision-maker *if* selected randomly from a group of public officials.[8] It might be the case that this feature in the design alters subjects' perception of how concentrated the responsibility is in that situation. If so, it can then influence the levels of embezzlement observed in these scenarios on concentrated responsibility and the comparison to scenarios of shared responsibility. Nevertheless, equivalent to the dictator games, the comparison between concentrated and shared responsibility relies on the fact that when the unequal allocation occurs, it is either because of just one person's decision or because of several people's decisions.

Third, I find that a more diffused impact makes public officials engage more in decisions of embezzlement compared to a condition of more shared responsibility for the outcome. This result follows from the previous two results where the diffusion of externality has a positive effect and shared responsibility has a null one. Finally, I show that the behavior observed in the experiment is consistent with a theoretical model on other-regarding preferences. The model I propose can rationalize 76.70% of the observed behavior.

This chapter contributes to the general literature studying the effects of shared responsibility and diffusion of externality and illustrates the relevance of these factors in the domain of corruption. With this, I contribute to the literature on corruption by adding further evidence of the role of group decision-making in corruption decisions, specifically in embezzlement, and by providing novel evidence on the diffusion of externality as a determinant of corrupt behavior.

[7]The dictator games are considered the most similar to the embezzlement games in this experiment because subjects make, usually, a binary decision on how to distribute an endowment between decision-makers and recipients. In the case of the embezzlement games, subjects make a redistribution decision over the recipient's endowment.

[8]Keeping constant the number of officials in a group across games is a crucial characteristic of this experimental design. This ensures that no efficiency concern could influence subjects' willingness to embezzle as the benefits for each public official and the aggregate earnings (and with this, the aggregate externality) do not vary across games. Given this, designing a condition for concentrated responsibility with only one official in a group that with certainty is the decision-maker is not feasible as it would compromise the comparisons between games.

Chapter 3

Attribution of responsibility in corrupt decisions

Abstract

This chapter studies responsibility attribution for outcomes of collusive bribery. In an experiment, we let either citizens or officials propose a bribe interchange to the other, and the other decides whether to accept the proposal. We then ask the victims of the corrupt transaction or the bystanders of it to judge the individual decisions of proposing and accepting a bribe interchange. We interpret their judgments as a measure of responsibility attribution. We identify three features in our data: (i) the person accepting a bribe interchange that has been proposed is regarded as more responsible than the person proposing it, but only when accepting the bribe is a decision taken by officials, (ii) officials are regarded as more responsible for corruption than citizens, even more, when they are the ones accepting the corrupt transaction, and (iii) victims do not assign responsibility consistently more than bystanders do. Our results suggest that people find corrupt actors responsible for the outcomes of corruption at different levels depending on factors like whether they are attached to a label of *law enforcer* (i.e., official), and whether they are the ones *sealing the deal* by accepting the bribe.

Keywords: Responsibility attribution, Bribery, Experiment.

JEL Codes: C90, D73, K42

This Chapter is coauthored with Maria Montero and Alex Possajennikov. This project has also benefited from feedback from Centre for Decision Research & Experimental Economics (CeDEx) members and participants at the CCC meeting. We thank CeDEx for funding this research. The experiment received ethical approval from the Nottingham School of Economics Research Ethics Committee.

3.1 Introduction

In the fight against corruption, governments focus on implementing strategies promoting transparency and accountability. Generally, enforcement mechanisms like severe monetary and legal sanctions on corrupt actors are the most common practice and examples of top-down interventions. These interventions have been followed by bottom-up approaches that involve, instead of the legal systems, citizens' participation in the form of community monitoring, free speech, and expressions of disapproval about acts of corruption. The empirical evidence suggests that practices like citizens monitoring how local authorities handle public funds (Reinikka & Svensson, 2005; Olken, 2007) and reporting bribe demands (Ryvkin et al., 2017) work, to some extent, in reducing corruption in developing countries where legal and judicial institutions are weak. Another practice that, according to experimental evidence, also has an impact on reducing intentions of corruption (i.e., willingness to offer/accept a bribe) is the victims' expression of disapproval toward corrupt actors (Salmon & Serra, 2017; Levati & Nardi, 2022). Although several advances have been made in the study of the effectiveness of bottom-up anti-corruption practices, little attention has been paid to the distribution of disapproval among participants of corruption. Therefore some important unanswered questions are: who do people think is more responsible for a simple act of corruption like bribery? Is the citizen proposing the bribe, or is the official accepting it? Does it depend on who is judging these corrupt actors? Would a victim of corruption judge them differently than a witness would?

In this chapter, we answer these questions by investigating how different people attribute responsibility to the individual decision-makers in a bribery situation. We do so by implementing an experiment eliciting people's judgments over the decisions to propose and accept a corrupt transaction that imposes a cost on a third party. We interpret judgments as a measure of responsibility attribution. In the experiment, there are groups of four people: a citizen, an official, a victim, and a bystander. Either the citizen or the official can propose a corrupt transaction to the other. The transaction benefits them both at the victim's expense, while the bystander only observes whether the transaction takes place. After the transaction takes place, we introduce the possibility of expressing social judgments in the form of non-monetary points that are assigned to the citizen and the official. We let victims or bystanders express judgments toward the two corrupt actors, as we are also interested in how affected versus unaffected parties react to corruption. The benefits for the citizen and the official for the corrupt transaction and the cost that it imposes on the victim are constant across treatments, allowing for direct comparability of the judgments expressed under each treatment variation while all else is equal.

In our bribery context, we observe that more severe judgments are directed at the responder, the person accepting the corrupt transaction, than at the proposer, only when the responders are under the label of official. In line with this, we observe that officials receive more severe judgments than citizens, especially when they are the person accepting the bribe. These findings imply that people assign more responsibility for an act of corruption to someone under the role of law enforcer, especially when they are the ones *sealing the deal* of a bribe interchange. Furthermore, we find no consistent differences in how affected and unaffected parties react to corruption. While bystanders' judgments are, on average, somewhat less harsh than those of victims, the difference between the judgments of victims and of bystanders is not significant.

Following the findings in the corruption treatments, we implement two additional outcome-equivalent treatments introducing a neutral framework to explore further the independence between the role of responder and the label of official in guiding judgment decisions. In these treatments, we abstain from referring to the transaction as a bribery interchange, and we use neutral labels to refer to the corrupt actors. As in the corruption treatments, we let both victims and bystanders express their judgments. In this neutral context, we find that significantly more responsibility is attributed to responders than proposers, and victims' judgments drive this result. In line with this, we also identify that victims react more strongly than bystanders do.

Given the design feature that results from having outcome-equivalent treatments with different frameworks (corruption and neutral), we compare judgments under both frameworks. We find that judgments are more severe under corruption-label treatments than under neutral-label treatments, showing that people understand the severity of acts of corruption and judge them accordingly.

Our chapter contributes to the literature on responsibility attribution and corruption. The evidence on responsibility attribution in situations with a neutral framework, focusing on collective decision-making with responsibility measured as punishment through monetary deduction points, suggests that victims attribute more responsibility to the proposer (first movers) (Duch et al., 2015) and to the pivotal voters (Bartling et al., 2015) of unequal allocations. In our case, we show that responders (second movers) receive more severe judgment and, therefore, more responsibility than the proposer in neutral contexts. This is also true in a corruption context only when the responder takes the label of official. Although the decision-making in our experiment cannot be considered a collective decision-making setup, as this is usually groups of more than two people voting on a decision to implement, it can be seen as a sequential setup given that a transaction has to be proposed by a first mover for a second mover to accept it. Our work thus complements this litera-

ture providing additional evidence of the importance of sequential decision-making and responsibility attribution, especially in the context of corruption.

The evidence on the attribution of responsibility to the decision-makers in bribery situations is mixed. We add to this literature on corruption by providing further evidence on how victims and bystanders of corruption judge the actors involved in a bribe interchange. To the best of our knowledge, most of the studies on bribery games with instances of monetary punishment or expressions of judgment toward the corrupt actors have focused on the effects of punishment/judgment on the levels of corruption but have not studied the decision to punish/judge in itself (Cameron et al., 2009; d'Adda et al., 2016; Salmon & Serra, 2017; Levati & Nardi, 2022). We differentiate our study from the literature by focusing on judgment decisions and how they inform us about the attribution of responsibility to each actor involved in a corrupt transaction. From what these studies report, we can extrapolate that victims react to corruption when they can react to both corrupt actors jointly given that they choose to punish them even when this action is costly (Cameron et al., 2009). There is also evidence of victims judging corrupt actors by sending them expressions of disapproval (Levati & Nardi, 2022). From the papers where the victims can punish/judge separately the proposer and the responder of a bribe, we identify that in some cases, they punish officials (second mover) slightly more than they punish firms (first mover) (d'Adda et al., 2016). In others, they judge more severely the citizen (first mover) than the official (second mover) (Salmon & Serra, 2017). In our case, we show that victims judge the responder of a bribe interchange more severely than the proposer when the responder is under a label of official.

More recently, Guerra & Zhuravleva (2021) advance the literature with the first study examining bystanders' decisions of punishment, as a measure of individual judgments, in the context of bribery. The authors find that bystanders punish citizens (first movers) and officials (second movers) at virtually the same level. Our work complements their findings by providing additional evidence on bystanders' judgments. We show that bystanders judge officials more severely than they judge citizens (regardless of whether officials are first or second movers). It is important to notice that, unlike Guerra & Zhuravleva (2021), we ensure that judgments do not affect total earnings in our game, as neither does the corrupt transaction we implement. We also study several dimensions (i.e., proposer-responder, official-citizen, and victim-bystander) that shed more detailed light on how individuals judge corruption situations. Understanding responsibility attribution, in general, is important because it informs us on how acceptable a behavior is and how easy is its proliferation. Moreover, understanding how they attribute responsibility individually to each corrupt actor can help us understand how much people condemn these actions and who in society is considered to be most to blame.

The rest of the chapter is structured in the following way: in Section 3.2, we explain the experiment and its implementation. Section 3.3 reports the results, and Section 3.4, discusses the findings and concludes the chapter.

3.2 Experimental Design

We implement a modification of Salmon & Serra (2017)'s bribery game. In our game, one proposer, one responder, one victim, and one bystander form a group after each of them has earned an initial endowment that is equal among them and fixed to the value of 100 Experimental Currency Units (ECUs).

The game consists of a proposer deciding to propose a corrupt transaction to a responder who decides whether to accept the proposal. Either a subject under a label of official or under a label of citizen can take the role of proposer and propose the transaction to the responder. The corrupt transaction comprises a bribe transfer: the citizen sends 20 ECUs to the official in exchange for a service that the official provides, and the service has a value of 40 ECUs to the citizen. The provision of the service comes at the expense of the victim, who is deducted the net gain of the transaction, 40 ECUs. The bystander is only a witness of the interaction and is unaffected by the transaction. Figure 3.1 illustrates the sequential representation of the game. The first payoff refers to proposer, the second to the responder, the third one to the victim, and the fourth one to the bystander.

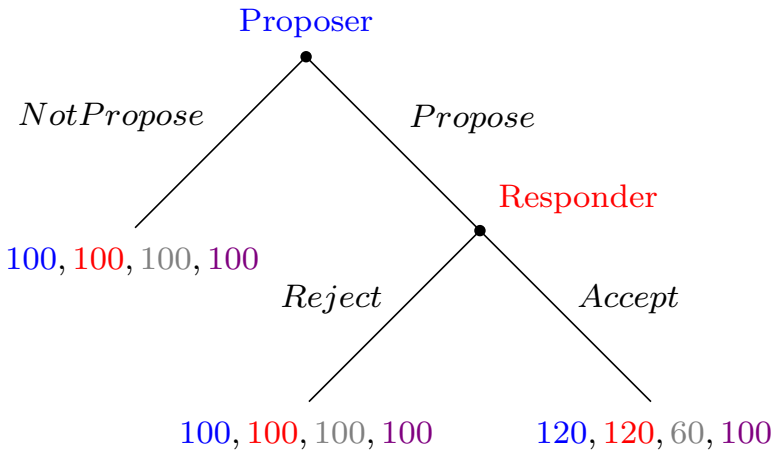


Figure 3.1: The sequential game

After the transaction takes place, we introduce the possibility of expressing social judgments in the form of non-monetary points that are assigned to the proposer and the responder. Social judgments are shown to all members of a group, with the information on how the outcome of the game is judged using a slider that goes from -9, corresponding to a red angry facial expression on their screen, to 9, corresponding

to a green happy facial expression on their screen. Figure 3.2 shows the slider. We let either victims or bystanders express judgments toward the two corrupt actors in different treatments.

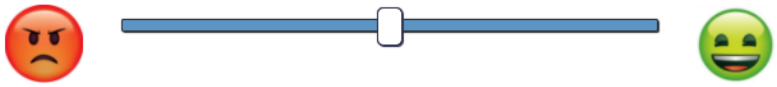


Figure 3.2: Slider

The treatment variations of the experiment come from two categories. The first category is the source of the social judgment: it can be from the victim who suffers a monetary loss if the transaction takes place or from the bystander who only witnesses the transaction. The second category is who takes the role of the proposer of the corrupt transaction: it can be the official or it can be the citizen. In the instance where the citizen(official) is the proposer of the corrupt transaction, the official(citizen) is the responder and decides whether to accept the proposal of the bribe transfer if proposed by the citizen(official). This leads us to a 2x2 between-subjects design illustrated in Table 3.1.

Table 3.1: 2x2 Design

		Judgment	
		Victim	**Bystander**
Proposer	**Citizen**	CP_VJ	CP_BJ
	Official	OP_VJ	OP_BJ

Each treatment comprises three stages: an endowment-earning stage, a decision-making stage, and a belief-elicitation stage. In the first stage, all subjects go through a real effort task to earn an initial endowment of 100 ECUs. The task is based on Benndorf et al. (2014)'s encryption task and consists of correctly decoding two text sequences into numbers within two minutes. In the second stage, subjects learn about the decision-making situation they face, and after answering control questions that check for their understanding of the situation, they are assigned one of the four roles of the game and they make decisions under their role only. The subject in the role of proposer decides whether to propose the transaction, and the one under the role of responder decides whether to accept the transaction if proposed. In the treatments where the victims express social judgments, the victim judges the proposer and the responder, using the slider, on every possible decision combination (i.e. Propose/Accept, Propose/Reject, NotPropose/Accept, NotPropose/Reject), and the bystander does not make any decision. Conversely, in the treatments where

the bystander expresses social judgments, the bystanders judge the proposer and the responder, using the slider, on every possible decision combination while the victim does not make any judgment decision.

In the third stage, we elicit subjects' beliefs about the decisions of the other group members in the game. Proposers state their beliefs about the decision of the responder and about the judgments expressed by either the victim or the bystander. Responders state their beliefs about the decision of the proposer and about the judgments expressed by either the victim or the bystander. Victims and bystanders express their beliefs about the decisions of both the proposer and the responder, and, if they are not expressing their judgments, they also state their beliefs about the judgments the other player is going to express. After this, we conduct the Aron et al. (1992)'s Inclusion of the Other in the Self scale to gather information about how close subjects perceive themselves to the other subjects in different roles in the game. We also conduct a simple demographic questionnaire that includes two questions about how responsible do they think the proposer and the responder are if the transaction takes place, and one question about how difficult do they find the experiment.

We use contextual labels in the experiment as we want subjects to perceive the context as a clear corruption situation. Therefore, we refer to the transaction as a corrupt transaction in which a bribe is transferred and we use the labels of citizen and official to refer to the proposer and responder (depending on the treatments), the label of other member of society to refer to the victim, and the label of observer to refer to the bystander.

After the treatments described above, we conduct the experiment with a neutral framework. It consists of two treatments in which we implement the same situation as in the corruption treatments, involving the same transaction and leading to the same material outcomes as the bribery game, only that using completely neutral labels instead of contextual labels. We assign the label of participant A to the proposer, participant B to the responder, participant C to the victim, and participant D to the bystander. Table 3.2 illustrates the design of these extra treatments.

Table 3.2: Neutral Treatments Design

		Judgment	
		Victim	**Bystander**
Proposer	**Neutral**	NP_VJ	NP_BJ

3.2.1 Procedures

Our sample consists of students registered with the CeDEx Laboratory at the University of Nottingham, UK. In total, 1167 students participated in the experiment, with 188-200 participants per treatment as shown in Table 3.3. We conducted the experiment online using software programmed in Lioness (Giamattei et al., 2020), with subjects recruited using ORSEE (Greiner, 2015). The experiment was conducted asynchronously: all subjects invited to a session made decisions individually and they were matched afterwards to determine their payoffs and received feedback about the decisions and judgments from the game. This implies that subjects on the role of responders make the decision of whether to accept a transaction *if* proposed by the proposer in their group. Subjects were randomly assigned to treatment and roles. There were some cases of attrition due to subjects timing out/not answering the control questions correctly, resulting in some groups being incomplete. For payment purposes, we matched the incomplete groups with a sample subject under the individual role that the group was missing.[1] Subjects were paid via PayPal, and the exchange rate used in the experiment was 100 ECU = £1.50. Subjects took approximately 15 minutes to complete the experiment, and the average payment was £11 per hour. The experimental instructions are available in Section C.6 of Appendix C.

Table 3.3: Subjects per treatment

	Proposer	**Responder**	**Victim**	**Bystander**	**Total**
CP_VJ	51	49	50	50	200
CP_BJ	49	49	48	48	194
OP_VJ	46	50	48	47	191
OP_BJ	43	49	45	51	188
NP_VJ	50	50	49	46	195
NP_BJ	48	49	51	51	199

3.2.2 Hypotheses

Our predictions are informed by the theoretical and empirical work on responsibility attribution and corruption. We are interested in how victims and bystanders of corruption attribute responsibility to the decision-makers involved in a corrupt transaction. More specifically, how responsibility is attributed to the subject proposing a corrupt transaction and to the responder accepting the proposal. We are also

[1] A sample subject is a subject who completed the experiment in the same treatment and belonged to a complete group. The decisions of that subject are used in any incomplete group and only for payment purposes. The sample subject is paid only once according to the decisions made in his/her own group.

interested in knowing how people that experience corruption differently (i.e., victims vs. bystanders) attribute responsibility to the corrupt actors.

As shown in Duch et al. (2015), subjects attribute significantly more responsibility to the proposer of an unfair allocation (players with proposal power). Guided by this finding, we can expect the proposers of the corrupt transaction in our game to receive more severe punishment than the responders. Alternatively, given the findings from Bartling et al. (2015) where more responsibility is attributed to pivotal players (players with decisive power), we can also expect the responders in our games to receive more severe judgments than the proposers. In our game, both proposer and responder are equally pivotal because for the transaction to take place, the transaction must be proposed by the proposer and accepted by the responder. However, given the sequentiality of the game, the responder has *the final* decisive power, and his decision to accept the transaction after it has been proposed, can be regarded as a more reprehensible decision than the decision of the proposer to initiate the transaction.

The evidence in the context of corruption is also inconclusive. In some cases, slighly more responsibility is assigned to responders than to proposers (d'Adda et al., 2016); in others, the proposers are found more responsible than the responders (Salmon & Serra, 2017), or they are found equally responsible (Guerra & Zhuravleva, 2021). Therefore, we do not have a strong indication of which player in our game will be judged more severely than the other, and it might even be the case that their role (i.e., proposer and responder) interacts with their label (i.e., citizen and official). For these reasons, a cautious anticipation would be that responders are judged as severely as proposers.

Hypothesis 1. *Responders are judged as severely as proposers.*

In our corruption-label treatments, we vary the way we refer to the proposer and responder between the labels of citizen and official. A label of citizen can be easier to relate to than a label of official, as the latter seems more distant in society because only a few people work under it. Additionally, it is usually associated with the duty of law enforcers. Given this, we can expect more severe judgments to be directed to the subjects under the role of officials than the subjects under the role of citizens. Being corrupt is a law-breaking behavior, and officials acting corruptly could be regarded as more reprehensible than citizens acting corruptly.

Hypothesis 2. *Officials get more severe judgments than citizens.*

There is empirical evidence suggesting that victims of harm inflicted by others tend to have a stronger emotional reaction toward the perpetrator of the harm than observers do; given that they suffer directly the harm in contrast to observers who only witness it. For instance, Lind et al. (1998) show that people rate a mild

personal injustice as more unfair than a severe injustice inflicted on someone else. In our experiment, victims suffer the cost of the transaction. Therefore, as they are monetarily affected by the transaction between the proposer and the responder while the bystander is not affected by it, we expect victims to express more severe judgments in comparison to bystanders.

Hypothesis 3. *Victims judge more severely than bystanders do.*

Moreover, we expect more severe judgments, when the transaction takes place, from subjects who expect the decision-makers not to be corrupt. The frustration-aggression hypothesis (Dollard, 1939; Berkowitz, 1989), and the psychological game theory perspective derived from it (Battigalli et al., 2019), suggest that people feel frustrated if their initial expectations are not met, and the tendency to hurt others is proportional to their level of frustration. Based on this, we anticipate that subjects' judgments can be affected by feelings of anger or frustration. In our game, if a victim (or a bystander) expects the proposer not to propose, and the responder to reject, and then the transaction takes place, that victim would express a worse judgment towards the proposer and the responder in comparison to the judgments that victims would express if her expectations were the opposite and the result the same.

Hypothesis 4. *Victims/bystanders that expect the decision-makers not to be corrupt judge them more severely if they engage in the corrupt transaction.*

Although the game dynamics produce the same material outcomes in both corruption-label and neutral-label treatments, we expect the artifact of corruption-labels to produce a stronger emotional reaction than an outcome-equivalent neutrally-framed situation. That is, we expect people to judge more severely the decisions to propose and accept a transaction in the corruption-label treatments than in the neutral-labels treatments.

Hypothesis 5. *Judgments in corruption-label treatments are more severe than judgments in neutral-label treatments.*

Our main interest in this chapter is to evaluate the social judgments surrounding decisions of corruption. However, considering the bribery game that we implement, we can also explore the decisions to propose and accept the corrupt transaction and form expectations around them. The literature on bribery games with monetary and non-monetary social judgment finds that people are equally likely to offer and to accept a bribe (Levati & Nardi, 2022), or they are more prone to accept a bribe than to offer it (Salmon & Serra, 2017; Guerra & Zhuravleva, 2021). Following the findings in the literature, we can expect responders to be more likely to accept a transaction than proposers to propose it.

Hypothesis 6. *Responders are more likely to accept a transaction than proposers to propose it.*

3.3 Results

In this section, we analyze the judgments decisions (Subsection 3.3.1), which are the main focus of the chapter, and the decisions to propose and accept a corrupt transaction (Subsection 3.3.2).

3.3.1 Judgment Decisions

Corruption-label Treatments

Victims or bystanders expressed judgments about the decisions of proposer and responder in the game in all four possible scenarios: Propose/Accept (P/A), Propose/Reject (P/R), Not propose/Accept (NP/A), Not propose/Reject (NP/R). Judgments take integer values from -9, corresponding to a red angry facial expression in the slider, to 9, corresponding to a green happy facial expression in the slider.

During the experiment, in each treatment, half of the subjects expressing judgments made a decision judging first the proposer's decision and then the responder's decision, while the other half made decisions in the opposite order. We test for order effects and do not find significant differences in judgment levels when comparing the two orders (see Table C.1 in Appendix C). Therefore, for our analysis, we combine judgment decisions by order. We focus our analysis in this section on the scenario where the bribe interchange occurs, that is, when the proposer proposes the corrupt transaction and the responder accepts (P/A). Section C.2 in Appendix C contains an overview of the other three scenarios. Table 3.4 shows the average judgments toward proposer and responder in each treatment in the Propose/Accept (P/A) scenario.

Table 3.4: Means of judgment decisions in corruption-label treatments for (P/A) scenario

Treatment		VJ			BJ		
		Mean	Std. Dev.	N	Mean	Std. Dev.	N
CP	Proposer	−5.70	4.36	50	−4.95	3.96	48
	Responder	−7.22	3.35	50	−6.27	3.44	48
OP	Proposer	−5.45	5.18	48	−5.70	4.30	51
	Responder	−5.85	4.12	48	−4.62	4.13	51

Our main question is whether the responder accepting the corrupt transaction is judged differently from the proposer proposing the transaction. To answer this question, we compare the judgments directed to proposers and responders in each treatment by the same victim/bystander (comparison within columns in Table 3.4), and we report p-values from signed-rank tests in parenthesis. The means of the judgments directed toward responders are generally larger than those directed toward proposers, except for the OP_BJ treatment where the difference goes in the opposite direction. We find that both victims and bystanders judge significantly more severely the responder than the proposer in the treatments where the responder is the official ($p < 0.01$ in CP_VJ and CP_BJ). But in the treatments where the responder is the citizen, the victims do not judge significantly differently the responders and the proposers ($p = 0.815$ in OP_VJ), and the bystanders judge more harshly the proposer (official) than the responder (citizen) ($p < 0.01$ in OP_BJ). The last observation indicates that the players' labels (official or citizen) may also be important, possibly even more than the roles (proposer or responder), since the officials appear to be judged more harshly than the citizens in our experiment.

We then look at whether bystanders' judgments differ from those of victims. For this purpose, we compare the judgment expressed by victims and bystanders toward proposers and responders (comparison within rows in Table 3.4 for either CP or OP condition), and we report p-values from rank-sum tests in parenthesis. We find that the judgments of victims are significantly more severe than those of bystanders for both when the responders are under the label of citizen ($p = 0.044$ in OP) and when the responders are under the label of official ($p = 0.052$ in CP). There are no significant differences between bystanders' and victims' judgments toward proposers under any condition (CP or OP). Generally, thus, in the corruption-label treatments, victims' judgments toward responders are somewhat more severe than those of bystanders but the difference is small.

We conduct a regression analysis to further understand the effects of both roles and labels. Table 3.5 reports estimates from an OLS model where the dependent variable is the judgment decision towards proposers and responders in the P/A scenario. As judgments can take integer values from -9 to 9, the closer a judgment is to the value of -9, the worse judgment it is. We compare average judgments expressed by bystanders when the base is judgments by victims, judgments toward proposers when the base is judgment toward responders, and judgments toward citizens when the base is judgment toward officials (column I). To understand whether the effect is present in some subsamples only, we include interactions between judgments toward proposers and judgments toward citizens (column II). In all specifications, we include exogenous controls starting by the order in which judgment decisions were made, in addition to demographic characteristics like gender ($1 = male$), age, degree in economics, and UK nationality. In column III, we include further endogenous (i.e. chosen by the subjects in the experiment) control variables, such as the belief about whether the decision-maker is going to choose the corrupt action, the perception of closeness (IOS) to the decision-makers, the perception of the difficulty of the task, and a self-reported measure of altruism. Table 3.5 also reports the p-values of Wald tests of hypotheses relating to the coefficients of our interest variables.

The main findings from these specifications support the findings from the non-parametric tests. From column I, we identify that the average judgment toward proposers is less harsh than that toward responders, and the average judgment toward citizens is less harsh than that toward officials. Column II shows that this effect is driven mainly by less harsh judgments toward citizens than toward officials in the responder role (β_C). For the proposer role, the difference in judgments toward citizens and officials is $\beta_C + \beta_{PC} = 0.287$ and is not significantly different from 0. The difference between judgments toward proposers and responders is significantly different from 0 at 10% level for officials (β_P) but it is not significantly different from 0 for citizens ($\beta_P + \beta_{PC} = -0.046$). These results continue to hold for the specification in column III. Thus, from the comparison of mean judgments and the regressions, both the role (proposer/responder) and the label (citizen/official) seem to affect the severity of judgment to some extent.[2]

Result 1. *Responders receive somewhat more severe judgments than proposers (under the label of officials).*

Result 2. *Judgments toward officials are more severe than judgments toward*

[2]Interestingly, if, instead of judgments, we look at a variable directly asking for a numerical measure (from 0 to 10) of the responsibility of each decision-maker for the corrupt outcome, as we asked (in a non-incentivized manner) in the questionnaire, then only the label (citizen or official) matters for differences in this variable, not the role (proposer or responder) or whether victims or bystanders assign this responsibility, see Table C.3 in Appendix C.

citizens (especially in the role of responders)

In all specifications, we can observe that while bystanders' judgments are, on average, somewhat less harsh than those of victims (β_B), the difference between their judgments is not significant. Furthermore, the additional variables in column III also refer to subjects' choices in the experiment, but after they made their judgments. The effects of these variables thus cannot be treated as causal but rather indicate correlation. We find that the belief about the decision-maker being corrupt (i.e. going to choose the corrupt action in the experiment) is significantly associated with less severe judgments. This finding is consistent with the frustration-aggression hypothesis: expecting the decision-makers to be corrupt softens the views of the victims and bystanders leading to less severe judgment from those expecting the decision-makers to be corrupt compared to those expecting them not to be corrupt. Moreover, the variable difficulty, the self-reported measure of how difficult the experiment was for the participants, appears to be significantly associated with less severe judgments (although the effect is relatively small, 0.3 out of -9 to 9 scale). All other controls are insignificant.

Result 3. *In the corruption-label treatments, bystanders judge (almost) as harshly as victims do.*

Result 4. *Those victims/bystanders expecting the decision-makers not to be corrupt judge them more severely if the transaction occurs compared to those expecting them not to be corrupt.*

Table 3.5: OLS regression for judgment decisions in P/A for corruption-label treatments

Variables	Judgment Decision (−9 to 9)		
	I	II	III
Bystander (β_B)	0.703	0.683	0.737
	(0.538)	(0.539)	(0.523)
ToProposer (β_P)	0.550**	1.177*	1.054*
	(0.253)	(0.610)	(0.596)
Citizen (β_C)	0.914***	1.540***	1.258**
	(0.253)	(0.550)	(0.547)
Prop×Citizen (β_{PC})		−1.253	−0.977
		(1.105)	(1.075)
BeliefCorrupt			1.277***
			(0.434)
Difficulty			0.298**
			(0.131)
Constant	−7.937***	−8.460***	−10.73***
	(2.723)	(2.754)	(2.972)
Exo. Controls	Yes	Yes	Yes
Endo. Controls	No	No	Yes
Observations	392	392	392
Clusters (subjects)	196	196	196
R-squared	0.032	0.038	0.092
$\beta_P + \beta_{PC} = 0$		[0.900]	[0.898]
$\beta_C + \beta_{PC} = 0$		[0.665]	[0.664]

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors (in parentheses) are clustered at the individual level. Note: The dependent variable takes values from −9 to 9. Exogenous controls are the order in which judgment decisions were made, gender($1 = male$), age, degree in economics, and UK nationality. Endogenous controls are the belief that the decision-maker is going to act corruptly, the perception of closeness (IOS) to the decision-makers, the perception of difficulty of the experiment, and a self-reported measure of altruism. p-values reported in brackets correspond to Wald tests of hypotheses on the parameters of the regression model.

