Does Social Observability Diminish Rule Breaking? An Experiment[*]

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Abstract

We experimentally investigate the extent to which social observability and the possibility of social judgment affect the decision to engage in theft, bribery and embezzlement conditional on individuals' cultural background. We involve a student sample characterized by cultural heterogeneity due to immigration of their ancestors to the US. We show that people with different cultural heritages respond differently to increased social observability of their actions. In particular, we find that the possibility of social judgment reduces rule breaking of individuals who identify culturally with countries characterized by high rule of law, as measured by the corresponding World Bank's governance indicator. On the other hand, we find that individuals who identify culturally with countries characterized by low rule of law, when given the chance to steal, bribe or embezzle public resources are unaffected by the possibility of social judgment.

JEL Codes: C90; D73; K42; Z10
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1 Introduction

In all societies norms exist to guide the actions of the members of society. In many cases these norms are enforced by formal laws that associate explicit material incentives with norm conformity. Examples are of course plentiful, as most societies rely on legal and judicial systems to proscribe behaviors like murder or theft, and impose specific penalties should individuals violate the law. While formal enforcement mechanisms are certainly important for ensuring conformance with norms, informal enforcement mechanisms relying on social sanctions and rewards are also an important way in which norm compliance is encouraged.[1] The nature of the behavioral norms

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[1]For a recent analysis and discussion of the relationship between formal laws and social norms see Benabou and Tirole (2012). For a theoretical model of how formal institutions influence the inter-generational transmission of values, see Tabellini (2008)**.**

that are formally or informally enforced in any society are of course defined by the institutional environment and, crucially, by social and cultural contexts. Societal views on the degree of importance of different behaviors also determine how severe the violation of any given rule is perceived and judged. In some societies it may be the case that petty crimes, such as running a red light or downloading pirated digital products, may not be viewed harshly or subject to much social disapproval, even though in other societies they could be seen as more serious infractions warranting some sort of social sanction (in addition to any legal sanctions that might also be in place). Even more serious crimes, such as embezzling resources from the workplace or stealing from a neighbor or the government, may be harshly condemned, formally and informally, in one country while being widely accepted or even informally rewarded, in another.

It is clearly the case that societies with high levels of norm violations in the form of petty or more severe crimes pay a price for these violations in terms of growth and development. Designing enforcement mechanisms to counter such behaviors is consequently an important goal for policy makers interested in encouraging economic development. Traditionally, the focus has been on the design and implementation of formal mechanisms relying on top-down monitoring and detection. In the last decade, however, mechanisms relying purely on social enforcement have attracted increasing attention among academics and practitioners.[2] This is because formal institutions involving law enforcement and judiciary agencies often lack the necessary physical and human resources to be fully functional and effective, and/or because their correct functioning is severely hindered by endemic corruption. Even in countries where formal institutions operate efficiently it is still the case that social enforcement can be useful and effective since individuals engage in many interactions on a day to day basis that are too small or too frequent to rely on formal enforcement institutions. A number of empirical evaluations of social enforcement mechanisms aimed at limiting violations of societal norms such as corruption, absenteeism and poor performance of service providers have been recently conducted in developing countries, with mixed results.[3] We hypothesize that one possible source for the different outcomes obtained in different societies might lie in what the social norms are in these societies, how the violation of a norm is seen or judged, how willing are individuals to engage in social sanctions against the rule violators, and how responsive to social sanctions are potential rule violators.

In this paper, we ask whether the effectiveness of institutions relying purely on social observation, interaction and judgement is related to the sociocultural background of the decision-makers. Addressing this question is necessary in order to gain a better understanding of whether social enforcement mechanisms would be effective in preventing rule breaking in a given context, and whether different mechanisms should be implemented in different sociocultural environments. The current approach to this question taken in the development literature is to adopt a trial and error approach, consisting of replicating the same mechanism in different societies using randomized controlled trials and noting whether it succeeds or fails in each. While this can provide an answer to the question, it is a very expensive and time-consuming approach, since each trial in a new country can take years to evaluate. Our approach will be to take a sample of individuals of dif-

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[2] A social enforcement mechanism that is especially gaining popularity is the "I paid a bribe" website, first launched in India and subsequently replicated in Kenya, Indonesia, Zimbabwe and Pakistan. See: See http://www.ipaidabribe.com/ . The website gives citizens the opportunity to anonymously report their bribery experiences, hence increasing the observability of acts of corruption on the part of public officials and civil servants. Although the I Paid a Bribe websites are highly used, their effectiveness in the reduction of corruption is still to be tested.

[3] See Banerjee, Banerji, Duflo, Glennerster, and Khemani (2010), Björkman and Svensson (2009), Duflo, Dupas, and Kremer (2011), Pradhan, Suryadarma, Beatty, Wong, Alishjabana, Gaduh, and Artha (2011), Olken (2007) among others.

ferent cultural heritages but who share the same formal institutional environment, give them the chance to engage in different forms of rule breaking and investigate how they respond to the same social enforcement mechanism. To this end, we conduct a specially designed economic experiment with a sample of individuals who grew up and currently live in the US yet claim cultural identification with different countries, corresponding to the countries of origin of their ancestors prior to migration to the US. In particular, 215 of our 432 experimental participants answered a survey question saying that they culturally identify with a country other than or in addition to the US. A total of 52 countries are represented in our sample. Given that our subjects all live in the US and 90 per cent were born in the US, any results we find regarding cultural differences should be interpreted as a lower bound on such differences. Consequently any such findings we observe should be seen as very conservative in nature. We will discuss these issues further at multiple points later in the paper. Given that we are not able to randomly assign our subjects to their cultural identifications, any results we find linking cultural background to behavior cannot be interpreted as causal. Our methodology relates to studies that identify the impact of culture on individual behavior by linking attitudes and actions of second-generation immigrants in a given country to the attitudes and actions prevailing in their ancestors' country of origin (Alesina and Giuliano, 2011, Fogli and Fernandez, 2009, Giuliano, 2007, Simpser, 2013).[4] An important difference in our methodology is that while the previous studies used survey measures to examine the relationship between culture and behavior we use an experiment to allow us to observe actual choices and behavior by our subjects which we can then relate to their cultural background.

The nature of our sample does not give us enough information to test how specific countries in our sample differ from each other. We instead need some way of ordering the countries to determine if there is some systematic relationship between behavior and culture along some defined linear order. For this purpose we use the Rule of Law index constructed by the World Bank, which measures the quality of legal and judicial institutions in each country, as well as individuals' attitudes towards the rules of society and, more generally, the likelihood of crime and violence. There are of course many other candidate measures one could use for this purpose and we will address some of those as well. We chose to use this measure because it seemed the most relevant one for measuring cultural attitudes on rule-breaking which matches the setting of the experiment. Due to the aggregate nature of the index, we will not be able to claim to have identified exactly which aspect of culture drives any results we might find. Our intent though is less ambitious. Our goal is to determine if there is a relationship between culture and behavior to help in determining whether or not one should consider culture when designing observability mechanisms to combat corruption and theft. Currently the possibility that different cultures might respond differently to these mechanisms is not taken into account and so we seek to determine if the lack of accounting for cultural differences could help explain the variable levels of success achieved by these mechanisms in the field.

We focus on individuals' willingness to engage in three forms of rule-breaking behavior, theft, bribery and embezzlement, in an attempt to determine the robustness of our findings across different contexts and situations. While the games differ in the number and nature of the parties involved and the potential monetary benefits, they have two common features: in each setting a clear behavioral rule exists, and the violation of such rule benefits the decision-maker at the expense of one or more other individuals. We have subjects engage in these games under three treatments in which we manipulate the degree of social observability of the rule breaker's actions. Our aim is to investigate whether those in the potential rule breaking role respond differently to knowing that their action will be hidden from others, knowing that they will be visible to only the

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[4]A brief review of this literature is provided in Section 2.2.

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victim or knowing that those in the victim roles will be sitting in judgment of their behavior. It is important to acknowledge the fact that the response to the observability treatments may differ between different types of situations and that is why we use three different games to investigate these issues rather than just a single game. This is a substantial advantage of our study as any observation of behavior that is systematic across the games lends additional weight behind the potential importance of the finding. Testing whether and why social observability may affect the three rule-breaking contexts differently is beyond the scope of this study.

There have been several previous experimental examinations of how individuals respond to social observability in contexts different from ours. Some papers, such as Dana, Weber, and Kuang (2007), Karlan and McConnell (2012) and Pan and Houser (2011), demonstrate that people will often behave more pro-socially when their actions are observed by others. In a study that focuses on gender rather than culture, Jones and Linardi (2012) find results that are similar to ours as they show that the impact of observability on behavior may depend on the characteristics of the individuals being observed. There is a different stream of literature which also examines the impact of informal sanctions on pro-social behavior, see for example Masclet, Noussair, Tucker, and Villeval (2003), Xiao and Houser (2005) and Carpenter and Seki (2011), and typically finds that such informal mechanisms can impact behavior despite the lack of formal incentives. An important difference between our study and these previous works is that we focus on anti-social behavior in an attempt to determine if social observability and informal sanctions can effectively limit such behavior. This is an aspect we have not found studied in prior work, yet we believe it is important to verify whether the effects observed in the context of pro-social behavior translate into differently framed contexts.

By combining our experimental data with information about the cultural heritage of the experimental participants we are able to investigate whether individuals' willingness to engage in the three forms of rule-breaking – theft, bribery and embezzlement – might vary across cultures and, crucially, whether the effectiveness of institutions relying on social enforcement to limit this behavior might vary in a systematic way across cultures. Our results suggest that the effectiveness of institutions relying on social observation and judgement may depend on the cultural background of individuals. We do find that overall rule breaking generally decreases as social observability increases and is lowest when victims are given the chance to express social approval or disapproval against the rule breakers. In a more detailed look at the data we find that individuals who self-identify with low rule of law countries tend to react differently to social observability than individuals who identify with high rule of law countries. The latter group responds to the social observability treatments as predicted, while the former is rarely found to respond to the possibility of social observability and peer judgement.

Our findings suggest that development policies that rely on social judgments to prevent rule breaking behavior need to consider carefully the population for which they are being implemented as according to our evidence different groups may respond differently to such policies. While we find that the Rule of Law measure correlates with the responsiveness to social judgment, our data do not allow us to identify the specific causal channel nor can we identify specifically which aspect of culture contained in the Rule of Law measure drives the correlation. We acknowledge also that there may well be other cultural measures one could also employ for this purpose and find a similar correlation. In our view, that fact reinforces rather than undermines the point of what we demonstrate. The main point of the paper is to determine if cultural heritage appears to matter for the effectiveness of policies relying on social judgment. Our findings suggest that culture does matter and the notion that one could use other measures of culture and find that they too matter does not diminish the importance of our finding. To facilitate the design of social observability

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mechanisms it is important to identify the exact cultural element behind any effect but doing so requires a study with much greater scope than we can provide here. Given the magnitude of such a project, it is important to first assess whether there is a credible reason to see such a project as necessary or worthwhile. Our results suggest that the more detailed studies would be worthwhile and may in fact be necessary prior to the implementation of mechanisms based on social judgment if one wants to design them to be effective. We discuss these issues more in the conclusion.

The paper is organized as follows. Section 2 provides a review of the related literature. Section 3 presents our design, our theoretical framework and hypothesis, and describes the implementation of the experiments. Section 4 reports our results and Section 5 concludes.

2 Related Literature

Our study relates to two distinct bodies of work: 1) the literature on the impact of social observability and informal sanctions and rewards on individual behavior, and 2) the literature on the relationship between cultural background, preferences and behavior. In what follows we review these two volumes of work separately.

2.1 Observability and Social Enforcement

There exist a number of explanations, spanning a wide range of literatures, for why social observability of one's actions may act as an enforcement mechanism. The underlying theme is that there exist social norms prescribing what is considered good behavior and individuals have a preference for appearing to follow those norms. Early theoretical examinations of this issue focused on labor and insurance markets, as in Arnott and Stiglitz (1991) and Akerlof (1980), while other early studies provided a more philosophical and sociological perspective on the nature of social norms, as described in Bicchieri (2006) and Elster (1989). Within the economic literature, some models of the impact of social observability on behavior are based on the notion that people value fairness in itself, yet they also value social reputation (Benabou and Tirole, 2006 and Andreoni and Bernheim, 2009). Others suggest that pro-social behavior can emerge even when individuals care nothing for fairness in itself but do care about being perceived as caring about fairness (Dana, Weber and Kuang, 2007).

One of the earliest experimental investigations of how behavior might depend on the observability of actions by others is found in Hoffman, McCabe, Shachat, and Smith (1994) and Hoffman, McCabe, and Smith (1996) where the authors show that observability by the experimenter significantly affects offers made in bargaining games. There have been many subsequent studies showing in various ways that individuals behave differently when their actions are or are not observable to others. For instance, in the context of a dictator game with a charity as a recipient, Karlan and McConnell (2012) find that donations significantly increase when donors are told that their names and donations would be posted on a board for all participants to see. In a similar experiment, Jones and Linardi (2012) find that, rather than necessarily increasing donations, observability increases participants tendency to conform to the donation they expect others to choose. This is particularly true of women. Other related studies include Rege and Telle (2004), Andreoni and Bernheim (2009), Ariely, Bracha, and Meier (2009), Carpenter and Myers (2010), and Tadelis (2011). Further evidence can be found in field studies on household energy consumption (Schultz et al, 2007), charitable giving (Della Vigna et al., 2011) and voter turnout (Gerber et al. 2008).

This volume of prior work shows that observability can matter in enforcing pro-social behavior

and that this is likely the result of individuals caring about whether they are perceived as adhering to conventional social norms. A few additional studies test the effectiveness of social enforcement based on informal sanctions and/or rewards, in the context of public goods games (Masclet et al., 2003; Dugar, 2010; Carpenter and Seki, 2011), ultimatum games (Xiao and Houser, 2005) and prisoner dilemma games (Lopez-Perez and Vorsatz, 2010). The findings of Masclet, Noussair, Tucker, and Villeval (2003) seem to suggest that contrary to formal punishment, nonmonetary sanctions might be effective in sustaining cooperation only when the sanctioned subject receives a high enough level of disapproval. Moreover, Carpenter and Seki (2011), in their sample of Japanese fishermen, find that different populations might respond differently to social disapproval.

The existing studies are framed as determining whether or not social observability and informal sanctions can enforce pro-social behavior. We examine how social observability affects anti-social behavior. While there is certainly a near mathematical equivalence between pro-social and anti-social behavior, the vast literature on pro-social behavior has shown that context matters.[5] There are no experimental studies, to the best of our knowledge, investigating the impact of observability and social enforcement on individuals' willingness to steal or act corruptly.[6] Moreover, due to the fact that social norms are by definition a product of the culture of specific societies, it is important to understand if norms proscribing the behaviors of interest are common across different cultures and if the response to observability and social enforcement differs across cultures.

2.2 Cultural background, preferences and behavior

In recent years, a number of studies have investigated the impact of cultural factors on a variety of economic behaviors and outcomes. Measuring culture and estimating cultural effects is challenging. The standard approach has been to conduct cross-country regression analyses using various measures of individual attitudes and beliefs drawn from cross-national surveys such as the World Values Survey as proxies for culture (Knack and Keefer, 1997; Tabellini, 2008). Recently a few studies have attempted to better isolate the role of cultural factors from that of country-specific institutional settings by comparing the behavior and outcomes of immigrants from different countries who are currently living in the same environment. For instance, Fisman and Miguel (2007) relate parking violations of diplomats in New York City to the level of corruption in their countries of origin. Comparing behavior and preferences of immigrants may be problematic due to self-selection into migration and the possible effects of migration on individual preferences and behavior; this problem is attenuated when considering second-generation immigrants. Fogli and Fernandez (2009), for instance, provide evidence of a strong positive correlation between labor participation of female US second-generation immigrants and female participation in the country of origin of their mothers. Giuliano (2007), also looking at behavior of second-generation immigrants in the US, shows that young adults' tendency to live or not live with their parents has significant cultural roots.[7] Very much in line with our investigation, in a recent study ?) shows that survey-based attitudes toward corruption of second-generation immigrants both in the US and in Europe are significantly correlated with attitudes toward corruption in the individuals' countries of ancestry.

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[5]See for instance Bardsley (2008) and List (2007).

[6]Experimental studies of bribery and embezzlement have investigated the effectiveness of exogenous formal punishment, monetary punishment from victims of corruption or from elected or appointed monitors, and combined monitoring systems. For a comprehensive review see ?).

[7]For a comprehensive review of the exisiting empirical literature on culture and behavior, based on cross-country studies or investigations of first- and second-generation immigrants, see Fernandez (2008), Guiso, Sapienza, and Zingales (2006) and Algan and Cahuc (2010).

Starting from Roth, Prasnikar, Okuno-Fujiwara, and Zamir (1991), a growing number of experimental studies have tested the impact of cultural variables on behavior by conducting the same economic experiment in different societies and comparing participants' behavior. While most of the existing experimental studies focus on cultural differences in pro-social preferences and behavior (Heinrich et al., 2006, Bohnet et al. 2008, 2010,Gächter et al. 2010) a few exceptions exist. Herrmann, Thoeni, and Gächter (2008) examined cross-cultural differentials in individuals' willingness to engage in anti-social punishment, i.e. punishment of cooperators in a public goods game demonstrating that cultural differences may lead to behavioral differences, but the context was very different than our study and the authors did not look at how culture may affects responsiveness to the possibility of social judgment. Cameron, Chaudhuri, Erkal, and Gangadharan (2009) investigated cultural difference in the propensity to engage in and punish bribery involving a large sample of students in Australia, India, Indonesia, and Singapore. Barr and Serra (2010) employed an international sample of Oxford University students – i.e., first-generation immigrants to the UK – and, similarly to Fisman and Miguel (2007), tested whether corruptibility in a simple bribery game could be predicted by the level of corruption in the participants' countries of origin.[8]

There are no cross-cultural investigations, to the best of our knowledge, of the effectiveness of social enforcement mechanisms relying on informal rewards and sanctions. We contribute to the literature by conducting such an investigation. In line with the body of work on second-generation immigrants, we employ a sample of US citizens that includes individuals who, due to their ancestors' immigration to the US from a number of different countries, identify culturally with a country other than or in addition the US. Our approach overcomes a number of possible disadvantages of cross-country experimental studies, such as biases due to the adoption of different languages in the game instructions, different experimental stakes, and usually different experimenters in each of the countries involved in the study (see Roth et al., 1991). However, it poses other limitations. In particular, the exposure of our subjects to the formal institutions, culture and norms prevailing in the US is likely to weaken the impact of their inherited cultural background on behavior. This reduces the likelihood of finding significant cultural effects, hence making our results conservative.

