

Corruption, social judgment and culture: An experiment[☆]Timothy C. Salmon^{*}, Danila Serra

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ABSTRACT

Modern societies rely on both formal and social mechanisms to enforce social norms of behavior. Formal enforcement mechanisms rely on monetary or other tangible incentives while social enforcement mechanisms rely on some form of social judgment involving informal sanctions. We experimentally investigate the extent to which social observability and the possibility of social judgment affect individuals' decisions to engage in corruption at the expense of others. We are also interested in the degree to which culture matters. We use a laboratory experiment with a sample of individuals who live in the U.S. but are also characterized by cultural heterogeneity due to the immigration of their ancestors to the U.S. We find that the possibility of social judgment reduces corruption only among individuals who identify culturally with countries characterized by low levels of corruption. Our findings suggest that the effectiveness of social enforcement mechanisms is at least partly dependent on the sociocultural norms prevailing in the target population.

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1. Introduction

In all social environments, from homeowner organizations to workplaces to large scale societies, norms exist to guide the actions of the individuals that interact in such environments. In many cases these norms are enforced by formal laws or workplace policies 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 theft and corruption, and impose specific penalties should individuals violate the law or institution specific rule. While formal enforcement mechanisms are certainly important for ensuring conformance with norms, enforcement mechanisms relying on social judgment and informal sanctions are also an important way in which norm compliance may be encouraged.¹ 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. Within the economic literature, some models of the impact of social observability on

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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).

behavior are based on the notion that people value fairness in itself, yet they also value social reputation (Benabou and Tirole, 2006; Andreoni and Bernheim, 2009).² 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 et al., 2007).

The nature of the behavioral norms that are formally or informally enforced in any social environment are of course defined by the institutional environment and, crucially, by social and cultural contexts. The same crime, e.g., bribing a public official to shorten the time required to get a license, may be harshly condemned, formally and informally, in one social environment while being widely accepted or even informally rewarded, in another. In this paper, we ask whether the effectiveness of enforcement institutions relying purely on social observation, interaction and judgement is affected by the sociocultural background of the decision-makers. This is an important question, especially given that bottom-up or crowd-sourced accountability systems are attracting increasing attention among academics and practitioners (The World Bank, 2004) as a viable solution to the problem of corruption and subpar behavior of service providers.³ However, since societal views on the degree of importance of different behaviors also determine how severe the violation of any given rule is perceived and judged, initiatives relying purely on social judgment and informal sanctions may be less effective in settings where low rule of law and pervasive corruption have become the social norm. Investigating whether this is the case is the main objective of this paper.

We employ a cross-cultural sample of university students and we analyze individuals' decisions to act corruptly in the context of a laboratory experiment under different social observability conditions. The main advantage of our experimental methodology is the ability to test whether and how individuals of different cultural heritages respond to the possibility of social judgment while holding institutional environment and monetary incentives constant. Our multi-cultural sample consists of mostly US-born individuals who grew up and live in the US yet claim cultural identification with another country – in addition to or instead of the US – due to their ancestors' migrant status. While 5% of our sample was born outside the US, the remaining 414 participants were born and raised in the US. Of them, 201 (49%) stated that, despite being born and raised in the US, they identify culturally with the country of origin of their ancestors prior to immigration to the US. Our investigation exploits the cross-cultural dimension of our sample by testing whether and how their responsiveness to the possibility of social observability and judgment is affected by the level of corruption in the country with which the subjects claim identification.

Our methodology relates to studies that identify the impact of culture on individual behavior by linking attitudes and actions of immigrants in a given country to the attitudes and actions prevailing in their, or their ancestors', country of origin. For instance, Fisman and Miguel (2007) related parking violations of diplomats in New York City to the level of corruption in their countries of origin and Barr and Serra (2010) employed an international sample of Oxford University students to test whether corruptibility in a simple bribery game could be predicted by the level of corruption in their countries of origin.⁴ Previous studies, such as Alesina and Giuliano (2011), Giuliano (2007), Fogli and Fernandez (2009) and Simpser (2013), have also examined the behavior of second and third generation immigrants with respect to their ancestral countries. In particular, Simpser (2013) 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 and this is the aspect of the individuals we wish to examine.

We employ a simplified version of Barr and Serra (2010)'s bribery game. This game simulates an interaction between a citizen and a public official where the citizen could bribe the official to obtain an illegal service, such as getting a drivers' license without passing the necessary driving test. In our game, a subject in the role of citizen chooses whether to offer a bribe and the public official decides whether he or she would accept. If the transaction happens then a third member of society suffers a monetary loss. This latter element is included to simulate the negative externalities generated by corruption. We conduct three treatments in which we manipulate the degree of social observability of citizens' and officials' actions: one where citizens and officials know that their corrupt actions will be hidden from others, one where they know that their actions will be visible to the victim and one where they know that others, including the victim, will be sitting in judgment of their behavior.⁵

² 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).

³ 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. See Banerjee et al. (2010), Björkman and Svensson (2009), Duflo et al. (2011), Pradhan et al. (2014), Olken (2007) among others.

⁴ Starting from Roth et al. (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. See for instance Henrich et al. (2006), Bohnet et al. (2008), Gächter et al. (2010), Herrmann et al. (2008). Cameron et al. (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. A study also involving international students, i.e. first-generation immigrants, is that of Bornhorst et al. (2010), 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.