Neutral Treatments

We analyze the data from the neutral-label treatments to check whether responders are judged differently than proposers. In these treatments, there are no "citizen" and "official" labels, and any differences in judgments are then attributed to the roles (proposer/responder). Table 3.6 reports the means of judgments in these treatments.

Table 3.6: Means of judgment decisions in neutral-label treatments

Treatment		VJ			BJ		
		Mean	Std. Dev.	N	Mean	Std. Dev.	N
NP	Proposer	−3.44	5.25	49	0.58	6.07	51
	Responder	−4.46	4.89	49	−0.25	5.40	51

We observe that the judgments are less severe under the neutral-label context than under the corruption-label context. This difference is evident from the comparison with the average values of judgments in Table 3.4. We conduct rank-sum tests treatment-by-treatment (i.e., CP_VJ vs. NP_VJ, etc.) and we find significantly harsher judgments in corruption-label treatments than in neutral-label treatments in almost all comparisons (the exception being judgments toward responders in OP_VJ vs. NP_VJ).

Result 5. *Judgements in corruption-label treatments are more severe than in neutral-label treatments.*

Comparing the means across columns in Table 3.6 with signed-rank tests, we find that the tendency to judge more severely the responder than the proposer is present in the neutral-label treatments when the victims judge ($p = 0.011$ in NP_VJ) but not when the bystanders judge ($p = 0.196$ in NP_BJ). Then, with rank-sum tests, we find that victims judge proposers ($p < 0.01$) and responders ($p < 0.01$) significantly more severely than bystanders do in the neutral-label treatments. Although in the previous treatments, we expected victims of corruption to react more than bystanders do to a corrupt transaction, we do not find strong evidence supporting this hypothesis. Still, we do find evidence of this in the neutral-label treatments, identifying a frame effect. This frame effect indicates that the potential difference between the judgments of victims and bystanders is largely washed away by corruption. The framework of corruption makes people react more severely, in general, but it has a larger effect on the bystanders' judgments. Corruption is so bad that bystanders also react to it; even though they are not directly involved nor affected by corruption, they find it so reprehensible that they react at virtually the same levels as the victims. On the contrary, in purely distributive neutral-label frame, bystanders are less severe in judging decisions that negatively affect victims.

Result 1.1 *In neutral-label treatments, responders also receive somewhat more severe judgments than proposers (from victims).*

Result 3.1 *In neutral-label treatments, victims' judgments are more severe than those of bystanders.*

We further conduct a regression analysis shown in Table 3.7 with similar specifications as in Table 3.5. First, we confirm that victims, on average, express more severe judgments than bystanders do and that the average judgments toward responders are harsher than those toward proposers (column I). Column II confirms that the former effect is present for both proposers and responders, and the latter effect comes from judgments expressed by victims (β_P) as in the judgments expressed by bystanders the difference between those directed to proposers and to responders is $\beta_P + \beta_{BP} = 0.843$ and is not significantly different from 0. These results largely hold in column III, although the difference between judgments toward proposers and responders by victims (β_P) is less significant now ($p = 0.053$).[3] Among the added variables in column III, higher beliefs about decision-maker going to act corruptly is still highly significantly associated with less severe judgments, consistent with *Result 4*. Judgments of those who found the experiment more difficult, and of those who (self-reportedly) have a higher degree of altruism also tend to be less severe.

[3]If, instead of judgments, the variable directly asking for the responsibility of each decision-maker for the unequal outcome is used, then none of the treatment variables is significant. Indeed, only the altruism variable is significant in the specification in column III in Table C.4 in Appendix C. There seems to be too much noise in the responsibility variable.

Table 3.7: OLS regression for judgment decision in P/A in neutral-label treatments

Variables	Judgment Decision (−9 to 9)		
	I	II	III
Bystander (β_B)	3.855***	3.943***	3.713***
	(1.077)	(1.087)	(1.077)
ToProposer (β_P)	0.930**	1.020**	1.349*
	(0.388)	(0.506)	(0.688)
Bystander×Prop (β_{BP})		−0.177	−0.776
		(0.775)	(0.899)
MyBelief			3.013***
			(0.795)
Difficulty			0.838***
			(0.212)
Altruism			0.005**
			(0.002)
Constant	−5.357	−5.402	−14.34***
	(5.091)	(5.101)	(5.041)
Exo. Controls	Yes	Yes	Yes
Endo. Controls	No	No	Yes
Observations	200	200	200
Clusters (subjects)	100	100	100
R-squared	0.161	0.161	0.352
$\beta_B + \beta_{BP} = 0$		[0.002]	[0.009]
$\beta_P + \beta_{BP} = 0$		[0.155]	[0.323]

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors (in parentheses) are clustered at the individual level. Note: The dependent variable takes values from −9 to 9. Exogenous controls are the order in which judgment decisions were made, gender 1 = *male*, age, degree in economics, and UK nationality. Endogenous controls are the belief that the decision-maker is going to act corruptly, the perception of closeness (IOS) to the decision-makers, the perception of difficulty of the experiment, and a self-reported measure of altruism. p-values reported in brackets correspond to Wald tests of hypotheses on the parameters of the regression model.

3.3.2 Propose and Accept Decisions

The decisions to propose and accept a transaction with negative externalities are not the main focus of this chapter. Nevertheless, in this subsection, we analyze the results and patterns found in corruption-label and neutral-label treatments. Overall, pooling across treatments, we find that proposers are significantly more likely to propose a corrupt transaction (74.74% of the time) than responders to accept it 55.94% of the time) ($p < 0.01$ from proportion test). The decisions to propose and accept are also significantly sensitive to our treatments. In Table 3.8, we report the frequencies of the decisions along with p-values of proportion tests. Examining each treatment individually, we observed the same pattern as in the pooled sample. Proposers are more likely to propose the transaction than responders to accept it in all treatments except CP_BJ and OP_VJ. We also find evidence suggesting

that deciding under the label of citizen, when the victim is the one judging their decisions instead of the bystanders, facilitates decisions of corruption. This finding is independent of the decision of the citizen being to propose the corrupt transaction or to accept it ($p = 0.0605$ in CP_VJ vs. CP_BJ and $p = 0.0257$ in OP_VJ vs OP_BJ). In contrast, in the neutral-label treatments, proposers are more likely to propose when the bystander rather than the victim judges their decisions ($p = 0.0603$ in NP_VJ vs. NP_BJ).

Table 3.8: Propose and Accept Decisions

Treatment		VJ			BJ			
		Freq.	Pct.	N	Freq.	Pct.	N	p-value
CP	Propose	40	78.43%	51	30	61.22%	49	0.0605
	Accept	30	61.22%	49	26	53.06%	49	0.4142
	p - value		0.0605			0.4142		
OP	Propose	38	76.00%	50	31	63.26%	49	0.1681
	Accept	28	60.86%	46	16	37.20%	43	0.0257
	p - value		0.1101			0.0126		
NP	Propose	39	78.00%	50	44	91.66%	48	0.0603
	Accept	30	60.00%	50	30	61.22%	49	0.9008
	p - value		0.0517			0.0004		

Result 6. *In our experiment, proposers are more likely to propose a transaction with negative externalities than responders to accept it.*

With regression estimates, we also confirm the differences observed between the frequencies of the decisions to propose. Table 3.9 reports estimates from a linear probability model estimation where the dependent variable is a dummy of the decision to either propose or accept the transaction. We compare the decision of the proposer when the base is being a responder, the decision to propose/accept in the neutral-label treatments when the base is corruption-label treatments, and the decision to propose/accept in the treatment with bystanders expressing judgments when the base is treatments with victims expressing judgments (column I). This specification includes exogenous controls corresponding to demographic characteristics like gender 1 = *male*, age, degree in economics, and UK nationality. In column II we include further endogenous (i.e. chosen by the subjects in the experiment)

control variables, such as the belief about whether the other decision-maker is going to choose the corrupt action, the belief about the judgment they will receive, the perception of their own responsibility for the transaction, the perception of closeness (IOS) to the other decision-maker involved in the transaction and to the victim of the transaction, the perception of the difficulty of the task, and a self-reported measure of altruism. To examine the effect of the labels of officials and citizens over decisions of corruption, we conduct the same analysis by restricting the sample to only the corruption-label treatments (columns III and IV).

The main findings from these specifications confirm the results from the non-parametric analysis in Table 3.8. We identify four patterns in the data: (i) proposers are more likely to propose the transaction than responders to accept it, (ii) people tend to propose and accept fewer transactions when the bystanders rather than the victims judge their decisions, (iii) the propensities to propose and accept are higher under neutral-label treatments than under corruption-label treatments, but this effect is not robust to the inclusion of controls, (iv) in the corruption label-treatments, citizens' propensity to be corrupt is not significantly different than that of officials.

Regarding our set of endogenous controls, we find that the decision to propose or accept is positive and significantly correlated to the beliefs that the other decision maker is corrupt and to receiving a better judgment. Although we elicit these beliefs in an incentivized way, we should read them with care as they were asked after subjects decided to propose or accept. The perception of own responsibility for the transaction is significant and negatively correlated to the decision to propose or accept, as well as the perception of closeness to the victim of the transaction. The perception of closeness to the other decision-maker is significant and positively correlated with the decision to propose or accept. From the set of exogenous controls, we find that age is significant and negatively associated with the decisions, economics is significant and positively associated with the decisions, and UK nationality is significant and negatively associated with the decisions. All other controls are insignificant. Table C.5 including the coefficients for all controls is in Appendix C.

Table 3.9: OLS regression for Propose and Accept Decisions

Variables	Decision to Propose and Accept (0/1)			
	I	II	III	IV
Proposer	0.178***	0.113***	0.152***	0.068
	(0.038)	(0.035)	(0.048)	(0.045)
NeutralLabels	0.130***	0.006		
	(0.039)	(0.038)		
BystdanderJudges	-0.060	-0.115***	-0.131***	-0.155***
	(0.038)	(0.035)	(0.048)	(0.043)
Citizen			-0.044	-0.042
			(0.048)	(0.043)
Constant	1.043***	1.032***	1.122***	0.987***
	(0.138)	(0.173)	(0.172)	(0.218)
Exo. Controls	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes
Observations	580	565	384	369
R-squared	0.101	0.299	0.097	0.310

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors (in parentheses). Note: The dependent variable is a dummy and takes the value of 1 if the subject proposes or accepts the transaction, 0 otherwise. Exogenous controls are gender, age, degree in economics, and UK nationality. Endogenous controls are the belief about the other decision-maker being corrupt, the belief about the judgment they will receive, the perception of their own responsibility for the transaction, the perception of closeness to the other decision-maker involved in the transaction and to the victim of the transaction, perceived difficulty of the experiment, and a self-reported measure of altruism.

Our finding that proposers, in general, are more likely to propose a transaction than responders to accept it is not in line with the findings from the literature where people are equally likely to offer and to accept a bribe (Levati & Nardi, 2022), or they are more prone to accept a bribe than to offer it (Salmon & Serra, 2017; Guerra & Zhuravleva, 2021). We should handle this comparison carefully as the dynamics surrounding the bribery game, and the bribery game itself, in our chapter, differ from those in the other papers in the literature. Our study largely differs from those of Levati & Nardi (2022) and Guerra & Zhuravleva (2021). In Levati & Nardi (2022), the size of the bribe is not fixed, and decision-makers face a cost for deciding corruptly; moreover, the social judgments are only expressed by victims and are not separate for proposers and responders. And in Guerra & Zhuravleva (2021), social judgments come in the form of monetary deductions, and only the bystanders express judgments. However, our bribery game with the labels of the CP_VJ treatment is most similar to Salmon & Serra (2017)'s bribery game.

With Salmon & Serra (2017)'s paper, we share the features of a fixed bribe, efficiency implications, and non-monetary social judgments. Salmon & Serra (2017)'s findings on corrupt behavior are consistent with their findings on social judgment. They find less corrupt behavior from the proposer than the responder, and people judge the proposer more than the responder. Even though our results go in

the opposite direction than Salmon & Serra (2017)'s results, we also find consistency between what we observe on corrupt behavior and on judgment decisions. We find that responders are less corrupt, and responders are more severely judged. Salmon & Serra (2017) articulate that a possible explanation is that people judge more harshly the decision makers that they expect less corrupt behavior from, and we find evidence supporting their conjecture. Our evidence is consistent with the frustration-aggression hypothesis (*Result 4*).

3.4 Conclusion

This chapter studies responsibility attribution in the context of corruption. Here we provide evidence on how different corrupt actors are regarded in society and whether the way they are regarded depends on who is expressing judgments toward them. We conduct an experiment where we elicit people's judgments over the decisions to propose and accept a bribe interchange, and we interpret the judgments as a measure of responsibility attribution. In the experiment, either a citizen or an official could propose the corrupt transaction to the other. We also let victims and bystanders of corruption judge the corrupt actors.

Our results indicate that more responsibility is attributed to the person accepting a bribe compared to the person proposing the bribe; only when accepting the bribe is a decision taken by officials. In addition, we find that people consider officials more responsible for corruption than citizens, especially when officials accept a bribe that has been proposed to them. Finally, we identify that victims do not assign responsibility consistently more than bystanders. These results are interesting because they show that two factors are important to determine who people find more responsible for corruption: whether they are the ones *sealing the deal* (i.e., accepting the corrupt transaction), and whether they are under a label of law-enforcer (i.e., official). A possible explanation derives from our finding that the belief about the decision makers being corrupt (i.e., going to propose/accept a bribe in the experiment) is significantly associated with less severe judgments. This means that expecting the decision-makers to be corrupt softens the views of the victims and bystanders and leads them to assign less responsibility to the corrupt actors. This is consistent with the frustration-aggression theory (Dollard, 1939; Berkowitz, 1989; Battigalli et al., 2019).

We conduct two extra treatments with a neutral framework to explore further the independence between the categories of being the responder and being the official. We confirm that more responsibility is attributed to the person accepting a transaction than the person proposing it, and the judgments of victims drive this result. We also find that, in general, people attribute less responsibility to decision-

makers in a neutral framework than in a corruption framework, and victims assign, on average, more responsibility than bystanders.

The results above show that the power of a corruption framework is noteworthy. We find that people react more severely to a transaction when it happens in the context of bribery than in a neutral context. They also judge the same decisions as more reprehensible if the one making the decision is someone under a label of law enforcer. With our findings, we are not only providing evidence on how people assign responsibility to corrupt actors (Cameron et al., 2009; d'Adda et al., 2016; Salmon & Serra, 2017; Levati & Nardi, 2022), but also on the relevance of bottom-up approaches as interventions against corruption (Reinikka & Svensson, 2005; Olken, 2007; Ryvkin et al., 2017; Levati & Nardi, 2022). We show that people understand the severity of acts of corruption and judge them accordingly. However, people find these acts less reprehensible if they expect others to act corruptly in the first place. Therefore, special attention and urgency should be given to anti-corruption practices in places where people are quickly adapting to corruption. Some evidence already suggests that the normalization of corruption can threaten the effectiveness of social enforcement mechanisms that rely on the judgments from civil society (Salmon & Serra, 2017).

General Conclusion

This thesis contributes to the investigation of corruption and, in particular, to the understanding of responsibility as a driver of corrupt decisions. I provide three independent but related chapters investigating various ways responsibility shapes decisions and perceptions of corruption. The main research questions of this thesis are listed as follows: "*are people more willing to accept a bribe or to embezzle money?*" (Chapter 1), "*how do the diffusion of externality and shared responsibility impact decisions of embezzlement?*" (Chapter 2), and "*how do victims and bystanders of bribery attribute responsibility to the corrupt decision-makers?*" (Chapter 3). The following paragraphs provide a summary of the main contributions and takeaways from each chapter.

In Chapter 1, I make use of three games to compare the willingness to engage in situations of bribery and embezzlement that differ in the fraction of responsibility that the decision-maker bears for the outcome of corruption. The first game is a bribery game with two decision-makers (briber and bribee), the second game is an embezzlement game with one decision-maker, and the third game is a modified embezzlement game that shares features from the two previous games. The modified embezzlement game involves only one decision-maker, as the pure embezzlement game, and it is outcome-equivalent to the bribery game. Given these shared features, the modified embezzlement game makes a situation of embezzlement comparable to a situation of bribery, allowing one to isolate the effect of shared responsibility on decisions of corruption. These three games are contained in an experimental design that I implement in a laboratory setup. The key result from this experiment is that sharing the responsibility for the outcome, as a briber and a bribee do in a bribery situation, leads to a higher willingness to engage in corruption than bearing entirely the responsibility for an outcome of corruption, as a single decision-maker does in an embezzlement situation. In an additional norm-elicitation experiment investigating the social appropriateness perceptions surrounding these decisions of corruption, I find that the appropriateness rating for each type of corruption does not differ from each other but, within the situation of bribery, the action of accepting a bribe is considered as more inappropriate than offering a bribe.

In Chapter 2, I study how the willingness to engage in embezzlement situations is

shaped by two factors: the fraction of responsibility that each decision-maker bears for the outcome of corruption and the diffusion of the externality of corruption. I implement an online experiment to study the incidence of these two factors in corruption decisions. The experiment consists of different embezzlement games that vary in the levels of responsibility (i.e., concentrated or shared) and externality (i.e., concentrated or diffused). The main findings are: (i) a diffused externality, compared to a concentrated one, leads to a higher willingness to embezzle, (ii) shared responsibility for the outcome, compared to concentrated responsibility, does not lead to a higher willingness to embezzle, and (iii) a more diffused externality has a higher impact on the willingness to engage in embezzlement than a more shared responsibility for the outcome.

An interesting insight into what shared responsibility is arises from the comparison of results from Chapter 1 and Chapter 2. In Chapter 1, shared responsibility leads to higher engagement in corruption decisions. The structure where shared responsibility takes place is a first mover proposing a corrupt transaction and a second mover deciding whether to accept it given that it has been proposed. In contrast, in Chapter 2, the structure of shared responsibility is everyone deciding simultaneously whether to engage in a corrupt decision. I find that the average willingness to be corrupt with the simultaneous structure in Chapter 2 does not depend much on whether responsibility is shared or concentrated. The contrast between these two structures of shared responsibility informs us further on the concept of responsibility as a whole. The distribution of responsibility entails more than the mere division of it among the decision-makers; it also comprises how said division takes place (i.e., the timing of the decisions).

I derive the predictions that I test for in Chapter 1 and Chapter 2 from a model of behavior based on the Cox et al. (2007)'s model of other-regarding preferences. In this model, I assume that the decision-makers care about their own and others' payoffs, they place a weight on the others' payoffs that varies with the fraction of responsibility they bear for the outcome, and I also account for preferences for a more equal distribution of wealth. After observing people's behavior in the experiments, I find that the model can rationalize, on average, 76.4% of exhibited behavior in Chapter 1 and 76.7% in Chapter 2.

Chapter 3 focuses on understanding how responsibility is assigned to corrupt actors instead of how responsibility shapes the willingness to engage in corruption, as is the focus in Chapter 1 and Chapter 2. Therefore, we design and implement an experiment that measures responsibility attribution in corruption. In this online experiment, we ask victims or bystanders of corruption to judge the corrupt actors involved in a corrupt transaction. The corrupt actors are under the labels of citizen and official, and either of them can propose a bribe interchange while the other

decides whether to accept the proposal. From this experiment, we find three key results: (i) more responsibility is attributed to subjects accepting a corrupt transaction that has been proposed to them, only when they are under the label of official, (ii) officials are regarded as more responsible for corruption than citizens, and (iii) victims do not assign consistently more responsibility than bystanders. We complement the experiment with two additional treatments with a neutral framework that are outcome-equivalent to the treatments in the corruption framework, and we find that (i) subjects accepting a transaction are regarded as more responsible than subjects proposing the transaction, (ii) victims attribute more responsibility than bystanders, and, when comparing levels of attribution of responsibility in corruption vs. neutral framework, (iii) higher levels of responsibility are attributed in corruption framework than in neutral frameworks.

These findings from Chapter 3 compare with the findings from the norm-elicitation experiment in Chapter 1. In Chapter 1, when a citizen is a briber and the official the bribee, people find accepting a bribe more socially inappropriate than offering a bribe. This result aligns with the findings from Chapter 3, where the official is regarded as more responsible for corruption, especially when accepting a bribe. The common results between Chapter 1 and Chapter 3 provide a fascinating insight: social norms are in line with responsibility attribution.

The research advances contained in this thesis contribute to several strands of the literature. First, I contribute to the literature on group versus individual decisions providing further evidence on the role of responsibility and how it shapes decision-making (Schikora, 2011; Charness & Sutter, 2012; Kugler et al., 2012; Frank et al., 2015; Bodenschatz & Irlenbusch, 2019). Second, I illustrate the relevance of the scope of the externality in the domain of corruption, contributing with this to the literature studying the diffusion of externality (Andreoni, 2007; Schumacher et al., 2017; Bartling et al., 2017; Chiang & Hsu, 2019). Third, I contribute further evidence to the literature on the attribution of responsibility providing evidence on the importance of sequential-decision making, especially in the context of corruption (Duch et al., 2015; Bartling et al., 2015). Finally, and most importantly, I provide a solid understanding of a not so explored driver of decisions of corruption: responsibility. With this, I add further evidence on the determinants of corruption (Abbink et al., 2002; Fisman & Svensson, 2007; Azfar & Nelson, 2007; Barr et al., 2009; Cameron et al., 2009; Barr & Serra, 2010; Abbink et al., 2014; d'Adda et al., 2016; Christöfl et al., 2017; Salmon & Serra, 2017; Guerra & Zhuravleva, 2021; Levati & Nardi, 2022).

This thesis sheds light on the factors that affect corrupt behavior and proposes ways to address them, which can inform the development of more effective anti-corruption policies. These policies must consider the role of responsibility, the scope

of a decision's impact, and the labels attached to the decision-makers. By understanding the intricate relationships between these factors, policymakers can identify facilitators of corrupt behavior and implement policies and regulations to prevent corruption and promote ethical conduct. Moreover, law enforcement agencies can utilize these findings to comprehend the motives driving corrupt behavior and create better strategies for investigating and prosecuting those who engage in corrupt acts.

Following the findings of the three chapters in this thesis, future research could investigate the impact of different types of externalities, such as environmental or social externalities, on corrupt behavior. Additionally, exploring the role of social norms and cultural factors in shaping perceptions of responsibility and accountability for corrupt behavior could yield valuable insights for researchers and policymakers in the fight against corruption.

I conclude with a couple of methodological observations from conducting the experiments contained in this thesis. The experiment in Chapter 1 was an in-person lab experiment programmed in z-Tree (Fischbacher, 2007). The experiments in Chapter 2 and Chapter 3 were online and programmed in Lioness (Giamattei et al., 2020), which is a software that provides the flexibility of conducting online experiments. Beyond the lab/online setup, a lesson learned was that a key factor in conducting online experiments is the quality of the sample used. For all the experiments in this thesis, the sample consisted of students at the University of Nottingham that are subscribed to the well-maintained CeDEx Laboratory list using the ORSEE recruiting software (Greiner, 2015). By using a reliable sample to conduct my experiments, I ensured the quality of the data collected, primarily because, at the moment of conducting them, the online form of data collection was non-standard in corruption experiments.

Additionally, a common factor in the experiments in this thesis is that all the games were embedded in the context of corruption. This means that the instructions of the experiments contained loaded terms such as bribe and embezzle to refer to the actions, and citizens and public officials to refer to the decision-makers. I implemented contextual instructions because it was important for the experiments that participants perceived the context of their decisions as explicit rule-breaking situations. Research advances in the experimental methodology already show that context-framed instructions improve the common understanding of the decision-making environment, which is essential in sophisticated tasks or emotionally-charged contexts (i.e., corruption context) (Alekseev et al., 2017). Specific advances in the context of corruption support the idea that context-frame instructions play a relevant role in the salience of the moral costs and the sense of entitlement that surround these situations (Barr & Serra, 2009; Banerjee, 2016). In fact, in Chapter 3, we show that people understand the severity of acts of corruption and judge them accordingly.

We learn this from comparing judgments against decision-makers in bribery framework treatments to the outcome-equivalent neutral framework treatments. With this comparison, we identify that the same actions that lead to the same material outcomes are judged as more reprehensible when contextualized in a situation of corruption.

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Appendix A

Chapter 1

A.1 Theory and Parameters

I adopt and extend the model by Salmon & Serra (2017) to inform the hypotheses in Chapter 1. It is a variation of the theory presented in Cox et al. (2007) given that *it was designed to deal with other-regarding preferences where the degree to which an individual cares about the welfare of others depends upon his emotional state.* The situations of corruption I aim to investigate here are also related to state-dependent other-regarding preferences. In my case, the individual's emotional state is based on the fraction of responsibility for the final outcome that the decision-maker bears.

As stated in the main text, the underlying utility function used in the model is $u(x, y) = x^{\alpha} + \theta(y_1^{\alpha} + y_2^{\alpha})$ where x is the material payoff of the decision maker and $y_{1,2}$ is the material payoff of the other players. The parameter α measures the preference for a more equal distribution of wealth, and θ represents the weight placed on the welfare of the others. The parameter $\theta = \theta_0 + vr$ express that the decision to be corrupt depends not only on the material payoffs but also on the decision-maker's preferences represented by θ_0 and v. Where $-1 \leq \theta_0 \leq 1$ is the base degree of caring about the welfare of others and $0 \leq v \leq 1$ is the responsibility sensitivity. The parameter v measures the importance of the changes (if any) on the fraction of responsibility, r, for the outcome of a decision. This implies that the decision to be corrupt varies with the degree of responsibility a player bears for the outcome of his decision.

The situations of corruption that I focus on are bribery and embezzlement, and I implement them through three games: a bribery game (BG), a pure embezzlement game (PEG), and a modified embezzlement game (MEG) that shares the feature of only one decision-maker as the PEG and is outcome equivalent to the BG. All three games involve three players i: public official ($i = p$), citizen/other member of society 1 ($i = c/s_1$), and other member of society 2 ($i = s_2$). In the games, all players start

with an initial endowment w_i. Depending on their decisions, if corruption occurs, the public official benefits by b, the citizen/other member of society 1 benefits by m, and the other member(s) of the society suffer a loss of l.

The Bribery Game (BG)

In the BG, the private citizen can decide whether to offer a bribe, b, to the public official in exchange for a corrupt service, m. The public official decides whether to accept the bribe while the other member of society suffers a loss, l, if a bribe is offered-accepted.

The normal form of the game showing the utility of the decision makers given each strategy pair is presented in table A.1. The weight θ each player assigns to the others involved in the game is specified as follows: θ_c is the weight placed on the citizen's welfare by the public official, θ_p is the weight placed on the public official's welfare by the citizen, and θ_s is the weight placed on the other member of society's welfare by the decision-makers.

Table A.1: Bribery Game Matrix

Citizen\Official		
	Accept	Reject
Bribe	$(w_c - b + m)^\alpha + \theta_p(w_p + b)^\alpha + \theta_s(w_s - l)^\alpha$, $(w_p + b)^\alpha + \theta_c(w_c - b + m)^\alpha + \theta_s(w_s - l)^\alpha$	$(w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha$, $(w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha$
No Bribe	$(w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha$, $(w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha$	$(w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha$, $(w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha$

Lemma A.1.1 *Given* $\alpha \in (-\infty, 0) \cup (0, 1]$, $r, w_p, w_c, w_s, b, l, m$, *for each* $\theta_0 \exists\ v$ *where* $U_p(Accept|Bribe) = U_p(Reject|Bribe)$. *In the same way, for each* $\theta_0 \exists\ v$ *where* $U_c(Bribe|Accept) = U_c(NoBribe|Accept)$.

I use the same parameters as in the experiment: the initial endowment is equal for all players, $w = 100$, $b = 20$, $l = 40$, $m = 40$, and I define the conditions for corrupt behavior to happen. For the pair (Bribe, Accept) to be an optimal strategy, the conditions $(U_c(bribe) \geq U_c(NoBribe))$ for the citizen and $(U_p(Accept) \geq U_p(Reject))$ for the public official must be satisfied.

The condition for the public official is:

$$(w_p + b)^\alpha + \theta_c(w_c - b + m)^\alpha + \theta_s(w_s - l)^\alpha \geq (w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha \qquad \text{(A.1)}$$

Substituting the value of the game parameters into (A.1) yields:

$$(120)^\alpha + \theta_c(120)^\alpha + \theta_s(60)^\alpha \geq (100)^\alpha + \theta_c(100)^\alpha + \theta_s(100)^\alpha$$

$$(120)^{\alpha} + \theta_c(120)^{\alpha} - (100)^{\alpha} - \theta_c(100)^{\alpha} \geq \theta_s(100)^{\alpha} - \theta_s(60)^{\alpha}$$

$$(120^{\alpha} - 100^{\alpha}) + \theta_c(120^{\alpha} - 100^{\alpha}) \geq \theta_s(100^{\alpha} - 60^{\alpha})$$

$$(1 + \theta_c)(120^{\alpha} - 100^{\alpha}) \geq \theta_s(100^{\alpha} - 60^{\alpha})$$

$$\frac{(1 + \theta_c)(120^{\alpha} - 100^{\alpha})}{(100^{\alpha} - 60^{\alpha})} \geq \theta_s \tag{A.2}$$

Assuming that $\theta_s = \theta_0 + vr$ and $\theta_c = \theta_p = \theta_s$, expression (A.2) simplifies to:

$$\frac{(120^{\alpha} - 100^{\alpha})}{(100^{\alpha} + 100^{\alpha} - 120^{\alpha} - 60^{\alpha})} - vr \geq \theta_0 \tag{A.3}$$

The condition for the citizen is:

$$(w_c - b + m)^{\alpha} + \theta_p(w_p + b)^{\alpha} + \theta_s(w_s - l)^{\alpha} \geq (w_c)^{\alpha} + \theta_p(w_p)^{\alpha} + \theta_s(w_s)^{\alpha} \tag{A.4}$$

Substituting the value of the game parameters into (A.4) yields:

$$(120)^{\alpha} + \theta_p(120)^{\alpha} + \theta_s(60)^{\alpha} \geq (100)^{\alpha} + \theta_p(100)^{\alpha} + \theta_s(100)^{\alpha}$$

$$(120)^{\alpha} + \theta_p(120)^{\alpha} - (100)^{\alpha} - \theta_p(100)^{\alpha} \geq \theta_s(100)^{\alpha} - \theta_s(60)^{\alpha}$$

$$(120^{\alpha} - 100^{\alpha}) + \theta_p(120^{\alpha} - 100^{\alpha}) \geq \theta_s(100^{\alpha} - 60^{\alpha})$$

$$(1 + \theta_p)(120^{\alpha} - 100^{\alpha}) \geq \theta_s(100^{\alpha} - 60^{\alpha})$$

$$\frac{(1 + \theta_p)(120^{\alpha} - 100^{\alpha})}{(100^{\alpha} - 60^{\alpha})} \geq \theta_s \tag{A.5}$$

Again, if $\theta_s = \theta_0 + vr$ and $\theta_c = \theta_p = \theta_s$, this can be re-written as:

$$\frac{(120^{\alpha} - 100^{\alpha})}{(100^{\alpha} + 100^{\alpha} - 120^{\alpha} - 60^{\alpha})} - vr \geq \theta_0 \tag{A.6}$$

As can be seen, equation (A.3) and equation (A.6) are equal given the assumption of $\theta_c = \theta_p = \theta_s$. This implies that the decision to offer a bribe under the role of citizen is symmetric to the decision to accept a bribe under the role of public official. I find a condition that expresses the relationship between the shared responsibility sensitivity (v) and the base degree of caring about the welfare of the other (θ_0). Figure A.1 is defined in the area $\theta_0 + vr \leq 1$ and shows the sets of pairs (θ_0, v) under which corruption is predicted to happen by the model, assuming $\alpha = 0.075$ and $r = 0.5$.