3   Experiment Design

3.1   Rule breaking games and observability treatments

We investigate how observability and social judgement affect a broad range of rule-breaking scenarios as a way of determining the consistency of individuals' responses to social enforcement. To this end, we designed an experiment incorporating three different situations, each involving anti-social behavior and constructed three different treatments in which we vary the degree of social observability. The three rule-breaking games simulate theft, bribery and embezzlement respectively. It is important for this study to have observed rule breaking behavior over multiple different games because it allows us to test the robustness of any effects we find over a variety of contexts. In order to have subjects perceive the decision-making contexts as clear rule breaking scenarios, we presented the games using the corresponding frames referring to the actions as stealing, bribery and embezzlement, rather than employing neutral language. Each game consists of two phases. In the first, all subjects engage in some task to earn an endowment. In the

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[8] A study also involving international students, i.e. first-generation immigrants, is that of ?), which investigates trusting behavior of graduate students in Italy from different European nationalities in the context of a repeated trust game where subjects are aware of others' nationalities and can choose with whom they want to play.

second, some of the subjects are given the opportunity to enrich themselves at a cost to someone else. Each rule-breaking game is a one shot interaction. One might be concerned that all of these different games imposes unnecessary complications to the experiment but this concern is unfounded. Each game is quite simple and our goal was to observe individuals engaging in rule breaking behavior in multiple contexts without their feeling that this was what the experiment was about. Thus we had to embed these situations as part of a number of different interactions.

In the stealing game, subjects first answer SAT math questions with the top 50% of performers receiving a high endowment and the bottom 50% receiving a low endowment. Then, they are randomly matched in pairs such that there is always one high endowment subject and one low endowment subject in a pair. Both subjects are referred to as private citizens in the game. One of the subjects in each pair is then randomly chosen and given the opportunity to steal from the other.

In the embezzlement game, subjects are randomly placed into groups of four. Three members of each group are labeled as private citizens while the fourth is labeled as a public official. In the first phase of the game, citizens engage in a letter encoding task similar to that used in Ku and Salmon (2012) that generates private earnings for each correct encoding. We use a different real effort task for this game than in the stealing game because we do not want to induce subjects to infer any connection between the games. Had we again had them answering SAT math questions, then the subjects would have reasonably inferred some connection between the two. The task also generates money into a public fund for each correct encoding. The official can engage in the encoding task if he/she wants to but the task does not generate earnings. The official is instead paid a fixed wage chosen to be higher than the amount the citizens should be capable of earning. After the citizens are finished, the official is told that it is his/her job to redistribute the public funds to all the citizens equally but is allowed to embezzle some of the fund if he/she chooses. Any non-embezzled funds are automatically redistributed among the citizens. The game is intended to mimic the notion of individuals earning income that is taxed for the purpose of redistribution. The amount available to the thief/government official to embezzle is the public fund generated by the tax.

In the bribery game, all subjects earn the same endowment for going through the Kandinsky and Klee painting preference elicitation module developed in Tajfel, Billig, Bundy, and Flament (1971). We chose this way to generate endowments because we wanted all endowments to be the same but we wanted the subjects to have engaged in some task to have earned them. This task serves that role better than any real effort task that would involve a piece rate wage. After that task is completed, in line with the experimental designs of Banuri and Eckel (2010), Cameron, Chaudhuri, Erkal, and Gangadharan (2009) and Serra (2012), subjects are randomly matched into groups of three with one subject being labeled a private citizen, one a public official and the third an other member of society. The rule-breaking decision-making phase allows the citizen to choose whether to offer a fixed bribe to the official and the official to simultaneously decide whether he would accept a bribe if it were offered. If the bribe is offered and accepted, citizen and official each gain money at the expense of the other member of society; indeed the other member of society suffers a loss equal to the net gain enjoyed by citizen and official.

In each game, we investigate whether the potential rule breakers respond differently to different levels of observability, corresponding to our three treatments, which will label Hidden Action, Victim Knows and Social Judgement. In the Hidden Action treatment a potential rule breaker is told that his or her victim would never know that there was the possibility of anti-social behavior in the game, or that he or she suffered monetary losses as a result of the decision-making of other subjects. We accomplish this by not telling subjects exactly how much they could earn from

each endowment-earning task while they are engaging in the task. We tell them they will earn money for the tasks and they will be informed how much they make at the end. As an example, in the stealing game under the Hidden Action treatment the only thing that a victim knows is his or her final earnings and not if someone stole from them or what the potential earnings could have been in the absence of stealing. In the Victim Knows treatment, a potential rule breaker is informed that the victim would know that there was the possibility to engage in the bad behavior and whether or not they were victims of such behavior and we do in fact inform the victim of the action by the rule breaker. In the Social Judgment treatment, the potential rule breaker is told that all subjects in the victim role would be able to observe his or her choice and they would be given the chance to send messages to him or her consisting of happy, indifferent or sad faces with no message also being an option.[9] This mechanism is similar to the mechanisms used in Masclet, Noussair, Tucker, and Villeval (2003), Carpenter and Seki (2011) and Dugar (2010) in the context of pro-social games. Note that by conducting each game as a one shot interaction we are not attempting to test whether subjects change their behavior after observing how people judged their prior actions in the Social Judgment treatment, but rather whether the knowledge that their action would be scrutinized by others would alter behavior.[10] Also, given that we have treatments in which the actions of the rule breakers are observable by others, this means that the results of each phase are made known to the subjects when that phase ends.

In order to identify differences in the cultural backgrounds of our subjects, we asked the experimental participants, as part of a standard post-experiment questionnaire, whether they and their families identified culturally with a country other than or in addition to the US. In our empirical analysis we use subjects' answers to this question as a means of identifying potentially important differences in the cultural background of the subjects. In particular, we associate to each country of cultural heritage the corresponding value of the Rule of Law index produced by the World Bank. The Rule of Law index is one of the Worldwide Governance Indicators created by the World Bank since 1996. It is a composite index generated by the aggregation of country assessments provided by different sources including non-governmental organizations (such as Freedom House and Global Integrity), public sector organizations (such as CPIA assessments of World Bank and regional development banks) and commercial business information providers (such as Economist Intelligence Unit and Global Insight). The country indexes provided by each individual source rely either on surveys of households and firms[11] or on expert assessments of the accountability and rule of law institutions and practices prevailing in a country.[12] As a result, the World Bank's Rule of Law composite index "captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence."[13] It is important to note that the determination of which country a subject identifies with is entirely determined by the subjects themselves. We take no role in that. So if a subject

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[9]A complete set of instruction screens demonstrating exactly what is shown to subjects and when is available as an Appendix to the paper.

[10]Between the Victim Knows and Social Judgment treatment, we change two things simultaneously. We allow the victim to send a message to the rule breaker but we also allow all other victims to know of the rule breakers bad behavior. Thus we are not trying to identify which of these two elements drive the result. We are instead just trying to determine if a Social Judgment mechanism of this sort can be more effective.

[11]For instance, the Afrobarometer survey asks households numerous questions about experiencing different kinds of crimes over the past year, and the level of trust in the "courts of law" and the police.

[12]For instance, the index provided by Global Insights Business Conditions and Risk Indicators relies on expert assessments on "how far the state and other outside actors can influence and distort the legal systems" and "how much of a threat businesses face from crime such as kidnapping, extortion, street violence, burglary and so on."

[13]For more information see: http://info.worldbank.org/governance/wgi/resources.htm

has ancestors from two or more different countries, the determination of which they identify with is chosen by themselves. While we do gather information on the background of ancestors (both parents and grandparents), we take no stand on how or why a subject made the choice to state the country that they did. To the extent that some individuals may have had weak identification or stated countries to which they had no ties, that would serve to weaken any results we might find making any result we do find stronger due to that potential bias.

We note that subjects do answer this survey question at the end of the experiment. This is in part because given the questions regarding corrupt behavior in the survey, administering it before the experiment would have made subjects suspicious about the purpose of the study or involved a form of priming that could have compromised the quality of the experimental data. However, administering the survey after the experiment might lead to a concern that somehow a subject might use their statement of identification at the end of the experiment as some way of justifying their behavior during the experiment. The notion that subjects could or would have engaged in this behavior in such a way that correlates with the experimental treatments is, however, too remote to consider seriously. The full survey that the subjects fill out consists of 42 different questions. Many of the questions focus on whether family members had ever been asked to pay a bribe, their views on how they believe corruption affects a society and so on. Those questions deal directly with issues of corruption and one could perhaps more reasonably envision the answers to how acceptable a subject finds corruption to vary with how corrupt his behavior was in the recent experiment.[14] If someone is going to engage in self-justification, those questions seem far more ripe for that purpose than questions regarding country identification. Even that claim is dubious though considering that the unethical behavior portion of the experiment consisted of at most 3 decisions of a two hour experiment. Also, as we discuss later, the statements subjects make regarding country identification are largely cross-validated as matching up with the countries of origin for their parents and or grandparents. A subject would have to be quite committed to a very obscure and subtle form of self-justification to either make up the country origins of their ancestors or to choose whether to claim identification with one of those countries as a way of somehow making any behavior they engaged in seem more acceptable to themselves and to do so in a way that varies with the experimental treatments. Due to the remoteness of this possibility and the already substantial length of the paper, we provide no analysis on this issue.

3.2 Theory and Parameters

As our baseline model of behavior we adopt the theory presented in Cox, Friedman, and Gjerstad (2007) (CFG). In order to conduct the tests of interest we need to find parameters for the games such that some, but not all individuals would engage in rule-breaking in each treatment. We adopt the CFG model because 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 situation we are investigating also involves state-dependent other regarding preferences though in our case the emotional state of the individual is not based on the prior actions of others but rather on the degree to which the decision maker's actions are observable to others. Our games are most similar to the version of the CFG model designed to capture the effects of status in a dictator game and so we adopt the specification for this game as our baseline.

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[14]While we asked these questions in the survey they were asked mostly for curiousity and we do not use them in the data analysis.

3.2.1 Stealing Game

The Stealing Game is essentially a dictator game with a negative frame. In the game, the thief is allowed the option of stealing some amount of money from someone else, the victim. One issue that may be important to this interaction is the relative size of endowments that both players possess and so we have designed the experiment to allow for examining this. Let w_1 be the endowment of the thief and w_2 be the endowment of the victim. The thief has to choose the fraction, p, of the victim's endowment to steal. This leads to a maximization problem for the thief of the form

$$\max_{p \in [0,1]} (w_1 + pw_2)^\alpha + (\theta_0 + bv)((1-p) * w_2)^\alpha \tag{1}$$

. The term $(\theta_0 + bv)$ captures the possibility that the weight placed on the welfare of the victim can be shifted. We specify θ_0 as capturing the base degree of caring about the welfare of others. The variable v represents the observability condition where $v = 0$ reflects no observability while higher levels of v would reflect differing levels of increased observability. The parameter b measures the importance of those changes in observability states. Here we have supposed a linear structure to any state changes which is obviously not required or necessarily valid but specified for simplicity.

For the experiment we need to find values of w_1 and w_2 such that an average person should be expected to make interior choices of p. CFG estimates values of the key parameters to be $\alpha = .075$ and $\theta_0 = .337$ in their data taken from dictator games. If we use those values in this model assuming $v = 0$ and $w_1 = 50$ and $w_2 = 100$, or that the endowment of the thief is the lower of the two, then we can get a prediction for the values of p that will lead to stealing. For values of $p \in [0, 0.54]$ stealing yields at least as much utility as not stealing while for $p > 0.54$, not stealing at all yields higher utility than stealing. In the experiment we give subjects the option to steal nothing or to steal at specific values of p rather than have them choose their own p. This analysis suggests that, when the act of stealing is unobservable to others, i.e. $v = 0$, an average person should be willing to steal at values of p up to 0.54. We therefore allow thieves to choose from the set $\{0, 0.35, 0.70\}$ as this should lead to a baseline prediction that in the default case of $v = 0$, we should observe relatively few choices of the high level of stealing but a relatively substantial amount of individuals willing to choose the lower value of stealing. If $b > 0$ and large enough, then as we increase v we should observe a decrease in stealing which would take the form of individuals being even more likely to choose not stealing or the low level of stealing than the high level. We also need to consider the case in which the thief has the smaller endowment, i.e. $w_1 = 50$ and $w_2 = 100$. For the CFG estimated preference parameters and these specific endowments, the thief should prefer stealing at values of $p \leq 0.97$. This situation is useful in that it provides a tougher test of the effect of increases in v as it should require the shift in v to have a large effect on the weight placed on the victim's welfare for the thief to choose anything other than to steal the high level.

As a result of our parameterization, in the Stealing Game individuals earn either a low endowment, equal to 50 ECU, or a high endowment, equal to 100 ECU based on their performance on the SAT questions. Then, high and low performers are matched, and one of the two subjects in each pair is randomly selected and given the chance to steal 35% or 70% of the endowment of the other subject.[15]

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[15] One might be concerned that the assignment to endowments here is not random and so there is a potential selection issue in the results. First, for this game to be stealing, individuals have to earn the money. So this issue is unavoidable. Second, we intentionally randomize whether it is the low or high endowment person who has the opportunity to steal and so we can observe the stealing behavior of both groups. While one might expect that the high endowment types would never steal from the low endowment types, this issue is corrected for in the

3.2.2 Embezzlement Game

The Embezzlement Game is similar to the Stealing Game in that it is also a form of negative framed dictator game but it involves more people being harmed. There are no situations in the original paper involving more than two parties. In the conclusion, the authors suggested that any additional individuals should just be treated additively. We adopt this specification along with the assumption that the decision-maker places equal weight on the welfare of each of these additional individuals.

   We again let w_1 refer to the endowment provided to the potential thief, i.e. the public official, and assume that there are 3 potential victims in the role of private citizens. The citizens earn money according to a piece rate wage that is divided into private income and public funds with any non-embezzled public funds being redistributed to the victims in equal proportions. The official is assumed to know the total amount in the public pool, G, but does not know the contribution of that from each individual victim and so he is unconcerned about any heterogeneity in the victims' individual contributions or private earnings. We also assume that the official knows the production function that relates the size of the public funds to the individual earnings and so he is able to infer the average private earnings of the citizens. Let g be the piece rate at which individual productivity leads to contributions to G and r be the piece rate at which individual productivity leads to individual earnings. Knowing g, r and G, the official therefore estimates the average individual earnings to be $\frac{G}{3g}r$. If we again let p be the fraction of the total possible public funds that is embezzled by the official then we get a maximization problem of

$$\max_{p \in [0,1]} (w_1 + pG)^\alpha + 3(\theta_0 + as + bv) \left(\frac{G}{3g}r + (1-p)\frac{G}{3} \right)^\alpha \qquad (2)$$

with θ_0 again representing the base weight the official places on the welfare of others, bv representing the same shift term as before regarding observability and as presenting a new status shift term which might exist in this environment corresponding to the official's responsiveness to the total productivity of the citizens. Let a reflect the extent to which an official might value the welfare of the citizens differently based upon their productivity and let $s = 0$ represent some baseline level of productivity, with positive levels indicating higher productivity.[16] We have no *a priori* expectation on the sign of a or how to specify s. An official might consider higher productivity citizens to be more deserving of their earnings and therefore $a > 0$ while alternatively an official could consider higher productivity citizens to need the public funds less, $a < 0$. We note this as a possibility and later we will evaluate empirically whether we can detect such an effect.

   While this game still has the strategic structure of a dictator game, the additional victims and other elements could certainly lead to a shift in preference parameters. For our baseline predictions we assume a modest increase in θ_0 based on the fact that in this environment the citizens have earned their endowments while the official has done nothing to earn his position. Consistent with the findings of CFG, that difference should lead to a higher weight placed on the utility of the citizens. We therefore use $\theta_0 = .5$ but keep $\alpha = 0.075$. We set piece rate wages at $g = 5$ and $r = 8$. Based upon the observed productivity in this task observed in Ku and Salmon (2012) we expect G to be around 150. We set the endowment for the public official at $w_1 = 195$. With these parameters, assuming $s = 0$, an average person would prefer embezzling

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regressions below and the results very clearly indicate that high endowment and low endowment individuals steal at an equivalent rate.

   [16] We could just replace s with G as s is a function of G and it could be specified as linear. We see no need to specify that s must be linear and mostly use this notation for convenience.

to not embezzling up to approximately $p = 0.64$ while at higher values of p, not embezzling is preferred. We therefore chose to allow embezzlement choices from the set $p \in \{0, 0.45, 0.80\}$ according to similar reasoning as before. In the Hidden Action treatment, i.e. when $v = 0$, we should expect to see most individuals choose to embezzle the smaller proportion of the public fund with a few choosing the higher proportion and in the other two treatments, representing higher values of v, we should expect decreasing fractions of people embezzling.

As a result of our parameterization, in the Embezzlement Game, a subject is allocated the role of public official and given a wage of 195 ECUs, whereas three citizens complete the encoding task and earn 5 ECUs for each correct word. The encoding task also generates 8 ECU in a public fund, for each correct word encoded by a citizen. The official is then given the task to redistribute the public fund equally among the three citizens. However, before redistributing the money he or she can embezzle 45% or 80% of the fund. Whatever is not embezzled is distributed equally to the citizens.

3.2.3   Bribery Game

Our bribery game is based on a commonly used model also used in Cameron, Chaudhuri, Erkal, and Gangadharan (2009) and Serra (2012). In the bribery game there are three individuals involved: a private citizen who has the option to bribe a public official or not, a public official who can accept the bribe or not and an other member of society that suffers the externalities generated by a corrupt agreement. This setting requires a strategic analysis and so we solve for Nash equilibria of the game rather than simply analyzing the choice behavior of an individual as before. Moreover, we need to specify a version of the utility function where there are three individuals involved and, unlike the Embezzlement game, the decision maker does not necessarily see the other two individuals as equivalent. The utility function needs to be specified for both the citizen, who has the option to offer a bribe, and the official, who has the option to accept or reject the bribe.