⁵ It could be argued that decisions made by student subjects within the controlled environment of the experimental lab are unlikely to reflect the decisions that the same students or ordinary citizens would make in outside-the-lab situations involving the possibility of corruption. While we acknowledge that the levels of corruption are likely to be different when moving from the lab to the field, we are not interested in levels; we are interested in comparative statics regarding the effects of social judgment on corrupt behavior. There is substantial evidence of the external validity of qualitative results generated

There have been several previous experimental examinations of how individuals respond to social observability in contexts different from ours. Some papers, such as [Dana et al. \(2007\)](#), [Karlan and McConnell \(2012\)](#) and [Pan and Houser \(2017\)](#), 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 that the impact of observability on behavior may depend on the characteristics of the individuals being observed.⁶ There is a different stream of literature which also examines the impact of informal sanctions on pro-social behavior; see for example [Masclot et al. \(2003\)](#), [Xiao and Houser \(2005\)](#) and [Carpenter and Seki \(2011\)](#). These studies typically find that 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.⁷ There are no experimental studies, to the best of our knowledge, investigating the impact of observability and social enforcement on individuals' willingness to act corruptly.⁸

We find that corruption weakly decreases as social observability increases and is lowest when society is given the chance to express social approval or disapproval against corrupt individuals. The reason for this weak response is that individuals who self-identify culturally with High Corruption countries tend to react differently to the possibility of social judgment than individuals who identify with Low Corruption countries. The latter group responds to the social observability treatments as predicted, while the former is unaffected by social observability and peer judgement. The analysis of the decision to send messages of disapproval in the treatment where we allow for social judgment shows that individuals that identify with High Corruption countries are less likely to disapprove of corrupt behavior. Our findings suggest that culture matters for the effectiveness of policies relying on social judgment and informal sanctions. This implies that governments and corporations intending to implement social enforcement mechanisms to prevent corrupt behavior should consider carefully the social context in which these programs will be implemented as the prevailing norms in the target population may be very important to the success of the policy.

2. Experiment design

2.1. Corruption game and observability treatments

We investigate how observability and social judgement affect corrupt behavior using a three-player game based on [Barr and Serra \(2009\)](#)'s bribery game. All subjects earn the same endowment of 100 ECUs for going through the Kandinsky and Klee painting preference elicitation module developed in [Tajfel et al. \(1971\)](#).⁹ After that task is completed, in line with the experimental designs of [Banuri and Eckel \(2012\)](#), [Cameron et al. \(2009\)](#) 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 citizen chooses whether to offer a bribe of 20 ECUs to the official, with the act of offering a bribe costing the citizen 5 ECUs. The official simultaneously decides whether he would accept a bribe if it were offered. If a bribe is offered and accepted, the citizen receives 45 ECUs minus the bribe and the cost of offering it, leaving a net earning of 20 ECUs. The official also receives the 20 ECU bribe with no cost. Corruption generates a loss of 40 ECUs to the other member of society. The total net of 40 ECUs earned by citizen and official comes out of the endowment of the other member of society.¹⁰

We conduct three treatments that vary the level of social observability. In the Hidden Action treatment a potential rule breaker – i.e., each citizen and each public official – is told that his or her victim would never know that there was the possibility of corruption 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 the endowment-earning task while they are engaging in the task. We tell them they will earn money for the task and they will be informed how much they make at the end. In the Victim Knows treatment, citizens and officials are informed that the other member of society would know that there was the possibility to engage in corruption and whether or not corruption occurred. In the Social Judgment treatment, citizens and officials are told that all subjects in the session playing in the role of other member of society would be able to observe their choices and would be given the chance to send them a message in the form of either a happy, an

by lab experiments ([Camerer, 2011](#); [Kessler and Vesterlund, 2011](#)). For a direct investigation of the external validity of lab experiments on corruption, see [Armantier and Boly \(2013\)](#).

⁶ Other related studies include [Rege and Telle \(2004\)](#), [Andreoni and Bernheim \(2009\)](#), [Ariely et al. \(2009\)](#), [Carpenter and Myers \(2010\)](#), and [Tadelis \(2011\)](#).

⁷ 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 seemingly insignificant institutional deals can substantially affect outcomes. See for instance [Bardsley \(2008\)](#) and [List \(2007\)](#).

⁸ Experimental studies of bribery and embezzlement have investigated the effectiveness of exogenous formal punishment ([Abbink et al., 2002](#)) monetary punishment from victims of corruption ([Banuri and Eckel, 2012](#); [Cameron et al., 2009](#)), combined monitoring systems ([Serra, 2012](#)) and asymmetric liability mechanisms ([Abbink et al., 2014](#)).

⁹ 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. It is not used to generate social identity here, just to give them a task for which we can pay them.

¹⁰ In designing the game our goal was to make it simple and straightforward yet at the same time maximize the chances that we would be able to observe the comparative static responses necessary to test our key hypotheses. In order to set appropriate parameters, we adopted a model based on [Cox et al. \(2007\)](#). A complete overview of this analysis is available in [Appendix A](#).

Table 1
Summary of experiment design.

	Bribery game	# 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

indifferent or a frowny face.¹¹ This mechanism is similar to the mechanisms used in [Masclét et al. \(2003\)](#), [Carpenter and Seki \(2011\)](#) and [Dugar \(2010\)](#) in the context of pro-social games.¹²

Each subject participated in one treatment of the bribery game and played the game only once. Note that by conducting the 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.

We conducted a total of 18 sessions with 24 subjects each, for a total of 432 subjects, as shown in [Table 1](#). In each session 8 subjects were randomly assigned the role of citizens, 8 the role of public official and 8 the role of other member of society. Citizens, officials and other members of society played in groups of three. All interactions were anonymous, therefore subjects could not identify their partners in the game.¹³ In referring to the subject roles, we used the same contextual labels we have used here. We did this as we believe that psychological and social factors play a significant role in individuals' decisions to engage in corrupt behavior, and we wanted to make sure that subjects understood the decision-making context.¹⁴

In order to identify differences in the cultural backgrounds of our subjects, we ask the experimental participants, as part of a standard post-experiment questionnaire, whether they and their families identify 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 Control of Corruption index produced by the World Bank.¹⁵ Since most of our sample who identify with a country other than the US is made of second- or above-generation immigrants, we use the first available measure for each country, which is 1996 for most countries. 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. If a subject has ancestors from two or more different countries, the determination of which they identify with is chosen by the subject himself/herself. 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 only to weaken any results we might find.

Our sample consists of students at Florida State University. We conducted the experiment using software programmed in z-tree, [Fischbacher \(2007\)](#), with subjects recruited using ORSEE, [Greiner \(2015\)](#). 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

¹¹ A complete set of instruction screens demonstrating exactly what is shown to subjects and when is available as an Appendix to the paper.