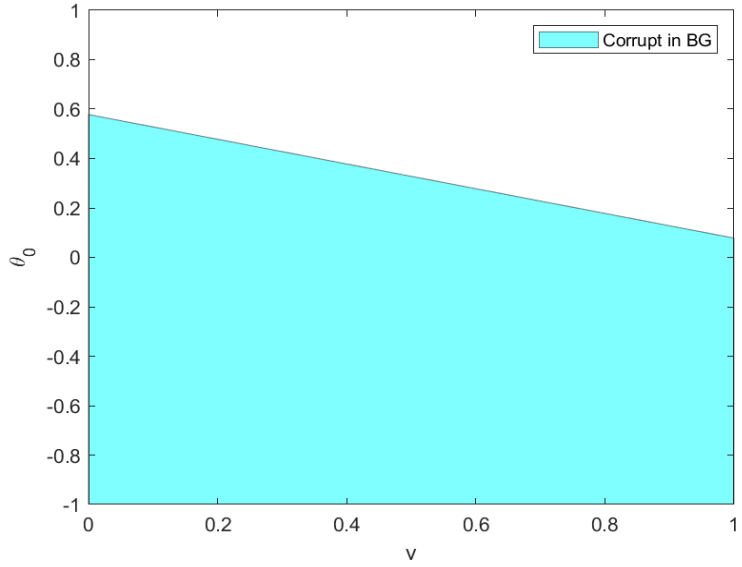


Figure A.1: Corrupt behavior in BG

Pure Embezzlement Game (PEG)

In the PEG, the public official can decide whether to embezzle money, b, from a shared account that the three individuals share and to which they contributed equally. If a public official decides to embezzle, he leaves the other members of society worse, suffering a loss of (l).

The normal form of the game using the decision maker's utility given each strategy is presented in table A.2.

Table A.2: Pure Embezzlement Game Matrix

Society\Official	
No Embezzle	Embezzle
$(w_p)^\alpha + \theta_{s_1}(w_{s_1})^\alpha + \theta_{s_2}(w_{s_2})^\alpha$	$(w_p + b)^\alpha + \theta_{s_1}(w_{s_1} - l/2)^\alpha + \theta_{s_2}(w_{s_2} - l/2)^\alpha$

Lemma A.1.2 *Given* $\alpha \in (-\infty, 0) \cup (0, 1]$, $r, w_p, w_c, w_s, b, l, m$, *for each* θ_0 $\exists$ v *where* $U_p(Embezzle) = U_p(NoEmbezzle)$.

I use the same parameters' values as in the experiment: the initial endowment is equal for all players, $w = 100$, $b = 20$, $l = 20$. For the strategy (Embezzle) to be an optimal strategy, the condition $(U_p(Embezzle) \geq U_p(NoEmbezzle))$ for the public official must be satisfied.

The condition for the public official is:

$$(w_p + b)^\alpha + \theta_{s_1}(w_{s_1} - l/2)^\alpha + \theta_{s_2}(w_{s_2} - l/2)^\alpha \geq (w_p)^\alpha + \theta_{s1}(w_{s_1})^\alpha + \theta_{s_2}(w_{s_2})^\alpha \quad \text{(A.7)}$$

Substituting the the value of the game parameters into (A.7) yields:

$$(120)^{\alpha} + \theta_{s_1}(90)^{\alpha} + \theta_{s_2}(90)^{\alpha} \geq (100)^{\alpha} + \theta_{s1}(100)^{\alpha} + \theta_{s_2}(100)^{\alpha}$$

$$(120)^{\alpha} + \theta_{s_1}(90)^{\alpha} + \theta_{s}(90)^{\alpha} \geq (100)^{\alpha} + \theta_{s_1}(100)^{\alpha} + \theta_{s}(100)^{\alpha}$$

$$(120^{\alpha} - 100^{\alpha}) + \theta_{s_1}(90^{\alpha} - 100^{\alpha}) + \geq \theta_{s}(100^{\alpha} - 90^{\alpha}) \tag{A.8}$$

Assuming that $\theta_{s_1} = \theta_{s_2} = \theta_s = \theta_0 + vr$, expression (A.8) simplifies to:

$$\frac{120^{\alpha} - 100^{\alpha}}{2(100^{\alpha} - 90^{\alpha})} - vr \geq \theta_0 \tag{A.9}$$

Equation (A.9) expresses the relationship between the shared responsibility sensitivity (v) and the base degree of caring about the welfare of the other (θ_0). Figure A.2 is defined in the area $\theta_0 + vr \leq 1$ and shows the sets of pairs (θ_0, v) for which the model predicts the public official to embezzle in the PEG, assuming $\alpha = 0.075$ and $r = 1$.

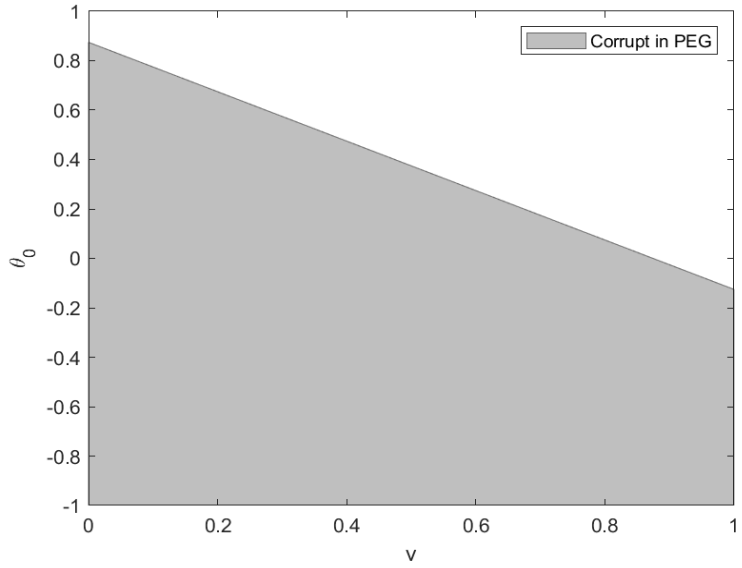


Figure A.2: Corrupt in PEG

Modified Embezzlement Game (MEG)

In the MEG, the public official can decide whether to embezzle money, b, from a shared account that the three individuals share and to which they contributed equally. If a public official decides to embezzle, he leaves the first other member of society better off by m, and the second other member of society worse off suffering a loss of l.

The normal form of the game using the decision maker's utility given each strategy is presented in table A.3.

Table A.3: Modified Embezzlement Game Matrix

Society\Official	
No Embezzle	Embezzle
$(w_p)^\alpha + \theta_{s1}(w_{s_1})^\alpha + \theta_{s_2}(w_{s_2})^\alpha$	$(w_p + b)^\alpha + \theta_{s_1}(w_{s_1} + m)^\alpha + \theta_{s_2}(w_{s_2} - l)^\alpha$

I use the same parameters' values as in the experiment: the initial endowment is equal for all players, $w = 100$, $b = 20$, $m = 20$, $l = 40$. For the strategy (Embezzle) to be an optimal strategy, the condition $(U_p(Embezzle) \geq U_p(NoEmbezzle))$ for the public official must be satisfied.

The condition for the public official is:

$$(w_p + b)^\alpha + \theta_{s_1}(w_{s_1} + b)^\alpha + \theta_{s_2}(w_{s_2} - l)^\alpha \geq (w_p)^\alpha + \theta_{s1}(w_{s_1})^\alpha + \theta_{s_2}(w_{s_2})^\alpha \quad \text{(A.10)}$$

Substituting the value of the game parameters into (A.10) yields:

$$(120)^\alpha + \theta_{s_1}(120)^\alpha + \theta_{s_2}(60)^\alpha \geq (100)^\alpha + \theta_{s1}(100)^\alpha + \theta_{s_2}(100)^\alpha$$

$$(120)^\alpha + \theta_{s_1}(120)^\alpha + \theta_{s}(60)^\alpha \geq (100)^\alpha + \theta_{s_1}(100)^\alpha + \theta_{s}(100)^\alpha$$

$$(120^\alpha - 100^\alpha) + \theta_{s_1}(120^\alpha - 100^\alpha) + \geq \theta_s(100^\alpha - 60^\alpha) \quad \text{(A.11)}$$

Assuming that $\theta_{s_1} = \theta_{s_2} = \theta_s = \theta_0 + vr$, expression (A.11) simplifies to:

$$\frac{\frac{120^\alpha - 100^\alpha}{100^\alpha - 60^\alpha}(1 + vr) - vr}{1 - \frac{120^\alpha - 100^\alpha}{100^\alpha - 60^\alpha}} \geq \theta_0 \quad \text{(A.12)}$$

Equation A.12 expresses the relationship between the shared responsibility sensitivity (v) and the base degree of caring about the welfare of the other (θ_0). Figure A.2 is defined in the area $\theta_0 + vr \leq 1$ and shows the sets of pairs (θ_0, v) for which the model predicts the public official to embezzle in the MEG, assuming $\alpha = 0.075$ and $r = 1$.

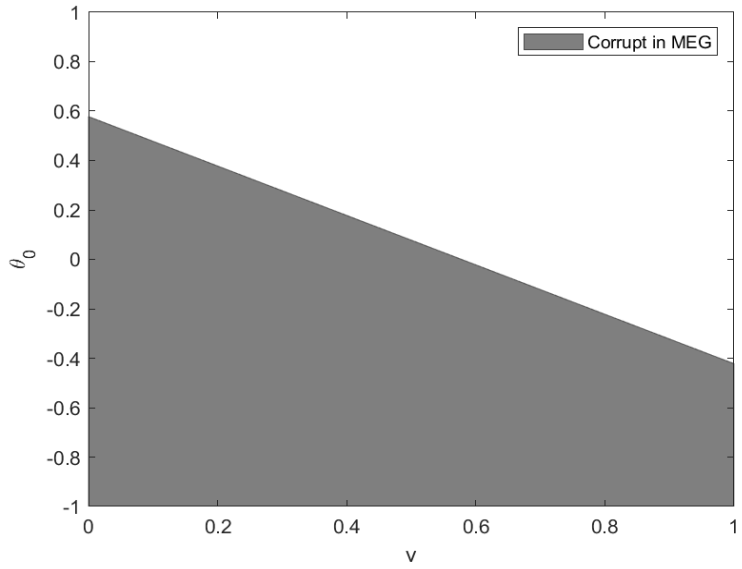


Figure A.3: Corrupt in MEG

Hypotheses

Figure A.4 shows the sets of pairs (θ_0, v) predicted by the model, assuming $\alpha = 0.075$, where corruption happens in all three games. The main predictions of my model are shown in this figure. First, the region for which subjects are corrupt in the BG is larger than the region in which subjects are corrupt in the MEG, implying that a situation of bribery leads to more corruption than an outcome equivalent situation of embezzlement given a fixed set of preference parameters (*Hypothesis 1*). Second, the area in which subjects are corrupt in the PEG is larger than the area in which subjects are corrupt in the MEG, implying that, given a fixed set of preference parameters, a situation of embezzlement that equally divides the externality between the two other members of society (a more equal distribution of wealth) leads to more corruption than a situation of embezzlement that benefits one of the other two members of society while harming with the externality the second other member of society (*Hypothesis 2*). Third, the scenarios of always being corrupt and never being corrupt are possible, given a fixed set of preference parameters. And fourth, there are unique sets of preference parameters for which a subject is indifferent between PEG and BG, and between MEG and BG.

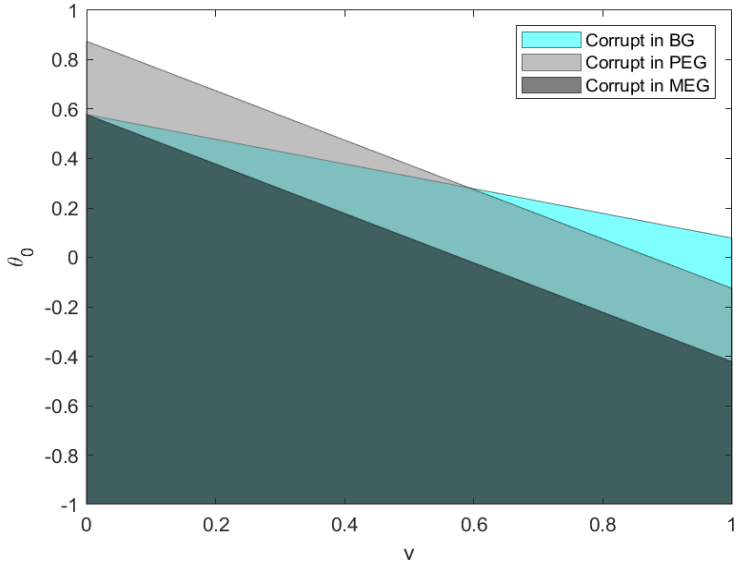


Figure A.4: Corrupt in BG-PEG-MEG

Proposition 1 *Given* $\alpha \in (-\infty, 0) \cup (0, 1]$, $r_{BG}, r_{PEG}, r_{MEG}, w_p, w_c, w_s, b, l, m$, $\exists$ *an unique pair* (θ_0, v) *where:*

- $U_p(Accept|Bribe) = U_p(Reject|Bribe)$, *and also* $U_p(Embezzle) = U_p(NoEmbezzle)$ *in the MEG.*
- $U_c(Bribe|Accept) = U_c(NoBribe|Accept)$, *and also* $U_p(Embezzle) = U_p(NoEmbezzle)$ *in the MEG.*

and $\exists$ *another unique pair* (θ_0, v) *where:*

- $U_p(Accept|Bribe) = U_p(Reject|Bribe)$, *and also* $U_p(Embezzle) = U_p(NoEmbezzle)$ *in the PEG.*
- $U_c(Bribe|Accept) = U_c(NoBribe|Accept)$, *and also* $U_p(Embezzle) = U_p(NoEmbezzle)$ *in the PEG.*

Proposition 2 *Given* $\alpha \in (-\infty, 0) \cup (0, 1]$, $r_{PEG}, r_{MEG}, w_p, w_c, w_s, b, l, m$, $\forall$ (θ_0, v) *where* $U_p(Embezzle) \geq U_p(NoEmbezzle)$ *in the MEG, then* $U_p(Embezzle) \geq U_p(NoEmbezzle)$ *in the PEG.*

Proofs

Proof for Lemma A.1.1

Given θ_0 and the condition for the public official that $U_p(Accept|Bribe) = U_p(Reject|Bribe)$, the following expression needs to be satisfied:

$$(w_p + b)^\alpha + \theta_c(w_c - b + m)^\alpha + \theta_s(w_s - l)^\alpha = (w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha \quad \text{(A.13)}$$

Assuming $\theta_p = \theta_c = \theta_s = \theta_0 + vr$, the simplification of the expression A.13 yields a v that satisfies the equality of the condition for the public official:

$$v = \left(\frac{\frac{(w_p)^\alpha - (w_p+b)^\alpha}{(w_c-b+m)^\alpha + (w_s-l)^\alpha - (w_c)^\alpha - (w_s)^\alpha} - \theta_0}{r} \right). \quad \text{(A.14)}$$

Now, given θ_0 and the condition for the citizen that $U_c(Bribe|Accept) = U_c(NoBribe|Accept)$, the following expression needs to be satisfied:

$$(w_c - b + m)^\alpha + \theta_p(w_p + b)^\alpha + \theta_s(w_s - l)^\alpha = (w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha \quad \text{(A.15)}$$

Assuming $\theta_p = \theta_c = \theta_s = \theta_0 + vr$, the simplification of the expression A.15 yields a v that satisfies the equality of the condition for the citizen:

$$v = \left(\frac{\frac{(w_c)^\alpha - (w_c-b+m)^\alpha}{(w_p+b)^\alpha + (w_s-l)^\alpha - (w_p)^\alpha - (w_s)^\alpha} - \theta_0}{r} \right). \quad \text{(A.16)}$$

Proof for Lemma A.1.2

Given θ_0 and the condition for the public official $U_{off}(Accept|Bribe) = U_{off}(Reject|Bribe)$, the following expression needs to be satisfied:

$$(w_p + b)^\alpha + \theta_{s_1}(w_{s_1} - l/2)^\alpha + \theta_{s_2}(w_{s_2} - l/2)^\alpha = (w_p)^\alpha + \theta_{s1}(w_{s_1})^\alpha + \theta_{s_2}(w_{s_2})^\alpha \quad \text{(A.17)}$$

Assuming $\theta_p = \theta_c = \theta_s = \theta_0 + vr$, the simplification of the expression A.17 yields a v that satisfies the equality of the condition for the public official:

$$v = \left(\frac{\frac{(w_p)^\alpha - (w_p+b)^\alpha}{(w_{s_1}-l/2)^\alpha + (w_{s_2}-l/2)^\alpha - (w_{s_1})^\alpha - (w_{s_1})^\alpha} - \theta_0}{r} \right). \quad \text{(A.18)}$$

Proof for Proposition 1

The conditions for the public officials $U_p(Accept|Bribe) = U_p(Reject|Bribe)$ in the BG and $U_p(Embezzle) = U_p(NoEmbezzle)$ in the MEG game, can be expressed as lines in the coordinate space (v, θ_0). The slope for the condition of the BG is $-r_{BG}$, which is the responsibility for the outcome of the BG. The slope for the condition

of the MEG is $-r_{MEG}$, which is the responsibility for the outcome of the MEG. As in the BG the responsibility for the outcome is shared between the decision-makers, and in the MEG is concentrated in the single decision-maker. It follows that the fraction of responsibility that each decision-maker bears for the outcome in each of these games differs in the following way: $r_{BG} < r_{MEG}$. Then, the expression for the intercepts of the BG and the MEG is:

$$\frac{(w_p)^\alpha - (w_p + b)^\alpha}{(w_{s_1} - l/2)^\alpha + (w_{s_2} - l/2)^\alpha - (w_{s_1})^\alpha - (w_{s_1})^\alpha} < \frac{(w_p)^\alpha - (w_p + b)^\alpha}{(w_c - b + m)^\alpha + (w_s - l)^\alpha - (w_c)^\alpha - (w_s)^\alpha} \tag{A.19}$$

The same logic applies for the comparison between the condition of the public official in the BG to the condition of the public official in the PEG. It also applies for the comparison between the condition of the citizen in the BG to the condition of the public official in the MEG and the PEG.

Proof for Proposition 2

The conditions $U_p(Embezzle) \geq U_p(NoEmbezzle)$ in the MEG and $U_p(Embezzle) \geq U - p(NoEmbezzle)$ in the PEG, can be expressed as lines in the coordinate space (v, θ_0). The slope for the condition of the MEG is $-r_{MEG}$, and the slope for the condition of the PEG is $-r_{PEG}$. As in both the MEG and the PEG the responsibility is concentrated in the single decision-maker; it follows that $-r_{MEG} = -r_{PEG}$. Then, the expression for the intercepts of the MEG and PEG is contained in the expression A.20, which means that all the area below the line of the MEG game is contained in the area below the PEG game.

$$\frac{(w_p)^\alpha - (w_p + b)^\alpha}{(w_{s_1} + b)^\alpha + (w_{s_2} - l)^\alpha - (w_{s_1})^\alpha - (w_{s_1})^\alpha} < \frac{(w_p)^\alpha - (w_p + b)^\alpha}{(w_{s_1} - l/2)^\alpha + (w_{s_2} - l/2)^\alpha - (w_{s_1})^\alpha - (w_{s_1})^\alpha} \tag{A.20}$$

A.2 Robustness of results

Probit Regression Model

The estimation of a probit model produces the same results as the Linear Probability model in the main text.

Table A.4: Probit model for the decision to act corruptly (PO)

	I	II	III	IV
BG Accept	0.098***	0.097***	0.096***	0.096***
	(0.036)	(0.036)	(0.036)	(0.036)
PEG	0.109***	0.110***	0.108***	0.108***
	(0.039)	(0.039)	(0.039)	(0.039)
BG First		-0.034	-0.045	-0.045
		(0.072)	(0.069)	(0.069)
PEG First		-0.089	-0.064	-0.064
		(0.075)	(0.072)	(0.072)
Individualist			0.315***	0.315***
			(0.057)	(0.057)
Demographic Controls	No	No	Yes	Yes
Order in BG Controls	No	No	No	Yes
N Observations	522	522	522	522
N Clusters	174	174	174	174
Pseudo R-squared	0.007	0.011	0.099	0.099

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Standard errors (in parentheses) are clustered at the individual level. Note: The dependent variable is binary and takes the value of 1 if an individual acts corruptly where the baseline is the MEG. Demographic controls include the corruption index of the country of origin, age, and gender. Order in BG controls accounts for making a decision under the role of citizen first in the BG and 0 otherwise.

A.3 Instructions - Corruption Games Experiment

General Instructions

Welcome to this experiment. Please switch your phone off.

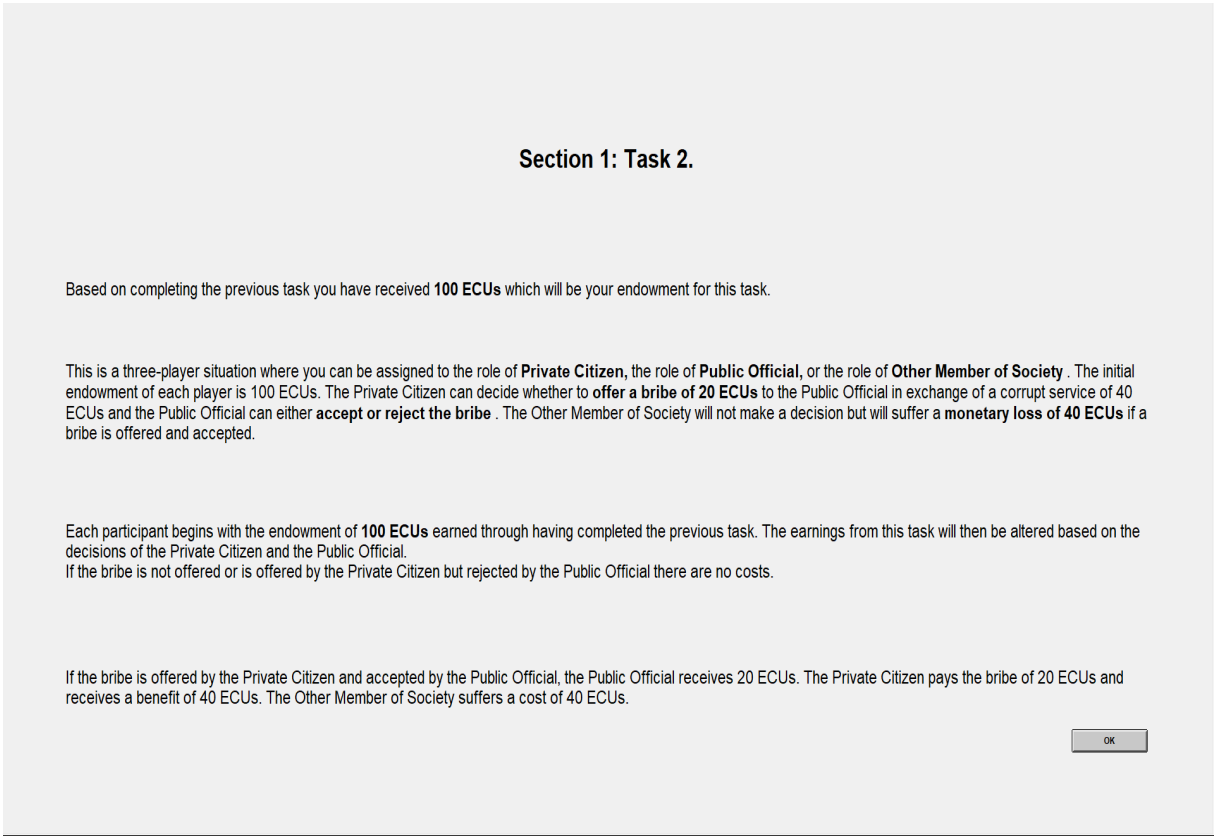
This session will take about 60 minutes. In this experiment, you will have the opportunity to earn money depending on your and other participants' decisions. All payments will be made in cash at the end of the session. Your decisions and payment will be kept strictly confidential. If you have any questions during the session, please raise your hand. One of us will come to your place and answer your question privately.

The experiment consists of six different sections and a short questionnaire. In each section, you will make one or more decisions. At the end of this session, the computer will randomly select one out of the six sections as the section-that-counts

for payment and it will be the same for all the participants in the room. Please notice that each section has the same probability of being selected.

You will see the instructions for each section on the screen in front of you. The earnings of the session are calculated in Experimental Currency Units (ECUs hereafter) and at the end of the session, the ECUs you earn will be converted to pounds according to the conversion rate: 100 ECU = £10. This payment will be added to a £2 participation fee.

Bribery Game Screens



What would be your decision in a situation where you have been randomly chosen to be a **Private Citizen** ?
Recall that based on completing the prior task you have received an endowment of 100 ECUs as well as the other players.

The payoffs that would result from the possible outcomes of the game are summarized below.

If you **Offer the bribe** and the Public Official **accepts** :
Private Citizen: 120 ECUs

Public Official: 120 ECUs

Other Member of Society: 60 ECUs

If you **Offer the bribe** and the Public Official **rejects** :
Private Citizen: 100 ECUs

Public Official: 100 ECUs

Other Member of Society: 100 ECUs

If you choose **Not to offer the bribe** regardless of the choice by the Public Official:
Private Citizen: 100 ECUs

Public Official: 100 ECUs

Other Member of Society: 100 ECUs

Please select your action [Offer Bribe of 20] [Not Offer Bribe]

What would be your decision in a situation where you have been randomly chosen to be a **Public Official** ?
Recall that based on completing the prior task you have received an endowment of 100 ECUs as well as the other players.

The payoffs that would result from the possible outcomes of the game are summarized below.