The game is played with simultaneous choices being made by the citizen and official, meaning that the choice by the official is whether or not to accept the bribe should the citizen have offered it. The most straightforward way to represent the game is to provide the normal form of the game and this is shown in Table 1.[17] We let w_c, w_p and w_s represent the endowments of the citizen, public official and the other member of society respectively. If the citizen offers a bribe, we assume he pays a cost of d regardless of whether the bribe is accepted or not. If the bribe is accepted then the other member of society suffers some loss, l, the public official receives the bribe amount, b, and the citizen receives a benefit equal to m. We let θ_c, θ_p and θ_s represent the weight placed on the citizen's welfare by the public official, the weight placed on the public official's welfare by the citizen and then the weight placed on the other member of society's welfare by both the citizen and the official. For simplicity we assume that the last parameter is held in common by the two decision makers, though it need not be. Further, we assume that θ_c and θ_p do not vary with whether the other member of society can observe the actions but θ_s does, so $\theta_s = \theta_{s0} + bv$ where θ_{s0} is the base value and bv represents the same shift term as above regarding the observability of actions by the victim.

So long as $d > 0$ or the cost of offering a bribe is positive, it is trivial to see that the strategy pair (Not Offer, Not Accept) is a Nash equilibrium regardless of the other parameters of the game.

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[17]We have chosen not to represent the payoffs of the other member of society in the game matrix since that player makes no strategic choices. The extent to which that player's welfare is important strategically is taken into account in the utility functions of the other two players.

Citizen\Official

	Accept	Not Accept
Offer	$(w_c - d - b + m)^\alpha + \theta_p(w_p + b)^\alpha + \theta_s(w_s - l)^\alpha,$ $(w_p + b)^\alpha + \theta_c(w_c - d - b + m)^\alpha + \theta_s(w_s - l)^\alpha$	$(w_c - d)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha,$ $(w_p)^\alpha + \theta_c(w_c - d)^\alpha + \theta_s(w_s)^\alpha$
Not Offer	$(w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha,$ $(w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha$	$(w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha,$ $(w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha$

Table 1: Bribery game.

If we want to potentially observe outcomes in which successful bribery occurs then we need to find parameters such that (Offer,Accept) is also an equilibrium or the parameters must satisfy the conditions

$$(w_c - d - b + m)^\alpha + \theta_p(w_p + b)^\alpha + \theta_s(w_s - l)^\alpha \geq (w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha \tag{3}$$

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

. There is a difficulty here in specifying appropriate values θ_c, θ_p and θ_s since there is no similar situation from CFG in which such parameters are estimated. We consider two extreme cases so that we understand the range of possibilities.

One extreme assumption is that corruption partners are not valued or $\theta_c = \theta_p = 0$ while the other member of society is valued as in the dictator game, $\theta_s = 0.337$. This is an extreme version of the case in which an individual values someone who is in a position to look out after their own welfare less than they value the welfare of an innocent bystander. We set all of the endowments to be equal so that we do not complicate this analysis with any further status comparisons and so $w_c = w_p = w_s = 100$. We set a nominal cost of attempting the bribe at $d = 5$ and a loss to the other member of society in the event of a successful bribe to be $l = 40$. This leaves m, or the benefit to the citizen from a successful bribe, and b, the amount paid, as free parameters. It can be shown that with $m = 40$ and $b = 20$, both inequalities approximately bind leaving the average citizen and official indifferent between their choices. A higher m would lead to the citizen strictly preferring to bribe (conditional on the offer being accepted) while a higher b will lead to the public official strictly preferring to accept (conditional on the bribe being offered).

It would also be reasonable to assume that coconspirators and innocent bystanders are considered to be equivalent; $\theta_c = \theta_p = \theta_s = 0.337$. Under this assumption we can observe two comparative static effects from the previous case. Offering the bribe becomes marginally less attractive to the citizen but accepting a bribe becomes substantially more attractive to the public official. The minimal m necessary to make bribing worthwhile increases slightly while the bribe necessary to induce acceptance falls dramatically.[18]

To balance these concerns, we have chosen parameter values of $m = 45$ and $b = 20$. At these values (Offer, Accept) should be supportable as an equilibrium for a substantial fraction of the population under either assumption though (Not Offer, Not Accept) is still an equilibrium for everyone. What we are really interested in though are the treatment effects regarding what happens as v rises. An upward shift in v leads to an increase in θ_s which makes the successful

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[18]There is another case we could have also considered due to the fact that accepting/offering a bribe could be considered a positively reciprocal choice by the other party. In this case the values of θ_c and θ_p might rise in the event that a bribe has been accepted or offered. This makes the (Offer, Accept) payoff even better than the deviation possibilities and so if preference parameters shift in this way it increases the likelihood of that pair of strategies being an equilibirium. The comparative static we are interested in regarding observability still holds though.

bribe outcome less attractive to both the citizen and the official as they now care more about the harm done to the other member of society. Thus we have a comparative static prediction that the propensity of offering and being willing to receive a bribe should be decreasing in v.

As a result of our parameterization, in the Bribery Game private citizen, public official and other member of society all earn an endowment of 100 ECUs from completing the Kandinsky and Klee painting preference elicitation module. Then, the private citizen is given the chance to offer a bribe of 20 ECUs to the public official, while the public official has to decide whether to accept or reject the bribe, should the citizen offer it. If the bribe is accepted, citizen and official gets 120 ECUs each, whereas the other member of society loses 40 ECUs and therefore earns 60 ECUs from this task.

3.3   Hypotheses

We can now explicitly state the hypotheses that the experiments were designed to allow us to test which are also consistent with the theory described above. Our main interest is in the effectiveness of the observability treatments on the propensity to engage in anti-social behavior and in determining whether cultural background affects behavior. Our first and central hypothesis is as follows:

Hypothesis 1 *In all three games the propensity to engage in rule-breaking should be lower in the Victim Knows and Social Judgment treatments than in the Hidden Action treatment. Also the propensity to engage in rule breaking behavior should be lower in the Social Judgment treatment than in the Victim Knows treatment.*

The support for this hypothesis is provided in the theoretical analysis in section 3.2. The hypothesis rests on the idea that the weight a decision maker will place on the welfare of a victim will be increasing in the observability of the decision to engage in anti-social behavior. If that weight does vary with the observability condition then, as shown above, this comparative static should be observed in all three games.

Hypothesis 2 *The propensity of an individual to engage in rule breaking is decreasing in the Rule of Law measure associated with the cultural heritage of that individual.*

While this hypotheses was not addressed directly in the models developed in section 3.2 for each game, the rationale behind it is that the culture with which individuals identify is likely to shape the degree to which they perceive the acts of stealing, bribing or embezzling as actual "rule breaking". Since the Rule of Law index captures attitudes toward formal institutions and general tendency to abide by rules, individuals that indicate a cultural connection to a society with a low Rule of Law score might have internalized at least some of the values and norms prevailing in their countries of origin. Consequently, their perceptions of what constitutes acceptable behavior and what constitutes rule breaking might differ from the perceptions of individuals that associate culturally to high Rule of Law countries. Hence our prediction that, in the absence of any formal enforcement, the former might be more likely than the latter to engage in stealing, bribery and embezzlement. Theoretically this can be represented by a positive correlation between the Rule of Law measure and the value of θ_0.

Hypothesis 3 *Social observability should have a greater deterrent effect on rule breaking behavior for those who self-identify with high Rule of Law countries.*

This final hypothesis is derived from the combination of the first two and in some sense is the core focus of our study. Should we find out that social observability affects behavior in a manner consistent with hypothesis 1 then the cultural background of an individual could have two possible effects on their behavior. One is the direct effect discussed in hypothesis 2. The second is the possibility of an interaction effect between cultural background and the treatments leading to individuals from different backgrounds responding differently to the treatments on observability. Our hypothesis is that those identifying with low Rule of Law countries could be less responsive to social observability than those identifying with higher Rule of Law countries. Theoretically this can be represented by a correlation between the Rule of Law measure and the value of b.

Our tests of hypotheses 2 and 3 are affected by the fact that our experimental participants have all been exposed to the formal and informal institutions prevailing in the US, which is a high Rule of Law country. In fact 90 per cent of our subjects were born in the US. Consequently we should expect that any correlations between cultural background and behavior are likely to be weaker than if we involved individuals that actually grew up and currently live in countries characterized by different Rule of Law scores. This should be expected to make observing any effect of the Rule of Law measure very difficult in our data and bias us against finding any relationship between behavior and the Rule of Law measure.

There are other ancillary hypotheses that we can also investigate with our data. In the Stealing game, as described in section 3.2.1 we might observe a differential tendency to steal from others based on relative endowments. Our prediction is that a thief is more likely to steal when they have the lower endowment. In the Embezzlement game, we could also observe differential tendencies to embezzle resources based on the size of the public fund. However, as discussed in Section 3.2.2, we do not have a clear prediction on the direction of such an effect.

3.4 Implementation

Each experimental subject participated in all three rule breaking games but only one treatment regarding the observability of actions. While we wanted to observe individuals making choices in all the rule breaking games, we did not want the results from one rule breaking game affecting the results of the others and we also wanted to ensure that experimental participants would not see the experiment as simply providing multiple opportunities for anti-social behavior. To deal with those issues, we included three other games in the experiment as distractor tasks. The distractor tasks included a module based on a shortened version of the risk aversion assessment module from Harrison and Rutström (2009) with 15 pairwise lottery choices as well as a second instance of this task where the decisions were made on behalf of another subject. Prizes from the lotteries ranged between 0 and 250 ECUs. The third task had subjects participating in a series of 5 auctions bidding against the computer for the right to win a lottery with the value of that lottery ranging between 0 and 85 ECUs. The intention of these games was to provide some mentally demanding tasks that might allow subjects to forget about the previous anti-social tasks and thereby disguise the objective of the experiment. The game involving lottery choice on the behalf of another subject also provides what might be considered a positive frame about making choices for others which should further cloud any demand effects from subjects seeing three games with anti-social behavior components. Given these tasks and the first phases of the anti-social games where the endowments were earned, there was actually a very small portion of each session, perhaps 5-10 minutes of sessions lasting around 1.5-2 hours, in which an opportunity for rule breaking would arise.

Table 2 provides a summary of the design of the experiment. We conducted 6 sessions per

	RA Self	Bribery	Auction	Stealing	RA Other	Embezzlement	# Subjects
Hidden Action			6 Sessions / 24 Subjects Each				144
Victim Knows			6 Sessions / 24 Subjects Each				144
Social Judgment			6 Sessions / 24 Subjects Each				144
# Subjects			18 Sessions/ 24 Subjects Each / 432				432

Table 2: Summary of experiment design.

treatment, involving a total of 432 subjects. In half of the sessions for each treatment, participants went through the games in the order indicated by the table while in the other half participants played the embezzlement game first and the bribery game last. We kept the order of the distractor tasks unchanged. While this does not allow us to eliminate all ordering effects from the data it does allow us to correct for some in a way that is feasible given the sample size. These ordering issues are examined in the results section and we find little effect from them. Subjects are randomly rematched across rounds. One complicating factor is that it was not possible to keep subjects either always in the role of the rule breaker or always in the role of the victim as the numbers of the two types varied across games. To the extent possible we minimized the amount of switching by making certain that all subjects in the role of Public Official in the embezzlement game, i.e. the one with the fewest rules breakers, were also rule breakers in the other two games. Further, all subjects in the role of Thief in the stealing game, i.e. the game with the moderate amount of rule breakers, were in one of the rule breaker roles for the bribery game. We can and do test for any effects from these role reversals. All games resulted in payment in all sessions and the results of each game were reported to the subjects upon completion of the game. This structure was necessary for the rule breaking games and we mimicked it for the distractor tasks for consistency.[19] Finally, we note that participants could not identify in any way their partners in the different games as all interactions were anonymous.

Our sample consists of Florida State University students. We conducted the experiment using software programmed in z-tree, Fischbacher (2007), with subjects recruited using ORSEE, Greiner (2004). The exchange rate used in the experiment to exchange ECUs for dollars was 1 ECU=$0.01 resulting in an average per subject payout of $21.

After the completion of the experimental tasks, subjects filled in a questionnaire that registered their demographic characteristics, including their cultural heritage. As mentioned before, subjects were asked whether they and their families identify culturally with a country other than or in addition to the US. In our empirical analysis we associate to each country of cultural heritage the corresponding value of the Rule of Law index produced by the World Bank, which measures the quality of legal and judicial institutions, as well as individuals' attitudes towards the rules of society and, more generally, the likelihood of crime and violence.[20]

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[19]There is some recent literature indicating that a more preferred approach would have involved paying on a single round as this leads to incentive compatibility, see ?). Other work tests this hypothesis directly and finds evidence suggesting that the underlying assumptions for this argument fail, ?). Given the fact that each of the phases are distinct from each other we see little scope for any of these issues being relevant and thus do not expect any problems from paying for each phase. Further, our interest is comparing across treatments and see no reason that any potential bias from paying for each phase would vary with the treatments.

[20]For further details about the Rule of Law Index, see the last paragraph of Section 3.1.

4 Results

4.1 Summary Measures

We begin this results section with a few quick summary looks at the data. The first important point to establish is that we observed a great deal of heterogeneity in the responses to the key question on our survey regarding a country (other than or in addition to the US) with which our subjects identified. In Figure 1 we provide a graphical view of this data. Along the $x-$axis we have ordered each of the countries mentioned by the students according to their score on the World Bank's Rule of Law index, which we have rescaled over a $0-5$ range,[21] and along the $y-$axis we report the number of subjects who identify culturally with that country. While all of the subjects were students at Florida State University and so lived in the US, 215 out of the 432 subjects in the sample indicated that they identified culturally with a country other than the US. As the figure demonstrates our sample is quite diverse, with a total of 52 countries being represented spanning almost the entire range of the Rule of Law index. Our survey allows us to check whether the countries of cultural heritage mentioned by the students are indeed the countries of origin of their ancestors. Of the 215 students who identify with a country other than (or in addition to) the US 35% have at least one parent who emigrated from that country, 20% have at least one grandparent that emigrated from that country, 34% have ancestors older than grandparents who emigrated from that country. Finally, 10% spent 10 years or more in that country and can therefore be considered first-generation immigrants. While we could have potentially constructed some variables that interact time spent in the US with the Rule of Law measure to somehow account for whether a subject is 1st, 2nd or 3rd generation we do not have a big enough sample to engage in such exercise. Moreover, there is little advantage for doing so. If we can identify behavioral differences due to cultural differences without these distinctions, then again it makes our findings extremely conservative in nature and indicates little reason to attempt to create some *ad hoc* measure regarding the strength of cultural connection a subject might have. We instead simply take all subjects at their word regarding whether they identify with a country or not and make no fine distinctions between them regarding the strength of their identification.

For much of the empirical analysis below we will want to separate the sample into Low and High Rule of Law (L/H RoL) groups. Given that the Rule of Law score for the US is the median in the sample and that all of the study participants have spent substantial time in the US, we have chosen this as the split point. We have also chosen to place the US in the high Rule of Law category given that otherwise the sample size in that group would have been very low. This division is marked on the graph. Splitting the sample around the US makes it more difficult on us to find evidence of significant cultural differences in subjects' behaviors. This is because everyone in the Low RoL group has been influenced to some degree by the formal and informal norms prevailing in the US, making it less likely for us to observe behavioral differences from those who identify solely with the US. Any result we might find should therefore be seen as a conservative estimate of the effect of culture on behavior.

Figure 2 provides a first summary of our experimental data. The figure shows the overall tendency of individuals to engage in rule breaking behavior in each game, broken out by observability treatment. The formal test of Hypothesis 1 will be provided in the next section but the figure demonstrates that we do regularly observe that the most anti-social behavior is observed in the Hidden Action treatment while the least is observed in the Social Judgment treatment

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[21]In order to capture values and norms associated with the Rule of Law that the subjects' ancestors brought with them when they migrated to the US, we take the oldest Rule of Law index which is from 1996, i.e. the first year the World Bank compiled the index.
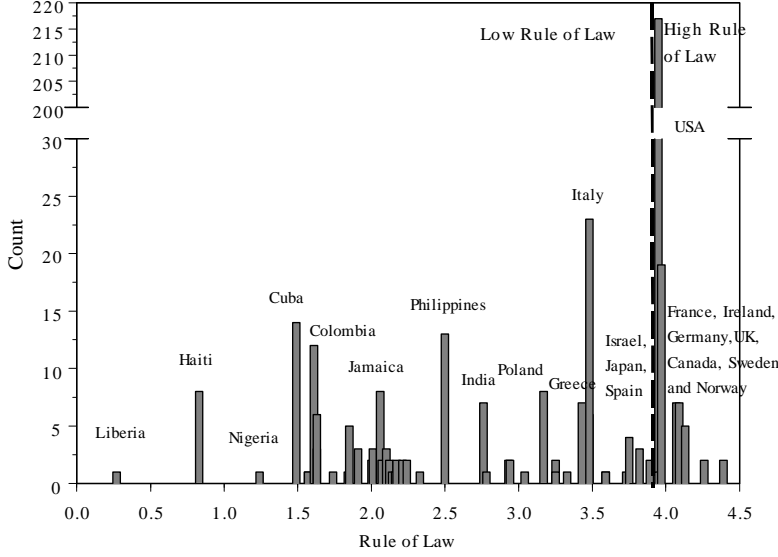
Figure 1: Histogram indicating number of subjects identifying with each of the countries mentioned in our sample ordered along the x-axis according to their Rule of Law score.

as expected. The ranking of the Victim Knows treatment is less clear. One point to note from this figure is that in both the Stealing and Embezzling games we observe many more individuals choosing to steal or embezzle the large amount rather than the small amount despite the fact that the parametric prediction made from the CFG estimated preference parameters was the opposite, i.e. we should have seen relatively fewer choices to steal the large amount than the small amount in each game. This suggests that the actual values of θ_0 for the subjects that participated in our games were lower than the values estimated in CFG. This difference is not necessarily surprising due to the differences in the subject pools, and more importantly, in the experimental contexts. Nevertheless, we note this difference from our baseline predictions.