¹² Between the Victim Knows and Social Judgment treatment, we change two things simultaneously. We allow the other member of society to send a message to the citizen and official in his or her group, but we also allow all other members of society to know of the rule breakers' corrupt behavior. Thus we are not trying to identify which of these two elements drive the result. We are instead trying to determine if a Social Judgment mechanism of this sort can be effective in reducing corruption.

¹³ Each session included five other games: an auction in which subjects bid against the computer, a risk aversion assessment module from [Harrison and Rutström \(2009\)](#), the same risk assessment task but where decisions were made on behalf of another subject, a stealing game and an embezzlement game. These were mostly distractor tasks and so the data is of little interest though the stealing and embezzlement games received the same treatments as the bribery game. Analysis of the behavior in these games shows similar patterns as the bribery game and can be found in a (much lengthier) working version of this paper. All games were incentivized and generated earnings. The results of each game were reported to the subjects upon completion of the game. We changed the order in which the bribery game was played across sessions, i.e., other at the beginning or at the end of the session. We control for ordering effects in all our empirical specifications by including a Bribery First dummy, which is never significant.

¹⁴ Framing effects have been found in a large set of pro-social games, including public goods games [Andreoni, 1995](#); [Cookson, 2000](#); [Rege and Telle, 2004](#), among the others), and dictator games ([Eckel and Grossman, 1996](#); [Brañas-Garza, 2007](#)). In the context of corruption games, [Abbink and Hennig-Schmidt \(2006\)](#) found no evidence of framing effect in their repeated bribery game. On the other hand, [Barr and Serra \(2009\)](#) in their one-shot petty corruption game found that subjects were significantly less likely to bribe when corruption-loaded language is used in the instructions. The common practice in subsequent studies employing corruption games has been to employ corruption loaded language. For a recent study of how frames significantly affect first- and second-order beliefs see [Dufwenberg et al. \(2011\)](#).

¹⁵ This 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, public sector organizations and commercial business information providers. The index "captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests." As a robustness check we also use the World Bank's Rule of Law composite index, which "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." We find equivalent results. For more information about the World Bank Governance Indicators see <http://info.worldbank.org/governance/wgi/index.aspx#doc>.

the experimental tasks, subjects filled in a questionnaire that registered their demographic characteristics, including their cultural heritage.

2.2. Hypotheses

We can now explicitly state the hypotheses that the experiment was designed to test, which are also consistent with the theory described in detail in [Appendix A](#). Our main interest is in the effectiveness of the observability treatments on the propensity to engage in corruption and in determining whether cultural background affects behavior. Our first and central hypothesis is as follows:

Hypothesis 1. The propensity to engage in corruption should be lower in the Victim Knows and Social Judgment treatments than in the Hidden Action treatment. Also the propensity to engage in corrupt 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 [Appendix A](#). The hypothesis rests on the idea that the weight a decision maker will place on the welfare of the victim will be increasing in the observability of the decision to engage in corrupt behavior. If that weight varies with the observability condition then this comparative static should be observed. The notion that the weight could or perhaps should vary with the treatment is provided by prior literature demonstrating that individuals may be concerned with how they are perceived by others (e.g. [Andreoni and Bernheim, 2009](#), or [Dana et al., 2007](#)) and in particular to the possibility that others might disapprove of their behavior. The model was derived on the basis of this literature to provide a theoretical justification for how observability might affect behavior.

There are also alternative notions for why the Hidden Action treatment might yield more rule breaking behavior than the others as well as why to Social Judgment treatment might lead to less. In the Hidden Action treatment, a rule breaker might justify their behavior based on the idea that the victim is unaware of any harm and so the bad action is not harming the victim in a manner the victim knows about. Of course the actual utility loss to the victim is the same but one could model the utility of the potential rule breaker as only being concerned about the potential utility loss if the agent knows about it and therefore knowingly suffers the pain. In the Hidden Action treatment, the victim feels no pain relative to a reference point of full earnings since they do not know that reference point. Such a theory might explain the behavior in this specific experiment, but it would not be consistent with the results more broadly in the social observability literature. There is also little reason to see why this would correlate with our culture variables that define the basis for later hypotheses.

In the Social Judgment treatment, it is worth noting that we actually change two elements between it and the Victim Knows treatment. We increase the number of people who observe the behavior of the potential rule breaker and simultaneously add in the ability for those observers to send messages of approval or disapproval. We did this based on our interest in examining social judgment mechanisms used in the field that possess these same features. We did not have a goal of distinguishing between the effect of these two features as we wanted to estimate the upper bound impact of social judgment and this we expected would require the messages, not just the fact that others have knowledge of the behavior. One might think that distinguishing between these two is important. However, in the field it would be impossible to prevent observers of corrupt behavior from sending messages signaling approval or disapproval to the individuals they have observed. Our view is that investigating such an artificial restriction in the lab is less important than providing an accurate representation of the kind of social judgment that may occur in the field.

Hypothesis 2. The propensity of an individual to engage in corruption is decreasing in the Corruption measure associated with the cultural heritage of that individual.

The rationale behind this hypothesis is that the culture with which individuals identify is likely to shape the degree to which they perceive corrupt behavior as socially acceptable behavior. Individuals that indicate a cultural connection to a society with a High Corruption 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 might differ from the perceptions of individuals that associate culturally with Low Corruption countries. Hence our prediction that, in the absence of any formal enforcement, the former might be more likely than the latter to engage in bribery.

Hypothesis 3. Social observability should have a greater deterrent effect on corrupt behavior for those who self-identify with Low Corruption countries than for those who self-identify with High Corruption countries.

Our third hypothesis is based on the notion that those individuals who associate with Low Corruption countries may care more about social judgment than those who identify with High Corruption countries. This may be because, due to the prevailing social norms associated with corruption in their countries of cultural affiliation, those who identify with Low Corruption countries expect more severe disapproval of corrupt behavior than those from High Corruption countries. This leads to our final hypothesis.

Hypothesis 4. The propensity to send negative messages to Public Officials and Citizens who act corruptly should be decreasing in the corruption index of the country with which subjects identify.