If the **bribe is offered** and you choose to **accept** :
Private Citizen: 120 ECUs

Public Official: 120 ECUs

Other Member of Society: 60 ECUs

If the **bribe is offered** and you choose to **reject** :
Private Citizen: 100 ECUs

Public Official: 100 ECUs

Other Member of Society: 100 ECUs

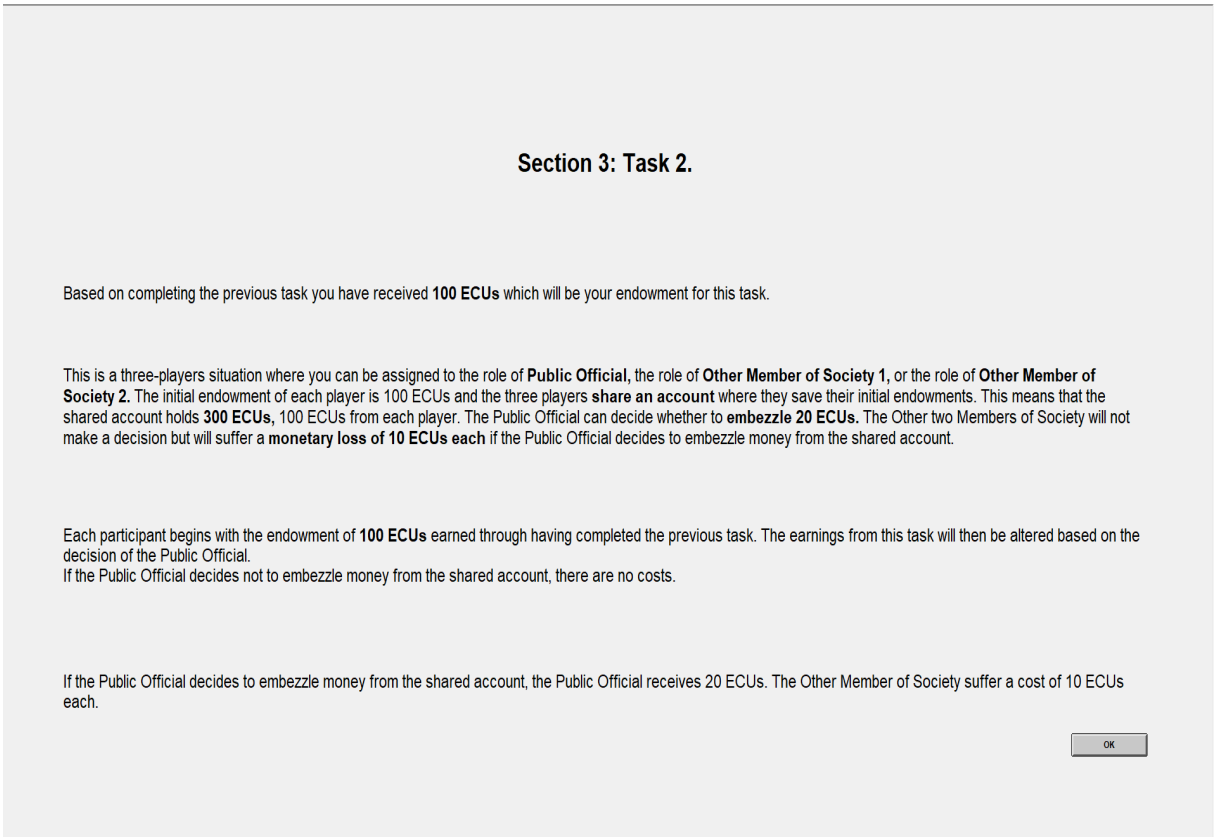
If **no bribe is offered,** the payoffs, regardless of your choice, will be:
Private Citizen: 100 ECUs

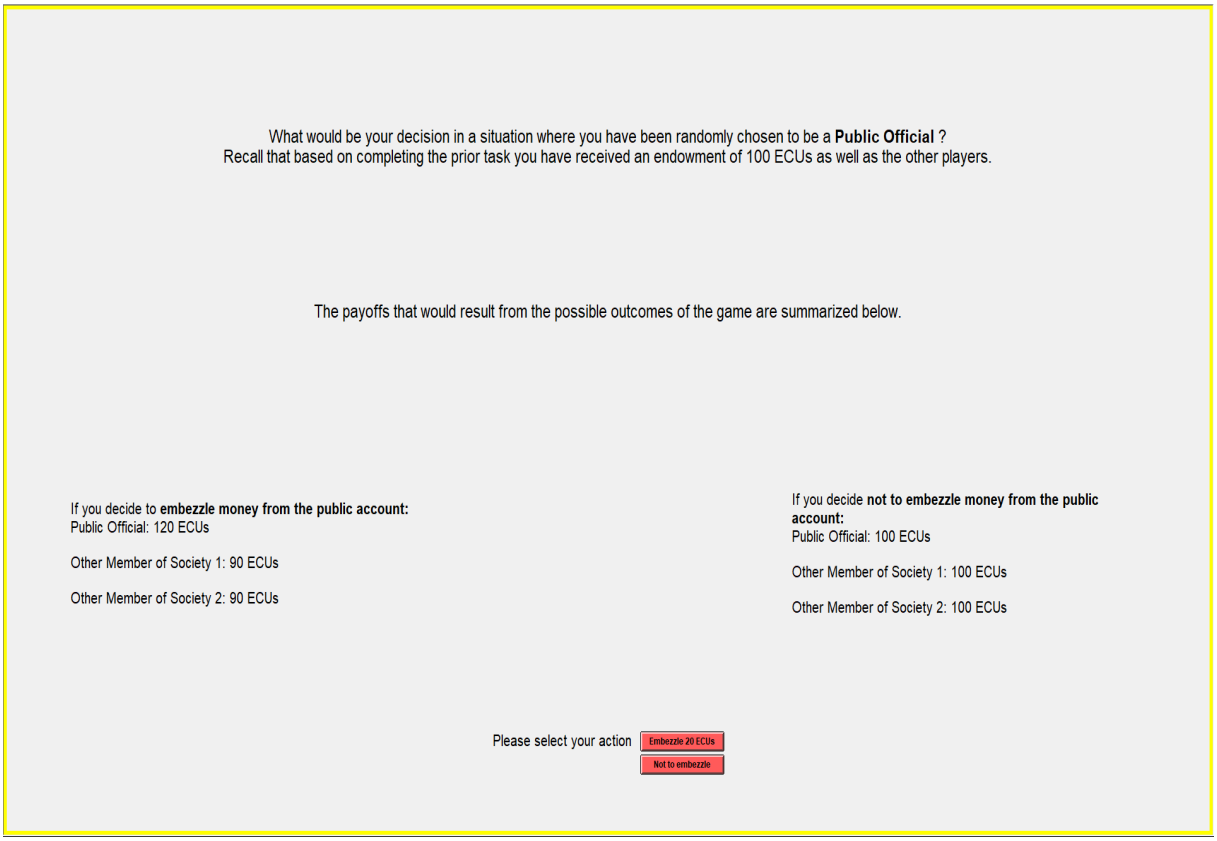
Public Official: 100 ECUs

Other Member of Society: 100 ECUs

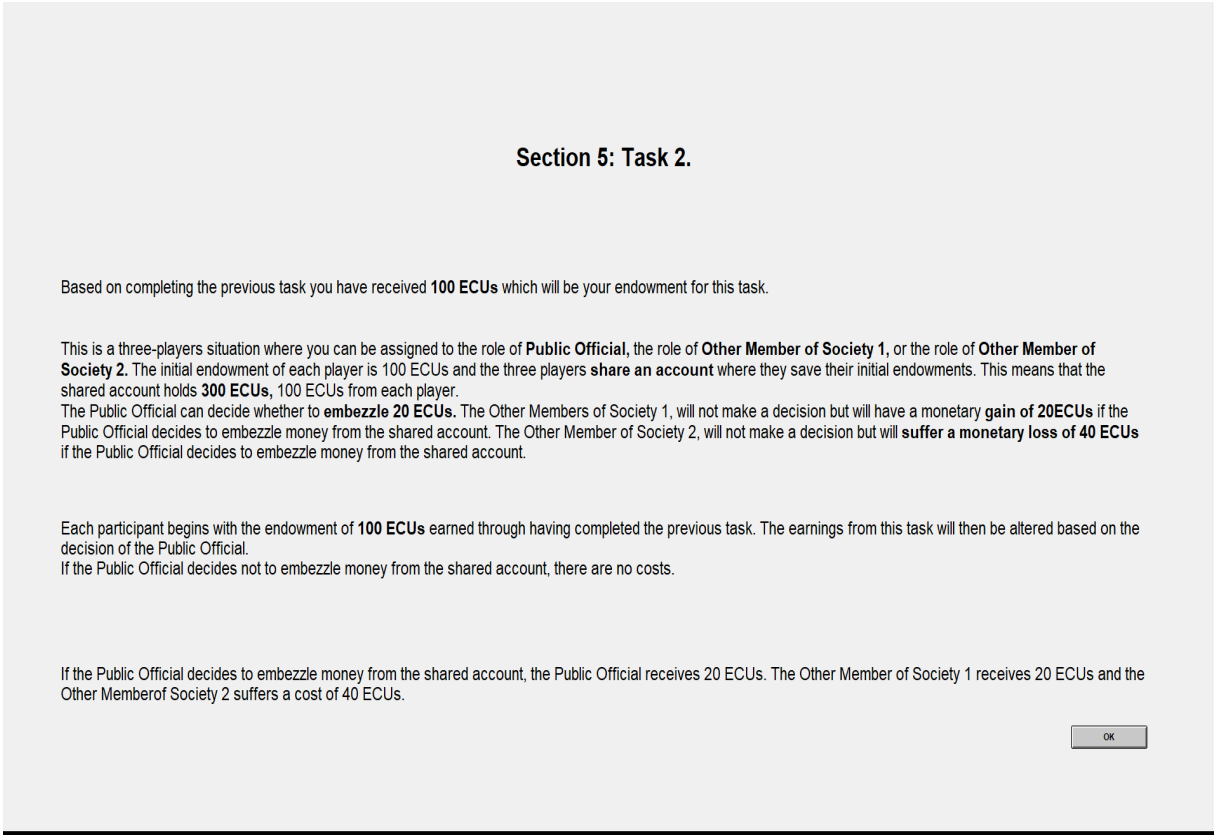
Please select your action [Accept Bribe] [Reject Bribe]

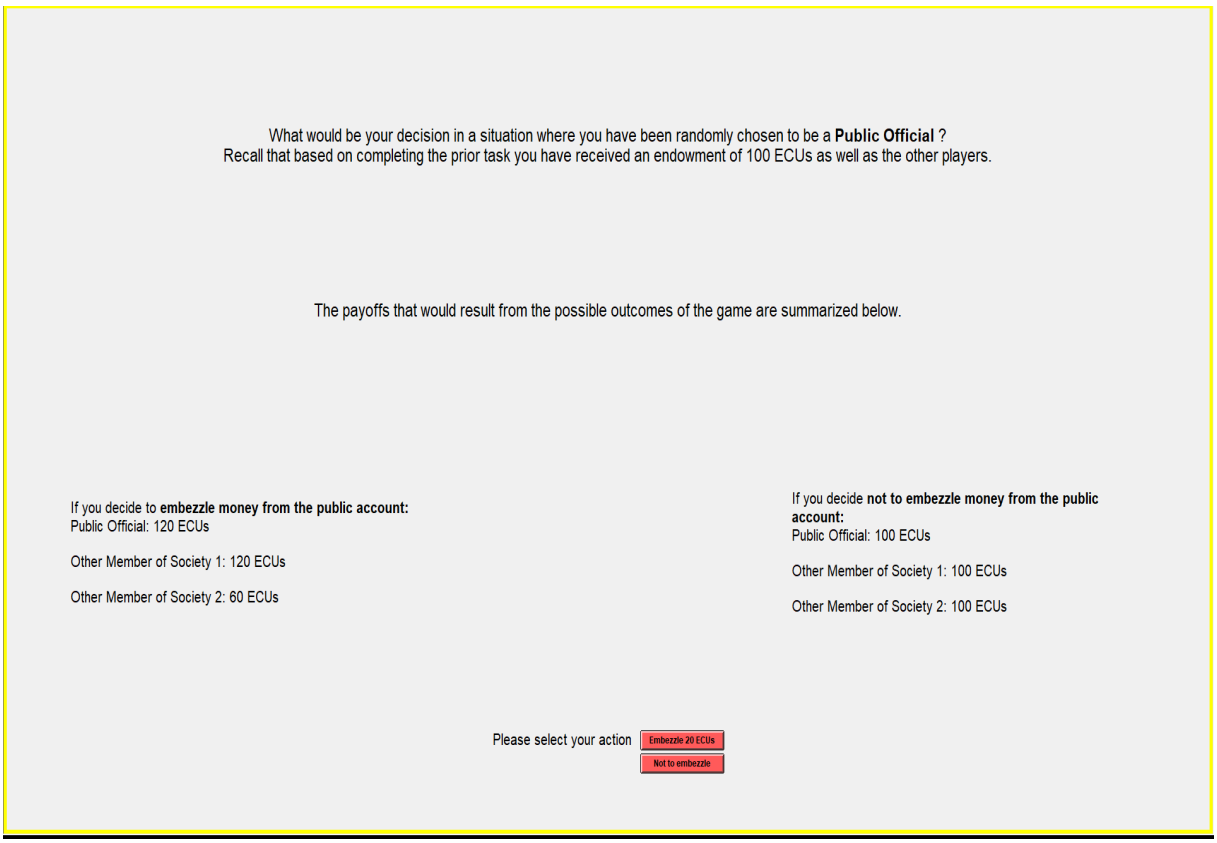
Pure Embezzlement Game Screens





Modified Embezzlement Game Screens





A.4 Instructions - Norm Elicitation Experiment

Welcome - Part 1

Thank you for taking part in this study.

For attendance purposes, we need to ask for your Student ID. This will not be linked in any way to your decisions in this study.
We will provide you with a **Secret ID** that will be your ID throughout the whole study.

Please enter your Student ID.

Continue

Welcome - Part 2

Please read the following information carefully.

You will be paid a **£1.50** participation fee if you complete the study. Additionally, you can earn up to **£2.00** depending on yours and other participants' decisions.

The study consists of **three different parts and a questionnaire**.
You will be paid only for one part, which will be selected at random at the end of the study. Each part has an equal chance of being selected.

Instructions will be provided as you go along.
Please read all instructions carefully, answer the comprehension questions, and complete the associated decision-making part.

It is important that you complete this study without any interruptions.
Please **do not close this window** or leave this webpage in any other way. If you close your browser, you will not be able to re-enter and we will not be able to pay you.

This is your **secret ID** in the experiment. Please make sure to write it down.

1006007

Please click continue to proceed.

Continue

Instructions

On the following screens, you will read descriptions of a series of situations. These descriptions correspond to situations in which a person must make a decision. These descriptions will include several possible choices available to, let's say, "Individual A".

After you read the description of a situation, you will be asked to evaluate the different possible choices available to Individual A and to decide, for each of the possible actions, whether taking that action would be “socially appropriate” and “consistent with moral or proper social behavior” or “socially inappropriate” and “inconsistent with moral or proper social behavior.”

By socially appropriate, we mean behavior that most people agree is the “correct” or “ethical” thing to do. Another way to think about what we mean is that if Individual A were to select a socially inappropriate choice, then someone else might be angry at Individual A for doing so.

In each of your responses, we would like you to answer as truthfully as possible, based on your opinions of what constitutes socially appropriate or socially inappropriate behavior.

Your earnings for this study will be computed as follows:

You will be asked to assess the possible choices in 3 different situations. At the end of the study, we will randomly select one of these 3 situations and one of the possible actions in that situation. For that random selection, we will check which response was most frequently given by the participants in this study (this is called the modal response). If you guess the modal response, you receive £2.00; otherwise, you only receive the participation fee of £1.50. In other terms, if you give the answer most frequently given by the participants in this study, then you receive another £2.00.

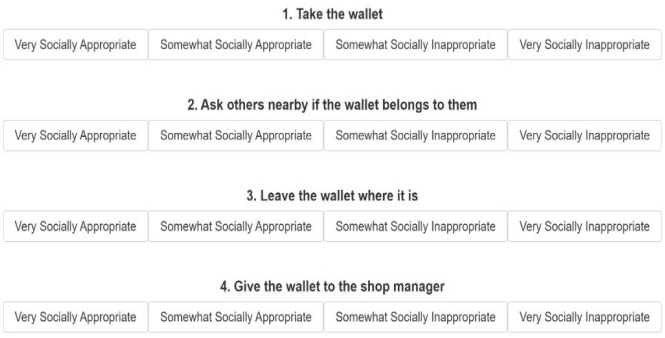
To give you an idea of how the study will proceed, we will go through an example and show you how you will indicate your responses.

Example Situation

Individual A is at a local coffee shop near campus. While there, Individual A notices that someone has left a wallet at one of the tables. Individual A must decide what to do. Individual A has four possible choices: take the wallet, ask others nearby if the wallet belongs to them, leave the wallet where it is, or give the wallet to the shop manager. Individual A can choose one of these four options.

The picture below presents a list of the possible choices available to Individual A. For each of the choices, you will be asked to indicate whether you believe choosing that option is *very socially appropriate*, *somewhat socially appropriate*, *somewhat socially inappropriate*, or *very socially inappropriate*.

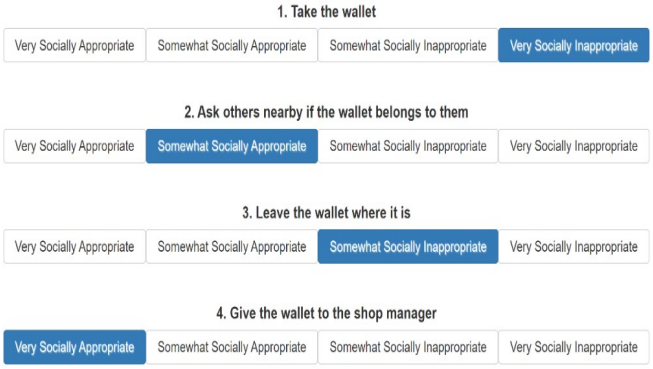
To indicate your response, you would click on the corresponding box.



If this was the situation for this study, you would consider each of the possible choices above and, for that choice, indicate the extent to which you believe taking that action would be "socially appropriate" and "consistent with moral or proper social behavior" or "socially inappropriate" and "inconsistent with moral or proper social behavior".

Recall that by socially appropriate we mean behavior that most people agree is the "correct" or "ethical" thing to do.

For example, suppose you thought that taking the wallet was very socially inappropriate, asking others nearby if the wallet belongs to them was somewhat socially appropriate, leaving the wallet where it is was somewhat socially inappropriate, and giving the wallet to the shop manager was very socially appropriate. Then you would indicate your responses as follows:



Control question

Please answer the following question. This is to check your understanding of the task. You only have 3 attempts to answer the question correctly. Otherwise, you are excluded from participating.

1. If the example situation above was the situation randomly selected for payment along with the choice of *taking the wallet*, what would your earnings be? Recall that we suppose you thought that taking the wallet was very socially inappropriate.

If the most frequently given evaluation to the choice taking the wallet was somewhat socially inappropriate, you earn another £2.00

If the most frequently given evaluation to the choice taking the wallet was very socially inappropriate, you earn another £2.00

If the most frequently given evaluation to the choice taking the wallet was somewhat socially appropriate, you earn another £2.00

Continue

Attempts left to answer the control questions: 2

Norm Elicitation Screens for Modified Embezzlement Game

Situation 1

This is a situation that involves 3 people: an official, and two other members of society that we call person 1 and person 2.

Each of them previously earned £10.00 and they share an account where they save their initial earnings. This means that the shared account holds £30.00.

The Official can decide whether to embezzle (corruptly appropriate for private use) £2.00 from the shared account. If the Official decides to embezzle, person 1 gains £2.00, and person 2 loses £4.00.

If the Official decides to embezzle, the final earning of the Official is £12.00, that of person 1 is £12.00, and that of person 2 is £6.00. Otherwise, each of them gets what they initially had, £10.00 each.

In this next screen, you will have to evaluate the possible choices of the official.

Control question

Please answer the following question. This is to check your understanding of the task. You only have 3 attempts to answer the question correctly. Otherwise, you are excluded from participating.

1. What are the final earnings if the Official decides to embezzle?

- Official:£12.00, Person 1: £12.00, Person 2: £10.00
- Official:£10.00, Person 1: £10.00, Person 2: £10.00
- Official:£12.00, Person 1: £12.00, Person 2: £6.00

Situation 1

We show all the possible choices for the official below. For each of them, indicate whether it is *very socially appropriate*, *somewhat socially appropriate*, *somewhat socially inappropriate*, or *very socially inappropriate*.

Remember:

- We are not asking what you personally think should be done, but what you think that most people find socially inappropriate or appropriate.
- If one of these choices is the one randomly selected for payment, you receive £2.00 if your answer is the one given most frequently by the other participants in this study.

1. The official decides to embezzle

Very Socially Appropriate	Somewhat Socially Appropriate	Somewhat Socially Inappropriate	Very Socially Inappropriate

2. The official does not embezzle

Very Socially Appropriate	Somewhat Socially Appropriate	Somewhat Socially Inappropriate	Very Socially Inappropriate

Continue

Norm Elicitation Screens for Pure Embezzlement Game

Situation 2

This is a situation that involves 3 people: an official, and two other members of society that we call person 1 and person 2.

Each of them previously earned £10.00 and they share an account where they save their initial earnings. This means that the shared account holds £30.00.

The Official can decide whether to embezzle (corruptly appropriate for private use) £2.00 from the shared account. If the Official decides to embezzle, each of the other two members of society loses £1.00.

If the Official decides to embezzle, the final earning of the Official is £12.00, that of person1 is £9.00, and that of person 2 is £9.00. Otherwise, each of them gets what they initially had, £10.00 each.

In this next screen, you will have to evaluate the possible choices of the official.

Control question

Please answer the following question. This is to check your understanding of the task. You only have 3 attempts to answer the question correctly. Otherwise, you are excluded from participating.

1. What are the final earnings if the Official decides to embezzle?

- Official:£12.00, Person 1: £9.00, Person 2: £9.00
- Official:£10.00, Person 1: £10.00, Person 2: £10.00
- Official:£9.00, Person 1: £9.00, Person 2: £9.00

Situation 2

We show all the possible choices for the official below. For each of them, indicate whether it is *very socially appropriate*, *somewhat socially appropriate*, *somewhat socially inappropriate*, or *very socially inappropriate*.

Remember:

- We are not asking what you personally think should be done, but what you think that most people find socially inappropriate or appropriate.
- If one of these choices is the one randomly selected for payment, you receive £2.00 if your answer is the one given most frequently by the other participants in this study.

1. The official decides to embezzle

Very Socially Appropriate	Somewhat Socially Appropriate	Somewhat Socially Inappropriate	Very Socially Inappropriate

2. The official does not embezzle

Very Socially Appropriate	Somewhat Socially Appropriate	Somewhat Socially Inappropriate	Very Socially Inappropriate

Continue

Norm Elicitation Screens for Bribery Game

Situation 3

This is a situation that involves 3 people: a citizen, an official, and another member of society. Each of them previously earned £10.00.

The citizen can decide whether to offer a bribe of £2.00 to the official in exchange for a corrupt service that will grant the citizen £4.00, and the official can either accept or reject the bribe. The other member of society will lose £4.00 if the bribe is offered and accepted.

If the bribe is offered by the citizen and accepted by the official, the final earning of the citizen is £12.00, that of the official is £12.00, and that of the other member of society is £6.00. Otherwise, each of them gets what they initially had, £10.00 each.

In this next screen, you will have to evaluate the possible choices of both the citizen and the official.

Control question

Please answer the following question. This is to check your understanding of the task. You only have 3 attempts to answer the question correctly. Otherwise, you are excluded from participating.

1. What are the final earnings if the bribe is offered and accepted?

- Citizen: £12.00, Official:£10.00, Other Member of Society: £6.00
- Citizen: £12.00, Official:£12.00, Other Member of Society: £6.00
- Citizen: £10.00, Official:£10.00, Other Member of Society: £10.00

Situation 3

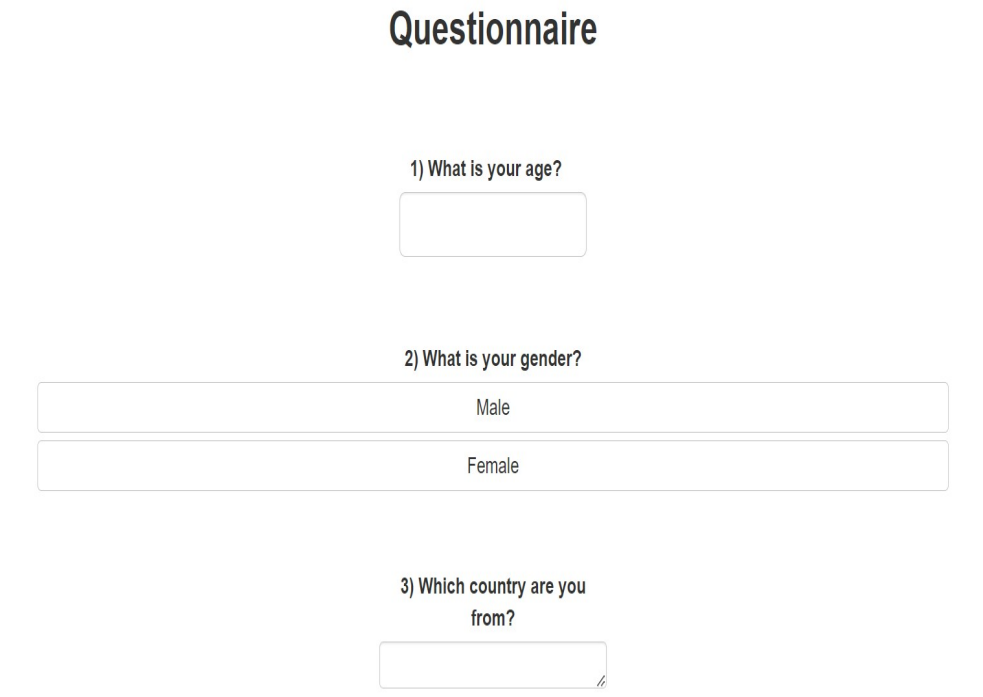
We show all the possible choices for both the citizen and the official below. For each of them, indicate whether it is *very socially appropriate*, *somewhat socially appropriate*, *somewhat socially inappropriate*, or *very socially inappropriate*.

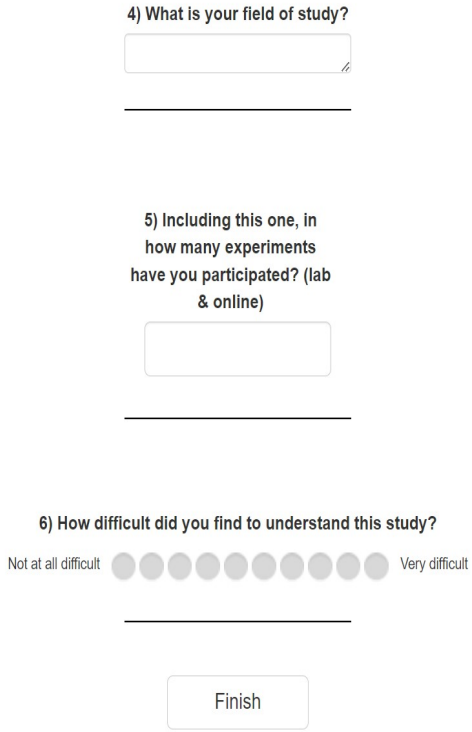
Remember:

- We are not asking what you personally think should be done, but what you think that most people find socially inappropriate or appropriate.
- If one of these choices is the one randomly selected for payment, you receive £2.00 if your answer is the one given most frequently by the other participants in this study.

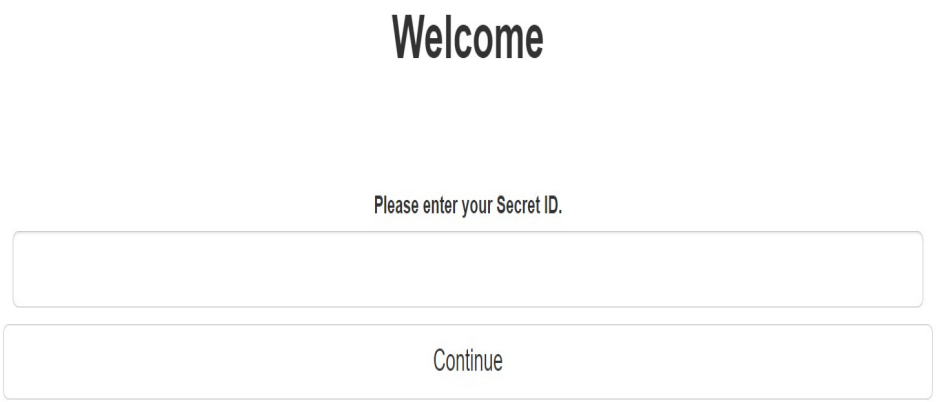


Questionnaire




4) What is your field of study?
5) Including this one, in how many experiments have you participated? (lab & online)
6) How difficult did you find to understand this study?
Not at all difficult
Very difficult
Finish

Feedback


Welcome
Please enter your Secret ID.
Continue

Your Feedback

The situation randomly selected for payment was the one that involves an official, and two other members of society that we call person 1 and person 2. These 3 people share an account with £30.00 (£10.00 from each of them), and the official can decide whether to embezzle £2.00. If the Official decides to embezzle, person 1 gains £2.00, and person 2 loses £4.00.

You evaluated two choices available to the official: embezzle, and not to embezzle.

From these two choices, the one randomly selected for payment was the choice **embezzle**.

The modal evaluation to that choice was: **Very Socially Inappropriate**

Your evaluation of that choice was: **Somewhat Socially Appropriate**

Therefore, your final payoff, including the participation fee, is (in £): **1.5**

Thank you for participating.

Appendix B

Chapter 2

B.1 Theory and Parameters

In order to make conjectures about subjects' behavior in the experiment contained in Chapter2, I conceptualize the decision-makers utility by adapting the theory presented in Cox et al. (2007). As stated in the main text, the utility function takes the form of $u(m, y) = m^{\alpha} + \theta \sum_{j=1, j\neq i}^{n} y_j^{\alpha}$ with m as the material payoff of player i and y as the material payoff of the other players. The parameter α measures the preference for a more equal distribution of wealth, and θ represents the weight placed on the welfare of the others. The parameter $\theta = \theta_0 + vr$ express that the decision to embezzle depends not only on the material payoffs but also on the decision-makers preferences represented by θ_0 and v. Where $-1 \leq \theta_0 \leq 1$ is the base degree of caring about the welfare of others and $0 \leq v \leq 1$ is the responsibility sensitivity. The parameter v measures the importance of the changes (if any) on the fraction of responsibility, r, for the outcome of a decision. This implies that the decision to be corrupt varies with the degree of responsibility a player bears for the outcome of his decision.

I focus on situations of embezzlement that differ on whether the responsibility for the outcome is concentrated in one decision-maker or shared among $n > 1$ decision-makers and on whether the externality that a decision generates is concentrated in one person or diffused among $n > 1$ people. The embezzlement games that represent these situations involve public officials (p) and citizens (c). All players start with an initial endowment of w_p for public officials and w_c for citizens. Depending on the decisions, if corruption occurs, the decision-maker(s) benefits by x, and the aggregate externality that corruption generates is nl.

CE&SR: Concentrated nl & Shared r

In the CE&SR game, n public officials can benefit each x from corruption if they

decide to embezzle, generating an externality of nl that is imposed on one citizen as the externality is concentrated. The normal form of the game showing the decision-makers utility given each strategy is presented in Table B.1.

Table B.1: CE&SR

Official\Official		
	Embezzle	No Embezzle
Embezzle	$(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+\theta(w_c-nl)^\alpha$, $(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+\theta(w_c-nl)^\alpha$	$(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha$, $(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha$
No Embezzle	$(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha$, $(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha$	$(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha$, $(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha$

For the strategy (Embezzle) to be an optimal strategy, the condition ($U(Embezzle) \geq U(NoEmbezzle)$) for the public officials must be satisfied.

The condition for the public official is:

$$(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+\theta(w_c-nl)^\alpha \geq (w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha \quad \text{(B.1)}$$

This condition simplifies to the expression B.2

$$(w_p+x)^\alpha-(w_p)^\alpha \geq (n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha-(n-1)\theta(w_p+x)^\alpha-\theta(w_c-nl)^\alpha$$

$$(w_p+x)^\alpha-(w_p)^\alpha \geq \theta((n-1)(w_p)^\alpha+(w_c)^\alpha-(n-1)(w_p+x)^\alpha-(w_c-nl)^\alpha)$$

$$\frac{(w_p+x)^\alpha-(w_p)^\alpha}{(n-1)(w_p)^\alpha+(w_c)^\alpha-(n-1)(w_p+x)^\alpha-(w_c-nl)^\alpha} \geq \theta \quad \text{(B.2)}$$

CE&CR: Concentrated nl & concentrated r

In the CE&CR game, n public officials can benefit each x from corruption if one of them decides to embezzle, generating an externality of nl that is imposed on one citizen as the externality is concentrated. The normal form of the game showing the utility of the decision-maker given each strategy is presented in Table B.2.