4.2   Analysis of Rule Breaking

Our first hypothesis is concerned with the degree to which the different observability treatments affect the behavior of subjects in the rule breaking position. Tables 3-5 provide the statistical tests of this hypothesis for each game. We employ specifications that look at a binary version of the decision, i.e. to break the rule or not, as well as specifications examining the severity of the decision, i.e. whether a bribe was attempted vs. successful and the percentage stolen/embezzled. The explanatory variables used in each regression include the dummy variables for the Victim Knows and Social Judgment treatment leaving the Hidden Action treatment as the baseline. We include a standard set of simple controls including gender, whether the subjects said they were raised religious and the score on the Rule of Law measure for the country with which they identify. We also include the dummy variable *BribeFirst* to control for/detect ordering effects which is equal to 1 for the sessions in which the Bribery Game was played first and it is equal to 0 for the sessions in which the Embezzlement game was played first. For the stealing and embezzling games there were other contextual variables hypothesized as being important, i.e., the relative
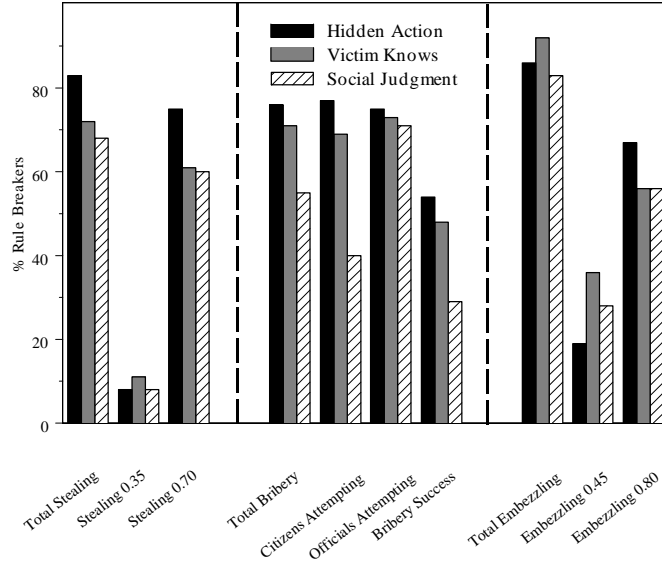
Figure 2: Summary of anti-social behavior by game and treatment.

endowment status for the stealing game and the size of the public fund in the embezzlement game; we include those variables in order to test for those effects. Finally, for each regression specification we show the results for three different populations: 1) the entire sample, 2) the subset of subjects that identify culturally with Low Rule of Law countries, and 3) the subset of subjects that identify culturally with High Rule of Law countries. This brings us to our first two results, which involves testing hypothesis 1 for the overall sample and then for the two subsets which is a test of hypothesis 3:

Result 1 *In the full sample of subjects we find that both treatments involving observability diminish rule breaking behavior in the stealing game, while only Social Judgment does so in the bribery game and neither has a significant impact in the embezzlement game.*

Result 2 *For the subjects in the high Rule of Law subset, the Social Judgment treatment has a negative and significant effect on the severity of rule breaking behavior in all games and a negative and signifcant effect on the propensity to engage in rule breaking behavior for the stealing and bribery games. The Victim Knows treatment is not robustly effective at diminishing either the propensity to engage in rule breaking or the severity of the acts. For the low Rule of Law subset both mechanisms are generally ineffective at altering behavior.*

Tables 3-5 provide support for these results. We start by examining the estimates obtained for the full sample, reported in the first and fourth columns of each table. In the Stealing game, the frequency of stealing and the severity of stealing drop in both the Victim Knows and the Social Judgment treatments relative to the Hidden Action treatment.[22] In the Bribery game, we find a significant effect only for the Social Judgment treatment and only in the decision to Offer a Bribe, not in the decision to Accept. Finally, in the Embezzlement game we find no significant effects in the overall sample for either treatment.

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[22]The coefficients on the dummy variables for the Victim Knows and Social Judgment treatment are not significantly different in either specification.

	Logit: Steal or Not			Ordered Logit: Percent Stolen		
	All	Low RoL	High RoL	All	Low RoL	High RoL
Victim Knows	-0.606**	-0.810	-0.466	-0.590**	-0.585	-0.796*
	(0.282)	(0.572)	(0.492)	(0.230)	(0.413)	(0.432)
Social Judgment	-0.829***	-1.539*	-0.667*	-0.707***	-0.621	-0.979***
	(0.201)	(0.804)	(0.388)	(0.231)	(0.528)	(0.369)
BribeFirst	0.363*	1.754***	-0.356	0.309*	1.041***	-0.112
	(0.209)	(0.611)	(0.376)	(0.185)	(0.377)	(0.331)
Larger Endowment	-0.448	-0.756	-0.205	-0.138	-0.0950	0.0371
	(0.366)	(0.598)	(0.467)	(0.314)	(0.547)	(0.448)
Male	0.119	0.656	-0.302	0.219	0.498	-0.108
	(0.309)	(0.651)	(0.420)	(0.293)	(0.525)	(0.363)
Raised Religious	-0.569	0.189	-1.209**	-0.188	0.552	-0.547
	(0.351)	(0.656)	(0.519)	(0.302)	(0.631)	(0.423)
Rule of Law	-0.143	-0.618*	-7.837**	-0.0805	-0.535**	-7.798**
	(0.174)	(0.375)	(3.601)	(0.121)	(0.256)	(3.847)
Constant	2.429***	2.567	33.85**	-	-	-
	(0.743)	(1.654)	(14.80)			
Obs	216	82	134	216	82	134

Robust standard errors in parentheses, clustered at session level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3: Logit and Ordered Logit regressions examining stealing behavior.

	Logit: Offer Bribe			Logit: Accept Bribe			Logit: Success
	All	Low RoL	High RoL	All	Low RoL	High RoL	All
Victim Knows	-0.371	-0.336	-0.481	0.0715	0.380	-0.356	-0.251
	(0.439)	(0.464)	(0.687)	(0.402)	(0.944)	(0.700)	(0.443)
Social Judgment	-1.608***	-1.141	-2.021***	-0.278	0.667	-1.051*	-1.056*
	(0.498)	(0.707)	(0.706)	(0.458)	(0.866)	(0.630)	(0.634)
BribeFirst	0.608	0.951**	0.223	-0.175	-0.0374	-0.491	0.178
	(0.409)	(0.476)	(0.532)	(0.298)	(0.735)	(0.444)	(0.430)
Male	0.639**	0.379	0.477	0.675*	1.326**	0.379	-
	(0.322)	(0.467)	(0.497)	(0.362)	(0.573)	(0.442)	
Raised Religious	-0.151	-0.020	-0.188	-1.083***	0.055	-1.542***	-
	(0.360)	(0.614)	(0.424)	(0.393)	(0.738)	(0.543)	
Rule of Law	0.230	0.108	3.550	-0.330	-0.890***	-1.909	-
	(0.195)	(0.426)	(8.917)	(0.281)	(0.339)	(4.345)	
Constant	-0.106	-0.170	-12.71	2.666**	2.133	10.23	0.0786
	(0.809)	(1.532)	(35.43)	(1.254)	(1.344)	(17.48)	(0.384)
Obs	144	59	85	144	57	87	144

Robust standard errors in parentheses, clustered at session level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4: Logit regressions examining bribe offering/accepting behavior.

	Logit: Embezzle or Not			Ordered Logit: Percent Embezzled		
	All	Low RoL	High RoL	All	Low RoL	High RoL
Victim Knows	0.734	1.568	0.541	-0.195	1.311	-1.458**
	(0.646)	(1.226)	(1.121)	(0.384)	(1.112)	(0.697)
Social Judgment	-0.247	0.134	-0.122	-0.434	0.242	-1.135**
	(0.614)	(1.575)	(1.042)	(0.268)	(0.808)	(0.459)
Public Fund	0.011	-0.006	0.050***	0.007	0.006	0.007
	(0.009)	(0.025)	(0.019)	(0.007)	(0.012)	(0.010)
BribeFirst	0.304	0.606	-1.495	0.389	-0.006	0.374
	(0.541)	(1.790)	(1.290)	(0.297)	(0.885)	(0.548)
Male	-1.218	-0.003		-0.245	0.885	-1.186***
	(0.992)	(1.348)		(0.361)	(0.629)	(0.444)
Raised Religious	-0.780	1.648*	-3.769***	-0.348	1.097*	-0.997*
	(0.508)	(0.934)	(0.790)	(0.340)	(0.605)	(0.557)
Rule of Law	-0.472	-1.517**		-0.113	-0.242	-3.405
	(0.343)	(0.645)		(0.181)	(0.526)	(2.934)
Constant	2.245	5.545	-6.511*			
	(2.028)	(4.961)	(3.453)			
Obs	108	40	34	108	40	68

Robust standard errors in parentheses clustered at session level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5: Logit and Ordered Logit regressions examining embezzling behavior.

We can further refine these results by examining whether subjects' responsiveness to treatments differed according to whether they identified with a high or low Rule of Law country. Rather than providing regressions with a large number of interaction terms we have chosen to present these results by showing separate regressions for each sub-sample. These regressions show that pooling the high and low Rule of Law subsamples constituted a specification error as the two subgroups tend to respond quite differently to the treatments. In the Stealing game the differences between the two groups are not substantial, even though it is only for the High RoL subjects that the downward shift in the severity of stealing caused by the observability treatments is large enough to be statistically significant. In the other two games the differences are more pronounced. In the Bribery game the response of the High RoL subjects to the Social Judgment treatment is much stronger than the (statistically insignificant) response of the Low RoL subjects. This applies to both the decision to offer and the decision to accept a bribe. In the Embezzlement game, both groups are not less likely to embezzle under the observability treatments relative to the Hidden Action treatment; however, when looking at the severity of the embezzlement decision we find that the high RoL subjects do respond to both treatments, while the low RoL do not.

The low RoL subjects fail to respond to either social observability treatment in a robust way. For the high RoL subjects, they respond to at least the Social Judgment mechanism in all games while the Victim Knows treatment is not robustly capable of improving behavior. The clear picture from these results is that individuals who associate with cultures characterized by a relatively high respect for the rule of law tend to respond to the possibility of social judgment as hypothesized. Those who associate with countries with a lesser respect for the rule of law tend not to respond to these treatments. There are several possible explanations for why these populations might have responded differently and we will return to this discussion in a later subsection. Also, we

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generally find that just the victim knowing of the transgression is not enough social observability to robustly trigger better behavior even among the high RoL sample.

Result 3 *We find that individuals who identify with higher Rule of Law countries tend to engage in slightly less rule breaking behavior and break the rules with less severity than individuals who associate with lower Rule of Law countries. The strength of the relationship seems to depend on the rule breaking game.*

The support for this result is also found in Tables 3-5. In each of the regressions we include the Rule of Law value for the country with which the individual identifies.[23] We find that across the regression specifications the coefficient on this variable is almost always negative and intermittently significant. While we hypothesized that this effect would be present as the Rule of Law score might serve as a proxy for the θ_0 of an individual, the effects we find are perhaps not as strong or robust as one would have expected. Indeed, while these effects seem to exist in the decision to steal, the decision to embezzle and the decision to accept a bribe (in the latter two only among the low RoL subjects, where we have more variation in the RoL continuous variable), they are not present in the decision to bribe and the severity of rule-breaking in both the Stealing and the Embezzlement game. This might seem surprising given the previous result showing the relatively robust differences in response to treatments by the low and high RoL samples. As to why the low RoL subjects might not have been found to more robustly engage in a higher degree to rule breaking behavior there are several possibilities. One is that the propensity by the low RoL subjects was already high and so observing an even higher level was empirically difficult. A second is that the cultural impact of growing up and living in the US might have homogenized the general propensity of individuals to engage in at least some forms of rule breaking behavior even if it did not homogenize their response to the treatments. We discuss this more later in the conclusion.

We had noted in the theoretical section above that other contextual variables in the Stealing and Embezzlement games might have impacted the behavior of the rule breakers and we can examine these same specifications to determine if those effects were realized. In Table 3, the relevant coefficient to examine is the one on the variable Larger Endowment. This is a dummy variable equal to 1 if the potential thief had a larger endowment than the potential victim. In the model presented before, this difference in relative endowments was expected to make a substantial difference in the tendency to steal but we find the variable to be statistically insignificant for all samples. In the theory section we also discussed that it might be reasonable for the size of the public fund in the Embezzlement game to affect the decision to embezzle but we noted that there were offsetting forces that precluded us from making a clear directional prediction. In Table 5 we include the size of the public fund in all of the regression specifications and find it to only be significant for the High RoL subjects in the decision to steal or not. We do not interpret this as a robust finding and conclude instead that the effect of this variable is not substantial.

While we find that individuals have a different response to our treatments depending on the Rule of Law score for the country with which they identify, it is reasonable to consider whether there are other individual characteristics which might also be able to explain our results or might provide a better explanation for them. One possible candidate is the socioeconomic environment in

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[23] In the regression in Table 5 we note that the Rule of Law variable drops out of the regression for the Steal or Not Steal decision among the high RoL sample. The reason is a lack of variability in the actions chosen by that group in that treatment, as virtually everyone in this subsample chose to embezzle at least the small amount. There was variation in the decision to embezzle the small or large amount and thus the variable did not drop out of that regression.

which the subjects were raised. It might be reasonable to think that individuals raised in poorer environments are more likely to break rules and that perhaps are also less affected by social observability and judgment. If there is a correlation between individuals' current socioeconomic status and the countries of origin of their ancestors, and if the differential treatment effects are driven purely by differences in socioeconomic status, this might have been picked up accidentally through the RoL variable. We do not have individual-level data on socioeconomic status. However, we asked our subjects for the zip code in which they spent most of their time growing up if raised in the US and we matched these zip codes with census data for the year 2000. In this way, we obtained data on per capita income in the area where each subject grew up. For the few subjects who grew up outside of the US we use per capita GDP in their countries of origin. If our Rule of Law results were simply picking up behavioral differences due to different socioeconomic backgrounds, we should be able to replicate our findings when using per capita income in the environment where subjects grew up in place of the Rule of Law index. We conducted such analysis and we were not able to replicate our results. In particular, contrary to our Rule of Law findings, the treatment effects obtained when splitting the sample based on the median value of per capita income ($23,861) in the areas where subjects grew up are not consistent across games and suggest an idiosyncratic impact of subjects' socioeconomic background on their response to the observability treatments.[24] Similarly inconsistent results are obtained when splitting the sample based on the average value of the per capita GDP of the countries with which our subjects identify culturally.[25] Given that the responses to the treatments do not vary systematically with these socioeconomic variables and do not replicate the results obtained with the Rule of Law variable, we are confident in interpreting the differential treatment effects obtained for the high RoL and low RoL subjects as the result of intergenerational transmission of values and norms rather than the by-product of differential socioeconomic backgrounds.

4.3   Behavior Across Games

Given the substantial differences between the games themselves, we are not really interested in comparing results in different games to suggest in which one we observe more or less rule breaking behavior. The games were not constructed to conduct such a comparison in a meaningful way and so we have no mechanism to explain why behavior may have differed across games. The games were constructed in an attempt to examine the response to the observability treatments in a broad range of rule-breaking situations to determine the robustness of that response. While we don't find it reasonable to pool the data across games to examine the core issues regarding treatment effects, there are some important questions regarding the design of our experiments we should examine across games. These questions relate to the possibility of cross game contamination. One might consider it ideal to have only had subjects engage in a single rule breaking game per session. Doing so though would have led to a tripling of the cost of the experiments or to a reduction in our ability to provide an investigation of the robustness of our results across situations. We therefore chose to have subjects engage in all three games inside of a session. As mentioned in the design section, we also had subjects engage in other tasks between rule breaking games in order

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[24]While in the stealing game we find that individuals from above average income locations are more responsive to the Social Judgment treatment than others, this does not translate to the other two games. We find no significant treatment effects for either group in the embezzlement game and only one in the bribery game. Results from these additional analyses are available from the authors upon request.

[25]We employed data on per capita GDP (PPP) in current international dollars for the year 1996, i.e. the same year we used for our Rule of Law variable. Data are from the World Bank and, for the missing countries - Cuba, Taiwan, Jamaica, Puerto Rico, South Korea - from **?**)'s Penn Tables, version 7.1.

| | Logit: Rule Break | |
	Rule Break Option at Least Twice	Rule Break Option 3 Times
Number Neg Messages $t-1$	0.060	0.020
	(0.081)	(0.092)
Prior Choice	1.400	2.486**
	(0.880)	(1.085)
Stealing Game	1.035**	-0.635
	(0.508)	(0.867)
Embezzle Game	0.932	-0.130
	(0.789)	(1.112)
Male	0.893**	1.037
	(0.419)	(0.675)
Raised Religious	-1.019**	-0.128
	(0.484)	(0.721)
Rule of Law	-0.00527	0.147
	(0.240)	(0.351)
Constant	-0.703	-1.172
	(1.057)	(1.092)
Observations	126	72

Robust standard errors in parentheses clustered at subject level. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Logit regressions examining how individuals in the Social Judgment treatment responded to messages.

to distract them or keep them from focusing on the rule breaking decisions and thereby minimize any cross game contamination. Here we investigate the degree to which the design was successful in that respect.

The first source of evidence on this issue is contained in Tables 3-5. In each of those regressions we included a variable called Bribe First which is a dummy variable equal to 1 in the sessions in which the Bribery game was the first of the three played and equal to 0 when the Embezzlement game was the first played. One demonstration of a lack of ordering effects would be to see that this coefficient is insignificant as that indicates that we observe no differences in the propensity to engage in rule breaking depending on whether the Bribery or Embezzlement game were played first. Indeed we find that this coefficient is typically insignificant in the Bribery and Embezzlement regressions. We do however find that it is significant and positive in some of the specifications for the Stealing game. A direct interpretation of this is that we observe more stealing behavior when subjects played the Bribery game first than when they played the Embezzlement game. We have no reasonable explanation for this phenomenon but we note that it exists and that the treatment effects of interest still hold with it controlled for.

Of greater potential concern is the implementation of the Social Judgment treatment, as one might imagine that individuals who engage in anti-social behavior early on and receive negative messages might be less likely to engage in such behavior in following games. Thus this treatment more than the other two might be expected to suffer from such ordering effects. To examine this issue we provide Table 6 that contains logit regressions to determine if subjects in the Social Judgment treatment respond to the messages received in previous rule-breaking games. This regression considers only data from the Social Judgment treatment and we pool the choices of the

subjects in the rule breaker positions across all games. We include dummy variables for each game to account for any differences in behavior across games as well as the demographic variables we included before. We also include two other variables which are the number of negative messages the person received the last time they were in the rule breaker role and the choice they made (a binary variable indicating whether they broke the rule or not). Given the design of the experiment, we had some individuals in the rule breaker role 3 times (108 total or 36 per treatment), some twice (108/36), a few once (72/24) and then many not at all (144/48). For this regression we can obviously exclude those who were never in the rule breaker role or were in it just once as they had no opportunity to respond to prior messages. We have provided the regression conducted with only the people who were in the rule breaker role in all 3 games as well as those who were in that role at least twice.