The support for our final hypothesis is predicated on the idea that countries with higher corruption levels are likely ones in which corruption is viewed as more normal or mainstream and therefore potentially socially accepted as a fact of life. If

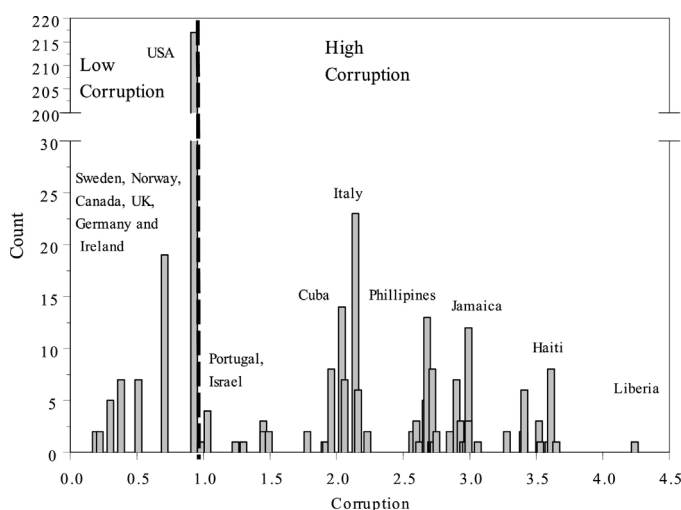


Fig. 1. Histogram indicating number of subjects identifying with each of the countries mentioned in our sample ordered along the x-axis according to their corruption score.

this is the case, individuals that have internalized the social norms prevailing in High Corruption countries will be less likely to send negative signals to citizens and public officials that engage in corrupt behavior.

3. Results

3.1. Summary measures

We begin with a few summary looks at the data. The first point to establish is that we observe substantial heterogeneity in the responses to the question on our survey regarding a country (other than or in addition to the US) with which our subjects identified. Fig. 1 contains 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 Control of Corruption index, which we have rescaled over a 0–5 range with higher numbers indicating higher levels of corruption. Along the y-axis we report the number of subjects who identify culturally with that country. While all of the subjects lived in the US at the time of the experiment, and 95% were also born in the US, 215 out of the 432 participants indicated that they identified culturally with a country other than or in addition to the US. Our sample is quite diverse with a total of 52 countries being represented spanning almost the entire range of the corruption index. We indicated some of the countries in Fig. 1, and we report the full list, with the corresponding value of the corruption index in Appendix.¹⁶

For much of the empirical analysis below we will want to separate the sample into High and Low Corruption (H/L Cor) groups. Given that the Corruption score for the US is the median in the sample and that 95% of the study participants have spent all of their life in the US and therefore have been influenced to some degree by the formal and informal norms prevailing in the US, we have chosen this as the split point and will place the US in the Low Cor set. This division is marked on the graph.

Table 2 provides a first summary of our experimental data. The table shows the tendency of individuals to engage in corrupt behavior by role, broken out by observability treatment and by our High versus Low Corruption variable. The formal test of our hypotheses will be provided in the next section where we employ properly specified regressions. Nevertheless, the table demonstrates a few key features in the data. First, in the full sample, we do find that the highest incidence of rule breaking is in the Hidden Action treatment and lowest in the Social Judgment Treatment. Further we see that this pattern is demonstrated clearly in the subset of individuals who identifies with Low Corruption countries but not for the subset that identifies with High Corruption countries. In fact, for the propensity to accept a bribe, the nominal pattern goes in the opposite direction for this group!¹⁷

¹⁶ Of the 215 students who identify with a country other than (or in addition to) the US, 35% are second-generation immigrants, 20% are third-generation immigrants, and 10% spent 10 years or more in the country with which they identify culturally, i.e., they are first-generation immigrants. About 35% of the students who claimed cultural affiliation with a country other than the US stated that do not have parents or grandparents emigrating from those country. Since we did not ask subjects for the emigration status of ancestors older than grandparents, it is possible that these remaining students are fourth- or above-generation immigrants. Our sample is not large enough to distinguish between the effects of being a first, second, third or above generation immigrant. However, if we can identify behavioral differences due to cultural differences even with some of our subjects having perhaps weak connections to the countries they report identifying with, that suggests the culture has a strong impact on behavior.

¹⁷ For completeness we have conducted various non-parametric tests on these summary statistics regarding the difference between the Hidden Action and the other two treatments for each set of data. We find that the difference between Hidden Action and Social judgment is significant at the 1% level,

Table 2

The propensity to Offer and Accept bribes by treatment and cultural background.

		All data	High Corruption	Low Corruption
Bribe Offer	Hidden Action	0.77 (48)	0.68 (22)	0.85 (26)
	Victim Knows	0.69 (48)	0.55 (20)	0.79 (28)
	Social Judgment	0.40 (48)	0.44 (18)	0.37 (30)
Bribe Accept	Hidden Action	0.75 (48)	0.67 (24)	0.83 (24)
	Victim Knows	0.73 (48)	0.69 (16)	0.75 (32)
	Social Judgment	0.71 (48)	0.76 (17)	0.68 (31)
Bribe Success	Hidden Action	0.54 (48)		
	Victim Knows	0.48 (48)		
	Social Judgment	0.29 (48)		

Summary statistics indicating propensity to Offer and Accept bribes by treatment including all observations and then broken out by High versus Low Corruption. Bribe Success cannot be split into high versus Low Corruption categories as this refers to an agreement of two agents possibly of different backgrounds.

Table 3

Probit regressions examining bribe offering and bribe accepting behavior.