Table B.2: CE&CR

No Embezzle	Embezzle
$(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha$	$(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+\theta(w_c-nl)^\alpha$

For the strategy (Embezzle) to be an optimal strategy, the condition ($U(Embezzle) \geq U(NoEmbezzle)$) for the public official must be satisfied.

The condition for the public official is:

$$(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+\theta(w_c-nl)^\alpha \geq (w_p)^\alpha+(n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha \quad \text{(B.3)}$$

This condition simplifies to the expression B.4

$$(w_p+x)^\alpha-(w_p)^\alpha \geq (n-1)\theta(w_p)^\alpha+\theta(w_c)^\alpha-(n-1)\theta(w_p+x)^\alpha-\theta(w_c-nl)^\alpha$$

$$(w_p+x)^\alpha-(w_p)^\alpha \geq \theta((n-1)(w_p)^\alpha+(w_c)^\alpha-(n-1)(w_p+x)^\alpha-(w_c-nl)^\alpha)$$

$$\frac{(w_p+x)^\alpha-(w_p)^\alpha}{(n-1)(w_p)^\alpha+(w_c)^\alpha-(n-1)(w_p+x)^\alpha-(w_c-nl)^\alpha} \geq \theta \quad \text{(B.4)}$$

DE&SR: Diffused nl & Shared r

In the DE&SR game, n public officials can benefit each x from corruption if they decide to embezzle, generating an externality of nl that is diffused among n citizens. The normal form of the game showing the utility of the decision-maker given each strategy is presented in Table B.3.

Table B.3: DE&SR

Official\Official		
	Embezzle	No Embezzle
Embezzle	$(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+n\theta(w_c-l)^\alpha$, $(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+n\theta(w_c-l)^\alpha$	$(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha$, $(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha$
No Embezzle	$(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha$, $(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha$	$(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha$, $(w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha$

For the strategy (Embezzle) to be an optimal strategy, the condition ($U(Embezzle) \geq U(NoEmbezzle)$) for the public officials must be satisfied.

The condition for the public official is:

$$(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+n\theta(w_c-l)^\alpha \geq (w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha \quad \text{(B.5)}$$

This condition simplifies to the expression B.6

$$(w_p+x)^\alpha-(w_p)^\alpha \geq (n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha-(n-1)\theta(w_p+x)^\alpha-n\theta(w_c-l)^\alpha$$

$$(w_p + x)^\alpha - (w_p)^\alpha \geq \theta((n-1)(w_p)^\alpha + n(w_c)^\alpha - (n-1)(w_p + x)^\alpha - n(w_c - l)^\alpha)$$

$$\frac{(w_p + x)^\alpha - (w_p)^\alpha}{(n-1)(w_p)^\alpha + n(w_c)^\alpha - (n-1)(w_p + x)^\alpha - n(w_c - l)^\alpha} \geq \theta \tag{B.6}$$

DE&CR: Diffused nl & Concentrated r

In the CE&SR game, n public officials can benefit each x from corruption if one of them decides to embezzle, generating an externality of nl that is diffused among n citizens. The normal form of the game showing the utility of the decision-maker given each strategy is presented in Table B.4.

Table B.4: DE&CR

No Embezzle	Embezzle
$(w_p)^\alpha + (n-1)\theta(w_p)^\alpha + n\theta(w_c)^\alpha$	$(w_p + x)^\alpha + (n-1)\theta(w_p + x)^\alpha + n\theta(w_c - l)^\alpha$

For the strategy (Embezzle) to be an optimal strategy, the condition $(U(Embezzle) \geq U(NoEmbezzle))$ for the public official must be satisfied.

The condition for the public official is:

$$(w_p+x)^\alpha+(n-1)\theta(w_p+x)^\alpha+n\theta(w_c-l)^\alpha \geq (w_p)^\alpha+(n-1)\theta(w_p)^\alpha+n\theta(w_c)^\alpha \tag{B.7}$$

This condition simplifies to the expression B.8

$$(w_p + x)^\alpha - (w_p)^\alpha \geq (n-1)\theta(w_p)^\alpha + n\theta(w_c)^\alpha - (n-1)\theta(w_p + x)^\alpha - n\theta(w_c - l)^\alpha$$

$$(w_p + x)^\alpha - (w_p)^\alpha \geq \theta((n-1)(w_p)^\alpha + n(w_c)^\alpha - (n-1)(w_p + x)^\alpha - n(w_c - l)^\alpha)$$

$$\frac{(w_p + x)^\alpha - (w_p)^\alpha}{(n-1)(w_p)^\alpha + n(w_c)^\alpha - (n-1)(w_p + x)^\alpha - n(w_c - l)^\alpha} \geq \theta \tag{B.8}$$

B.2 Consistency of behavior: Relaxing $v > 0$ assumption

The Consistency of behavior section finding about the behavior of subjects that the model cannot explain suggests that there might be a type of subject with a preference for bearing the responsibility for the outcome individually instead of sharing it. This pattern comes from the observation that subjects that are not predicted by the

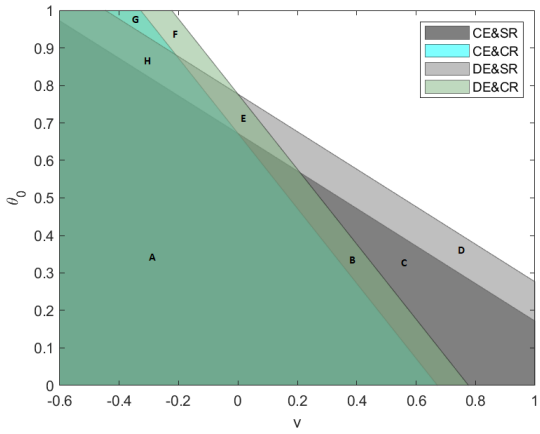
model exhibit higher rates of corruption in games with concentrated responsibility compared to games with shared responsibility.

In order to evaluate whether there are subjects with a preference for concentrated responsibility in the framework of my model, I need to re-visit the theoretical assumptions. In my model, the defined preference parameters are the base degree of caring about the welfare of the other player θ_0 with $\theta_0 > 0$, and the shared responsibility sensitivity v with $v > 0$. If I relax the assumption of $v > 0$ and allow for negative values of v, I can take into consideration preferences for concentrated responsibility.

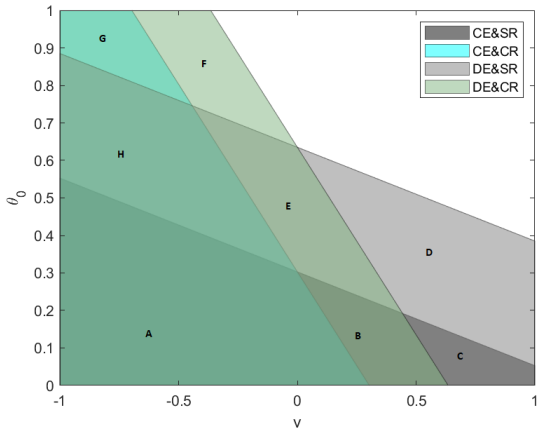
Next, I present an exercise where I analyze the consistency of subjects' behavior again, allowing for $-1 < v < 1$. I show graphically the combination of decisions that are in the space of my preferences parameters in Figure B.1. The colored regions show the combination of preference parameters for which an individual decides to be corrupt in each game in $n = 2$ (panel a), $n = 4$ (panel b), and $n = 6$ (panel c). Table B.5 classifies the new regions that emerge in addition to the preexisting ones and shows the percentage of the exhibited behavior under each size of n that this extension to the model can explain. With the new $-1 < v < 1$ assumption, an additional 12.11% of the sample for $n = 2$, 11.52% for $n = 4$, and 10.07% for $n = 6$ can be explained. Table B.5 also shows the previous total of behavior explained under the original assumption of the model ($v > 0$), and a global total accounting for the percentage explained by the original model plus the additional percentage explained by the extension.

Table B.5: Decisions explained by the model with $-1 < v < 1$

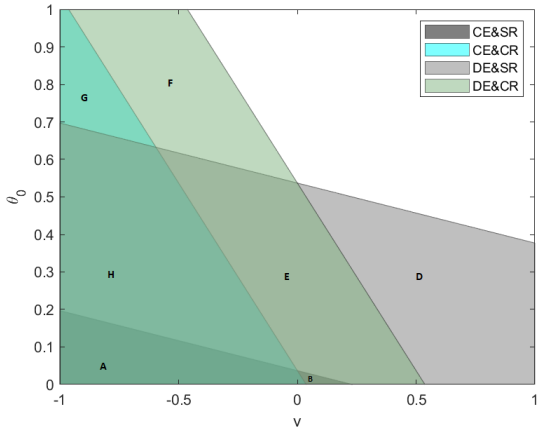
Region	**DE&SR**	**DE&CR**	**CE&SR**	**CE&CR**	$n = 2$	$n = 4$	$n = 6$
F		✓			6.06%	5.38%	3.10%
G		✓		✓	3.78%	2.30%	1.55%
H	✓	✓		✓	2.27%	3.84%	5.42%
Total new regions					**12.11%**	**11.52%**	**10.07%**
Total with $v > 0$					**76.50%**	**79.20%**	**74.40%**
Global Total					**88.61%**	**90.72%**	**84.47%**



(a) $n = 2$



(b) $n = 4$



(c) $n = 6$

Figure B.1: Model Predictions for each n with $-1 < v < 1$

B.3 The DE Game

I implement the DE game to further explore the effect of the diffusion of externality. The theoretical model derivation for this game is as following.

DE: Diffused l & Concentrated r

In the DE game, one public official can benefit by x from corruption if he decides to embezzle, generating an externality of l that is diffused among n citizens. The normal form of the game showing the utility of the decision-maker given each strategy is presented in Table B.6.

Table B.6: DE

No Embezzle	Embezzle
$(w_p)^\alpha + n\theta(w_c)^\alpha$	$(w_p + x)^\alpha + n\theta(w_c - l/n)^\alpha$

For the strategy (Embezzle) to be an optimal strategy, the condition $(U(Embezzle) \geq U(NoEmbezzle))$ for the public official must be satisfied.

The condition for the public official is:

$$(w_p + x)^\alpha + n\theta(w_c - l/n)^\alpha \geq (w_p)^\alpha + n\theta(w_c)^\alpha \tag{B.9}$$

This condition simplifies to the expression B.10

$$(w_p + x)^\alpha - (w_p)^\alpha \geq n\theta(w_c)^\alpha - n\theta(w_c - l/n)^\alpha$$

$$(w_p + x)^\alpha - (w_p)^\alpha \geq \theta(n(w_c)^\alpha - n(w_c - l/n)^\alpha)$$

$$\frac{(w_p + x)^\alpha - (w_p)^\alpha}{n(w_c)^\alpha - n(w_c - l/n)^\alpha} \geq \theta \tag{B.10}$$

As Table B.7 shows, in this game one public official is matched with n citizens, the size of the aggregated externality is x, and each citizen in the group endures a fraction n of the externality.

Table B.7: Payoffs Parameters

Embezzlement Game	# Decision Makers	# Officials Benefit	# Citizens Hurt	$Payoff_p$	$Payoff_c$
DE	1	1	n	$w + x$ each	$w - x/n$ each

The DE game can be conceived as a game of diffusion of externality with concentrated responsibility as there is only one decision-maker. Still, it is not directly comparable to the DE&CR game from the main 2x2 design. There are two differences between DE and DE&CR. In both DE and DE&CR the responsibility is

concentrated because there is only one decision-maker, but in DE, only that public official benefits from his decision, while in DE&CR, all the public officials in the group benefit. Also, in both DE and DE&CR the externality is diffused because the impact is divided between the n citizens in the group, but the aggregate externality differs. In DE&CR, given that in that game there are n public officials per group, the aggregate externality is nx, while in DE, there is only one public official per group, making the aggregate externality only x. Table B.8 show the the mean propensity of subjects to embezzle in the DE game in the pooled by n sample and in the groups with different sizes of n: $n = 2$, $n = 4$, and $n = 6$.

Table B.8: The propensity to embezzle in DE game by size of n

	Pooled	$n = 2$	$n = 4$	$n = 6$	$n = 2$ to $n = 4$	$n = 2$ to $n = 6$	$n = 4$ to $n = 6$
DE	0.54	0.53	0.554	0.558	-0.024	-0.028	-0.004

B.4 Robustness of Results

Regression Tables for the shared responsibility

Table B.9 and Table B.10 are the regressions tables showing the coefficients for all controls for the estimations of the effect of diffusion of externality under shared responsibility and concentrated responsibility respectively. No control shows significance in a systematic way.

Table B.9: Probit regression for the decision to embezzle in CE&SR and DE&SR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&SR	0.038	0.037	0.107**	0.111***	0.220***	0.218***
	(0.039)	(0.038)	(0.042)	(0.041)	(0.048)	(0.048)
Index		0.287***		0.268***		0.287***
		(0.013)		(0.022)		(0.023)
Guilt		-0.001		-0.006		-0.008
		(0.006)		(0.008)		(0.006)
Shame		-0.007		-0.003		0.009
		(0.009)		(0.011)		(0.008)
Risk		0.027**		0.019		-0.023*
		(0.013)		(0.012)		(0.012)
Difficulty		0.017		0.010		0.026
		(0.016)		(0.016)		(0.022)
Gender	0.007	-0.046	0.116	-0.031	0.024	0.065
	(0.078)	(0.060)	(0.074)	(0.067)	(0.068)	(0.057)
Age	0.009	0.004	-0.024**	-0.007	-0.018*	-0.009
	(0.012)	(0.009)	(0.010)	(0.008)	(0.010)	(0.008)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.002	0.325	0.031	0.292	0.052	0.279

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&SR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Table B.10: Probit regression for the decision to embezzle in CE&CR and DE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&CR	0.150***	0.151***	0.122***	0.122***	0.190***	0.184***
	(0.041)	(0.040)	(0.041)	(0.040)	(0.046)	(0.045)
Index		0.271***		0.244***		0.300***
		(0.014)		(0.021)		(0.021)
Guilt		-0.013**		-0.012*		0.013**
		(0.006)		(0.007)		(0.006)
Shame		0.019**		0.008		-0.026***
		(0.008)		(0.011)		(0.008)
Risk		-0.019		-0.030***		0.025*
		(0.013)		(0.012)		(0.013)
Difficulty		-0.003		0.007		-0.013
		(0.016)		(0.012)		(0.019)
Gender	0.001	0.035	0.172**	0.131**	-0.017	-0.091*
	(0.076)	(0.057)	(0.072)	(0.062)	(0.071)	(0.055)
Age	0.006	0.004	-0.023**	-0.009	-0.019**	-0.003
	(0.011)	(0.008)	(0.011)	(0.008)	(0.009)	(0.007)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.017	0.320	0.045	0.320	0.042	0.303

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&CR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Regression Tables for the shared responsibility

Table B.11 and Table B.12 are the regressions tables showing the coefficients for all controls for the estimations of the effect of shared responsibility under diffusion of externality and concentrated externality respectively. No control shows significance in a systematic way.

Table B.11: Probit regression for the decision to embezzle in DE&SR and DE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&SR	-0.076*	-0.080**	0.023	0.028	0.031	0.031
	(0.039)	(0.038)	(0.040)	(0.039)	(0.041)	(0.041)
Index		0.267***		0.256***		0.207***
		(0.014)		(0.028)		(0.037)
Guilt		-0.015**		-0.009		0.000
		(0.007)		(0.007)		(0.009)
Shame		-0.003		0.012		-0.014
		(0.010)		(0.010)		(0.011)
Risk		0.002		-0.034**		0.001
		(0.012)		(0.014)		(0.016)
Difficulty		0.026*		0.018		0.023
		(0.015)		(0.018)		(0.026)
Gender	0.022	0.006	0.075	0.001	0.013	-0.019
	(0.077)	(0.060)	(0.077)	(0.065)	(0.077)	(0.076)
Age	0.019	0.023**	-0.032***	-0.029**	-0.014	-0.006
	(0.012)	(0.010)	(0.011)	(0.011)	(0.011)	(0.009)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.012	0.322	0.031	0.259	0.009	0.123

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the DE&CR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Table B.12: Probit regression for the decision to embezzle in CE&SR and CE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
CE&SR	0.038	0.036	0.039	0.038	-0.001	-0.001
	(0.039)	(0.038)	(0.037)	(0.036)	(0.043)	(0.042)
Index		0.284***		0.227***		0.175***
		(0.015)		(0.021)		(0.032)
Guilt		-0.002		-0.013**		0.007
		(0.007)		(0.006)		(0.008)
Shame		0.017*		-0.004		-0.012
		(0.009)		(0.009)		(0.010)
Risk		0.004		0.019		-0.004
		(0.013)		(0.014)		(0.016)
Difficulty		-0.008		0.008		0.007
		(0.014)		(0.017)		(0.026)
Gender	-0.015	-0.011	0.211***	0.113*	-0.006	-0.032
	(0.078)	(0.059)	(0.070)	(0.061)	(0.072)	(0.071)
Age	-0.003	-0.013	-0.016	0.008	-0.024**	-0.020**
	(0.014)	(0.012)	(0.010)	(0.008)	(0.010)	(0.008)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.001	0.293	0.041	0.280	0.022	0.131

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&CR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

Regression Tables for the diffusion of externality vs. shared responsibility

Table B.13 is the regression table showing the coefficients for all controls for the estimations of the comparison between diffusion of externality and shared responsibility. No control shows significance in a systematic way.

Table B.13: Probit regression for the decision to embezzle in CE&SR and DE&CR

Variables	Decision to embezzle (0/1)					
	n=2	*n=2*	*n=4*	*n=4*	*n=6*	*n=6*
DE&CR	0.113***	0.111***	0.084*	0.087*	0.191***	0.184***
	(0.042)	(0.041)	(0.047)	(0.046)	(0.044)	(0.043)
Index		0.315***		0.290***		0.290***
		(0.008)		(0.011)		(0.024)
Guilt		-0.010		-0.006		-0.002
		(0.006)		(0.005)		(0.006)
Shame		-0.009		-0.004		-0.004
		(0.007)		(0.007)		(0.009)
Risk		-0.018*		-0.002		-0.020
		(0.011)		(0.010)		(0.014)
Difficulty		-0.006		0.013		0.012
		(0.010)		(0.014)		(0.021)
Gender	-0.003	-0.012	0.142**	0.023	0.077	0.132**
	(0.075)	(0.046)	(0.070)	(0.045)	(0.071)	(0.060)
Age	0.013	0.011*	-0.028**	-0.013	-0.021**	-0.015*
	(0.011)	(0.006)	(0.011)	(0.009)	(0.011)	(0.009)
Exo. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes	No	Yes
Observations	264	264	260	260	258	258
Pseudo R2	0.013	0.425	0.037	0.392	0.054	0.282

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Probit for the decision to embezzle (marginal effects reported in the table) with the CE&SR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment.

The effect of n

Here I show how the effect of the diffusion of externality evolves the more the externality is diffused (when n increases) by estimating linear probability models that account for the interactions between the changes in the propensity to embezzle when the externality is diffused instead of concentrated and the changes in the size of n. I only conduct this exercise for the effect of diffusion of externality and not for shared responsibility, as in the latter, I found no effect in the main analysis. I start with Table B.14 where I show the balance for all control variables among the three sizes of n.

Table B.14: Balance Control variables by size of n

	$n=2$		$n=4$		$n=6$		Diff	Diff	Diff
	N	Mean	N	Mean	N	Mean	$n=2$ to $n=4$	$n=2$ to $n=6$	$n=4$ to $n=6$
Guilt	132	21.77	130	21.26	129	21.01	0.511	0.757	0.246
Shame	132	24.4	130	23.99	129	24	0.409	0.394	-0.015
Risk	132	6.08	130	6.3	129	5.96	-0.224	0.122	0.346
Difficulty	132	2.35	130	2.23	129	1.84	0.118	0.511**	0.394**
Gender	132	0.47	130	0.49	129	0.39	-0.023	0.074	0.097
Age	132	21.93	130	21.83	129	21.65	0.101	0.28	0.18

Next, I analyze the effect of diffusion of externality under shared responsibility. Table B.15 reports estimates from a linear probability model for the pooled sample by n where the dependent variable is the decision to embezzle, the base is the CE&SR game, and it is compared to the DE&SR game. In column I, I include dummy variables for $n = 4$ and $n = 6$; in column II, I include interactions between the different sizes of n and DE&SR; and in column III, I include further endogenous controls. From column I, the average embezzlement rate is higher in DE&SR than in CE&SR, showing a higher propensity to engage in corruption when the externality is diffused. From column II, I check the general effect of being in a specific size of n. The sum $\beta_{n4}+\beta_{DEn4}$ = -0.017 is not significantly different from 0, therefore, there are not specific effects for $n = 4$. Then, there are not specific effects for $n = 6$ either as the sum $\beta_{n6}+\beta_{DEn6} = 0.066$ is not significantly different from 0. The effect of diffusion of externality for $n = 2$ is not significant, and it is given by β_{DE}. Now, I analyze the effect of diffusion of externality for a specific n compared to the baseline $n = 2$. The embezzlement rate of diffusion of externality increases with $n = 4$ compared to $n = 2$ (the sum $\beta_{DE}+\beta_{DEn4} = 0.108$ is significantly different from 0 at 5% level). The same is true for $n = 6$. The embezzlement rate of diffusion of externality increases with $n = 6$ compared to $n = 2$ (the sum $\beta_{DE}+\beta_{DEn6}$ = 0.225 is significantly different from 0 at 1% level). With this, I confirm that, under a condition of shared responsibility, diffusing the externality leads to a higher willingness to embezzle than concentrating it, and this effect increases the more the externality is diffused (when n increases). These results continue to hold for the specification in column III.

Table B.15: LPM regression for the decision to embezzle in CE&SR and DE&SR

Variables	Decision to embezzle (0/1)		
	I	II	III
DE&SR (β_{DE})	0.123***	0.038	0.038
	(0.026)	(0.039)	(0.040)
$n = 4$ (β_{n4})	-0.052	-0.087	-0.021
	(0.054)	(0.061)	(0.048)
$n = 6$ (β_{n6})	-0.028	-0.121**	-0.074
	(0.052)	(0.060)	(0.049)
DE&SR $\times$ $n = 4$ (β_{DEn4})		0.070	0.070
		(0.058)	(0.058)
DE&SR $\times$ $n = 6$ (β_{DEn6})		0.187***	0.187***
		(0.065)	(0.065)
Index			0.330***
			(0.019)
Guilt			-0.004
			(0.004)
Shame			-0.001
			(0.005)
Risk			0.007
			(0.007)
Difficulty			0.019*
			(0.011)
Gender	0.044	0.044	-0.007
	(0.043)	(0.043)	(0.036)
Age	-0.012**	-0.012**	-0.002
	(0.005)	(0.005)	(0.004)
Constant	0.656***	0.698***	0.211
	(0.127)	(0.128)	(0.169)
Exo. Controls	Yes	Yes	Yes
Endo. Controls	No	No	Yes
Observations	782	782	782
Clusters (subjects)	391	391	391
R2	0.025	0.031	0.351
$\beta_{n4} + \beta_{DEn4} = 0$		[0.7772]	[0.3308]
$\beta_{DE} + \beta_{DEn4} = 0$		[0.0121]	[0.0124]
$\beta_{n6} + \beta_{DEn6} = 0$		[0.2906]	[0.0312]
$\beta_{DE} + \beta_{DEn6} = 0$		[0.0000]	[0.0000]

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: LPM for the decision to embezzle with the CE&SR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment. p -values reported in squared parentheses correspond to Wald tests of hypotheses on the parameters of the regression model.

Next, I analyze the effect of diffusion of externality under concentrated responsibility. Table B.16 reports estimates from a linear probability model for the pooled sample by n where the dependent variable is the decision to embezzle, the base is the CE&CR game, and it is compared to the DE&CR game. In column I, I include dummy variables for $n = 4$ and $n = 6$; in column II, I include interactions between the different sizes of n and DE&CR; and in column III, I include further endogenous controls. From column I, the average embezzlement rate is higher in DE&CR than in

CE&CR, showing a higher propensity to engage in corruption when the externality is diffused. From column II, I check the general effect of being in a specific size of n. The sum β_{n4}+β_{DEn4} = -0.116 is significantly different from 0 at 10% level, therefore, being in $n = 4$ leads to smaller rates of embezzlement. Then, there are not specific effects for $n = 6$ as the sum β_{n6}+β_{DEn6} = 0.042 is not significantly different from 0. The effect of diffusion of externality for $n = 2$ is given by $\beta_{DE} = 0.152$ is significantly different from 0 at 1% level. Now, I analyze the effect of diffusion of externality for a specific n compared to the baseline $n = 2$. The embezzlement rate of diffusion of externality decreases with $n = 4$ compared to $n = 2$ (the sum β_{DE}+β_{DEn4} = 0.124 is significantly different from 0 at 1% level and β_{DE}+β_{DEn4}¡β_{DE}). The opposite is true for $n = 6$. The embezzlement rate of diffusion of externality increases with $n = 6$ compared to $n = 2$ (the sum β_{DE}+β_{DEn6} = 0.194 is significantly different from 0 at 1% level and β_{DE}+β_{DEn6}¿β_{DE}). These results continue to hold for the specification in column III.

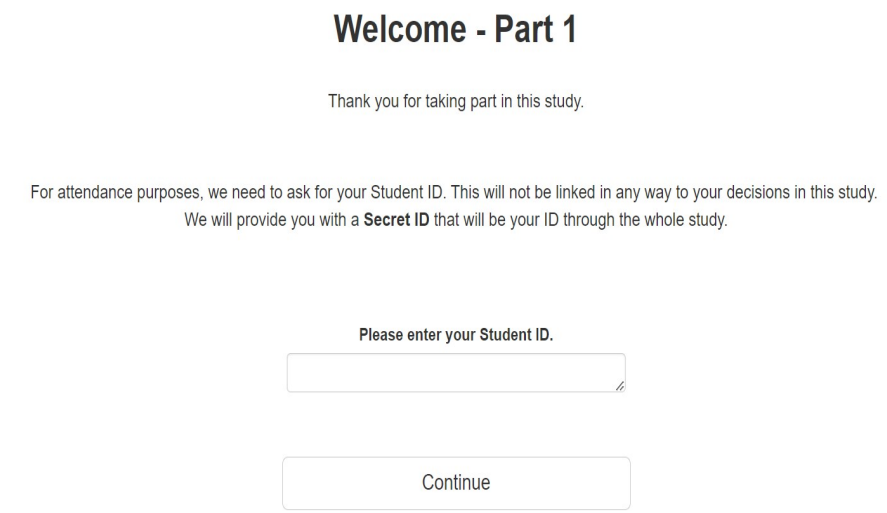
Table B.16: LPM regression for the decision to embezzle in CE&CR and DE&CR

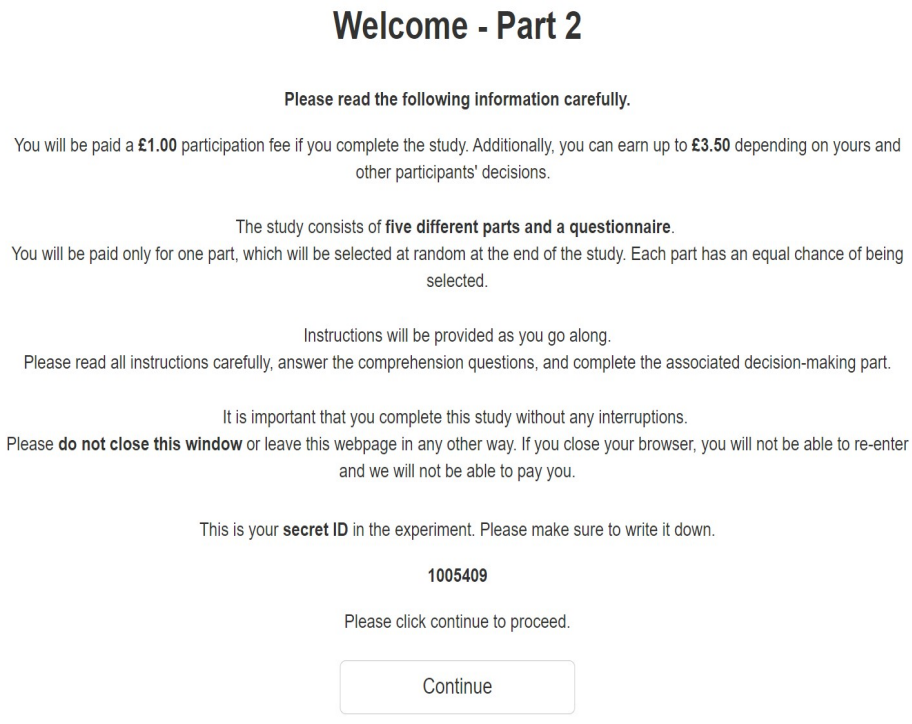
Variables	Decision to embezzle (0/1)		
	I	II	III
DE&CR (β_{DE})	0.156***	0.152***	0.152***
	(0.026)	(0.042)	(0.043)
$n = 4$ (β_{n4})	-0.102*	-0.088	-0.054
	(0.053)	(0.060)	(0.049)
$n = 6$ (β_{n6})	-0.061	-0.083	-0.069
	(0.052)	(0.060)	(0.052)
DE&CR $\times$ $n = 4$ (β_{DEn4})		-0.028	-0.028
		(0.060)	(0.060)
DE&CR $\times$ $n = 6$ (β_{DEn6})		0.042	0.042
		(0.065)	(0.065)
Index			0.328***
			(0.019)
Guilt			-0.004
			(0.004)
Shame			0.001
			(0.005)
Risk			-0.008
			(0.007)
Difficulty			-0.003
			(0.010)
Gender	0.050	0.050	0.028
	(0.043)	(0.043)	(0.035)
Age	-0.011**	-0.011**	-0.003
	(0.005)	(0.005)	(0.004)
Constant	0.645***	0.647***	0.296*
	(0.124)	(0.126)	(0.156)
Exo. Controls	Yes	Yes	Yes
Endo. Controls	No	No	Yes
Observations	782	782	782
Clusters (subjects)	391	391	391
R2	0.040	0.041	0.352
$\beta_{n4} + \beta_{DEn4} = 0$		[0.0592]	[0.0966]
$\beta_{DE} + \beta_{DEn4} = 0$		[0.0039]	[0.0040]
$\beta_{n6} + \beta_{DEn6} = 0$		[0.5152]	[0.5829]
$\beta_{DE} + \beta_{DEn6} = 0$		[0.0001]	[0.0001]

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: LPM for the decision to embezzle with the CE&SR game as base. Robust standard errors clustered at the subject level shown in parentheses. Exogenous controls include gender and age. Endogenous controls include self-evaluations of risk aversion, guilt, shame, and difficulty of the experiment. p -values reported in squared parentheses correspond to Wald tests of hypotheses on the parameters of the regression model.