The regressions demonstrate the while the prior choice of the individual figures into future decisions, indicating perhaps that there are rule breaker types and non-rule breaker types, the number of negative messages received by an individual in one round does not affect future decisions. This might seem surprising based on prior studies showing that formal and informal sanctions can impact behavior in repeated games. Given the differences in our one-shot rule breaking games and the inclusion of distractor tasks between those games, we do not view our results as contradicting those of prior studies. Rather we view this as evidence that the distractor tasks of having subjects make choices in many different lotteries and bid in auctions for lotteries diminished the impact of the results from prior games. As a further test for (the absence of) cross game contamination, we also investigated whether potential rule-breakers who were assigned the role of victim in a prior game were more likely to engage in rule-breaking when given the chance conditioned on their experience in the victim role. We were able to conduct this test because 108 individuals were assigned the role of rule-breaker in two games and the role of victim in the remaining game, and 72 were given the role of rule-breaker in one game and that of victim in two games. We found that having played a game in the role of victim does not have any effect on the decision to break the rule in a following game. This confirms that our distractor tasks were successful in inducing subjects to perceive the rule-breaking games as three separate scenarios.

4.4   Explaining the Differential Response to Treatments

The difference in response to the treatments by the different subject groups is intriguing and warrants further investigation as to why the difference might be there. There are certainly many possible explanations. One is that perhaps the subjects who identify with the low Rule of Law countries do not expect others to view the decisions to steal/bribe/embezzle as violating any social norms. That is, they might think that others will not disapprove, and might even approve, of these behaviors. If so, then whether or not others viewed the actions should have no impact on the behavior. As a way of investigating the validity of this possible explanation we can examine the messaging data from the Social Judgment treatment. In that treatment, subjects in the victim roles were able to send messages of approval or disapproval. Therefore, we can examine the messaging data to see if the tendency to disapprove of stealing, bribery and embezzlement varies with the Rule of Law score of the victims.

Table 7 presents the results of the corresponding regression analysis. There are four possible message states a subject could choose; {No Message, Unhappy Face, Neutral Face, Happy Face}. For our purposes we do not need to examine the full space of messages but rather it is more useful to analyze two binary situations of sending a message versus not sending and then sending a negative message versus any other choice, conditional on the action of the potential rule breaker.

Table 7 provides logit regressions using both of those dependent variables where each data point is one decision by a victim regarding the message to send to a person in the rule breaker role. Recall that each victim could send a message to all of those in the rule breaker role, not just the one(s) in their group. We again provide regressions using the same high and low RoL subsamples as before. These regressions pool the message sending decisions of victims across games. This is done to economize on the number of tables necessary and because our focus is on how the behavior changes based on the Rule of Law variable. We do include dummy variables for the Stealing and Embezzlement games leaving the Bribery game as the base category. The variable Choice is a binary equal to 1 if the relevant rule breaker chose to engage in the rule breaking behavior (at any level) and it is equal to 0 otherwise. The Severity variable is used to indicate how severe was the violation. For the Stealing and Embezzlement games this variable is equal to 1 if the rule breaker stole/embezzled the high amount. For the Bribery game this is equal to 1 if the bribe was successful. We include an indicator variable for whether the rule breaker was in the victim's own group, i.e. was the one with whom the victim interacted, and then the standard demographic variables we employed before. This leads us to our final result.

Result 4 *Victims in the high and the low Rule of Law subsamples respond roughly equivalently to decisions by rule breakers. However, in both subsamples, the likelihood to send a message of any sort and the likelihood to send a bad message both increase with the Rule of Law of the country with which subjects identify.*

There are two dimensions to this result. We do find that the Rule of Law variable is positive and significant in all specifications which supports the claim that the higher is the Rule of Law with which a subject is associated, the more likely that subject is to send any message and to send a negative message. On the other hand, if we examine the coefficients for how individuals respond to the Choice by the rule breaker and the severity of that choice, the coefficient values that we obtain in the two subsamples are all roughly similar. In the decision of whether to send a message or not, the primary determinant seems to be the severity of the rule violation rather than simply whether the rule is broken. For both groups the choice itself is insignificant and for the High RoL group, the severity is positive and significant. In the decision to send a negative message or not, both variables are important, showing a positive and significant coefficient in both subsamples. The values of the coefficients are slightly different, yet the important point to note is that their similarity indicates that both groups respond in a largely similar manner when disapproving of rule breaking behavior on its own, and then being more likely to disapprove of severe violations.

While we do see some differences in behavior based on the RoL in the subjects' countries of cultural heritage, it is not that we observe subjects in the low RoL group approving of bad behavior and subjects in the high RoL group disapproving of such behavior. Consequently, it is unlikely that the differential responses of high and low RoL rule breakers to the social observability treatments are due to the low RoL individuals not expecting to be judged badly when engaging in rule breaking behavior. An alternative explanation that is consistent with our data is that while the low RoL subjects expect some disapproval, perhaps they expect to receive a lower level of disapproval as compared to the high RoL subjects and so the difference in behavior is simply due to different beliefs about the extent of social disapproval associated with each rule breaking scenario. We cannot reject this explanation without more data.

Other possibilities include a greater tendency on the part of the low RoL individuals to believe that any disapproval of rule breaking is hypocritical as they would expect victims to also break the rule if they were given the chance. It might also be that individuals who associate with low

	Logit: Message or No Message			Logit: Negative Message or Other		
	All	Low RoL	High RoL	All	Low RoL	High RoL
Choice	-0.267	-0.651	-0.125	2.532***	2.147***	2.922***
	(0.211)	(0.414)	(0.256)	(0.438)	(0.532)	(0.728)
Severity	0.407**	0.330	0.562**	2.391***	3.078***	2.245***
	(0.194)	(0.455)	(0.242)	(0.241)	(0.410)	(0.297)
Stealing Game	1.397***	0.953	1.875***	0.519	0.746	0.449
	(0.439)	(0.760)	(0.605)	(0.347)	(0.590)	(0.443)
Embezzle Game	0.856***	0.398	1.229***	0.0974	0.251	0.0599
	(0.323)	(0.499)	(0.473)	(0.318)	(0.496)	(0.430)
Own Group	0.399*	0.525	0.436*	0.169	0.0205	0.252
	(0.211)	(0.439)	(0.251)	(0.174)	(0.282)	(0.215)
Rule of Law	0.705**	1.872***	106.9***	0.402**	0.768*	7.543***
	(0.306)	(0.677)	(34.46)	(0.175)	(0.396)	(2.491)
Male	0.130	-0.707	1.103	0.460	-0.483	0.893***
	(0.512)	(0.777)	(0.725)	(0.286)	(0.532)	(0.342)
Raised Religious	0.958	2.827**	0.469	0.452	1.445*	0.265
	(0.710)	(1.394)	(0.743)	(0.326)	(0.798)	(0.361)
Constant	-1.490	-3.828	-422.1***	-5.437***	-6.681***	-34.15***
	(1.300)	(2.608)	(136.2)	(0.872)	(1.638)	(10.25)
Observations	2,928	1,076	1,852	2,928	1,076	1,852

Robust standard errors clustered by subject in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Logit regressions examining message sending behavior.

RoL countries might be less accustomed to the idea that informal social disapproval could be accompanied by some sort of formal sanctions while individuals who associate with high RoL countries are more accustomed to such a connection and respond even when the formal sanctions are not present. Our data does not allow us to test the validity of these possible explanations.

5   Conclusion

In every society, the correct functioning of economic, political and social institutions relies on the establishment and enforcement of norms guiding the behavior of the members of society. Norm enforcement is especially important in contexts where infractions of the norm caused by self-interest generate negative externalities on other members of societies. This is for instance the case of bureaucrats or politicians embezzling public resources or demanding bribes for the provision of government services, or the case of workers stealing from their employer, or more generally the case of members of societies stealing from other members of society. While norm enforcement has been traditionally based on the institution of legal and judiciary systems relying on top-down monitoring and punishment, in the last two decades there has been increasing interest in the design and implementation of enforcement mechanisms based purely on social judgment and informal fines and/or rewards. A number of social enforcement mechanisms are being tested especially in countries characterized by high levels of corruption and poor rule of law, where attempts to change formal incentive systems through top-down interventions are likely to fail.

In this paper we asked whether the effectiveness of social enforcement mechanisms in reducing rule-breaking behavior in the form of theft, bribery and embezzlement is conditional on the cultural background of the potential rule breaker. This is an important question since what constitutes a social norm, and hence what actions one expects to be socially approved or disapproved, are defined by the cultural context. Studying the extent to which the possibility of social judgement acts as a deterrent for individuals that identify culturally with low rule of law countries is especially important, given its implications for the design of interventions relying on social enforcement mechanisms in developing countries.

We conducted an experiment simulating three rule-breaking situations, theft, bribery and embezzlement, where we varied the extent to which the actions of the potential rule-breaker are visible to others and are subject to social judgment in the form of informal approval and disapproval messages. We involved a US student sample characterized by cultural heterogeneity due to the immigration of their ancestors to the US from a multitude of countries characterized by different levels of rule of law, as measured by the World Bank's Rule of Law index. We found significant differences in the responses of potential rule breakers to our social observability treatments. In particular, while subjects that identify with high rule of law countries responded to the possibility of social judgment by decreasing their propensities to engage in rule breaking behavior, subjects who identify culturally with low rule of law countries did not.

Translating these results into a field context requires a careful understanding of their implications. Our key finding is that responsiveness to social observability mechanisms is correlated with the cultural background of individuals. As we used the Rule of Law variable as a summary measure of the cultures, our findings suggest that social enforcement mechanisms aimed at curbing crimes such as corruption of public officials are likely to fail in developing countries characterized by a low Rule of Law score. It is, however, important to recognize that countries are rarely homogenous with respect to citizens' attitudes toward the law and respect for formal institutions. Even a country scoring very low or high on the Rule of Law scale may well have sub-populations whose internalized norms do not conform with the norms prevailing in the country and reflected

in the Rule of Law index. Think for instance of the variation in crime rates and, more generally, social norms and citizens' attitudes toward formal institutions in Northern and Southern Italy, or among American States where there are populations that differ substantially along these dimensions. This means that even in low Rule of Law countries there might be some regions where social enforcement mechanisms might be effective even though in others the same mechanisms would fail. The opposite can certainly be true in high Rule of Law countries. We also wish to be clear on the fact that the Rule of Law measure we use is but one possible measure of cultural background and our data is not sufficient to establish a claim of which institutional or sociocultural element captured by that index is truly responsible for the differential response. The more general message that can be taken from our findings is that when designing and implementing a social enforcement mechanism one must give very careful thought to the specific populations being targeted by the mechanism and the cultural contexts in which they are embedded.

In future research we intend to engage in further testing to determine the validity of the different hypotheses for why low rule of law subjects do not seem to respond to the possibility of being socially judged. The hope is that such research will then allow us to identify ways to enhance the effectiveness of social enforcement mechanisms so that they could work even among low rule of law populations. An obvious enhancement to the social judgment mechanism employed in our experiment would involve non-anonymous interactions where victims not only observe that subject #14 stole from one of them but get to observe the actual identity of that person. Also, the possibility of receiving messages of disapproval might be more effective if the potential rule breaker knows that such messages would be broadcast to the broader community. We intend to conduct research on these issues in future work.

We also note that there are other patterns in our data which suggest additional issues that might deserve further study. In particular we observe interesting differences in behavior across the rule breaking games. In the stealing game we find a weak response by the low rule of law subjects to our social judgment treatment, while such a response is absent in the bribery and embezzlement games. This suggests that there might be important differences in how different forms of rule breaking are perceived, with theft being more universally recognized as a norm violation, and potential rule breakers being more fearful to be stigmatized as thieves than as corrupt individuals. Since our experiments were not designed to test for specific differences in behavior across rule-breaking scenarios, but rather to test for consistency in individuals' response to social judgement across contexts, we cannot formally test the validity of this interpretation of our result. Future research will implement such formal tests.

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Appendix
Experiment Instructions
(For Online Publication Only)

All instructions in this experiment were provided to the subjects on their computer screens. This is due to the fact that in some treatments subjects in some roles were engaging in activities that had to be unknown to subjects in other roles. We have included screenshots of all instruction screens from all portions of the experiment and from all treatments.

Victim Knows - Bribery

Please indicate your preferred painting

Painting A

Painting B

Based on completing the task you have received 100 ECUs which will be your endowment for the next interaction.

For the next task you will be matched with two other individuals and you will each be assigned a role randomly. One will be assigned to the role of Private Citizen, one the role of Public Official and the third will be assigned the role of Other Member of Society. The Private Citizen will have the opportunity to offer a bribe of 20 to the Public Official. The Public Official can either accept or reject the bribe. The Other Member of Society will not make a decision but will suffer a monetary loss of 40 if a bribe is offered and accepted.

Each participant will begin with an endowment earned through having completed the previous task. The earnings from this task will then be altered based on the decisions of the Private Citizen and Public Official.

If the Private Citizen offers the bribe then it costs him or her 5 ECUs regardless of whether it is accepted or rejected.

If the bribe is offered by the Private Citizen and it is rejected by the Public Official, there are no costs or benefits to the Public Official or the Other Member of Society. The Private Citizen though still pays 5 ECUs to have made the offer.

If the bribe is offered by the Private Citizen and it is accepted by the Public Official, the Public Official receives 20 ECUs. The Private Citizen still pays their cost of 5 ECUs and the bribe of 20 ECUs but also receives a benefit of 45 ECUs. The Other Member of Society suffers a cost of 40 ECUs.

OK

Victim Knows - Bribery
Public official Screen

You have been randomly chosen to be a **Public Official** . Based on completing the prior task you have received an endowment of 100 ECUs. The Private Citizen with whom you have been matched has received an endowment of 100 ECUs and the Other Member of Society has received an endowment of 100 ECUs.

The Private Citizen with whom you have been matched is currently deciding whether or not to offer you a bribe.

After you have made your decision, all three participants will see the actions chosen by the Private Citizens and Public Official and see their own final earnings.

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

If the **bribe is offered** and you choose to:

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

Accept:
Private Citizen: 120

Reject:
Private Citizen: 95

Private Citizen: 100

The Official: 120

The Official:100

The Official: 100

Other Member of Society: 60

Other Member of Society: 100

The Other Member of Society: 100

Please select your action in the event that the bribe is offered.

| Accept Bribe | Reject Bribe |

You selected to accept the bribe, if offered

You chose to Accept. The Citizen with whom you have been matched chose to offer a bribe.

Your final earnings are therefore 120.

The final earnings of the Citizen are 120.

The final earnings of the Other Member of Society are 60

Victim Knows - Bribery

Private Citizen Screens

You have been randomly chosen to be a **Private Citizen** . Based on completing the prior task you have received an endowment of 100 ECUs. The Public Official with whom you have been matched has received an endowment of 100 ECUs and the Other Member of Society has received an endowment of 100 ECUs.

You have the opportunity to choose whether or not to offer a bribe to the Public Official.

After you have made your decision, all three participants will see the actions chosen by the Private Citizen and Public Official and see their own final earnings.

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

If you **offer the bribe** and the Public Official:

If you choose **not offer a bribe** , regardless of the choice by Public Official, the payoffs will be:

Accept:
Private Citizen: 120

The Official: 120

Other Member of Society: 60

Reject:
Private Citizen: 95

The Official:100

Other Member of Society: 100

Private Citizen: 100

The Official: 100

The Other Member of Society: 100

Please select your action.

| Offer Bribe of 20 | Not Offer Bribe |

You chose to offer a bribe. The Official with whom you have been matched chose accept a bribe.

Your final earnings are therefore 120.

The final earnings of the Official are 120.

The final earnings of the Other Member of Society are 60

Victim Knows - Bribery
Other member of society screens

You have been randomly chosen to be an **Other Member of Society** . Based on completing the prior task you have received an endowment of 100 ECUs. The Public Official with whom you have been matched has received an endowment of 100 ECUs and the Private Citizen has received an endowment of 100 ECUs.

The Private Citizen is deciding whether or not to offer a bribe. The Public Official is simultaneously choosing whether they would be willing to accept a bribe if offered. When they have made their decisions, the choices will be matched to determine the outcome. You will be informed of the decisions made by both as well as the outcome.

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

If the **bribe is offered** and the Public Official chooses to:

If **no bribe is offered** , the payoffs, regardless of the Public Official's choice, will be:

Accept:
Private Citizen: 120
The Official:120
The Other Member of Society: 60

Reject:
Private Citizen: 95
The Official:100
The Other Member of Society: 100

Private Citizen: 100
The Official: 100
The Other Member of Society: 100

You have been randomly chosen to be an **Other Member of Society** . Based on completing the prior task you have received an endowment of 100 ECUs. The Public Official with whom you have been matched has received an endowment of 100 ECUs and the Private Citizen has received an endowment of 100 ECUs.

The Private Citizen is deciding whether or not to offer a bribe. The Public Official is simultaneously choosing whether they would be willing to accept a bribe if offered. When they have made their decisions, the choices will be matched to determine the outcome. You will be informed of the decisions made by both as well as the outcome.

The Public Official and Private Citizen have reached their decisions.

Earnings for this segment

You made 60.

The Citizen chose to offer a bribe.

The Official made 120.

The Official chose to accept a bribe.

The Citizen made 120.

	OK

Victim Knows - Stealing

Please answer the questions below. You may cycle back and forth between the questions as you wish. The answers you have selected when the timer runs out will be your final answers.

Every Sunday Greg jogs 3 miles. For the rest of the week, each day he jogs 1 mile more than the previous day. How many miles does Greg jog in 2 weeks?

- ○ 42
- ○ 63
- ○ 84
- ○ 98
- ○ 117

- ● NO ANSWER

Next Question

Victim Knows - Stealing

Thief Screen

From completing the SAT questions you have earned 100 ECUs. For the next task, you have been paired at random with another participant. You will both be participating in the role of Private Citizens.

The Private Citizen with whom you have been paired has earned 50 ECUs from completing the SAT questions.

You have been randomly determined to be allowed the option of choosing whether or not to steal 35% or 70% of the other's earnings from the SAT task. The person with whom you have been paired has not been given the opportunity to steal from you or anyone else.

After you have made your decision, the Private Citizen with whom you are matched will see the money they earned from the SAT task, your choice to steal from them or not, and their final earnings.

Please select your action.

Not Steal   Steal 35%   Steal 70%

You have stolen 70% of the earnings of the other Private Citizen.

You therefore received 100 ECUs from completing the SAT questions and 35 ECUs from stealing.

Your final earnings are therefore 135.

Victim Knows - Stealing

Victim Screen

You have been paired at random with another participant for the next task. You will both be participating in the role of Private Citizens.

From completing the SAT questions you have earned 50 ECUs.

The Private Citizen with whom you have been paired has earned 100 ECUs.