	Probit: Offer Bribe				Probit: Accept Bribe			
	All	High Cor	Low Cor	All	All	High Cor	Low Cor	All
Victim Knows	−0.182 (0.478) [0.500]	−0.185 (0.498) [0.493]	−0.142 (0.703) [0.715]	−0.277 (0.292) [0.355]	0.066 (0.773) [0.770]	0.450 (0.433) [0.431]	−0.170 (0.670) [0.669]	0.181 (0.761) [0.744]
Social Judgment	−1.024*** (<0.001) [0.002]	−0.849* (0.084) [0.097]	−1.210*** (0.002) [0.003]	−0.757 (0.118) [0.134]	−0.155 (0.569) [0.597]	0.520 (0.366) [0.365]	−0.636* (0.069) [0.071]	0.390 (0.455) [0.438]
Low Corruption				0.440 (0.159)				0.477 (0.359)
LC*VK				0.145 (0.712)				−0.348 (0.699)
LC*SJ				−0.470 (0.471)				−1.002 (0.124)
Corruption96	−0.170 (0.134)	−0.072 (0.827)	−0.093 (0.941)		0.099 (0.555)	0.652*** (0.010)	−0.001 (0.022)	
Constant	0.864** (0.015)	0.0940 (0.896)	1.108 (0.365)	0.339 (0.259)	1.005*** (<0.001)	−1.200 (0.164)	1.651** (0.723)	0.919** (0.034)
Hypothesis tests of important parameter combinations (<i>p</i> -values displayed).								
VK = SJ	0.008***	0.192	0.001***	0.355	0.209	0.914	0.093*	0.734
VK + VK*LC = 0				0.728				0.695
SJ + SJ*LC = 0				0.002***				0.083*
VK = SJ if LC = 1				0.003***				0.118
Obs (Clusters)	144 (18)	60 (18)	84 (18)	144 (18)	144 (18)	57 (18)	87 (18)	144 (18)

Control variables are Gender, Raised Religious, Econ or Business Major and whether bribery game was played first or last. Robust standard errors in parentheses, clustered at session level. Standard errors corrected for small number of clusters according to [Kline and Santos \(2012\)](#) in brackets.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

3.2. Treatment and cultural effects

[Table 3](#) reports estimates from probit regressions aimed at testing our first three hypotheses. Our dependent variables are the decision to offer a bribe for the citizen (columns 1 to 4) and to accept a bribe for the official (columns 5 to 8). The explanatory variables used in each regression include the dummy variables for the Victim Knows and Social Judgment treatments leaving the Hidden Action treatment as the baseline. We also include the score of the corruption index for the country with which each subject identifies. We further include a standard set of simple controls indicated in the tables though we suppress the coefficients as there is no specific interest in their values and they have no systematic significance. For each regression specification we show the results for three different populations: the entire sample, the subset of subjects that identify with High Corruption countries, and the subset of subjects that identify with Low Corruption countries. In addition to these specifications, we include an alternate specification that includes all subjects and interacts the Low Corruption dummy

using either a Wilcoxon test or a χ^2 test, for offering and accepting a bribe in the overall data and the Low Corruption subset. We also find the difference significant for the Bribe Success in the overall data. The other differences are not significant. These results match the regression based results discussed in the next section. The regression based tests are more appropriate as they allow for additional controls and for clustering of standard errors across sessions.

and the observability treatments. For these last regressions, in order to examine the total impact of the Social Judgment or the Victim Knows treatment on the behavior of the Low Corruption group, we test the significance of the total effects ($VK+LC*VK$ and $SJ+LC*SJ$) and we report the resulting p -values at the bottom of the regression table. The standard errors in these regressions are clustered at the session level. Given that we only have 18 sessions, this gives rise to a concern that the standard errors may be biased. In the tables we provide the standard clustered p -values for each variable in parentheses while for the main treatment effects we also provide the p -values corrected for the small number of clusters issue using the technique from [Kline and Santos \(2012\)](#).¹⁸ One limitation of the [Kline and Santos \(2012\)](#) technique is that it does not allow for testing the linear combinations of coefficients. Given that our main results are based on the coefficients on the treatment variables themselves and that the p -values do not change much between the corrected and uncorrected versions, we have reported the p -values of those linear combination tests using the uncorrected values.

Result 1. *In the full sample of subjects we find there is no significant difference in behavior between Hidden Action and Victim Knows treatments. The Social Judgment treatment leads to a statistically significant decrease in the propensity to offer bribes relative to the Hidden Action treatment but there is no effect on the propensity to accept bribes.*

Result 2. *We find no statistically significant correlation between corrupt behavior and the value of the corruption index for the country with which the subjects identify.*

Result 3. *For the subjects that identify with Low Corruption countries, the Social Judgment treatment has a negative and significant effect on both bribe offering and bribe accepting behavior. For the subjects identifying with High Corruption countries, Social Judgment is generally ineffective at altering corrupt behavior.*

The support for all three results is contained in the regression estimates. While we expected that the social observability treatment and the corruption index would both be associated with shifts in behavior, as stated in Hypotheses 1 and 2, we find no support for Hypothesis 2 and limited support of Hypothesis 1. If our third hypothesis were correct though, then pooling High and Low Corruption individuals would be a specification error when testing Hypothesis 1 as the impact of the social observability treatments should differ between the groups causing our test of Hypothesis 1 to be mis-specified. Indeed, the results support this notion. When we separate out the two groups, we find that Social Judgment significantly lowers the likelihood of both offering and accepting a bribe among those who identify with Low Corruption countries, whereas it has no effect on bribe accepting behavior and only a weak effect on bribe offering behavior among the individuals who associate with High Corruption countries. In the Low Corruption population, the Social Judgment treatment is also significantly different from the Victim Knows treatment, which, on the other hand, is never effective in reducing corrupt behavior. The latter result suggests that just the victim knowing of the corrupt transaction is not enough social observability to trigger better behavior even among the subjects identifying with Low Corruption countries.

The results presented in [Table 3](#) are confirmed when pooling the citizen and official samples and looking at subjects' decision to act corruptly by either offering or accepting a bribe. In particular, in [Table 4](#) we report estimates from probit regressions where the dependent variable is a dummy equal to 1 if the subject engaged in corruption, i.e., offered a bribe if playing in the role of citizen or accepted a bribe if playing in the role of official. In columns 1 to 4, we employ the same set of specifications as in [Table 3](#), while also controlling for the role played by each subject in the game. The larger sample size allows us to restrict the analysis to only the students that identify with a country other than or in addition to the US. In other words, in column 5 and 6 of [Table 4](#) we exclude the students that identify exclusively with the US. One might be concerned that, due to self-selection issues, first generation immigrants may be very different from both the average citizen in their home country and from second- and above-generation immigrants. As we noted before, research finds that attitudes regarding corruption correlate well between second generation immigrants and citizens in their parent's home country ([Simpser, 2013](#)) but that is not necessarily the case for first generation immigrants ([Barr and Serra, 2010](#)). We address these concerns in column 6, where we restrict our sample further by excluding the first generation immigrants. As before, at the bottom of the regression table we report the p -values generated by tests of the significance of the total treatment effects for the Low Corruption group.