B.5 Instructions

The experimental instructions were the same for all sizes of n, where the only variation was the group size (that varies with n). To avoid repetition, here I only include the screens corresponding to the groups with $n = 4$.





Instructions

Each of the five parts of this study has two tasks, an encryption task, and a decision-making task.

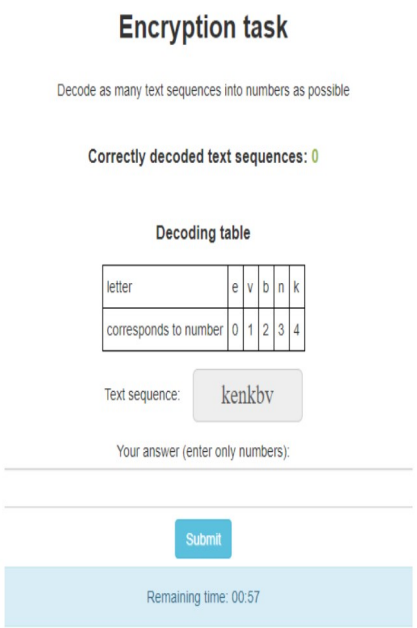
Below are the instructions for the encryption task. You will see the instructions for the decision-making task after you complete the encryption task in each part.

The Encryption Task

You will be given sequences of **random** letters. An example of such a sequence can be seen below. These have to be decoded into numbers with the given decoding table. For each text sequence, the decoding table changes.

You will have 2 minutes to correctly decode 2 text sequences into numbers. Note that each letter must be decoded correctly. After entering the decoded text sequence, hit the submit button. Subsequently, irrespective of whether the text sequence was decoded correctly or not, a new text sequence and a new decoding table will appear.

If you decode 2 text sequences correctly you will earn 120 points to use in the corresponding part.
The conversion rate is 120 points = £3.00.



In the example, you can see the text sequence *kenkbv*. The decoding table tells you that e=0, v=1,... This means that you have to decode *kenkbv* into *403421* and enter this numeric value into the answer field.

Control questions

Please answer the following 2 questions. This is to check your understanding of the task. You only have 2 attempts to answer them all correctly. Otherwise, you are excluded from participating.

1. What is the aim of the encryption task?

- Write meaningful words from the given letters.
- Decode the letters into numbers.
- Reorder the letters according to the alphabet.
- Assign a value to each letter and calculate the total value.

Which of the following statements is false?

- There are 5 parts.
- If you decode 2 text sequences correctly you will earn 120 points.
- For each text sequence, the decoding table changes.
- You have as much time as you want to decode the text sequences.

Continue

Attempts left to answer the control questions: 2

Part 1 : Encryption Task

Decode text sequences into numbers

Correctly decoded text sequences: 0

Decoding table

letter	k	i	f	b	r
corresponds to number	0	1	2	3	4

Text sequence: frrbbb

Your answer (enter only numbers):

Submit

Remaining time: 01:55

Your performance

You earned **120 points** which you can use in the next task.

The decision-making Task

You are part of a society of 24 participants where 12 are Public Officials and the other 12 are Citizens.

Each participant earned 120 points in the previous task; which means that the society has, in total, 2880 points.

You will make decisions as if you were a Public Official and at the end of the study you will be randomly assigned to one of the two roles.

Within the society, you are part of a group formed by **YOU, 3 OTHER OFFICIALS, and 4 CITIZENS**.

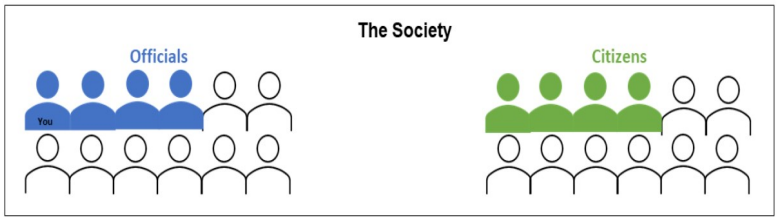
You can decide whether to **embezzle (corruptly appropriate for private use) 20 points** from the Citizens.

Please click continue to proceed.

Continue

Part 1 : Decision-Making Task

Each member of the society earned **120 points** in the previous task.
You and 3 other Officials are matched to 4 Citizens.
You can **embezzle (corruptly appropriate for private use)** from the 4 Citizens.
You and 3 other Officials each get **20 points** from your decision to **embezzle.**



Your options are:

EMBEZZLE

If you **embezzle**, earnings are:

You: 140 points
Other Officials (each): 140 points
Citizens (each): 100 points

Society: 2880 points

NOT TO EMBEZZLE

If you **don't embezzle**, earnings are:

You: 120 points
Other Officials (each): 120 points
Citizens (each): 120 points

Society: 2880 points

No matter what the other Officials decide, if YOU decide to **embezzle,** embezzlement is implemented.

If YOU decide **NOT TO embezzle**, embezzlement is not implemented.

What is your decision?

NOT TO EMBEZZLE	EMBEZZLE 20 POINTS

Continue

CE&SR Game

Your performance

You earned **120 points** which you can use in the next task.

The decision-making Task

You are part of a society of 24 participants where 12 are Public Officials and the other 12 are Citizens.

Each participant earned 120 points in the previous task; which means that the society has, in total, 2880 points.

You will make decisions as if you were a Public Official and at the end of the study you will be randomly assigned to one of the two roles.

Within the society, you are part of a group formed by **YOU, 3 OTHER OFFICIALS, and 1 CITIZEN**.

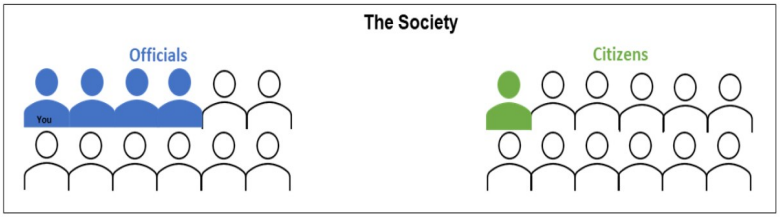
You can decide whether to **embezzle (corruptly appropriate for private use) 20 points** from the Citizen.

Please click continue to proceed.

Continue

Part 2 : Decision-Making Task

Each member of the society earned **120 points** in the previous task.
You and 3 other Officials are matched to 1 Citizen.
You and 3 other Officials can **embezzle (corruptly appropriate for private use)** from the Citizen.
You and 3 other Officials each get **20 points** from the decision to **embezzle.**



Your options are:

EMBEZZLE

If you and the 3 other Officials **embezzle**, earnings are:

You: 140 points
Other Officials (each): 140 points
Citizen: 40 points

Society: 2880 points

NOT TO EMBEZZLE

If you or any of the 3 other Officials **don't embezzle**, earnings are:

You: 120 points
Other Officials (each): 120 points
Citizen: 120 points

Society: 2880 points

If you and the 3 other Officials decide to **embezzle,** embezzlement is implemented.

If **one** of the Officials (including you) decides **NOT TO embezzle**, embezzlement is not implemented.

What is your decision?

EMBEZZLE 20 POINTS	NOT TO EMBEZZLE

Continue

DE Game

Your performance

You earned **120 points** which you can use in the next task.

The decision-making Task

You are part of a society of 24 participants where 12 are Public Officials and the other 12 are Citizens.

Each participant earned 120 points in the previous task; which means that the society has, in total, 2880 points.

You will make decisions as if you were a Public Official and at the end of the study you will be randomly assigned to one of the two roles.

Within the society, you are part of a group formed by **YOU and 4 CITIZENS**.

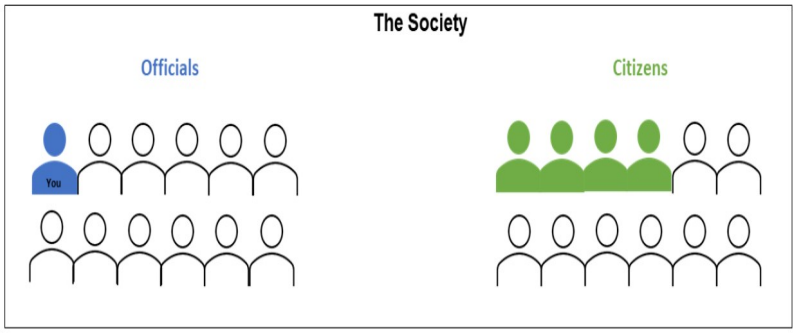
You can decide whether to **embezzle (corruptly appropriate for private use) 20 points** from the Citizens.

Please click continue to proceed.

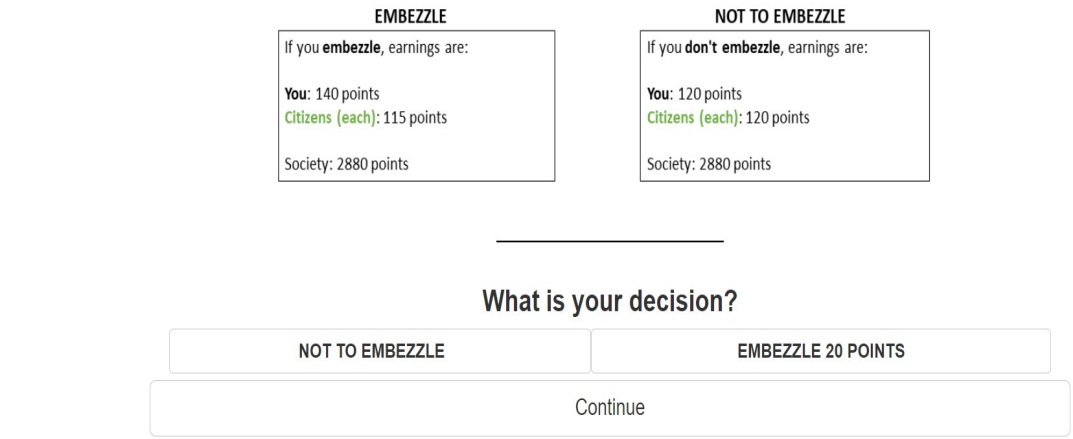
Continue

Part 3 : Decision-Making Task

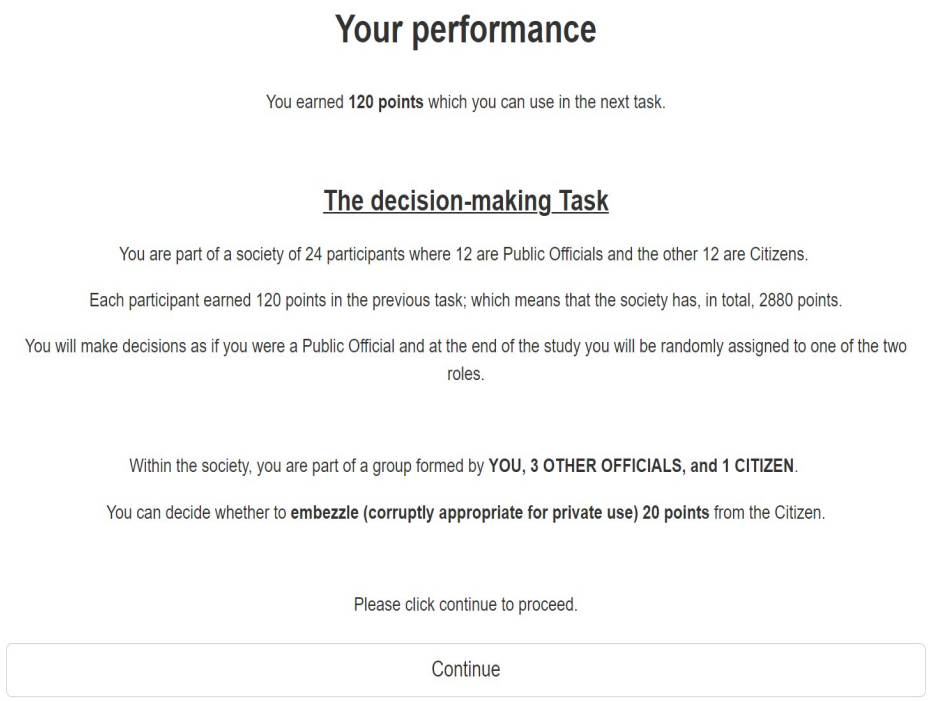
Each member of the society earned **120 points** in the previous task.
You are an Official matched to 4 Citizens.
You can **embezzle (corruptly appropriate for private use) 20 points** from the 4 Citizens.



Your options are:

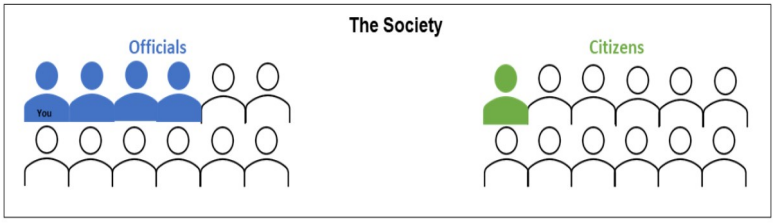

EMBEZZLE
If you embezzle, earnings are:
You: 140 points
Citizens (each): 115 points
Society: 2880 points
NOT TO EMBEZZLE
If you don't embezzle, earnings are:
You: 120 points
Citizens (each): 120 points
Society: 2880 points
What is your decision?
NOT TO EMBEZZLE
EMBEZZLE 20 POINTS
Continue

CE&CR Game


Your performance
You earned 120 points which you can use in the next task.
The decision-making Task
You are part of a society of 24 participants where 12 are Public Officials and the other 12 are Citizens.
Each participant earned 120 points in the previous task; which means that the society has, in total, 2880 points.
You will make decisions as if you were a Public Official and at the end of the study you will be randomly assigned to one of the two roles.
Within the society, you are part of a group formed by YOU, 3 OTHER OFFICIALS, and 1 CITIZEN.
You can decide whether to embezzle (corruptly appropriate for private use) 20 points from the Citizen.
Please click continue to proceed.
Continue

Part 4 : Decision-Making Task

Each member of the society earned **120 points** in the previous task.
You and 3 other Officials are matched to 1 Citizen.
You can **embezzle (corruptly appropriate for private use)** from the Citizen.
You and 3 other Officials each get **20 points** from your decision to **embezzle.**



Your options are:

EMBEZZLE

If you **embezzle**, earnings are:

You: 140 points
Other Officials (each): 140 points
Citizen: 40 points

Society: 2880 points

NOT TO EMBEZZLE

If you **don't embezzle**, earnings are:

You: 120 points
Other Officials (each): 120 points
Citizen: 120 points

Society: 2880 points

No matter what the other Officials decide, if YOU decide to **embezzle,** embezzlement is implemented.

If YOU decide **NOT TO embezzle**, embezzlement is not implemented.

What is your decision?

NOT TO EMBEZZLE	EMBEZZLE 20 POINTS

Continue

Your performance

You earned **120 points** which you can use in the next task.

The decision-making Task

You are part of a society of 24 participants where 12 are Public Officials and the other 12 are Citizens.

Each participant earned 120 points in the previous task; which means that the society has, in total, 2880 points.

You will make decisions as if you were a Public Official and at the end of the study you will be randomly assigned to one of the two roles.

Within the society, you are part of a group formed by **YOU, 3 OTHER OFFICIALS, and 4 CITIZENS**.

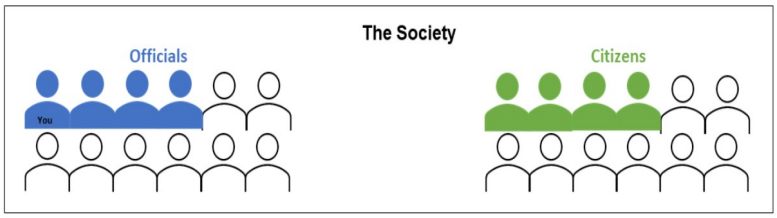
You can decide whether to **embezzle (corruptly appropriate for private use) 20 points** from the Citizens.

Please click continue to proceed.

Continue

Part 5 : Decision-Making Task

Each member of the society earned **120 points** in the previous task.
You and 3 other Officials are matched to 4 Citizens.
You and 3 other Officials can **embezzle (corruptly appropriate for private use)** from the 4 Citizens.
You and 3 other Officials each get **20 points** from the decision to **embezzle.**



Your options are:

EMBEZZLE

If you and the 3 other Officials **embezzle**, earnings are:

You: 140 points
Other Officials (each): 140 points
Citizens (each): 100 points

Society: 2880 points

NOT TO EMBEZZLE

If you or any of the 3 other Officials **don't embezzle**, earnings are:

You: 120 points
Other Officials (each): 120 points
Citizens (each): 120 points

Society: 2880 points

If you and the 3 other Officials decide to **embezzle**, embezzlement is implemented.

If **one** of the Officials (including you) decides **NOT TO embezzle**, embezzlement is not implemented.

What is your decision?

NOT TO EMBEZZLE	EMBEZZLE 20 POINTS

Continue

Questionnaire

Questionnaire - Part 1/2

In this questionnaire you will read about situations that people are likely to encounter in day-to-day life, followed by common reactions to those situations. As you read each scenario, try to imagine yourself in that situation. Then indicate the likelihood that you would react in the way described. Please answer each statement by indicating your likelihood ranging from **Very Unlikely** to **Very Likely**.

1) After realizing you have received too much change at a store, you decide to keep it because the salesclerk doesn't notice. What is the likelihood that you would feel uncomfortable about keeping the money?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

2) You rip an article out of a journal in the library and take it with you. Your teacher discovers what you did and tells the librarian and your entire class. What is the likelihood that this would make you would feel like a bad person?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

3) You give a bad presentation at work. Afterwards your boss tells your coworkers it was your fault that your company lost the contract. What is the likelihood that you would feel incompetent?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

4) You secretly commit a felony. What is the likelihood that you would feel remorse about breaking the law?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

5) You successfully exaggerate your damages in a lawsuit. Months later, your lies are discovered and you are charged with perjury. What is the likelihood that you would think you are a despicable human being?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

6) You make a mistake at work and find out a coworker is blamed for the error. Later, your coworker confronts you about your mistake. What is the likelihood that you would feel like a coward?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

7) At a coworker's housewarming party, you spill red wine on their new cream-colored carpet. You cover the stain with a chair so that nobody notices your mess. What is the likelihood that you would feel that the way you acted was pathetic?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

8) You lie to people but they never find out about it. What is the likelihood that you would feel terrible about the lies you told?

Very Unlikely ○ ○ ○ ○ ○ ○ ○ Very Likely

Continue

Questionnaire - Part 2/2

1) Please indicate, in general, how willing or unwilling you are to take risks?

Please use a scale from 0 to 10, where 0 means '*Completely unwilling* to take risks' and a 10 means you are '*Very willing* to take risks'.

Pick a response from 0 to 10 to indicate below where you fall on this scale.

Completely unwilling ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ Very willing

1) What is your age?

2) What is your gender?

Male

Female

3) Which country are you from?

4) What is your field of study?

How difficult did you find to understand this study?

Not at all difficult Very difficult

Finish

You have completed this study and you will be paid the participation fee of **£1.00** plus your additional earnings in the part selected for payment.

As we mentioned in the invitation email, **we are going to pay you via PayPal**. Please enter below your email address associated with PayPal and **make sure there are no typos**. We won't be able to pay you if you provide an incorrect email account.

We will pay you today.

Please enter your email address associated with PayPal:

This is your **secret ID** in the experiment. Please make sure to write it down.

1005409

Thank you for participating.

Feedback

Your Feedback

The task selected for payment was the one where, within the society, you were part of a group formed by **4 OFFICIALS and 1 CITIZEN**. In this task, for embezzlement to be implemented, **ALL** Officials had to decide to embezzle.

Your role was: **Official 1**

Your decision was: **Embezzle**

The decision of Official 2 in your group was: **Not to Embezzle**

The decision of Official 3 in your group was: **Embezzle**

The decision of Official 4 in your group was: **Not to Embezzle**

Therefore, you earned (in points): **120**

Your final payoff, including the participation fee, is (in £): **4**

Thank you for participating.

Your Feedback

The task selected for payment was the one where, within the society, you were part of a group formed by **4 OFFICIALS and 1 CITIZEN**. In this task, for embezzlement to be implemented, **ALL** Officials had to decide to embezzle.

Your role was: **Official 4**

Your decision was: **Not to Embezzle**

The decision of Official 1 in your group was: **Embezzle**

The decision of Official 2 in your group was: **Not to Embezzle**

The decision of Official 3 in your group was: **Embezzle**

Therefore, you earned (in points): **120**

Your final payoff, including the participation fee, is (in £): **4**

Thank you for participating.

Appendix C

Chapter 3

C.1 Order analysis

The average judgment (left: first in order; right: second) in each of the treatments, and comparisons by this order (ranksum tests) are, for proposers and responders is contained in Table C.1. We find no significant order effects.

Table C.1: Order Analysis

Proposer	VJ	BJ
CP	−6.16 (=) −5.24	−4.08 (=) −5.83
	(0.304)	(0.128)
OP	−5.20 (=) −5.74	−5.66 (=) −5.74
	(0.493)	(0.656)
NP	−3.80 (=) −3.08	−0.04 (=) 1.11
	(0.845)	(0.537)
Responder	VJ	BJ
CP	−7.60 (=) −6.84	−5.50 (=) −7.04
	(0.124)	(0.133)
OP	−6.08 (=) −5.61	−5.13 (=) −4.19
	(0.391)	(0.974)
NP	−5.04 (=) −3.88	−1.26 (=) 0.57
	(0.381)	(0.252)

C.2 Analysis of the other scenarios

We start by checking the consistency of judgments. Recall that judgments can take integer values from -9, corresponding to a red angry facial expression in the slider, to 9, corresponding to a green happy facial expression in the slider. Figure C.1 shows the mean of judgment in each treatment for all possible scenarios, from left to right, Propose/Accept (P/A), Propose/Reject (P/R), Not propose/Accept (NP/A), Not propose/Reject (NP/R). We find evidence of intuitive patterns, that is, decisions

to propose or accept the transaction receive on average negative judgments; while decisions of not to propose or reject receive positive judgments. We also find evidence suggesting that neutral-label treatments produce milder judgment.

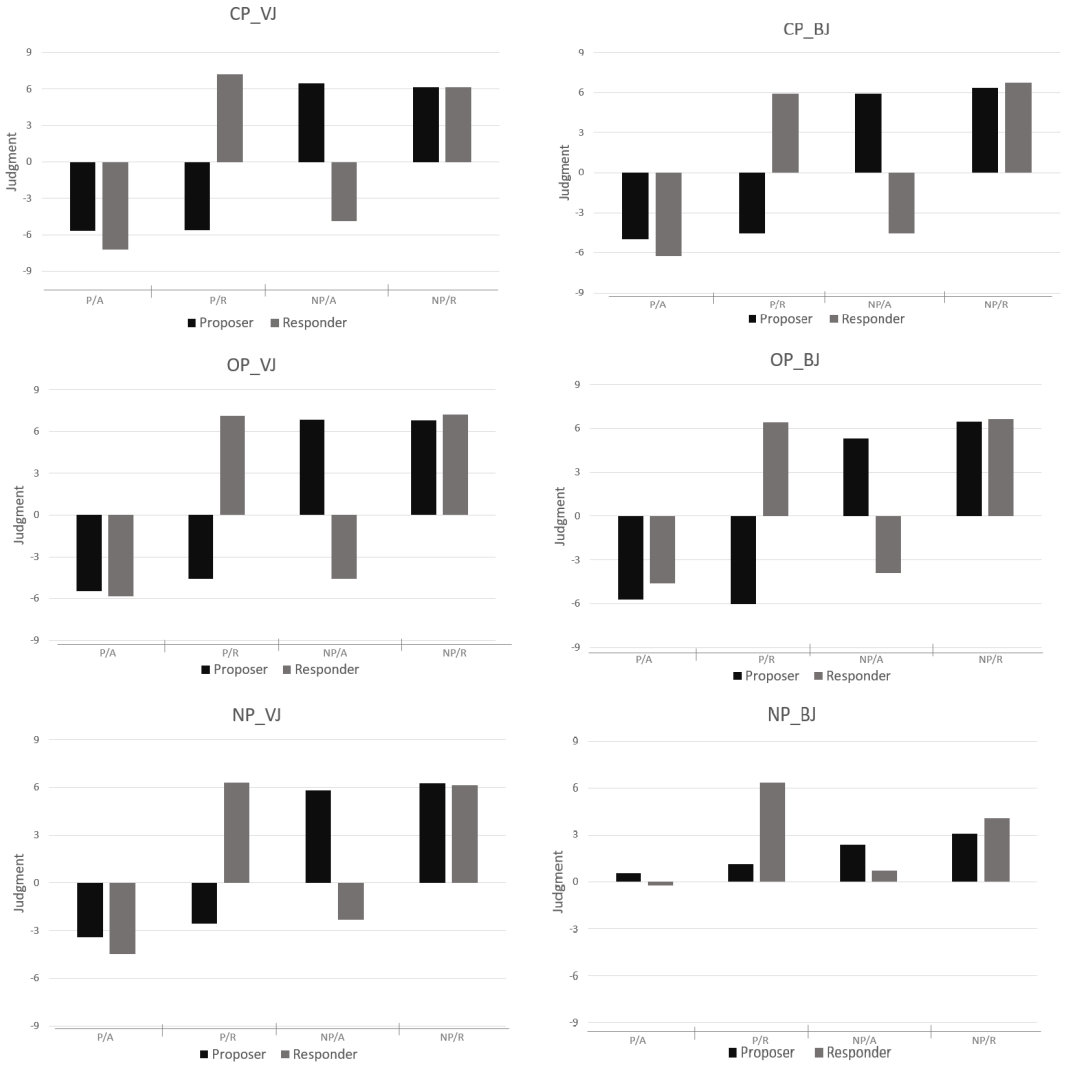


Figure C.1: Mean of Judgment Decisions per treatment

C.3 Beliefs about judgment decisions

Table C.2 shows the average beliefs about judgment decisions in P/A (left: proposer, right: responder), separated by role:

Table C.2: Beliefs about judgment decisions in P/A

		VJ	BJ
Proposers	NP	$-4.62, -5.80$	$-0.18, -1.35$
	CP	$-6.27, -6.76$	$-4.28, -5.42$
	OP	$-6.06, -5.28$	$-5.20, -4.42$
		VJ	BJ
Responders	NP	$-5.20, -6.58$	$-1.48, -2.18$
	CP	$-5.71, -7.30$	$-4.63, -6.06$
	OP	$-7.08, -5.41$	$-5.37, -4.37$
		VJ	BJ
Victims	NP	–	$0.47, -0.41$
	CP	–	$-4.87, -5.56$
	OP	–	$-4.08, -5.17$
		VJ	BJ
Bystanders	NP	$-4.65, -6.93$	–
	CP	$-6.98, -7.72$	–
	OP	$-6.89, -7.08$	–
		VJ	BJ
Total beliefs	NP	$-4.82, -6.42$	$-0.89, -1.30$
	CP	$-6.32, -7.26$	$-4.59, -5.68$
	OP	$-6.66, -5.91$	$-4.89, -4.65$
		VJ	BJ
Actual	NP	$-3.44, -4.46$	$0.58, -0.25$
	CP	$-5.7, -7.22$	$-4.95, -6.27$
	OP	$-5.45, -5.85$	$-5.70, -4.62$

C.4 Effects on the "responsibility" variable

Table C.3: OLS regression for responsibility variable in corruption-label treatments

Variables	"Responsibility" (0 to 10)		
	I	II	III
Bystander (β_B)	-0.252	-0.252	-0.258
	(0.244)	(0.247)	(0.245)
ToProposer (β_P)	0.084	0.085	0.172
	(0.157)	(0.264)	(0.248)
Citizen (β_C)	-1.017^{***}	-1.016^{***}	-0.896^{***}
	(0.157)	(0.305)	(0.290)
Prop×Citizen (β_{PC})		-0.001	-0.125
		(0.479)	(0.438)
BeliefCorrupt			-0.695^{***}
			(0.226)
Difficulty			-0.159^{***}
			(0.051)
Constant	7.719^{***}	7.718^{***}	8.324^{***}
	(1.077)	(1.097)	(1.114)
Exo. Controls	Yes	Yes	Yes
Endo. Controls	No	No	Yes
Observations	346	346	346
Clusters (subjects)	173	173	173
R-squared	0.110	0.110	0.170
$\beta_P + \beta_{PC} = 0$		[0.786]	[0.870]
$\beta_C + \beta_{PC} = 0$		[< 0.001]	$<$ [0.001]

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors (in parentheses) are clustered at the individual level. Note: The dependent variable takes values from 0 to 10. Exogenous controls are the order in which judgment decisions were made, gender, age, degree in economics, and UK nationality. Endogenous controls are the belief that the decision-maker is going to act corruptly, the perception of closeness (IOS) to the decision-makers, the perception of difficulty of the experiment, and a self-reported measure of altruism. p-values reported in brackets correspond to Wald tests of hypotheses on the parameters of the regression model.