The Private Citizen with whom you have been paired has been randomly determined to be allowed the option of choosing whether or not to steal 35% or 70% of your earnings from the SAT task.

Please wait for the Private Citizen to reach their decision.

You have been paired at random with another participant for the next task. You will both be participating in the role of Private Citizens.
From completing the SAT questions you have earned 50 ECUs.

The Private Citizen with whom you have been paired has earned 100 ECUs.

The Private Citizen with whom you have been paired has reached their decision.

The Private Citizen with whom you have been paired made the choice to steal 70% from you.

Your final earnings are therefore 15

OK

Victim Knows – Embezzlement

For the next segment of today's experiment you will be matched with three other individuals. You will all have the opportunity to engage in a task. The task will involve encoding sequences of letters into a numerical code. There will be a table at the top of the screen with all the letters in the alphabet and a number below each one. This table will represent a code. Below the table you will find a four letter "word" which is a randomly generated set of four letters. You will be asked to enter the corresponding number below each letter and then press OK to submit and move on to the next word.

OK

Victim Knows – Embezzlement

Public official Screen

You have been randomly assigned the role of **Public Official** in your society consisting of you and three Private Citizens. You will receive a fixed wage for being the Public Official. The three Private Citizens with whom you are matched will be receiving 8 ECU for each correct encoding they submit while also generating 5 ECU into a public fund. You can complete as many encodings as you like, but they will not generate private earnings for you and they will also not generate any earnings to go into the public fund. At the end of this three minute production period, it will be your task to decide how to redistribute the money generated into the public fund by the effort of the three Private Citizens.

Your wage as the Public Official is 195 ECUs. We have set your wage so that it is expected to be higher than any earnings likely to be achieved by a Private Citizen.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	12	14	10	9	6	24	22	7	5	11	3	18	1	21	16	23	2	13	19	25	4	26	17	20	15

Word: X   L   A   R

Code: [   ]   [   ]   [   ]   [   ]

OK

Wage Rate:	8
Number Coded Correctly:	0
Number Coded Incorrectly:	0
Earnings this period:	0

Your wage as the Public Official is 195 ECUs. We have set your wage so that it is expected to be higher than any earnings likely to be achieved by a Private Citizen. The Private Citizens have generated 30 ECUs into the public fund. It is your job to redistribute the public fund that has been generated by the work of the Private Citizens. You have the opportunity to choose whether or not to embezzle 45% or 80% of the public fund and redistribute the rest to the Private Citizens with each of them getting equal share. If you choose to embezzle you will receive your fixed wage plus the embezzled funds. If you choose not to embezzle, you will receive your fixed wage and the entire public fund will be redistributed to the Private Citizens, with each of them getting equal share.

After you have made your decision, all three Private Citizens will see the money their efforts generated into the public fund, your choice to embezzle or not, and their final earnings.

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

If you choose not to embezzle   **If you choose to embezzle 45%**   **If you choose to embezzle 80%**

Each Citizen will earn 10+ private earnings   Each Citizen will earn 6+ private earnings   Each Citizen will earn 2+ private earnings

You will earn 195   You will earn 209   You will earn 219

Please select your action.

[Not Embezzle]   [Embezzle 45%]   [Embezzle 80%]

You chose to Embezzle. You therefore received 14 from the public funds generated by the Private Citizens. You also received your fixed wage of 195.

The Private Citizens on average earned 16 in Private Earnings.

The Private Citizens each received 6 from the Public Funds.

Victim Knows – Embezzlement

Private citizen Screen

Please use the code provided to translate the random strings of four letters into the corresponding numerical code. You and other "Private Citizens" will each have three minutes to complete as many encodings as you choose. For every correct encoding you submit, you will earn 8 ECU in private earnings. You and the other Private Citizens will also be generating earnings that will be deposited in a public fund. After the production period is ended, the earnings that accrue to the public fund will be redistributed.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	12	14	10	9	6	24	22	7	5	11	3	18	1	21	16	23	2	13	19	25	4	26	17	20	15

Word: X   L   A   R

Code:

OK

Wage Rate:	8
Number Coded Correctly:	0
Number Coded Incorrectly:	0
Earnings this period:	0

You completed 3 encodings correctly earning 8 ECU for each.

You earned 24 ECU in Private Earnings.

You were matched with 3 other individuals for this task. One has been randomly assigned the role of Public Official. You and the other two have been assigned the role of Private Citizen. Any encodings completed by the Public Official did not generate either private or public earnings. He or she will receive a fixed wage of 195. The encodings completed by you and the other two Private Citizens also generated 5 ECU into the public fund for each encoding completed correctly. Your group of Private Citizens completed 6 encodings correctly resulting in 30 ECUs being generated into the public fund.

The Public Official has been given the task to redistribute the Public Funds. He or she has the opportunity to embezzle 45% or 80% of these funds prior to redistribution with any non-embezzled funds being redistributed equally among all Private Citizens. Consequently you could receive either 10 ECUs if the Public Official elects to not embezzle or 6 or 2 ECUs depending on the amount the Public Official elects to embezzle.

The Public Official is making his or her embezzling decision. The experiment will continue after the choice is made.

You completed 3 encodings correctly earning 8 ECU for each.

You earned 24 ECU in Private Earnings.

You were matched with 3 other individuals for this task. One has been randomly assigned the role of Public Official. You and the other two have been assigned the role of Private Citizen. Any encodings completed by the Public Official did not generate either private or public earnings. He or she will receive a fixed wage of 195. The encodings completed by you and the other two Private Citizens also generated 5 ECU into the public fund for each encoding completed correctly. Your group of Private Citizens completed 6 encodings correctly resulting in 30 ECUs being generated into the public fund.

The Public Official has been given the task to redistribute the Public Funds. He or she has the opportunity to embezzle 45% or 80% of these funds prior to redistribution with any non-embezzled funds being redistributed equally among all Private Citizens.

The Public Official has reached their decision.

The Public Official for your group selected to embezzle 45% of the funds. You therefore received 6 ECUs from the Public Fund.

Total Earnings from this task:30

OK

Hidden Action - Bribery

Please indicate your preferred painting

Painting A

Painting B

Hidden Action - Bribery

Public official

Based on completing the task you have received 100 ECUs which will be your endowment for the next interaction.

For the next task you will be matched with two other individuals and you will each be assigned a role randomly. One will be assigned to the role of Private Citizen, one the role of Public Official and the third will be assigned the role of Other Member of Society. The Private Citizen will have the opportunity to offer a bribe of 20 to the Public Official. The Public Official can either accept or reject the bribe. The Other Member of Society will not make a decision but will suffer a monetary loss of 40 if a bribe is offered and accepted.

Only individuals who have been determined to be Private Citizens or Public Officials are currently seeing this instruction screen.

Each participant will begin with an endowment earned through having completed the previous task. The earnings from this task will then be altered based on the decisions of the Private Citizen and Public Official.

If the Private Citizen offers the bribe then it costs him or her 5 ECUs regardless of whether it is accepted or rejected.

If the bribe is offered by the Private Citizen and it is rejected by the Public Official, there are no costs or benefits to the Public Official or the Other Member of Society. The Private Citizen though still pays 5 ECUs to have made the offer.

If the bribe is offered by the Private Citizen and it is accepted by the Public Official, the Public Official receives 20 ECUs. The Private Citizen still pays their cost of 5 ECUs but also receives a benefit of 45 ECUs. The Other Member of Society suffers a cost of 40 ECUs.

OK

You have been randomly chosen to be a **Public Official** . Based on completing the prior task you have received an endowment of 100 ECUs. The Private Citizen with whom you have been matched has received an endowment of 100 ECUs and the Other Member of Society has received an endowment of 100 ECUs.

The Private Citizen with whom you have been matched is currently deciding whether or not to offer you a bribe.

After you have made your decision the Other Member of Society will see their earnings but will not be informed of the potential or actual actions taken by the Public Official and Private Citizen. The Other Member of Society with whom you have been matched has been told only that they have been matched with two other participants who are engaged in some task and they will be informed of their net earnings at the end. This means that the Other Member of Society will not know what choices were available or what payoffs they could have received from other outcomes.

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

If the **bribe is offered** and you choose to:

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

Accept:
Private Citizen: 120

The Official: 120

Other Member of Society: 60

Reject:
Private Citizen: 95

The Official:100

Other Member of Society: 100

Private Citizen: 100

The Official: 100

The Other Member of Society: 100

Please select your action in the event that the bribe is offered.

| Accept Bribe | Reject Bribe |

You chose to Accept. The Citizen with whom you have been matched chose to offer a bribe.

Your final earnings are therefore 120.

The final earnings of the Citizen are 120.

The final earnings of the Other Member of Society are 60

15

Hidden Action - Bribery

Private citizen

Based on completing the task you have received 100 ECUs which will be your endowment for the next interaction.

For the next task you will be matched with two other individuals and you will each be assigned a role randomly. One will be assigned to the role of Private Citizen, one the role of Public Official and the third will be assigned the role of Other Member of Society. The Private Citizen will have the opportunity to offer a bribe of 20 to the Public Official. The Public Official can either accept or reject the bribe. The Other Member of Society will not make a decision but will suffer a monetary loss of 40 if a bribe is offered and accepted.

Only individuals who have been determined to be Private Citizens or Public Officials are currently seeing this instruction screen.

Each participant will begin with an endowment earned through having completed the previous task. The earnings from this task will then be altered based on the decisions of the Private Citizen and Public Official.

If the Private Citizen offers the bribe then it costs him or her 5 ECUs regardless of whether it is accepted or rejected.

If the bribe is offered by the Private Citizen and it is rejected by the Public Official, there are no costs or benefits to the Public Official or the Other Member of Society. The Private Citizen though still pays 5 ECUs to have made the offer.

If the bribe is offered by the Private Citizen and it is accepted by the Public Official, the Public Official receives 20 ECUs. The Private Citizen still pays their cost of 5 ECUs but also receives a benefit of 45 ECUs. The Other Member of Society suffers a cost of 40 ECUs.

OK

You have been randomly chosen to be a **Private Citizen** . Based on completing the prior task you have received an endowment of 100 ECUs. The Public Official with whom you have been matched has received an endowment of 100 ECUs and the Other Member of Society has received an endowment of 100 ECUs.

You have the opportunity to choose whether or not to offer a bribe to the Public Official.

After you have made your decision the Other Member of Society will see their earnings but will not be informed of the potential or actual actions taken by the Public Official and Private Citizen. The Other Member of Society with whom you have been matched has been told only that they have been matched with two other participants who are engaged in some task and they will be informed of their net earnings at the end. This means that the Other Member of Society will not know what choices were available or what payoffs they could have received from other outcomes.

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

If you **offer the bribe** and the Public Official:

If you choose **not offer a bribe** , regardless of the choice by Public Official, the payoffs will be:

Accept:
Private Citizen: 120

The Official: 120

Other Member of Society: 60

Reject:
Private Citizen: 95

The Official:100

Other Member of Society: 100

Private Citizen: 100

The Official: 100

The Other Member of Society: 100

Please select your action.

| Offer Bribe of 20 | Not Offer Bribe |

You chose to offer a bribe. The Official with whom you have been matched chose accept a bribe.

Your final earnings are therefore 120.

The final earnings of the Official are 120.

The final earnings of the Other Member of Society are 60

Hidden Action - Bribery
Other member of society

You have been matched with two other participants. Those two participants have been randomly chosen to take part in an additional task. When it is completed you will be informed of your earnings from this section of the experiment.

You have been matched with two other participants. Those two participants were randomly chosen to take part in an additional task.

You earned 60 from this section of today's experiment.

OK

Hidden Action - Stealing

Please answer the questions below. You may cycle back and forth between the questions as you wish. The answers you have selected when the timer runs out will be your final answers.

Every Sunday Greg jogs 3 miles. For the rest of the week, each day he jogs 1 mile more than the previous day. How many miles does Greg jog in 2 weeks?

- ○ 42
- ○ 63
- ○ 84
- ○ 98
- ○ 117

- ⊙ NO ANSWER

[Next Question]

Hidden Action - Stealing
Thief

From completing the SAT questions you have earned 100 ECUs. For the next task, you have been paired at random with another participant. You will both be participating in the role of Private Citizens.

The Private Citizen with whom you have been paired has earned 50 ECUs from completing the SAT questions.

You have been randomly determined to be allowed the option of choosing whether or not to steal 35% or 70% of the other's earnings from the SAT task. The person with whom you have been paired has not been given the opportunity to steal from you or anyone else.

After you have made your decision, the Private Citizen with whom you have been paired will see their final earnings but will not be informed of the money they earned from the SAT task, nor will they be informed about the potential or actual actions taken by you. They will simply see their final earnings from this segment of the experiment. This means that the Private Citizen with whom you are paired will not know what choices were available to you or what payoffs they could have received from other outcomes.

Please select your action.

[Not Steal]   [Steal 35%]   [Steal 70%]

You have stolen 70% of the earnings of the other Private Citizen.

You therefore received 100 ECUs from completing the SAT questions and 35 ECUs from stealing.

Your final earnings are therefore 135.

Hidden Action - Stealing

Victim

You have been matched with one other participant. That participant has been randomly chosen to take part in an additional task. When it is completed you will be informed of your earnings from this section of the experiment.

You have been matched with one other participant. That participant has been randomly chosen to take part in an additional task. When it is completed you will be informed of your earnings from this section of the experiment

Total Earnings from this section: 15.

OK

Hidden Action – Embezzlement Game

For the next segment of today's experiment you will be matched with three other individuals. You will all have the opportunity to engage in a task. The task will involve encoding sequences of letters into a numerical code. There will be a table at the top of the screen with all the letters in the alphabet and a number below each one. This table will represent a code. Below the table you will find a four letter "word" which is a randomly generated set of four letters. You will be asked to enter the corresponding number below each letter and then press OK to submit and move on to the next word.

OK

Hidden Action – Embezzlement Game

Public official

Remaining time [sec]: 150

You have been randomly assigned the role of **Public Official** in your society consisting of you and three Private Citizens. You will receive a fixed wage for being the Public Official. The three Private Citizens with whom you are matched will be receiving 8 ECU for each correct encoding they submit while also generating 5 ECU into a public fund. You can complete as many encodings as you like, but they will not generate private earnings for you and they will also not generate any earnings to go into the public fund. At the end of this three minute production period, it will be your task to decide how to redistribute the money generated into the public fund by the effort of the three Private Citizens.

Your wage as the Public Official is 195 ECUs. We have set your wage so that it is expected to be higher than any earnings likely to be achieved by a Private Citizen.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	12	14	10	9	6	24	22	7	5	11	3	18	1	21	16	23	2	13	19	25	4	26	17	20	15

Word: X   L   A   R

Code: [|] [   ] [   ] [   ]

OK

Wage Rate:	8
Number Coded Correctly:	0
Number Coded Incorrectly:	0
Earnings this period:	0

22

Your wage as the Public Official is 195 ECUs. We have set your wage so that it is expected to be higher than any earnings likely to be achieved by a Private Citizen.

The Private Citizens have generated 25 ECUs into the public fund. It is your job to redistribute the public fund that has been generated by the work of the Private Citizens. You have the opportunity to choose whether or not to embezzle 45% or 80% of the public fund and redistribute the rest to the Private Citizens with each of them getting equal share. If you choose to embezzle you will receive your fixed wage plus the embezzled funds. If you choose not to embezzle, you will receive your fixed wage and the entire public fund will be redistributed to the Private Citizens, with each of them getting equal share.

After you have made your decision, the Private Citizens will see their final earnings but will not be informed of the money they generated into the public fund, nor will they be informed about the potential or actual actions taken by you. They will simply see their final earnings from the public account. This means that the Private Citizens will not know what choices were available to you or what payoffs they could have received from other outcomes.

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

If you choose not to embezzle	**If you choose to embezzle 45%**	**If you choose to embezzle 80%**
Each Citizen will earn 8+ private earnings	Each Citizen will earn 5+ private earnings	Each Citizen will earn 2+ private earnings
You will earn 195	You will earn 206	You will earn 215

Please select your action.

[Not Embezzle]   [Embezzle 45%]   [Embezzle 80%]

You chose to Embezzle. You therefore received 11 from the public funds generated by the Private Citizens. You also received your fixed wage of 195.

The Private Citizens on average earned 13 in Private Earnings.

The Private Citizens each received 5 from the Public Funds.

23

Hidden Action – Embezzlement Game
Private citizen

Remaining time [sec]: 178

Please use the code provided to translate the random strings of four letters into the corresponding numerical code. You and other "Private Citizens" will each have three minutes to complete as many encodings as you choose. For every correct encoding you submit, you will earn 8 ECU in private earnings. You and the other Private Citizens will also be generating earnings that will be deposited in a public fund. After the production period is ended, the earnings that accrue to the public fund will be redistributed.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	12	14	10	9	6	24	22	7	5	11	3	18	1	21	16	23	2	13	19	25	4	26	17	20	15

Word: X   L   A   R

Code:

[OK]

Wage Rate: 8
Number Coded Correctly: 0
Number Coded Incorrectly: 0
Earnings this period: 0

One of the participants with whom you have been matched has been randomly chosen to take part in an additional task. When it is completed you will be informed of your earnings from this section of the experiment.

One of the participants with whom you have been matched has been randomly chosen to take part in an additional task. When it is completed you will be informed of your earnings from this section of the experiment.

You completed 3 encodings correctly earning 8 ECU for each.

You earned 24 ECUs in Private Earnings.

You earned 5 ECUs from the redistribution of earnings from the Public Funds.

OK

Social Judgment - Bribery

Please indicate your preferred painting

Painting A

Painting B

Based on completing the task you have received 100 ECUs which will be your endowment for the next interaction.

For the next task you will be matched with two other individuals and you will each be assigned a role randomly. One will be assigned to the role of Private Citizen, one the role of Public Official and the third will be assigned the role of Other Member of Society. The Private Citizen will have the opportunity to offer a bribe of 20 to the Public Official. The Public Official can either accept or reject the bribe. The Other Member of Society will not make a decision but will suffer a monetary loss of 40 if a bribe is offered and accepted.

Each participant will begin with an endowment earned through having completed the previous task. The earnings from this task will then be altered based on the decisions of the Private Citizen and Public Official.

If the Private Citizen offers the bribe then it costs him or her 5 ECUs regardless of whether it is accepted or rejected.

If the bribe is offered by the Private Citizen and it is rejected by the Public Official, there are no costs or benefits to the Public Official or the Other Member of Society. The Private Citizen though still pays 5 ECUs to have made the offer.