These results confirm that the possibility of social judgment is ineffective among individuals that identify with High Corruption countries. Alternatively, estimates of marginal effects suggest that the possibility of social judgment reduces the probability of engaging in corruption by about 30 percentage points among individuals that identify with Low Corruption countries. When excluding the subjects that identify exclusively with the US (fifth column of [Table 4](#)), the possibility of social judgment lowers the probability of engaging in corruption in the Low Corruption subsample by over 40 percentage points, and by about 56 percentage points when excluding the first generation immigrants.

The clear picture emerging from these results is that individuals who associate with cultures characterized by Low Corruption tend to respond to the possibility of social judgment as hypothesized, i.e., they are less likely to act corruptly. In contrast, those who associate culturally with countries characterized by High Corruption tend not to respond to the possibility of social approval or disapproval.

¹⁸ Separately we have also reconducted each regression as a linear probability model using standard OLS and found the corrected p -values for all variables using the techniques described in [Cameron et al. \(2008\)](#). We find no differences in significance levels between these regressions and the probit regressions with the uncorrected p -values. These supplemental tables are available in a separate appendix for the paper.

Table 4

Probit regressions examining the decision to act corruptly.

	Probit: the decision to act corruptly					
	All	High Cor	Low Cor	All	No US-Only	No 1st generation
Victim Knows	−0.069 (0.687) [0.697]	0.011 (0.961) [0.968]	−0.171 (0.614) [0.630]	−0.058 (0.814) [0.800]	0.030 (0.906) [0.909]	−0.104 (0.702) [0.689]
Social Judgment	−0.571*** (0.006) [0.017]	−0.209 (0.568) [0.588]	−0.889** (0.003) [0.005]	−0.218 (0.547) [0.578]	−0.207 (0.565) [0.582]	−0.406 (0.346) [0.384]
Low Corruption				0.446 (0.183) [0.183]	0.671 (0.343) [0.343]	0.681 (0.371) [0.371]
LC*VK				−0.113 (0.815) [0.815]	−0.481 (0.515) [0.515]	−0.439 (0.586) [0.586]
LC*SJ				−0.669 (0.170) [0.170]	−1.109 (0.343) [0.343]	−1.147 (0.244) [0.244]
Corruption96	−0.024 (0.807) [0.807]	0.246 (0.229) [0.229]	−0.067 (0.921) [0.921]			
Public Official	0.288* (0.085) [0.085]	0.368 (0.206) [0.206]	0.218 (0.203) [0.203]	0.289* (0.079) [0.079]	0.387 (0.162) [0.162]	0.165 (0.542) [0.542]
Constant	0.823*** (0.006) [0.006]	−0.479 (0.429) [0.429]	1.349** (0.046) [0.046]	0.535** (0.012) [0.012]	0.147 (0.643) [0.643]	0.264 (0.458) [0.458]
Hypothesis tests of important parameter combinations. <i>p</i> –values displayed.						
VK = SJ	0.003***	0.545	0.002***	0.662	0.516	0.486
VK + VK*LC = 0				0.628	0.548	0.488
SJ + SJ*LC = 0				0.005***	0.089*	0.038**
VK = SJ if LC=1				0.002***	0.130	0.071**
Obs (Clusters)	288 (18)	117 (18)	171 (18)	288 (18)	143 (18)	124 (18)

Control variables are Gender, Raised Religious, Econ or Business Major and whether bribery game was played first or last. Robust standard errors in parentheses, clustered at session level. Standard errors corrected for small number of clusters according to [Kline and Santos \(2012\)](#) in brackets.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.**Table 5**

Probit regressions of the decision to act corruptly incorporating High vs. Low Rule of Law and High vs. Low GDP.

	Bribe Offer		Bribe Accept		Bribe Offer		Bribe Accept	
	(1) Low RoL	(2) High RoL	(3) Low RoL	(4) High RoL	(5) Low GDP	(6) High GDP	(7) Low GDP	(8) High GDP
VK	−0.075 (0.767) [0.778]	−0.282 (0.467) [0.497]	0.315 (0.584) [0.591]	−0.177 (0.663) [0.681]	−0.257 (0.422) [0.481]	−0.009 (0.982) [0.985]	0.265 (0.600) [0.585]	−0.156 (0.703) [0.746]
SJ	−0.920* (0.081) [0.078]	−1.229** (0.002) [<0.001]	0.484 (0.357) [0.384]	−0.634* (0.070) [0.072]	−1.049** (0.024) [0.042]	−1.114*** (0.007) [0.015]	0.105 (0.770) [0.708]	−0.476 (0.135) [0.152]
Constant	−0.115 (0.885) [0.885]	−6.694 (0.701) [0.701]	1.862* (0.020) [0.020]	3.890 (0.719) [0.719]	0.295 (0.605) [0.605]	1.054* (0.019) [0.019]	1.513*** (0.004) [0.004]	1.626*** (0.000) [0.000]
Obs	59	85	57	87	68	76	75	69
(Clusters)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)

Control; Gender, Raised Religious, Econ or Business Major, whether bribery game was played first or last, RoL and GDP. Robust standard errors in parentheses, clustered at session level. Standard errors corrected for small number of clusters according to [Kline and Santos \(2012\)](#) in brackets.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

We have tested the robustness of the result in many ways. The two most important ones consist of attempting to replicate the results by replacing the corruption index with either the Rule of Law Index – another World Bank Governance Indicator, which “captures perceptions of the extent to which agents have confidence in and abide by the rules of society” – or with the per capita GDP in the country with which a subject identifies. The results are robust when using the Rule of Law measure but not when using per capita GDP. This can be seen in [Table 5](#) in which we find essentially the same results using the Rule of Law variable as we did using the corruption variable earlier. When we segment the groups by whether the GDP of the countries with which they identify are above or below the median, we find no behavior differences between the two segmented groups. These results suggest that our findings reflect cultural heterogeneity, as measured by indicators that

Table 6

The decision to send messages of disapproval to corrupt individuals.