Table C.4: OLS regression for responsibility variable in neutral-label treatments

Variables	"Responsibility" (0 to 10)		
	I	II	III
Bystander (β_B)	-0.555^{*}	-0.582^{*}	-0.566
	(0.302)	(0.347)	(0.367)
ToProposer (β_P)	-0.320^{*}	-0.347	-0.305
	(0.189)	(0.245)	(0.256)
Bystander×Prop (β_{BP})		0.053	-0.004
		(0.377)	(0.392)
MyBelief			0.129
			(0.297)
Difficulty			-0.064
			(0.069)
Altruism			-0.001^{**}
			(0.001)
Constant	8.969	8.982	9.788^{***}
	(1.432)	(1.436)	(1.580)
Exo. Controls	Yes	Yes	Yes
Endo. Controls	No	No	Yes
Observations	200	200	200
Clusters (subjects)	100	100	100
R-squared	0.047	0.048	0.084
$\beta_B + \beta_{BP} = 0$		[0.153]	[0.124]
$\beta_P + \beta_{BP} = 0$		[0.307]	[0.292]

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors (in parentheses) are clustered at the individual level. Note: The dependent variable takes values from 0 to 10. Exogenous controls are the order in which judgment decisions were made, gender, age, degree in economics, and UK nationality. Endogenous controls are the belief that the decision-maker is going to act corruptly, the perception of closeness (IOS) to the decision-makers, the perception of difficulty of the experiment, and a self-reported measure of altruism. p-values reported in brackets correspond to Wald tests of hypotheses on the parameters of the regression model.

C.5 Table with all controls for the decisions to propose and accept

Table C.5: OLS regression for Propose and Accept Decisions

Variables	Decision to Propose and Accept (0/1)			
	I	II	III	IV
Proposer	0.178***	0.113***	0.152***	0.068
	(0.038)	(0.035)	(0.048)	(0.045)
NeutralLabels	0.130***	0.006		
	(0.039)	(0.038)		
BystdanderJudges	-0.060	-0.115***	-0.131***	-0.155***
	(0.038)	(0.035)	(0.048)	(0.043)
Citizen			-0.044	-0.042
			(0.048)	(0.043)
Age	-0.022***	-0.011**	-0.024***	-0.010
	(0.005)	(0.005)	(0.007)	(0.007)
Gender	0.062	0.009	0.080	0.001
	(0.039)	(0.035)	(0.050)	(0.045)
Economics	0.134***	0.116***	0.101*	0.088*
	(0.045)	(0.041)	(0.057)	(0.051)
UK	-0.095**	-0.102**	-0.068	-0.102**
	(0.043)	(0.040)	(0.054)	(0.050)
Difficulty		-0.007		-0.004
		(0.008)		(0.011)
MyBeliefOther		0.253***		0.291***
		(0.050)		(0.057)
MyBeliefPun		0.010***		0.013**
		(0.004)		(0.005)
OwnResponsibility		-0.030***		-0.016
		(0.009)		(0.011)
MyDistOther		0.049***		0.045***
		(0.010)		(0.012)
IOSVictim		-0.073***		-0.076***
		(0.011)		(0.014)
Altruism		0.000		0.000
		(0.000)		(0.000)
Constant	1.043***	1.032***	1.122***	0.987***
	(0.138)	(0.173)	(0.172)	(0.218)
Exo. Controls	Yes	Yes	Yes	Yes
Endo. Controls	No	Yes	No	Yes
Observations	580	565	384	369
R-squared	0.101	0.299	0.097	0.310

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors (in parentheses). Note: The dependent variable is a dummy and takes the value of 1 if the subject proposes or accepts the transaction, 0 otherwise. Exogenous controls are gender, age, degree in economics, and UK nationality. Endogenous controls are the belief about the other decision-maker being corrupt, the belief about the judgment they will receive, the perception of their own responsibility for the transaction, the perception of closeness to the other decision-maker involved in the transaction and to the victim of the transaction, perceived difficulty of the experiment, and a self-reported measure of altruism.

C.6 Instructions

WELCOME STAGE

ALL ROLES – ALL TREATMENTS

Welcome - Part 1

Thank you for taking part in this study.

For attendance purposes, we need to ask for your Student ID. This will not be linked in any way to your decisions in this study.
We will provide you with a **Secret ID** that will be your ID throughout the whole study.

Please enter your Student ID.

Continue

ALL ROLES – ALL TREATMENTS

Welcome - Part 2

Please read the following information carefully.

You will be paid a **£1.00** participation fee if you complete the study. Additionally, you can earn up to **£1.75** depending on yours and other participants' decisions.

The study consists of **three different parts and a questionnaire**.

Instructions will be provided as you go along.
Please read all instructions carefully, answer the comprehension questions, and complete the associated decision-making part.

It is important that you complete this study without any interruptions.
Please **do not close this window** or leave this webpage in any other way. If you close your browser, you will not be able to re-enter and we will not be able to pay you.

This is your **secret ID** in the experiment. Please make sure to write it down.

Please click continue to proceed.

Continue

ENCRYPTION TASK STAGE

ALL ROLES – ALL TREATMENTS

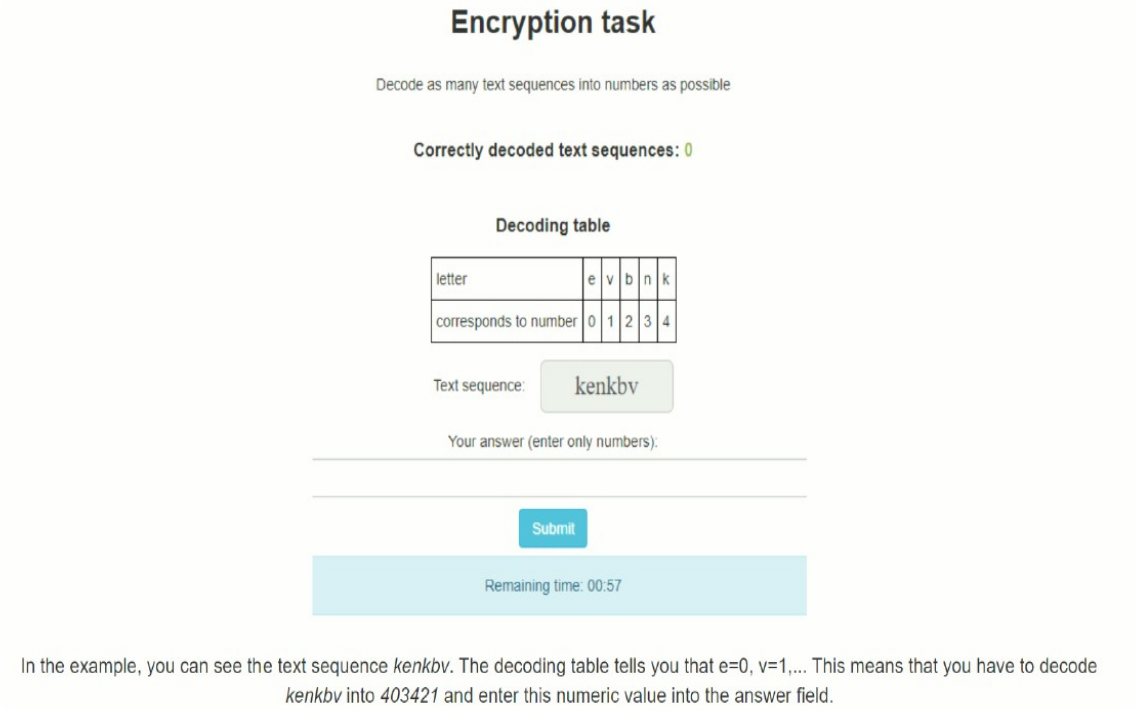
Instructions - Part 1

The Encryption Task

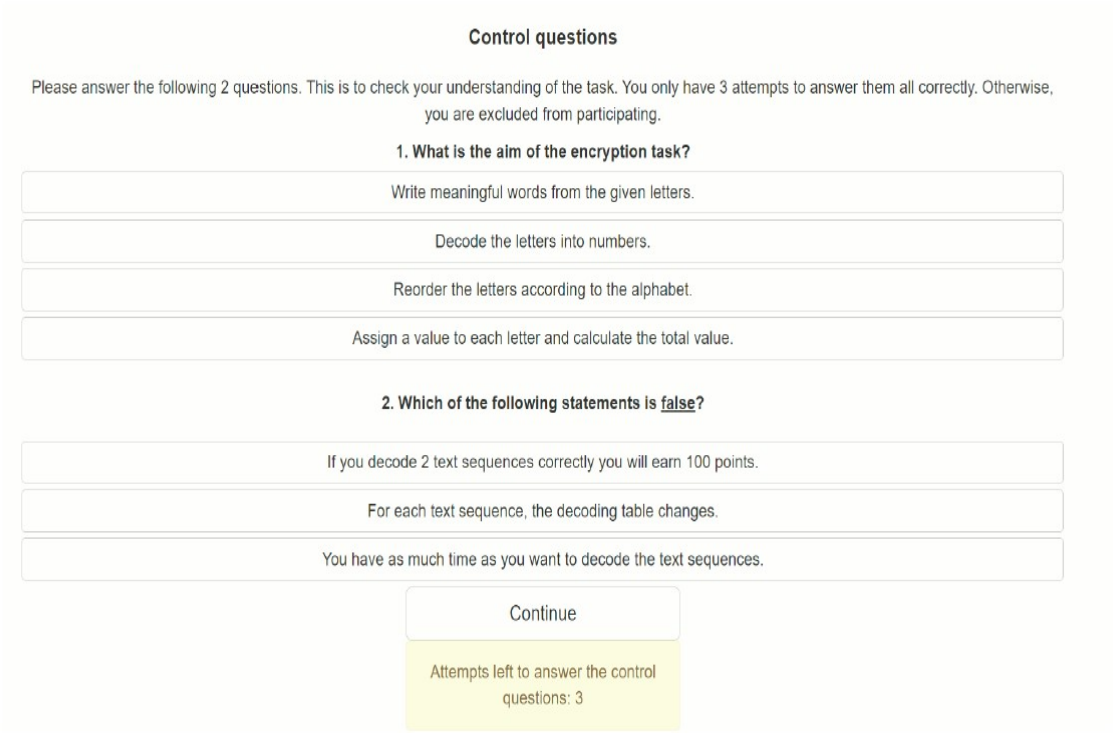
You will be given sequences of **random** letters. An example of such a sequence can be seen below. These have to be decoded into numbers with the given decoding table. For each text sequence, the decoding table changes.

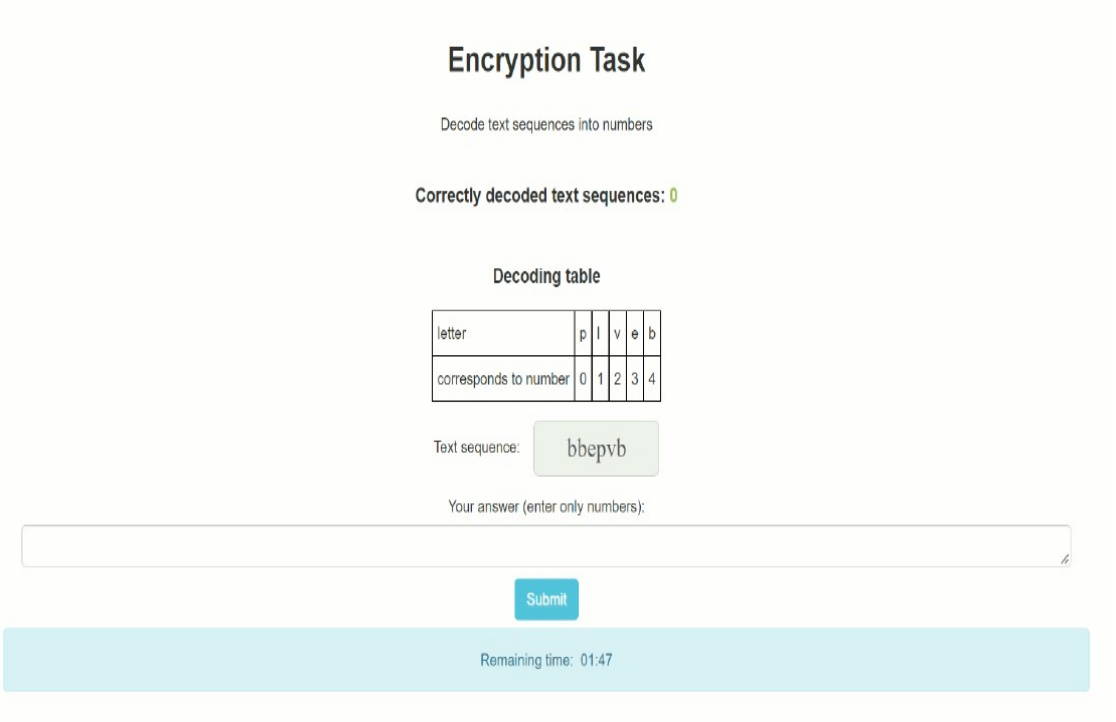
You will have 2 minutes to correctly decode 2 text sequences into numbers. Note that each letter must be decoded correctly. After entering the decoded text sequence, hit the submit button. Subsequently, irrespective of whether the text sequence was decoded correctly or not, a new text sequence and a new decoding table will appear.

If you decode 2 text sequences correctly you will earn 100 points to use in Part 2.
The conversion rate is 100 points = £1.50.



In the example, you can see the text sequence *kenkbv*. The decoding table tells you that e=0, v=1,... This means that you have to decode *kenkbv* into *403421* and enter this numeric value into the answer field.


Control questions
Please answer the following 2 questions. This is to check your understanding of the task. You only have 3 attempts to answer them all correctly. Otherwise, you are excluded from participating.
1. What is the aim of the encryption task?
Write meaningful words from the given letters.
Decode the letters into numbers.
Reorder the letters according to the alphabet.
Assign a value to each letter and calculate the total value.
2. Which of the following statements is false?
If you decode 2 text sequences correctly you will earn 100 points.
For each text sequence, the decoding table changes.
You have as much time as you want to decode the text sequences.
Continue
Attempts left to answer the control questions: 3


Encryption Task
Decode text sequences into numbers
Correctly decoded text sequences: 0
Decoding table
letter p l v e b
corresponds to number 0 1 2 3 4
Text sequence: bbepvb
Your answer (enter only numbers):
Submit
Remaining time: 01:47

BRIBERY GAME STAGE

INSTRUCTIONS BRIBERY GAME - ALL ROLES – TREATMENT CITIZEN PROPOSER/VICTIM PUNISHER

Instructions - Part 2

You earned **100 points** by completing successfully the encryption task. This is your endowment for the decision-making task. Please read *carefully* the following instructions.

The decision-making Task

You are part of a group of four participants and will make decisions in the following situation.

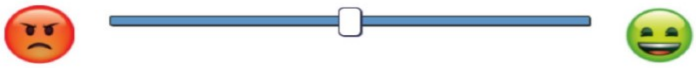
This is a four-person situation where you can be assigned to the role of **Private Citizen**, the role of **Public Official**, the role of **Other Member of Society**, or the role of **Observer**. The **Private Citizen** will have the opportunity to **propose a corrupt transaction** to the **Public Official**. The corrupt transaction consists of the Private Citizen sending a bribe of 20 points to the Public Official in exchange for a corrupt service of 40 points. The **Public Official** can either **accept or reject the proposal**. The **Other Member of Society** will not make a decision but will suffer a **monetary loss of 40 points** if the corrupt transaction is proposed and accepted. The **Observer** will not make a decision nor will suffer a monetary loss, but **will observe whether a corrupt transaction is proposed and accepted**.

Each participant in your group will begin with an endowment of 100 points earned through having completed the encryption task. The earnings from this part may be altered based on the decisions of the Private Citizen and the Public Official.

If a corrupt transaction is proposed by the Private Citizen **and accepted** by the Public Official, the **Public Official receives 20 points**. The **Private Citizen pays the bribe of 20 points and receives a benefit of 40 points**. The **Other Member of Society suffers a cost of 40 points**. The **Observer does not benefit or suffer a cost** from the corrupt transaction. These amounts are added or subtracted from the initial 100 points of each participant.

If there is **no proposal or if the proposal is rejected** by the Public Official there are no costs and **earnings remain 100 points** for each participant.

Moreover, the **Other Member of the Society** will be allowed to **judge the decisions** of the **Private Citizen** and the **Public Official** in his/her group. The Other Member of Society can express judgments using a slider like the one below that goes from -9 to 9. The **Private Citizen**, the **Public Official**, and the **Observer will see the judgments expressed by the Other Member of Society** in their group.



You will be randomly assigned to one of the four roles, and you will make decisions under that role only. If you are the Private Citizen, you will decide whether to propose a corrupt transaction. If you are the Public Official, you will decide whether to accept the corrupt transaction if proposed. If you are the Other Member of Society, you will judge every possible decision of the Private Citizen and the Public Official. And if you are the Observer, you will observe the decisions and the judgments in your group.

Control questions

Please answer the following 2 questions. This is to check your understanding of the task. You only have 3 attempts to answer them all correctly. Otherwise, you are excluded from participating.

1. If the Private Citizen proposes the corrupt transaction and the Public Official accepts the proposal, what is the cost that the Other Member of the Society suffers?

- 100 points.
- 40 points.
- 20 points.

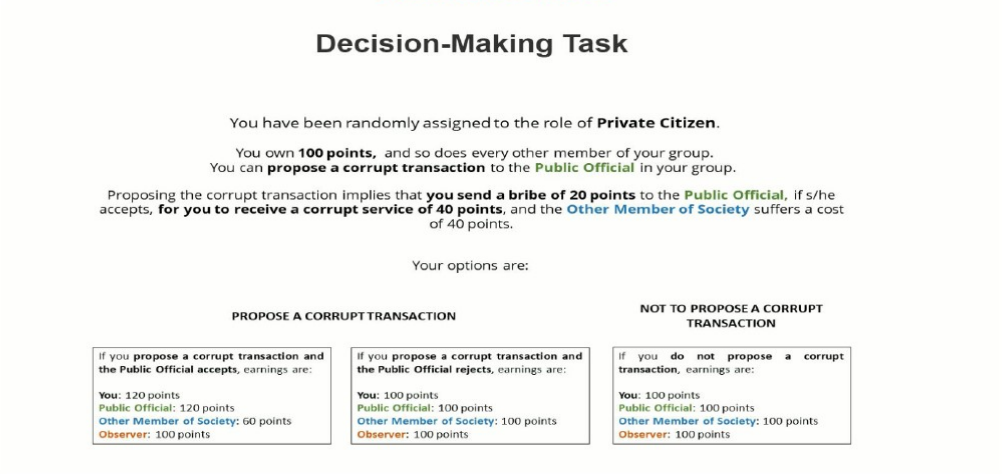
Which of the following statements is false?

- Everyone in your group owns 100 points for completing the encryption task.
- The Observer does not participate in the corrupt transaction nor suffers from it.
- The Other Member of Society will only judge the decisions of the Private Citizen.

Continue

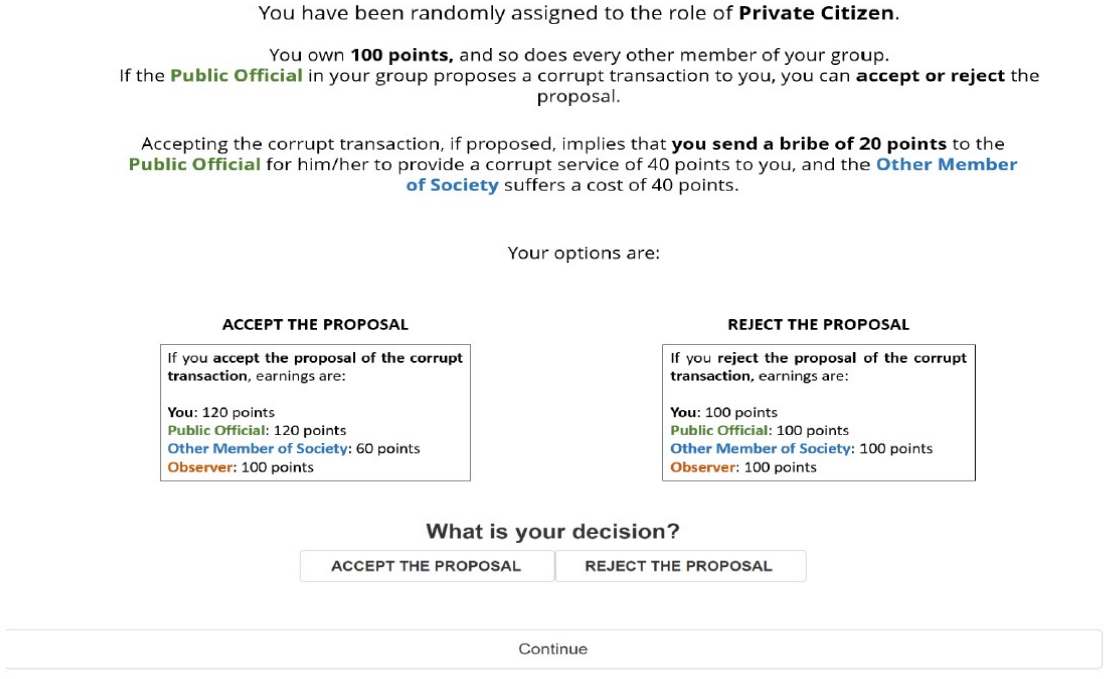
DECISIONS STAGE

DECISION CITIZEN AS PROPOSER





DECISION CITIZEN AS RESPONDER



DECISION OFFICIAL AS PROPOSER

You have been randomly assigned to the role of **Public Official**.

You own **100 points,** and so does every other member of your group.
You can **propose a corrupt transaction** to the **Private Citizen** in your group.

Proposing the corrupt transaction implies that the **Private Citizen** **sends a bribe of 20 points** to you, if s/he accepts the proposal, **to receive a corrupt service of 40 points from you**, and the **Other Member of Society** suffers a cost of 40 points.

Your options are:

PROPOSE A CORRUPT TRANSACTION		NOT TO PROPOSE A CORRUPT TRANSACTION
If you **propose a corrupt transaction and the Private Citizen accepts**, earnings are: **You**: 120 points **Private Citizen**: 120 points **Other Member of Society**: 60 points **Observer**: 100 points	If you **propose a corrupt transaction and the Private Citizen rejects**, earnings are: **You**: 100 points **Private Citizen**: 100 points **Other Member of Society**: 100 points **Observer**: 100 points	If you **do not propose a corrupt transaction**, earnings are: **You**: 100 points **Private Citizen**: 100 points **Other Member of Society**: 100 points **Observer**: 100 points

What is your decision?

PROPOSE A CORRUPT TRANSACTION | NOT TO PROPOSE A CORRUPT TRANSACTION

Continue

DECISION OFFICIAL AS RESPONDER

Decision-Making Task

You have been randomly assigned to the role of **Public Official**.

You own **100 points,** and so does every other member of your group.
If the **Private Citizen** in your group proposes a corrupt transaction to you, you can **accept or reject** the proposal.

Accepting the corrupt transaction, if proposed, implies that **you receive a bribe of 20 points** from the **Private Citizen** for him/her to receive a corrupt service of 40 points, and the **Other Member of Society** suffers a cost of 40 points.

Your options are:

ACCEPT THE PROPOSAL	REJECT THE PROPOSAL
If you **accept the proposal of the corrupt transaction**, earnings are: **You**: 120 points **Private Citizen**: 120 points **Other Member of Society**: 60 points **Observer**: 100 points	If you **reject the proposal of the corrupt transaction**, earnings are: **You**: 100 points **Private Citizen**: 100 points **Other Member of Society**: 100 points **Observer**: 100 points

What is your decision?

ACCEPT THE PROPOSAL | REJECT THE PROPOSAL

Continue

DECISION VICTIM AS PUNISHER (WHEN CITIZEN PROPOSER)

Decision-Making Task

You have been randomly assigned to the role of **Other Member of Society**.

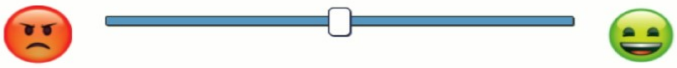
You own **100 points,** and so does every other member of your group.
The **Private Citizen** is deciding whether to propose a corrupt transaction. The **Public Official** is simultaneously deciding whether to accept the corrupt transaction if proposed.

The corrupt transaction, if proposed and accepted, implies that the **Private Citizen** sends a bribe of 20 points to the **Public Official** for him/her to receive a corrupt service of 40 points, and **you suffer a cost of 40 points.**

The earnings that would result from the possible outcomes are summarized below:

If the Private Citizen **proposes a corrupt transaction and the Public Official accepts**, earnings are:	If the Private Citizen **proposes a corrupt transaction and the Public Official rejects**, earnings are:	If the Private Citizen **does not propose a corrupt transaction**, earnings are:
You: 60 points **Private Citizen**: 120 points **Public Official**: 120 points **Observer**: 100 points	**You**: 100 points **Private Citizen**: 100 points **Public Official**: 100 points **Observer**: 100 points	**You**: 100 points **Private Citizen**: 100 points **Public Official**: 100 points **Observer**: 100 points

You have now the opportunity to judge separately the possible decisions of the Private Citizen and the Public Official in your group by using sliders like the one below. Each slider can go from -9 to 9. The initial position of a slider is at 0, and you can move it to the left, to the right, or you can move it back to the initial position depending on your judgments. Your judgments for the actual scenario will be observed by everyone in your group.



Please click on Continue to judge the decisions in the first possible scenario.

NO ACTION: INFORMATION VICTIM (WHEN OFFICIAL PROPOSER AND BYSTANDER PUNISHER)

You have been randomly assigned to the role of **Other Member of Society**.

You own **100 points,** and so does every other member of your group.
The **Public Official** is deciding whether to propose a corrupt transaction. The **Private Citizen** is simultaneously deciding whether to accept the corrupt transaction if proposed.

The corrupt transaction, if proposed and accepted, implies that the **Private Citizen** sends a bribe of 20 points to the **Public Official** for him/her to receive a corrupt service of 40 points, and **you suffer a cost of 40 points.**

The earnings that would result from the possible outcomes are summarized below:

If the Public Official **proposes a corrupt transaction and the Private Citizen accepts**, earnings are:	If the Public Official **proposes a corrupt transaction and the Private Citizen rejects**, earnings are:	If the Public Official **does not propose a corrupt transaction**, earnings are:
You: 60 points **Public Official**: 120 points **Private Citizen**: 120 points **Observer**: 100 points	**You**: 100 points **Public Official**: 100 points **Private Citizen**: 100 points **Observer**: 100 points	**You**: 100 points **Public Official**: 100 points **Private Citizen**: 100 points **Observer**: 100 points

You have no action to take. You will observe the decisions of the Private Citizen and the Public Official, and the judgments of the Observer.

Continue

NO ACTION: INFORMATION BYSTANDER (WHEN CITIZEN PROPOSER AND VICTIM PUNISHER)

Decision-Making Task

You have been randomly assigned to the role of **Observer**.

You own **100 points,** and so does every other member of your group.
The **Private Citizen** is deciding whether to propose a corrupt transaction. The **Public Official** is simultaneously deciding whether to accept the corrupt transaction if proposed.

The corrupt transaction, if proposed and accepted, implies that the **Private Citizen** sends a bribe of 20 points to the **Public Official** for him/her to receive a corrupt service of 40 points, and the **Other Member of the Society** suffers a cost of 40 points.

The earnings that would result from the possible outcomes are summarized below:

If the Private Citizen **proposes a corrupt transaction and the Public Official accepts**, earnings are:	If the Private Citizen **proposes a corrupt transaction and the Public Official rejects**, earnings are:	If the Private Citizen **does not propose a corrupt transaction**, earnings are:
You: 100 points **Private Citizen**: 120 points **Public Official**: 120 points **Other Member of the Society**: 60 points	**You**: 100 points **Private Citizen**: 100 points **Public Official**: 100 points **Other Member of the Society**: 100 points	**You**: 100 points **Private Citizen**: 100 points **Public Official**: 100 points **Other Member of the Society**: 100 points

You have no action to take. You will observe the decisions of the Private Citizen and the Public Official, and the judgment of the Other Member of the Society.

Continue

DECISION BYSTANDER AS PUNISHER (WHEN OFFICIAL PROPOSER)

You have been randomly assigned to the role of **Observer**.

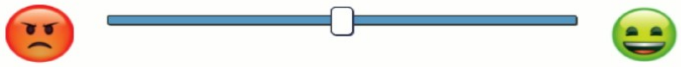
You own **100 points** as well as every other member of your group.
The **Public Official** is deciding whether to propose a corrupt transaction. The **Private Citizen** is simultaneously deciding whether to accept the corrupt transaction if proposed.

The corrupt transaction, if proposed and accepted, implies that the **Private Citizen** sends a bribe of 20 points to the **Public Official** for him/her to receive a corrupt service of 40 points, and the **Other Member of the Society** suffers a cost of 40 points.

The earnings that would result from the possible outcomes are summarized below:

If the Public Official **proposes a corrupt transaction and the Private Citizen accepts**, earnings are:	If the Public Official **proposes a corrupt transaction and the Private Citizen rejects**, earnings are:	If the Public Official **does not propose a corrupt transaction**, earnings are:
You: 100 points **Public Official**: 120 points **Private Citizen**: 120 points **Other Member of the Society**: 60 points	**You**: 100 points **Public Official**: 100 points **Private Citizen**: 100 points **Other Member of the Society**: 100 points	**You**: 100 points **Public Official**: 100 points **Private Citizen**: 100 points **Other Member of the Society**: 100 points

You have now the opportunity to judge separately the possible decisions of the Private Citizen and the Public Official in your group by using sliders like the one below. Each slider can go from -9 to 9. The initial position of a slider is at 0, and you can move it to the left, to the right, or you can move it back to the initial position depending on your judgments. Your judgments for the actual scenario will be observed by everyone in your group.



Please click on Continue to judge the decisions in the first possible scenario.

PUNISHMENT DECISIONS FROM EITHER VICTIM/BYSTANDER (WHEN CITIZEN PROPOSER AND ORDER 1)

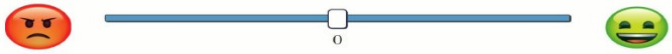
Possible Scenario 1

If the Private Citizen **does not propose a corrupt transaction and the Public Official accepts**, earnings are:

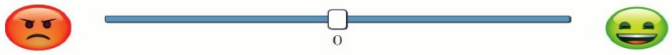
You: 100 points
Private Citizen: 100 points
Public Official: 100 points
Observer: 100 points

In this scenario, the corrupt transaction would not take place because the Private Citizen does not propose a corrupt transaction, even though the Public Official would accept the corrupt transaction if proposed. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **not proposing** a corrupt transaction.



Please select how would you judge the decision of the ***Public Official*** of **accepting** a corrupt transaction if proposed.