If the bribe is offered by the Private Citizen and it is accepted by the Public Official, the Public Official receives 20 ECUs. The Private Citizen still pays their cost of 5 ECUs and the bribe of 20 ECUs but also receives a benefit of 45 ECUs. The Other Member of Society suffers a cost of 40 ECUs.

OK

Social Judgment - Bribery
Public official

You have been randomly chosen to be a **Public Official** . Based on completing the prior task you have received an endowment of 100 ECUs. The Private Citizen with whom you have been matched has received an endowment of 100 ECUs and the Other Member of Society has received an endowment of 100 ECUs.

The Private Citizen with whom you have been matched is currently deciding whether or not to offer you a bribe.

 You can either accept or reject the bribe, if offered. After you have made your decision, all three participants will see the actions chosen by the Private Citizens and Public Official and see their own final earnings.

Moreover, all the participants who have been assigned the role of Other Member of Society in this segment of today's experiment will see the actions chosen by all of the Private Citizens and Public Officials. The Other Members of Society will be allowed the opportunity to send any of the images below as a message to any of the Private Citizens and Public Officials they choose on an individual basis. They can also choose to send no message to any individual Private Citizen or Public Official. After the Other Members of Society have chosen what messages they wish to send and to whom, those in the role of Public Official and Private Citizen will see how many messages and of which sort they have been sent, if any.

The possible messages are: 🙂 😐 🙁 NONE

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

If the **bribe is offered** and you choose to:

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

Accept:
Private Citizen: 120

Reject:
Private Citizen: 95

Private Citizen: 100

The Official: 120

The Official:100

The Official: 100

Other Member of Society: 60

Other Member of Society: 100

The Other Member of Society: 100

Please select your action in the event that the bribe is offered.

[Accept Bribe] [Reject Bribe]

You chose to Accept. The Citizen with whom you have been matched chose to offer a bribe.

Your final earnings are therefore 120.

The final earnings of the Citizen are 120.

The final earnings of the Other Member of Society are 60

On the next screen you will see the messages sent to you by all participants acting in the role of Other Members of Society in this segment of today's experiment.

Official

You could have chosen to accept a bribe or reject a bribe.

You have chosen to accept a bribe.

There were 8 Other Members of Society who could have sent messages.

You received the following messages:

OK
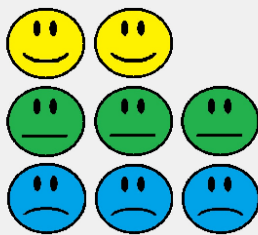
Social Judgment - Bribery
Private citizen

You have been randomly chosen to be a **Private Citizen** . Based on completing the prior task you have received an endowment of 100 ECUs. The Public Official with whom you have been matched has received an endowment of 100 ECUs and Other Member of Society has received an endowment of 100 ECUs.

You have the opportunity to choose whether or not to offer a bribe to the Public Official.

After you have made your decision, all three participants will see the actions chosen by the Private Citizens and Public Official and see their own final earnings.

Moreover, all the participants who have been assigned the role of Other Members of Society in this segment of today's experiment will see the actions chosen by all of the Private Citizens and Public Officials as well as observe their own earnings. The Other Members of Society will be allowed the opportunity to send any of the images below as a message to any of the Private Citizens and Public Officials; they choose on an individual basis. They can also choose to send no message to any individual Private Citizen or Public Official. After the Other Members of Society have chosen what messages they wish to send and to whom, those in the role of Public Official and Private Citizen will see how many messages and of which sort they have been sent, if any.

The possible messages are: 😊 😐 🙁   NONE

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

If you **offer the bribe** and the Public Official:

If you choose **not offer a bribe** , regardless of the choice by Public Official, the payoffs will be:

Accept:
Private Citizen: 120

The Official: 120

Other Member of Society: 60

Reject:
Private Citizen: 95

The Official:100

Other Member of Society: 100

Private Citizen: 100

The Official: 100

The Other Member of Society: 100

Please select your action.

[Offer Bribe of 20] [Not Offer Bribe]

You chose to offer a bribe. The Official with whom you have been matched chose accept a bribe.

Your final earnings are therefore 120.

The final earnings of the Official are 120.

The final earnings of the Other Member of Society are 60

On the next screen you will see the messages sent to you by all participants acting in the role of Other Members of Society in this segment of today's experiment.

Private Citizen

You could have chosen to offer a bribe or not offer a bribe.

You have chosen to offer a bribe.

There were 8 Other Members of Society who could have sent messages.

You received the following messages:

OK
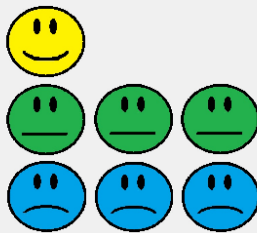
Social Judgment - Bribery
Other member of society

You have been randomly chosen to be an **Other Member of Society** . Based on completing the prior task you have received an endowment of 100 ECUs. The Public Official with whom you have been matched has received an endowment of 100 ECUs and the Private Citizen has received an endowment of 100 ECUs.

The Private Citizen is deciding whether or not to offer a bribe. The Public Official is simultaneously choosing whether they would be willing to accept a bribe if offered. When they have made their decisions, the choices will be matched to determine the outcome. You will be informed of the decisions made by both as well as the outcome.

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

If the **bribe is offered** and the Public Official chooses to:

If **no bribe is offered** , the payoffs, regardless of the Public Official's choice, will be:

Accept:
Private Citizen: 120
The Official:120
The Other Member of Society: 60

Reject:
Private Citizen: 95
The Official:100
The Other Member of Society: 100

Private Citizen: 100
The Official: 100
The Other Member of Society: 100

After the outcome is determined you will have the opportunity to observe the decisions of all participants acting in the role of Private Citizen and Public Official in this segment of today's experiment and you will be allowed the opportunity to send any of the images below as a message to any of the Private Citizens and Public Officials on an individual basis. You can also choose to send no message to any individual Private Citizen or Public Official.

The possible messages are: NONE

You have been randomly chosen to be an **Other Member of Society** . Based on completing the prior task you have received an endowment of 100 ECUs. The Public Official with whom you have been matched has received an endowment of 100 ECUs and the Private Citizen has received an endowment of 100 ECUs.

The Private Citizen is deciding whether or not to offer a bribe. The Public Official is simultaneously choosing whether they would be willing to accept a bribe if offered. When they have made their decisions, the choices will be matched to determine the outcome. You will be informed of the decisions made by both as well as the outcome.

The Public Official and Private Citizen have reached their decisions.

The Citizen chose to offer a bribe.

The Official chose to accept a bribe.

Earnings for this segment

You made 60.

The Official made 120.

The Citizen made 120.

After the outcome is determined you will have the opportunity to observe the decisions of all participants acting in the role of Private Citizen and Public Official in this segment of today's experiment and you will be allowed the opportunity to send any of the images below as a message to any of the Private Citizens and Public Officials on an individual basis. You can also choose to send no message to any individual Private Citizen or Public Official.

The possible messages are: NONE

OK

Top panel:

Citizen | Official

Offered | Accepted

You now have the opportunity to send a message to any of the Private Citizens or Public Officials participating in this segment of today's experiment. To the left you can choose messages for the Private Citizen and Public Official with whom you are matched. You can see the choices made by both and then the messages you could possibly send them.

Below is a table indicating the choices made by the participants in the role of Private Citizen and Public Official in each of the other groups. In this version of the table you are choosing messages to send to the Public Officials.

Please click OK after you have selected the messages you wish to send.

NONE

Message for Officials

		Group 1	Group2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
	Citizen	Offered	Not Offered	Not Offered	Offered	Not Offered	Offered	Not Offered	Offered
	Official	Accept	Accept	Reject	Reject	Accept	Reject	Accept	Accept

NONE

BACK | OK

Bottom panel:

Citizen | Official

Offered | Accepted

You now have the opportunity to send a message to any of the Private Citizens or Public Officials participating in this segment of today's experiment. To the left you can choose messages for the Private Citizen and Public Official with whom you are matched. You can see the choices made by both and then the messages you could possibly send them.

Below is a table indicating the choices made by the participants in the role of Private Citizen and Public Official in each of the other groups. In this version of the table you are choosing messages to send to the Private Citizens. On the next screen you will have the option to send messages to the Public Officials.

NONE

Message for Private Citizens

		Group 1	Group2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
	Citizen	Offered	Not Offered	Not Offered	Offered	Not Offered	Offered	Not Offered	Offered
	Official	Accept	Accept	Reject	Reject	Accept	Reject	Accept	Accept

NONE

OK

Social Judgment - Stealing

Please answer the questions below. You may cycle back and forth between the questions as you wish. The answers you have selected when the timer runs out will be your final answers.

Every Sunday Greg jogs 3 miles. For the rest of the week, each day he jogs 1 mile more than the previous day. How many miles does Greg jog in 2 weeks?

- ○ 42
- ○ 63
- ○ 84
- ○ 98
- ○ 117

- ● NO ANSWER

[Next Question]

Social Judgment - Stealing
Thief

From completing the SAT questions you have earned 50 ECUs. For the next task, you have been paired at random with another participant. You will both be participating in the role of Private Citizens.

The Private Citizen with whom you have been paired has earned 100 ECUs from completing the SAT questions.

You have been randomly determined to be allowed the option of choosing whether or not to steal 35% or 70% of the other's earnings from the SAT task. The person with whom you have been paired has not been given the opportunity to steal from you or anyone else.

After you have made your decision, the Private Citizen with whom you are matched will see the money they earned from the SAT task, your choice to steal from them or not, and their final earnings.

Moreover, all Private Citizens not allowed the opportunity to steal in this segment of today's experiment will see the actions chosen by all of the Private Citizens who were allowed the opportunity to steal. The Private Citizens who did not have the chance to steal will then be allowed the opportunity to send any of the images below as a message to any of the Private Citizens who did have the chance to steal; they choose on an individual basis. They can also choose to send no message to any individual Private Citizen. After they have chosen what messages they wish to send and to whom, those who had the opportunity to steal will see how many messages and of which sort they have been sent, if any.

The possible messages: 🙂 🙂 🙁 NONE

Please select your action.

[Not Steal] [Steal 35%] [Steal 70%]

From completing the SAT questions you have earned 50 ECUs. For the next task, you have been paired at random with another participant. You will both be participating in the role of Private Citizens.

The Private Citizen with whom you have been paired has earned 100 ECUs from completing the SAT questions.

You have been randomly determined to be allowed the option of choosing whether or not to steal 35% or 70% of the other's earnings from the SAT task. The person with whom you have been paired has not been given the opportunity to steal from you or anyone else.

 After you have made your decision, the Private Citizen with whom you are matched will see the money they earned from the SAT task, your choice to steal from them or not, and their final earnings.

Moreover, all Private Citizens not allowed the opportunity to steal in this segment of today's experiment will see the actions chosen by all of the Private Citizens who were allowed the opportunity to steal. The Private Citizens who did not have the chance to steal will then be allowed the opportunity to send any of the images below as a message to any of the Private Citizens who did have the chance to steal; they choose on an individual basis. They can also choose to send no message to any individual Private Citizen. After they have chosen what messages they wish to send and to whom, those who had the opportunity to steal will see how many messages and of which sort they have been sent, if any.

The possible messages:　🙂　🙂　🙁　　NONE

You selected to not steal

You selected to not steal any of the earnings of the other Private Citizen.

You therefore received 50 ECUs from completing the SAT questions and 0 ECUs from stealing.

Your final earnings are therefore 50.

On the next screen you will see the messages sent to you by all participants acting in the role of Private Citizens who did not have the opportunity to steal in this segment of today's experiment.

Please wait for messages sent by the Private Citizens.

34

You could have selected to steal or not steal

You selected to not steal

There were 12 citizens who could have sent messages.

You recieved the following messages:

OK
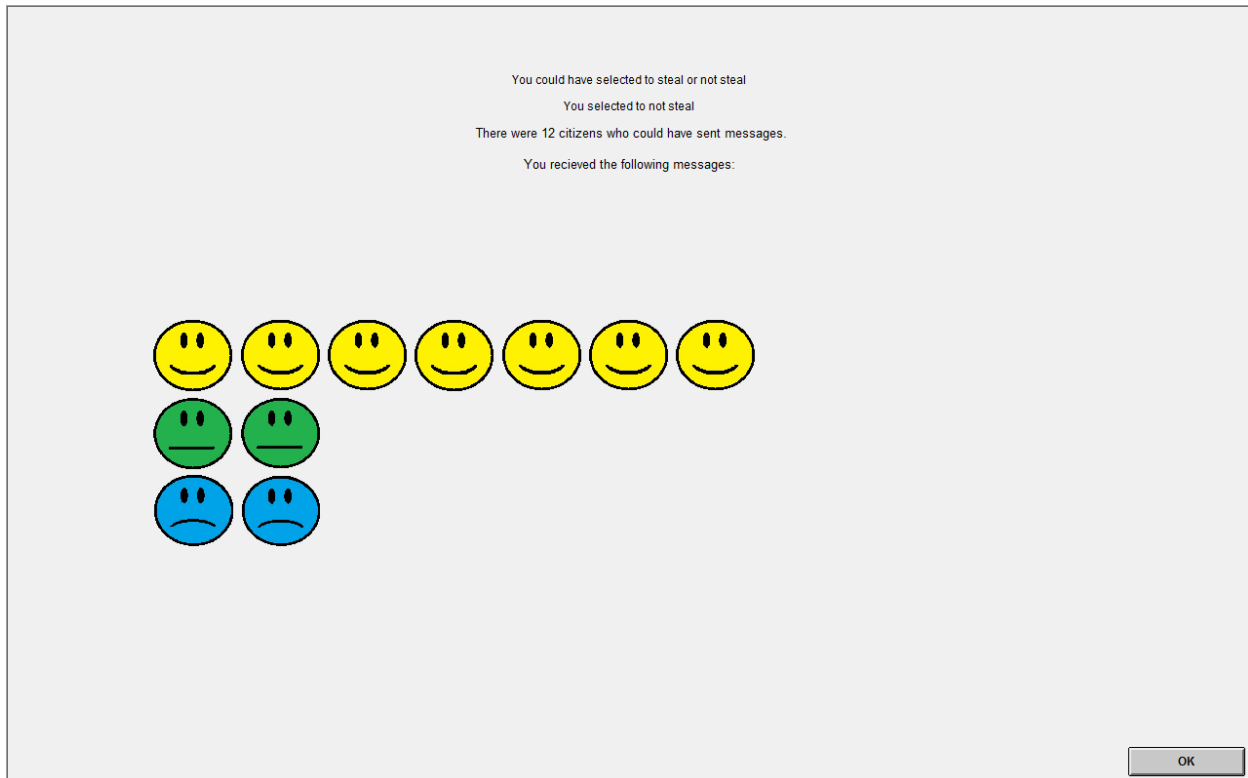
Social Judgment - Stealing
Victim

You have been paired at random with another participant for the next task. You will both be participating in the role of Private Citizens.

From completing the SAT questions you have earned 100 ECUs.

The Private Citizen with whom you have been paired has earned 50 ECUs.

The Private Citizen with whom you have been paired has been randomly determined to be allowed the option of choosing whether or not to steal 35% or 70% of your earnings from the SAT task.

Please wait for the Private Citizen to reach their decision.

On the next screen you will have the opportunity to observe the decisions of all Private Citizens who had the opportunity to steal in this segment of today's experiment and you will be allowed the opportunity to send any of the images below as a message to any of the Private Citizens who had the opportunity to steal from other Private Citizens, on an individual basis.

The possible signals are: NONE

You have been paired at random with another participant for the next task. You will both be participating in the role of Private Citizens.
From completing the SAT questions you have earned 100 ECUs.

The Private Citizen with whom you have been paired has earned 50 ECUs.

The Private Citizen with whom you have been paired has reached their decision.

The Private Citizen with whom you have been paired made the choice to not steal from you.

Your final earnings are therefore 100

On the next screen you will have the opportunity to observe the decisions of all Private Citizens who had the opportunity to steal in this segment of today's experiment and you will be allowed the opportunity to send any of the images below as a message to any of the Private Citizens who had the opportunity to steal from other Private Citizens, on an individual basis.

The possible signals are: 😊   😐   🙁   NONE

OK

Citizen

Action: Not Steal

○   😊
○   😐
○   🙁
○   NONE

You now have the opportunity to send a message to any of the Private Citizens participating in this segment of today's experiment. To the left you can choose messages for the Private Citizen with whom you are matched. You can see the choices made by the Private Citizen with whom you are matched and the messages you could possibly send them.

Below is a table indicating the choices made by the participants in the role of Private Citizen in each of the other groups.

Messages for Private Citizens

Action	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12
	Not Steal	Steal 35%	Steal 70%	Not Steal	Steal 35%	Steal 70%	Steal 35%	Not Steal	Steal 70%	Steal 35%	Steal 70%	Steal 35%
😊	●	○	○	●	○	○	○	○	○	○	○	○
😐	○	●	○	○	●	○	○	●	○	○	○	●
🙁	○	○	●	○	○	●	○	○	●	○	●	○
NONE	○	○	○	○	○	○	●	○	○	●	○	○

😊 😐 🙁 😊 😐 🙁 NONE 😐 🙁 NONE 🙁 😐

OK

Social Judgment – Embezzlement

For the next segment of today's experiment you will be matched with three other individuals. You will all have the opportunity to engage in a task. The task will involve encoding sequences of letters into a numerical code. There will be a table at the top of the screen with all the letters in the alphabet and a number below each one. This table will represent a code. Below the table you will find a four letter "word" which is a randomly generated set of four letters. You will be asked to enter the corresponding number below each letter and then press OK to submit and move on to the next word.

OK

Social Judgment – Embezzlement
Public official

Remaining time [sec]:   169

You have been randomly assigned the role of **Public Official** in your society consisting of you and three Private Citizens. You will receive a fixed wage for being the Public Official. The three Private Citizens with whom you are matched will be receiving 8 ECU for each correct encoding they submit while also generating 5 ECU into a public fund. You can complete as many encodings as you like, but they will not generate private earnings for you and they will also not generate any earnings to go into the public fund. At the end of this three minute production period, it will be your task to decide how to redistribute the money generated into the public fund by the effort of the three Private Citizens.