	Negative msg. to corrupt citizen	Negative msg. to corrupt official
Low Corruption OMS	66.67%	56.04%
High Corruption OMS	45.28%	38.89%
H ₀ : LC = HC χ^2 p-value	0.011**	0.008***

* $p < 0.1$.**Table 7**

Probit regression examining OMS' disapproving behavior.

	Probit: the decision to send a negative message to corrupt people		
	All	All	No US-only
Own group	0.366 ⁺ (0.214)	0.374 ⁺ (0.219)	0.466 (0.314)
Corruption96	−0.405*** (0.139)	−0.389** (0.167)	−0.490** (0.231)
Public official	−0.268 ⁺ (0.136)	−0.248 ⁺ (0.143)	−0.338 ⁺ (0.187)
Constant	0.862*** (0.329)	0.848 ⁺ (0.445)	1.791*** (0.648)
Obs (Clusters)	424 (48)	424 (48)	203 (23)
Controls	No	Yes	Yes

Control variables are Gender, Raised Religious, Econ or Business Major and whether bribery game was played first. Robust standard errors clustered by subject in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

capture norms related to corrupt behavior, rather than other cross-country heterogeneities – such as wealth and education – captured by per capita GDP.

3.3. The decision to express disapproval of corrupt behavior

The difference in response to the Social Judgment treatment by the different subject groups warrants further investigation. A possible explanation of the differential treatment effects is that the subjects who identify with High Corruption countries do not expect others to view the decisions to offer or accept a bribe as violating any social norm. 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 their actions should have no impact on their behavior.

As a way of investigating the validity of this possible explanation and test our fourth hypothesis, we examine the messaging data from the Social Judgment treatment. In that treatment, all the subjects in the role of other member of society (OMS) – 8 in each session – were informed about the bribery decisions of the 8 citizens and 8 officials in the sessions, including those in their group, and were given the chance to send a message to each of them if they wanted to. In particular, they could send a happy face to signal approval, a frowny face to signal disapproval or a neutral face to signal perhaps uncertainty or mild disapproval. Sending no message was also a possibility.

Table 6 shows the propensity of other members of society who decided to send messages of disapproval to citizens and officials who acted corruptly. Simple tests show that other members of society that identify with High Corruption countries are significantly less likely to send a negative message to both corrupt citizens and corrupt officials. This result is confirmed by probit regression analysis in Table 7, where we cluster the standard errors for each other member of society. The dependent variable is equal to 1 if the OMS sent a negative message, 0 otherwise. As in Table 6, the data is restricted to only consider cases in which the observed citizen or official acted corruptly. The independent variables are whether or not the corrupt individual belongs to the OMS' own group, the corruption index of the country with which the OMS identifies, and an indicator variable equal to 1 if the target of the judgment is a public official and 0 if it is a citizen. In columns 2 and 3 we also include our standard control variables. Finally, in column 3 we restrict the sample by excluding the other members of society that identify solely with the US.

The results confirm that the propensity to send negative messages is negatively related to the level of corruption in the OMS's country of cultural heritage. This leads us to our final result.

Result 4. *The propensity of Other Members of Society to send messages of disapproval to corrupt individuals is decreasing in the level of Corruption in the country with which they identify.*

The estimates in Table 7 also suggest that individuals tend to judge more harshly the corrupt behavior of people in their own group, from which they may be directly harmed, as compared to other groups, although this result vanishes when

excluding the US-only individuals. Finally, the results show that individuals are generally less disapproving of corrupt public officials than corrupt citizens. This may be because those in the OMS position simply expect more corrupt behavior from those in the role of public official and are less troubled by them engaging in expected behavior. Corrupt behavior is less expected from citizens; consequently, citizens are held in greater contempt if they act corruptly. As a general note, the fact that public officials are less likely to be disapproved when engaging in corruption suggests that different norms apply to the behavior of citizens and officials, which may explain why Social Judgment seems to be more effective in preventing bribe offering than bribe accepting behavior, as shown in [Table 3](#).

Overall, our analysis suggests that inherited sociocultural norms significantly impacted subjects' judgment of bribe offering and bribe accepting behavior. This finding supports the possibility that the differential responses to the Social Judgment treatment of citizens and officials who identify with High versus Low Corruption countries are due to different expectations on how corrupt behavior would be judged by others.¹⁹

4. Conclusion

The correct functioning of every society and organization relies on the establishment and enforcement of norms guiding the behavior of its members. Norm enforcement is especially important in contexts where infractions of the norm caused by self-interest generate negative externalities on other members of the group. This is the case of bureaucrats demanding bribes for the provision of government services. While norm enforcement has been traditionally based 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.

In this paper we assessed the effectiveness of social enforcement mechanisms in reducing corrupt behavior. Since what constitutes a social norm, and hence what actions one expects to be socially approved or disapproved, are defined by the cultural context, we also asked whether the effectiveness of social enforcement mechanisms may depend at least partly on culture. We conducted an experiment simulating a bribery exchange between a citizen and an official at the expense of another member of society. We varied the extent to which the actions of citizens and officials were visible to others and were subject to social judgment in the form of informal approval and disapproval messages. We involved a sample of university students living in the US characterized by cultural heterogeneity due to the immigration of their ancestors to the US from a multitude of countries characterized by different levels of corruption, as measured by the World Bank's Control of Corruption index.

We found significant differences in the responses of potentially corrupt individuals to our social observability treatments. In particular, while subjects that identify with Low Corruption countries responded to the possibility of social judgment by decreasing their propensities to engage in corruption, subjects who identify culturally with High Corruption countries did not. The analysis of the other members of society's decisions to send messages to disapproval to corrupt individuals suggests that the observed differential treatment effects are due to different expectations on the extent to which corrupt behavior would be negatively judged by others. Subjects' propensities to express social disapproval toward corrupt individuals are indeed significantly and negatively affected by the level of corruption in their countries of cultural heritage, providing evidence of strong cultural influences on the social norms that affect corrupt behavior in our experiment.