Continue

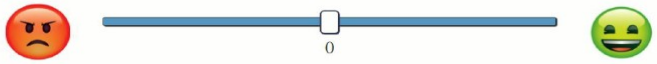
Possible Scenario 2

If the Private Citizen **proposes a corrupt transaction and the Public Official rejects**, earnings are:

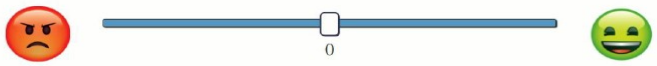
You: 100 points
Private Citizen: 100 points
Public Official: 100 points
Observer: 100 points

In this scenario, the corrupt transaction would not take place given that the Private Citizen proposes a corrupt transaction, but the Public Official rejects. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **proposing** a corrupt transaction.



Please select how would you judge the decision of the ***Public Official*** of **rejecting** the corrupt transaction.



Continue

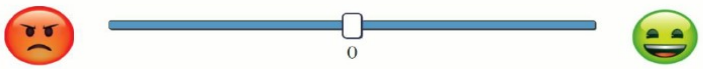
Possible Scenario 3

If the Private Citizen **proposes a corrupt transaction and the Public Official accepts**, earnings are:

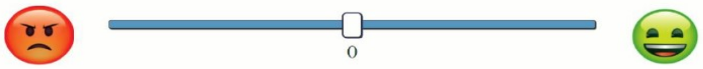
You: 60 points
Private Citizen: 120 points
Public Official: 120 points
Observer: 100 points

In this scenario, the corrupt transaction would take place given that the Private Citizen proposes a corrupt transaction, and the Public Official accepts. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **proposing** a corrupt transaction.



Please select how would you judge the decision of the ***Public Official*** of **accepting** the corrupt transaction.



Continue

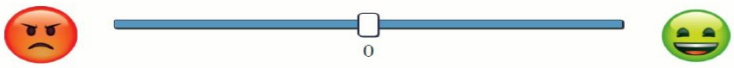
Possible Scenario 4

If the Private Citizen **does not propose a corrupt transaction and the Public Official rejects**, earnings are:

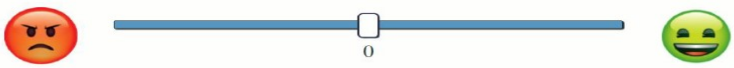
You: 100 points
Private Citizen: 100 points
Public Official: 100 points
Observer: 100 points

In this scenario, the corrupt transaction would not take place because the Private Citizen does not propose a corrupt transaction, and the Public Official would reject the corrupt transaction if proposed. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **not proposing** a corrupt transaction.



Please select how would you judge the decision of the ***Public Official*** of **rejecting** a corrupt transaction if proposed.



Continue

PUNISHMENT DECISIONS FROM EITHER VICTIM/BYSTANDER (OFFICIAL PROPOSER AND ORDER 2)

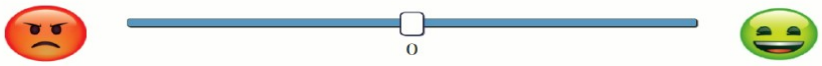
Possible Scenario 1

If the Public Official **does not propose a corrupt transaction and the Private Citizen accepts**, earnings are:

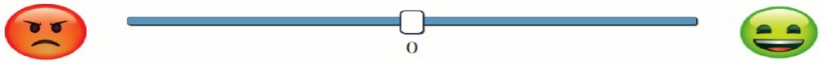
You: 100 points
Public Official: 100 points
Private Citizen: 100 points
Other Member of the Society: 100 points

In this scenario, the corrupt transaction would not take place because the Public Official does not propose a corrupt transaction, even though the Private Citizen would accept the corrupt transaction if proposed. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **accepting** a corrupt transaction if proposed.



Please select how would you judge the decision of the ***Public Official*** of **not proposing** a corrupt transaction.



Continue

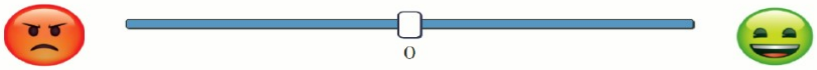
Possible Scenario 2

If the Public Official **proposes a corrupt transaction and the Private Citizen accepts**, earnings are:

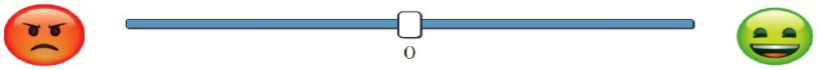
You: 100 points
Public Official: 120 points
Private Citizen: 120 points
Other Member of the Society: 60 points

In this scenario, the corrupt transaction would take place given that the Public Official proposes a corrupt transaction, and the Private Citizen accepts. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **accepting** the corrupt transaction.



Please select how would you judge the decision of the ***Public Official*** of **proposing** a corrupt transaction.



Continue

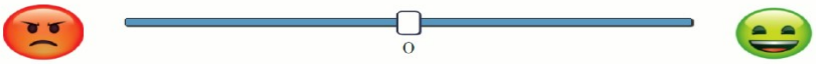
Possible Scenario 3

If the Public Official **does not propose a corrupt transaction and the Private Citizen rejects,** earnings are:

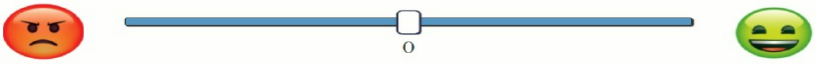
You: 100 points
Public Official: 100 points
Private Citizen: 100 points
Other Member of the Society: 100 points

In this scenario, the corrupt transaction would not take place because the Public Official does not propose a corrupt transaction, and the Private Citizen would reject the corrupt transaction if proposed. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **rejecting** a corrupt transaction if proposed.



Please select how would you judge the decision of the ***Public Official*** of **not proposing** a corrupt transaction.



Continue

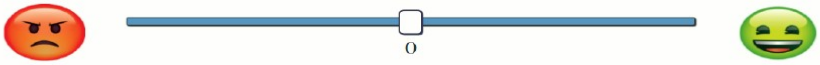
Possible Scenario 4

If the Public Official **proposes a corrupt transaction and the Private Citizen rejects,** earnings are:

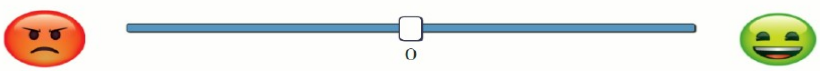
You: 100 points
Public Official: 100 points
Private Citizen: 100 points
Other Member of the Society: 100 points

In this scenario, the corrupt transaction would not take place given that the Public Official proposes a corrupt transaction, but the Private Citizen rejects. We ask you how would you judge these decisions.

Please select how would you judge the decision of the ***Private Citizen*** of **rejecting** the corrupt transaction.



Please select how would you judge the decision of the ***Public Official*** of **proposing** a corrupt transaction.



Continue

BELIEFS STAGE

BELIEFS ABOUT PROPOSER AND RESPONDER ACTIONS

BELIEFS OF THE VICTIM AND THE BYSTANDER (WHEN CITIZEN PROPOSER ORDER 1)

Instructions - Part 3

Now you will be asked about what you think the decisions of the others in your group are. You will answer two questions and one out of the six questions will be randomly selected for payment. From the selected answer, if what you think they will do matches what they actually do, you will receive an extra payment of £0.25.

The first question is about what you think the Private Citizen in your group decides and the second question is about what you think the Public Official in your group decides.

1) What do you think will be the decision of the ***Private Citizen*** in your group?

Not to propose the corrupt transaction	Propose the corrupt transaction

2) What do you think will be the decision of the ***Public Official*** in your group if the corrupt transaction is proposed?

Reject the proposal	Accept the proposal

Continue

BELIEFS OF THE VICTIM AND THE BYSTANDER (WHEN OFFICIAL PROPOSER ORDER 2)

Instructions - Part 3

Now you will be asked about what you think the decisions of the others in your group are. You will answer six questions and one out of the six questions will be randomly selected for payment. From the selected answer, if what you think they will do matches what they actually do, you will receive an extra payment of £0.25.

The first two questions are about what you think the Private Citizen and the Public Official in your group will decide. Then, in the next screens, you will answer questions about what you think the judgment of the Observer will be for every possible scenario.

1) What do you think will be the decision of the ***Private Citizen*** in your group if a corrupt transaction is proposed?

Accept the proposal	Reject the proposal

2) What do you think will be the decision of the ***Public Official*** in your group?

Not to propose the corrupt transaction	Propose the corrupt transaction

Continue

BELIEFS OF THE PROPOSER ABOUT RESPONDER

Instructions - Part 3

Now you will be asked about what you think the decisions of the others in your group are. You will answer five questions and one out of the five questions will be randomly selected for payment. From the selected answer, if what you think they will do matches what they actually do, you will receive an extra payment of £0.25.

The first question is about what you think the Public Official in your group will decide. Then, in the next screens, you will answer questions about what you think the judgments of the Other Member of Society will be for every possible scenario.

1) What do you think will be the decision of the ***Public Official*** in your group if the corrupt transaction is proposed?

Reject the proposal | **Accept the proposal**

Continue

BELIEFS OF THE RESPONDER ABOUT PROPOSER

Instructions - Part 3

Now you will be asked about what you think the decisions of the others in your group are. You will answer five questions and one out of the five questions will be randomly selected for payment. From the selected answer, if what you think they will do matches what they actually do, you will receive an extra payment of £0.25.

The first question is about what you think the Public Official in your group will decide. Then, in the next screens, you will answer questions about what you think the judgments of the Observer will be for every possible scenario.

1) What do you think will be the decision of the ***Public Official*** in your group?

Not to propose the corrupt transaction | **Propose the corrupt transaction**

Continue

BELIEFS ABOUT PUNISHMENT (WHEN VICTIM IS PUNISHER AND CITIZEN PROPOSER)

Possible Scenario 1

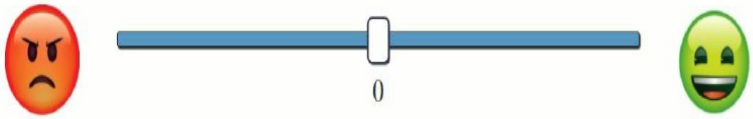
If the Private Citizen proposes a corrupt transaction and the Public Official rejects, earnings are:

Private Citizen: 100 points
Public Official: 100 points
Other Member of the Society: 100 points
Observer: 100 points

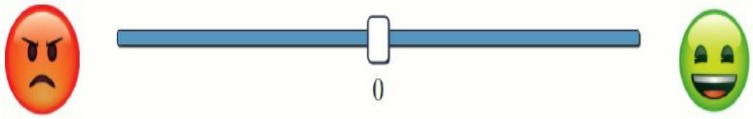
In this scenario, the corrupt transaction would not take place given that the Private Citizen proposes a corrupt transaction, but the Public Official rejects. We ask you how do you think the Other Member of the Society will judge these decisions.

Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Other Member of the Society will judge the decision of the ***Private Citizen*** of **proposing** a corrupt transaction.



Please select how do you think the Other Member of the Society will judge the decision of the ***Public Official*** of **rejecting** a corrupt transaction.



Continue

Possible Scenario 2

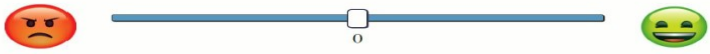
If the Private Citizen does not propose a corrupt transaction and the Public Official accepts, earnings are:

Private Citizen: 100 points
Public Official: 100 points
Other Member of the Society: 100 points
Observer: 100 points

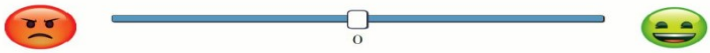
In this scenario, the corrupt transaction would not take place because the Private Citizen does not propose a corrupt transaction, even though the Public Official would accept the corrupt transaction if proposed. We ask you how do you think the Other Member of the Society will judge these decisions.

Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Other Member of the Society will judge the decision of the ***Private Citizen*** of **not proposing** a corrupt transaction.



Please select how do you think the Other Member of the Society will judge the decision of the ***Public Official*** of **accepting** a corrupt transaction if proposed.



Continue

Possible Scenario 3

If the Private Citizen does not propose a corrupt transaction and the Public Official rejects, earnings are:

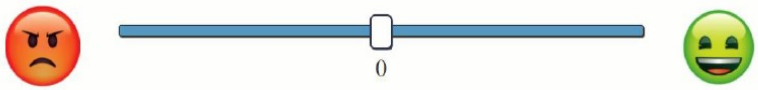
Private Citizen: 100 points
Public Official: 100 points
Other Member of the Society: 100 points
Observer: 100 points

In this scenario, the corrupt transaction would not take place because the Private Citizen does not propose a corrupt transaction, and the Public Official would reject the corrupt transaction if proposed. We ask you how do you think the Other Member of the Society will judge these decisions.

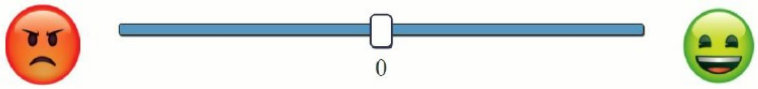
Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Other Member of the Society will judge the decision of the ***Private Citizen*** of **not proposing** a corrupt transaction.

Please select how do you think the Other Member of the Society will judge the decision of the ***Private Citizen*** of **not proposing** a corrupt transaction.



Please select how do you think the Other Member of the Society will judge the decision of the ***Public Official*** of **rejecting** a corrupt transaction if proposed.



Continue

Possible Scenario 4

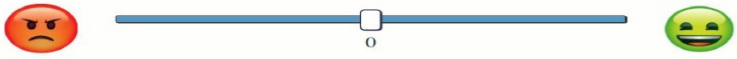
If the Private Citizen proposes a corrupt transaction and the Public Official accepts, earnings are:

Private Citizen: 120 points
Public Official: 120 points
Other Member of the Society: 60 points
Observer: 100 points

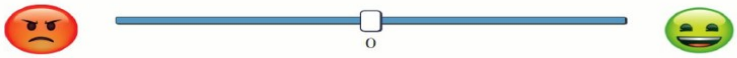
In this scenario, the corrupt transaction would take place given that the Private Citizen proposes a corrupt transaction, and the Public Official accepts. We ask you how do you think the Other Member of the Society will judge these decisions.

Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Other Member of the Society will judge the decision of the ***Private Citizen*** of **proposing** a corrupt transaction.



Please select how do you think the Other Member of the Society will judge the decision of the ***Public Official*** of **accepting** a corrupt transaction.



Continue

BELIEFS ABOUT PUNISHMENT (WHEN BYSTANDER IS PUNISHER AND OFFICIAL PROPOSER ORDER 2)

Possible Scenario 1

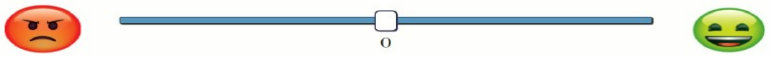
If the Public Official does not propose a corrupt transaction and the Private Citizen rejects, earnings are:

Public Official: 100 points
Private Citizen: 100 points
Other Member of the Society: 100 points
Observer: 100 points

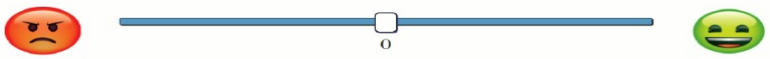
In this scenario, the corrupt transaction would not take place because the Public Official does not propose a corrupt transaction, and the Private Citizen would reject the corrupt transaction if proposed. We ask you how do you think the Observer will judge these decisions.

Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Observer will judge the decision of the ***Private Citizen*** of **rejecting** a corrupt transaction if proposed.



Please select how do you think the Observer will judge the decision of the ***Public Official*** of **not proposing** a corrupt transaction.



Continue

Possible Scenario 2

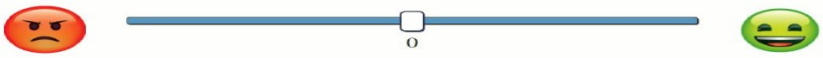
If the Public Official proposes a corrupt transaction and the Private Citizen rejects, earnings are:

Public Official: 100 points
Private Citizen: 100 points
Other Member of the Society: 100 points
Observer: 100 points

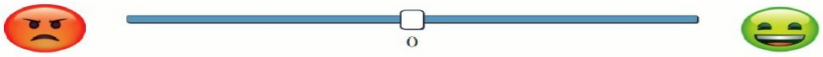
In this scenario, the corrupt transaction would not take place given that the Public Official proposes a corrupt transaction, but the Private Citizen rejects. We ask you how do you think the Observer will judge these decisions.

Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Observer will judge the decision of the ***Private Citizen*** of **rejecting** a corrupt transaction.



Please select how do you think the Observer will judge the decision of the ***Public Official*** of **proposing** a corrupt transaction.



Continue

Possible Scenario 3

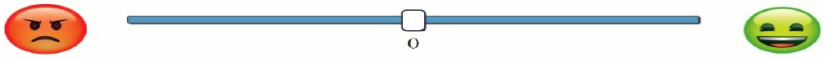
If the Public Official does not propose a corrupt transaction and the Private Citizen accepts, earnings are:

Public Official: 100 points
Private Citizen: 100 points
Other Member of the Society: 100 points
Observer: 100 points

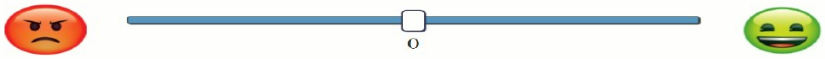
In this scenario, the corrupt transaction would not take place because the Public Official does not propose a corrupt transaction, even though the Private Citizen would accept the corrupt transaction if proposed. We ask you how do you think the Observer will judge these decisions.

Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Observer will judge the decision of the ***Private Citizen*** of **accepting** a corrupt transaction if proposed.



Please select how do you think the Observer will judge the decision of the ***Public Official*** of **not proposing** a corrupt transaction.



Continue

Possible Scenario 4

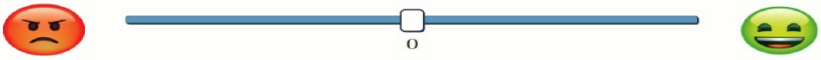
If the Public Official proposes a corrupt transaction and the Private Citizen accepts, earnings are:

Public Official: 120 points
Private Citizen: 120 points
Other Member of the Society: 60 points
Observer: 100 points

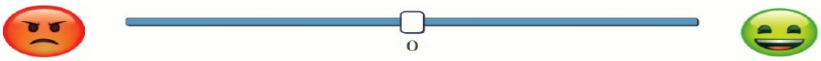
In this scenario, the corrupt transaction would take place given that the Public Official proposes a corrupt transaction, and the Private Citizen accepts. We ask you how do you think the Observer will judge these decisions.

Remember that each slider can go from -9 to 9, and the initial position of a slider is at 0. You can move a slider to the left, to the right, or you can move it back to the initial position.

Please select how do you think the Observer will judge the decision of the ***Private Citizen*** of **accepting** a corrupt transaction.



Please select how do you think the Observer will judge the decision of the ***Public Official*** of **proposing** a corrupt transaction.



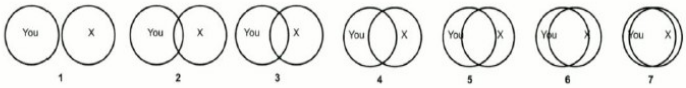
Continue

QUESTIONNAIRE STAGE

Questionnaire

Describing your relationship with the others

The pictures below present seven options that could describe your relationship with someone else (X). We will ask you to describe your relationship with all the other members of your group by typing the number of the picture that best describes it.



1) Use the radioline to indicate the number of the picture which best describes your relationship with the ***Public Official*** in your group.

1 ○ ○ ○ ○ ○ ○ ○ 7

2) Use the radioline to indicate the number of the picture which best describes your relationship with the ***Other Member of Society*** in your group.

1 ○ ○ ○ ○ ○ ○ ○ 7

3) Use the radioline to indicate the number of the picture which best describes your relationship with the ***Observer*** in your group.

1 ○ ○ ○ ○ ○ ○ ○ 7

4) What is your age?

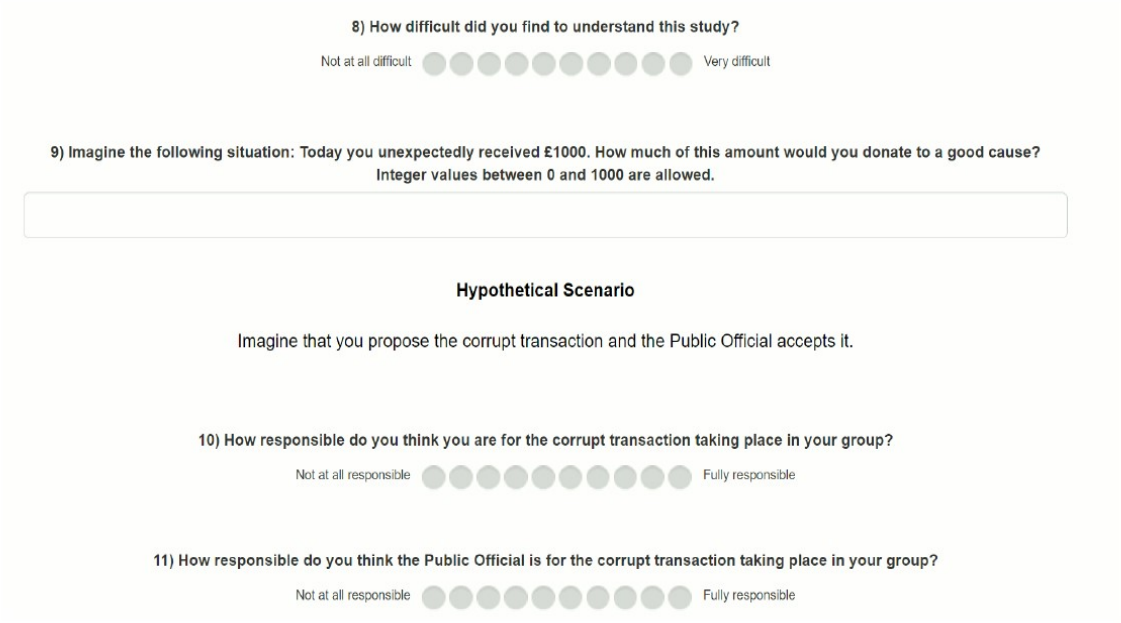
5) What is your gender?

Male

Female

6) Which country are you from?

7) What is your field of study?



- **The wording of this last questions about the hypothetical scenario changes depending on the role/action. So above is the scenario for the citizen when the citizen is the proposer and below is the scenario for victim/bystander when the official is the proposer.**



You have completed this study and you will be paid the participation fee of **£1.00** plus your additional earnings. **You will receive an email with feedback about the decisions of the other members of your group.**

As we mentioned in the invitation email, **we are going to pay you via PayPal**. Please enter below your email address associated with PayPal and **make sure there are no typos**. We won't be able to pay you if you provide an incorrect email account.

We will pay you today.

Please enter your email address associated with PayPal:

This is your **secret ID** in the experiment. Please make sure to write it down.

Thank you for participating.

FEEDBACK

FEEDBACK CITIZEN AS PROPOSER

Your Feedback

Your role was: **Private Citizen**

Your decision was: **Propose the corrupt transaction**

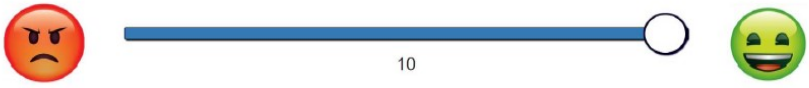
The decision of the Public Official in your group was: **Reject the proposal**

Therefore, you earned (in points): **100**

The Other Member of Society judged your decision in the following way:



The Other Member of Society judged the decision of the Public Official in the following way:



We also asked you five questions about predicting the decisions of the others in your group for an extra £0.25.

Out of the five questions, the question selected for payment was the following: What do you think will be the decision of the ***Public Official*** in your group if the corrupt transaction is proposed?

Your answer was: **Accept the proposal**

Your final payoff, including the participation fee, is (in £): **2.5**

Thank you for participating.

Now you can close this window.

FEEDBACK OFFICIAL AS RESPONDER

Your Feedback

Your role was: **Public Official**

Your decision was: **Reject the proposal**

The decision of the Private Citizen in your group was: **Propose the corrupt transaction**

Therefore, you earned (in points): **100**

The Other Member of Society judged the decision of the Private Citizen in the following way:



The Other Member of Society judged your decision in the following way:



We also asked you five questions about predicting the decisions of the others in your group for an extra £0.25.

Out of the five questions, the question selected for payment was the following: What do you think will be the decision of the ***Private Citizen*** in your group?

Your answer was: **Propose the corrupt transaction**

Your final payoff, including the participation fee, is (in £): **2.75**

Thank you for participating.

Now you can close this window.

FEEDBACK OFFICIAL AS PROPOSER

Your Feedback

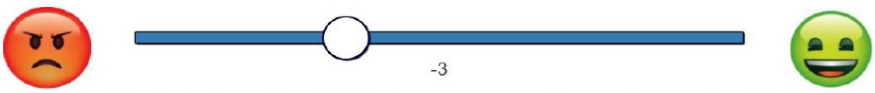
Your role was: **Public Official**

Your decision was: **Propose the corrupt transaction**

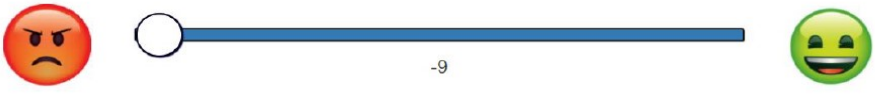
The decision of the Private Citizen in your group was: **Accept the proposal**

Therefore, you earned (in points): **120**

The Other Member of Society judged your decision in the following way:



The Other Member of Society judged the decision of the Private Citizen in the following way:



We also asked you five questions about predicting the decisions of the others in your group for an extra £0.25.

Out of the five questions, the question selected for payment was the following: What do you think will be the decision of the ***Private Citizen*** in your group if the corrupt transaction is proposed?

Your answer was: **Accept the proposal**

Your final payoff, including the participation fee, is (in £): **3.05**

Thank you for participating.

Now you can close this window.

Activate Windows
Go to Settings to activate Windows.

FEEDBACK VICTIM AS PUNISHER

Your Feedback

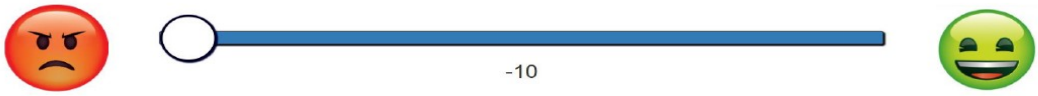
Your role was: **Other Member of Society**

The decision of the Private Citizen in your group was: **Propose the corrupt transaction**

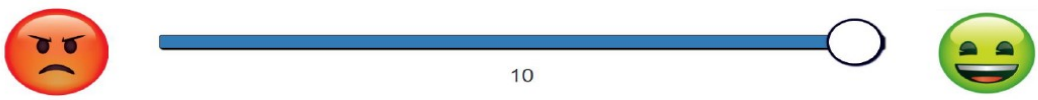
The decision of the Public Official in your group was: **Reject the proposal**

Therefore, you earned (in points): **100**

You judged the decision of the Private Citizen in the following way:



You judged the decision of the Public Official in the following way:



We also asked you two questions about predicting the decisions of the others in your group for an extra £0.25.

Out of the two questions, the question selected for payment was the following: What do you think will be the decision of the ***Public Official*** in your group if the corrupt transaction is proposed?

Your answer was: **Accept the proposal**

Your final payoff, including the participation fee, is (in £): **2.5**

Thank you for participating.

Now you can close this window.

FEEDBACK BYSTANDER

Your Feedback

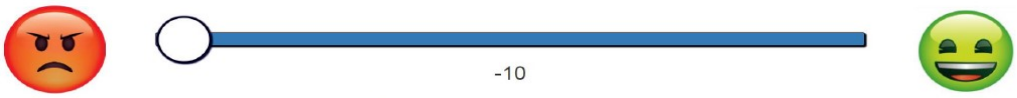
Your role was: **Observer**

The decision of the Private Citizen in your group was: **Propose the corrupt transaction**

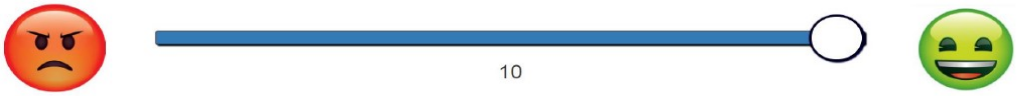
The decision of the Public Official in your group was: **Reject the proposal**

Therefore, you earned (in points): **100**

The Other Member of Society judged the decision of the Private Citizen in the following way:



The Other Member of Society judged the decision of the Public Official in the following way:



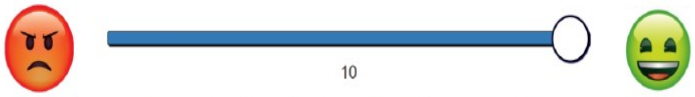
We also asked you six questions about predicting the decisions of the others in your group for an extra £0.25.

Out of the six questions, the question selected for payment was the one about predicting how the Other Member of Society in your group would judge the decisions of the Private Citizen and the Public Official in the following scenario:

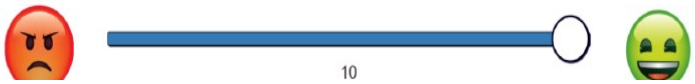
If the Private Citizen does not propose a corrupt transaction and the Public Official rejects, earnings are:

Private Citizen: 100 points
Public Official: 100 points
Other Member of the Society: 100 points
Observer: 100 points

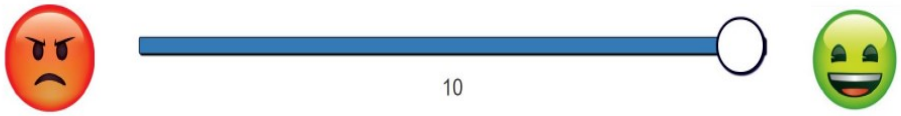
Your answer about the judgment of decision of the Private Citizen was:



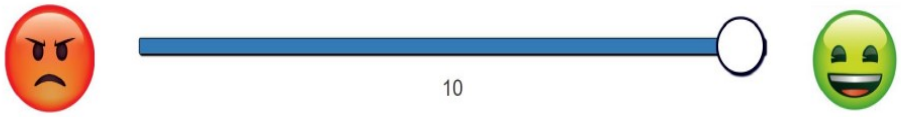
Your answer about the judgment of the decision of the Public Official was:



The Other Member of Society judged the decision of the Private Citizen in that scenario in the following way:



The Other Member of Society judged the decision of the Public Official in that scenario in the following way:



Your final payoff, including the participation fee, is (in £): **2.75**

Thank you for participating.

Now you can close this window.