Your wage as the Public Official is 195 ECUs. We have set your wage so that it is expected to be higher than any earnings likely to be achieved by a Private Citizen.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	12	14	10	9	6	24	22	7	5	11	3	18	1	21	16	23	2	13	19	25	4	26	17	20	15

Word: X   L   A   R

Code:

OK

Wage Rate: 8
Number Coded Correctly: 0
Number Coded Incorrectly: 0
Earnings this period: 0

37

Your wage as the Public Official is 195 ECUs. We have set your wage so that it is expected to be higher than any earnings likely to be achieved by a Private Citizen. The Private Citizens have generated 15 ECUs into the public fund. It is your job to redistribute the public fund that has been generated by the work of the Private Citizens. You have the opportunity to choose whether or not to embezzle 45% or 80% of the public fund and redistribute the rest to the Private Citizens with each of them getting equal share. If you choose to embezzle you will receive your fixed wage plus the embezzled funds. If you choose not to embezzle, you will receive your fixed wage and the entire public fund will be redistributed to the Private Citizens, with each of them getting equal share.

After you have made your decision, all three Private Citizens will see the money their efforts generated into the public fund, your choice to embezzle or not, and their final earnings.

Moreover, all participants in the role of Private Citizens in this segment of today's experiment will see the actions chosen by all of the Public Officials. The Private Citizens will be allowed the opportunity to send any of the images below as a message to any of the Public Officials; they choose on an individual basis. They can also choose to send no message to any individual Public Official. After the Private Citizens have chosen what messages they wish to send and to whom, those in the role of Public Official will see how many messages and of which sort they have been sent, if any.

The possible messages are: 😊 😐 ☹️ NONE

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

If you choose not to embezzle	**If you choose to embezzle 45%**	**If you choose to embezzle 80%**
Each Citizen will earn 5+ private earnings	Each Citizen will earn 3+ private earnings	Each Citizen will earn 1+ private earnings
You will earn 195	You will earn 202	You will earn 207

Please select your action.

[Not Embezzle] [Embezzle 45%] [Embezzle 80%]

Your wage as the Public Official is 195 ECUs. We have set your wage so that it is expected to be higher than any earnings likely to be achieved by a Private Citizen. The Private Citizens have generated 15 ECUs into the public fund. It is your job to redistribute the public fund that has been generated by the work of the Private Citizens. You have the opportunity to choose whether or not to embezzle half of the public fund and redistribute the rest to the Private Citizens with each of them getting equal share. If you choose to embezzle you will receive your fixed wage plus the embezzled funds. If you choose not to embezzle, you will receive your fixed wage and the entire public fund will be redistributed to the Private Citizens, with each of them getting equal share.

After you have made your decision, all three Private Citizens will see the money their efforts generated into the public fund, your choice to embezzle or not, and their final earnings.

Moreover, all participants in the role of Private Citizens in this segment of today's experiment will see the actions chosen by all of the Public Officials. The Private Citizens will be allowed the opportunity to send any of the images below as a message to any of the Public Officials; they choose on an individual basis. They can also choose to send no message to any individual Public Official. After the Private Citizens have chosen what messages they wish to send and to whom, those in the role of Public Official will see how many messages and of which sort they have been sent, if any.

The possible messages are: 😊 😐 ☹️ NONE

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

If you choose not to embezzle	**If you choose to embezzle 45%**	**If you choose to embezzle 80%**
Each Citizen will earn 5+ private earnings	Each Citizen will earn 3+ private earnings	Each Citizen will earn 1+ private earnings
You will earn 195	You will earn 202	You will earn 207

You selected to embezzle 80%

You chose to Embezzle. You therefore received 12 from the public funds generated by the Private Citizens. You also received your fixed wage of 195.

The Private Citizens on average earned 8 in Private Earnings.

The Private Citizens each received 1 from the Public Funds.

On the next screen you will see the messages sent to you by all participants acting in the role of Private Citizens in this segment of today's experiment.
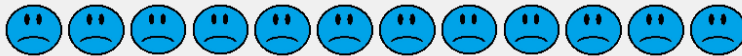
Please wait for the messages sent by the Private Citizens.

You could have selected to embezzle or not embezzle.

You selected to embezzle 80% of the public funds

There were 18 citizens who could have sent messages.

You received the following messages:

OK

Social Judgment – Embezzlement
Private citizen

Please use the code provided to translate the random strings of four letters into the corresponding numerical code. You and other "Private Citizens" will each have three minutes to complete as many encodings as you choose. For every correct encoding you submit, you will earn 8 ECU in private earnings. You and the other Private Citizens will also be generating earnings that will be deposited in a public fund. After the production period is ended, the earnings that accrue to the public fund will be redistributed.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	12	14	10	9	6	24	22	7	5	11	3	18	1	21	16	23	2	13	19	25	4	26	17	20	15

Word: X L A R

Code:

OK

Wage Rate: 8
Number Coded Correctly: 0
Number Coded Incorrectly: 0
Earnings this period: 0

You completed 1 encodings correctly earning 8 ECU for each.

You earned 8 ECU in Private Earnings.

You were matched with 3 other individuals for this task. One has been randomly assigned the role of Public Official. You and the other two have been assigned the role of Private Citizen. Any encodings completed by the Public Official did not generate either private or public earnings. He or she will receive a fixed wage of 195. The encodings completed by you and the other two Private Citizens also generated 5 ECU into the public fund for each encoding completed correctly. Your group of Private Citizens completed 3 encodings correctly resulting in 15 ECUs being generated into the public fund.

The Public Official has been given the task to redistribute the Public Funds. He or she has the opportunity to embezzle 45% or 80% of these funds prior to redistribution with any non-embezzled funds being redistributed equally among all Private Citizens. Consequently you could receive either 5 ECUs if the Public Official elects to not embezzle or 3 or 1 ECUs depending on the amount the Public Official elects to embezzle.

The Public Official is making his or her embezzling decision. The experiment will continue after the choice is made.

On the next screen you will have the opportunity to observe the decisions of all participants acting in the role of Public Official in this segment of today's experiment and you will be allowed the opportunity to send any of the images below as a message to any of the Public Officials on an individual basis.

The possible messages are: NONE

You completed 1 encodings correctly earning 8 ECU for each.

You earned 8 ECU in Private Earnings.

You were matched with 3 other individuals for this task. One has been randomly assigned the role of Public Official. You and the other two have been assigned the role of Private Citizen. Any encodings completed by the Public Official did not generate either private or public earnings. He or she will receive a fixed wage of 195. The encodings completed by you and the other two Private Citizens also generated 5 ECU into the public fund for each encoding completed correctly. Your group of Private Citizens completed 3 encodings correctly resulting in 15 ECUs being generated into the public fund.

The Public Official has been given the task to redistribute the Public Funds. He or she has the opportunity to embezzle 45% or 80% of these funds prior to redistribution with any non-embezzled funds being redistributed equally among all Private Citizens.

The Public Official has reached their decision.

The Public Official for your group selected to embezzle 80% of the funds. You therefore received 1 ECUs from the Public Fund.

Total Earnings from this task:9

On the next screen you will have the opportunity to observe the decisions of all participants acting in the role of Public Official in this segment of today's experiment and you will be allowed the opportunity to send any of the images below as a message to any of the Public Officials on an individual basis.

The possible messages are: 🙂 😐 🙁 NONE

OK

Official

Action: Embezzle 80%

○ 🙂
○ 😐
◉ 🙁
○ NONE

You now have the opportunity to send a message to any of the Public Officials participating in this segment of today's experiment. To the left you can choose the message for the Public Official with whom you are matched. Below you can see the choices made by all Public Officials and then the messages you could possibly send them.

Messages for Public Officials

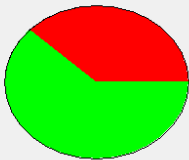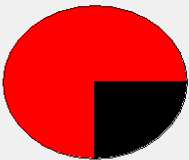| Action	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
	Embezzle 80%	Embezzle 45%	Not Embezzle	Embezzle 45%	Embezzle 80%	Embezzle 45%
🙂	○	○	◉	○	○	○
😐	○	○	○	○	○	○
🙁	◉	◉	○	◉	◉	◉
NONE	○	○	○	○	○	○

OK

Own lottery

You will have the opportunity to choose between playing multiple pairs of lotteries. In each set there will be a lottery A and lottery B. Each will give you certain chances at winning four different prize values. The probabilities of winning each prize will be shown in the lottery descriptions below and are represented in the pie charts. Please choose which lottery you would prefer to play or indicate that you have no preference between the two. After you have made your choice for each of the sets of lotteries the computer will randomly pick 1 set of lotteries to generate an actual payoff for you and you will receive the earnings from the lottery you chose in that set. If you indicated no preference between the two lotteries chosen to generate payment, one of them will be randomly chosen to generate your earnings.

OK

You will have the opportunity to choose between playing multiple pairs of lotteries. In each set there will be a lottery A and lottery B. Each will give you certain chances at winning four different prize values. The probabilities of winning each prize will be shown in the lottery descriptions below and are represented in the pie charts. Please choose which lottery you would prefer to play or indicate that you have no preference between the two. After you have made your choice for each of the sets of lotteries the computer will randomly pick 1 set of lotteries to generate an actual payoff for you and you will receive the earnings from the lottery you chose in that set. If you indicated no preference between the two lotteries chosen to generate payment, one of them will be randomly chosen to generate your earnings.

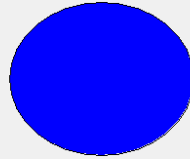|	LOTTERY A				LOTTERY B		
Prize 1:	0	with probability	38 %	Prize 1:	0	with probability	75 %
Prize 2:	83	with probability	62 %	Prize 2:	83	with probability	0 %
Prize 3:	167	with probability	0 %	Prize 3:	167	with probability	0 %
Prize 4:	250	with probability	0 %	Prize 4:	250	with probability	25 %

Which lottery do you choose?
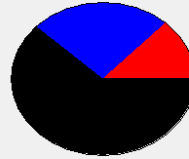
LOTTERY A   No Preference   LOTTERY B

You will have the opportunity to choose between playing multiple pairs of lotteries. In each set there will be a lottery A and lottery B. Each will give you certain chances at winning four different prize values. The probabilities of winning each prize will be shown in the lottery descriptions below and are represented in the pie charts. Please choose which lottery you would prefer to play or indicate that you have no preference between the two. After you have made your choice for each of the sets of lotteries the computer will randomly pick 1 set of lotteries to generate an actual payoff for you and you will receive the earnings from the lottery you chose in that set. If you indicated no preference between the two lotteries chosen to generate payment, one of them will be randomly chosen to generate your earnings.

	LOTTERY A				LOTTERY B		
Prize 1:	-133	with probability	0 %	Prize 1:	-133	with probability	13 %
Prize 2:	-50	with probability	0 %	Prize 2:	-50	with probability	0 %
Prize 3:	50	with probability	100 %	Prize 3:	50	with probability	25 %
Prize 4:	133	with probability	0 %	Prize 4:	133	with probability	62 %

You have completed all of the lotteries. Please click Continue...

CONTINUE

You've now completed this segment of the experiment.   The payoffs from your decisions are shown below.

	Choice	Outcome
Decision 1	Lottery A	0
Decision 2	Lottery A	83
Decision 3	No Preference	83
Decision 4	Lottery B	0
Decision 5	Lottery B	83
Decision 6	No Preference	167
Decision 7	Lottery A	83
Decision 8	Lottery B	0
Decision 9	No Preference	167
Decision 10	Lottery B	83
Decision 11	Lottery A	133
Decision 12	No Preference	-50
Decision 13	Lottery B	50
Decision 14	No Preference	133
Decision 15	Lottery A	50

The randomly selected decision for payment is 6.

Your earnings for this segment of the experiment are 167.

OK

Auction

This phase of the experiment will consist of 5 rounds. In each round you will be bidding against a computerized opponent for the right to play a lottery.

The lottery you will be bidding for will involve some chance at winning x or x+ 10 where x will be randomly determined for each round. The possible values for x are the integers between 0 and 75 with all values being equally likely.

Bidding will take place using a bid clock which will start at a price of 0 and tick up by 2 ECUs every second. When the price on the clock reaches your maximum willingness to pay for the lottery in that round, you can click the Drop Out button to exit from the auction. Your computerized opponent will choose a drop out price at random. You will not however be informed when your computerized opponent has chosen to drop out. The bid clock will continue rising until you choose to drop out.

You will win the auction if you drop out at a higher price than the one chosen by your computerized opponent. If you win the auction you will earn the right to play your lottery for that round and you will receive as earnings the payoff from it. You will, however, have to pay a price for winning. The price will not be the price at which you dropped out but the price at which your computerized opponent dropped out.

If you chose a drop out below that of your computerized opponent, you will not win the auction and will earn 0 for that round.

In this kind of auction, you should think carefully about the amount you are willing to pay, and click the Drop Out button when the Bid Clock reaches this price. To help you better understand how the price is determined in each auction, we will go through an example. Assume that you have received a lottery for a round with x=5 and so your possible payoff at the end will be either 5 or 15 with equal probability. If you choose to drop out of the auction at a price of 7 then you win if the computer opponent dropped out at a price lower than 7. So if the computer dropped out at a price of 3, you would win the auction and pay a price equal to 3. You would then play the lottery and receive either 5 or 15 with equal probability. Had the computer opponent dropped out at a price of 9 then you would lose the auction that round and receive no earnings.

OK

You are bidding for the right to receive the earnings from a lottery that pays you 12 with probability 50% and 22 with probability 50%.

The price clock will start rising and continue until you click on the drop out button. You will win the auction if you choose a drop out price above that of your computerized opponent. If you win you will receive the earnings from your lottery and you will pay a price equal to the price at which the computerized opponent dropped out. If you choose a drop out price below that of the computerized opponent you will lose the auction for this round earning 0. The price will start rising after you hit start.
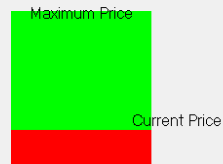
Maximum Price

Current Price

Price: 0

Start

You are bidding for the right to receive the earnings from a lottery that pays you 17 with probability 50% and 27 with probability 50%.

The price clock will start rising and continue until you click on the drop out button. You will win the auction if you choose a drop out price above that of your computerized opponent. If you win you will receive the earnings from your lottery and you will pay a price equal to the price at which the computerized opponent dropped out. If you choose a drop out price below that of the computerized opponent you will lose the auction for this round earning 0. The price will start rising after you hit start.

Maximum Price

Current Price

Price: 20

DROP OUT

You are bidding for the right to receive the earnings from a lottery that pays you 17 with probability 50% and 27 with probability 50%.

The price clock will start rising and continue until you click on the drop out button. You will win the auction if you choose a drop out price above that of your computerized opponent. If you win you will receive the earnings from your lottery and you will pay a price equal to the price at which the computerized opponent dropped out. If you choose a drop out price below that of the computerized opponent you will lose the auction for this round earning 0. The price will start rising after you hit start.

Maximum Price

Current Price
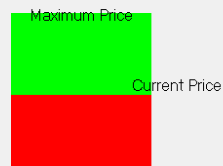
Price: 40

Computer bid 49.

You did not win the auction this round and so your earnings are 0.

OK

Below is a summary of your earnings for each round of this segment of the experiment.

Period	Pay	Total
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0

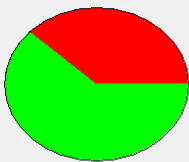Your total earnings for this segment of the experiment are 0.

OK

Partner lottery

You have been matched with another participant in today's experiment and will be making decisions for them in this segment of the experiment. You will have the opportunity to choose multiple pairs of lotteries that the person with whom you are matched will potentially receive earnings from. In each set there will be a lottery A and lottery B. Each will give certain chances at winning four different prize values. The probabilities of winning each prize will be shown in the lottery descriptions below and are represented in the pie charts. Please choose which lottery you would prefer to generate earnings for the person with whom you are matched or indicate that you have no preference between the two lotteries. After you have made your choice for each of the sets of lotteries the computer will randomly pick 1 set of lotteries to generate an actual payoff for the other person and he or she will receive the earnings from the lottery you chose in that set. If you indicated no preference between the two lotteries chosen to generate payment, one of the two lotteries will be randomly chosen to generate the other person's earnings.
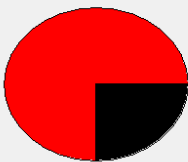
OK

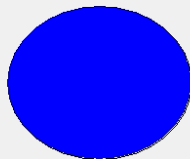|	LOTTERY A				LOTTERY B	
Prize 1:	0	with probability	38 %	Prize 1:	0	with probability	75 %
Prize 2:	83	with probability	62 %	Prize 2:	83	with probability	0 %
Prize 3:	167	with probability	0 %	Prize 3:	167	with probability	0 %
Prize 4:	250	with probability	0 %	Prize 4:	250	with probability	25 %

Which lottery do you choose?

LOTTERY A   No Preference   LOTTERY B

You have been matched with another participant in today's experiment and will be making decisions for them in this segment of the experiment. You will have the opportunity to choose multiple pairs of lotteries that the person with whom you are matched will potentially receive earnings from. In each set there will be a lottery A and lottery B. Each will give certain chances at winning four different prize values. The probabilities of winning each prize will be shown in the lottery descriptions below and are represented in the pie charts. Please choose which lottery you would prefer to generate earnings for the person with whom you are matched or indicate that you have no preference between the two lotteries. After you have made your choice for each of the sets of lotteries the computer will randomly pick 1 set of lotteries to generate an actual payoff for the other person and he or she will receive the earnings from the lottery you chose in that set. If you indicated no preference between the two lotteries chosen to generate payment, one of the two lotteries will be randomly chosen to generate the other person's earnings.

	LOTTERY A				LOTTERY B		
Prize 1:	-133	with probability	0 %	Prize 1:	-133	with probability	13 %
Prize 2:	-50	with probability	0 %	Prize 2:	-50	with probability	0 %
Prize 3:	50	with probability	100 %	Prize 3:	50	with probability	25 %
Prize 4:	133	with probability	0 %	Prize 4:	133	with probability	62 %
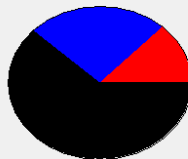
You have completed all of the lotteries. Please click Continue...

CONTINUE

Below are the decisions you made and the resulting outcomes for the person you were partnered with.

	Your Choice	Partner's Potential Earnings
Decision 1	Lottery A	0
Decision 2	No Preference	83
Decision 3	Lottery B	83
Decision 4	No Preference	0
Decision 5	Lottery A	250
Decision 6	No Preference	167
Decision 7	Lottery B	83
Decision 8	No Preference	83
Decision 9	Lottery A	0
Decision 10	No Preference	167
Decision 11	Lottery B	50
Decision 12	No Preference	50
Decision 13	Lottery A	50
Decision 14	No Preference	-50
Decision 15	Lottery B	50

While you were making choices for another participant, one of the other participants was also making lottery choices for you. Based on their choices you earned 0.

OK

48