Our findings are important as they suggest that social enforcement mechanisms that may be highly effective in decreasing rule-breaking behavior, such as corruption, in one population could be ineffective in others. The crucial implication is that when designing and implementing an enforcement mechanism based purely on social judgment one must give very careful thought to the specific populations being targeted and the cultural contexts in which they are embedded.

Appendix A. Theory and parameters

As our baseline model of behavior we adopt the theory presented in [Cox et al. \(2007\)](#) (CFG). In order to conduct the tests of interest we need to find parameters such that some, but not all individuals would engage in corruption 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 game is 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.

Our bribery game is based on a commonly used model also used in [Cameron et al. \(2009\)](#) 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

¹⁹ One could suppose that an alternate driver of our differential behavior was due to approval seeking behavior in which people engage in good behavior in hopes of receiving approval from others. If the expectation of approval varied by culture then this could provide an alternate or complementary expectation. We have carried out this analysis looking at the how the propensity to send positive messages to people who engaged in non-corrupt behavior and find no indication of a relationship with culture. Thus it seems unlikely that approval seeking behavior is driving the differences in measured levels of corrupt choices due to cultural difference. This analysis is available in a separate appendix for the paper.

Table 8
Bribery game.

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	$(w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha$, $(w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha$	$(w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha$, $(w_p)^\alpha + \theta_c(w_c)^\alpha + \theta_s(w_s)^\alpha$

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. Moreover, we need to specify a version of the utility function where there are three individuals involved and 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 8.²⁰ 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. 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

$$(w_c - d - b + m)^\alpha + \theta_p(w_p + b)^\alpha + \theta_s(w_s - l)^\alpha \geq (w_c)^\alpha + \theta_p(w_p)^\alpha + \theta_s(w_s)^\alpha \quad (1)$$

$$(w_p + b)^\alpha + \theta_c(w_c - d - b + m)^\alpha + \theta_s(w_s - l)^\alpha \geq (w_p)^\alpha + \theta_c(w_c - d)^\alpha + \theta_s(w_s)^\alpha \quad (2)$$

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.²¹

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

²⁰ 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.

²¹ 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 equilibrium. The comparative static we are interested in regarding observability still holds though.

Accept) is still an equilibrium for everyone. What we are really interested in though are the treatment effects regarding what happens as ν rises. An upward shift in ν leads to an increase in θ_s which makes the successful 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 ν .

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.

Appendix B. Countries of cultural heritage and corruption index

Country	Corruption index	Country	Corruption index
Albania	3.59	Mexico	2.95
Bahamas	1.30	Nicaragua	2.99
Bolivia	3.40	Nigeria	3.65
Brazil	2.57	Norway	0.22
Canada	0.30	Pakistan	3.65
China	2.75	Panama	2.85
Colombia	2.99	Peru	2.67
Cuba	2.04	Philippines	2.68
Dominican Republic	2.60	Poland	1.96
Ecuador	3.41	Portugal	0.98
France	1.24	Puerto Rico	2.06
Germany	0.51	Russia	3.52
Ghana	2.72	Spain	1.45
Greece	2.16	Sweden	0.19
Haiti	3.61	South Korea	2.23
Hungary	1.92	Syria	3.28
India	2.90	Taiwan	1.91
Indonesia	3.06	Thailand	2.71
Ireland	0.71	Trinidad & Tobago	1.49
Israel	1.03	Turkey	2.73
Italy	2.14	Ukraine	3.53
Jamaica	2.72	United Kingdom	0.38
Japan	1.45	Uruguay	1.78
Jordan	2.62	USA	0.93
Lebanon	2.97	Venezuela	3.41
Liberia	4.24	Vietnam	2.93

Appendix C. Propensity to send positive messages

In the main text of the paper we examine how the propensity to send negative messages to those who engage in bad behavior might differ according to cultural background. We find that those who identify with cultures measured as more corrupt are less likely to disapprove of bad behavior. This is a potential explanation for why those who identify with those cultures might be less affected by social judgment, i.e. due to a lack of expectation of negative judgment. An alternative hypothesis is that people engage in good behavior in order to seek positive judgment and perhaps this is responsible for our results. In order to do so, it would have to be the case that those who identify with Low Corruption cultures have a greater expectation of receiving positive messages from engaging in good behavior than those from High Corruption countries. This expectation can be proxied by determining if those from Low Corruption countries are more or less likely to send such positive messages. Below we reproduce the tables from the main text examining the propensity for those in the role of other member of society to send positive messages to those who engaged in good behavior and examine how this might vary with cultural background. Our clear finding is that there is no relationship between cultural background and propensity to send positive messages indicating that this cannot explain our findings of difference in cultural behavior regarding rule breaking.

	Positive msg. to non-corrupt citizen		Positive msg. to non-corrupt official
Low Corruption OMS	56.38%		71.21%
High Corruption OMS	60.24%		67.39%
	Probit: the decision to send a positive message to non-corrupt people		
	All	All	Without US-Only
Own Group	0.764*** (0.276)	0.787*** (0.265)	1.632*** (0.558)
Corruption96	−0.096 (0.155)	−0.076 (0.193)	−0.262 (0.246)

Public Official	0.421** (0.172)	0.440*** (0.166)	0.588* (0.322)
Constant	0.389 (0.353)	0.539 (0.402)	1.542** (0.618)
Obs (Clusters)	344 (48)	344 (48)	165 (23)
Controls	No	Yes	Yes

Control variables are Gender, Raised Religious, Econ or Business Major and whether bribery game was played first. Robust standard errors clustered by subject in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Appendix D. Linear probability models

One way of testing the robustness of our Probit regressions is to conduct those same regressions as linear probability models which allows us to correct for the small number of clusters using the techniques developed in [Cameron et al. \(2008\)](#). Here we provide two tables that replicate all of the regressions in the main tables in the paper using this alternative specification. All significance levels are essentially unchanged between the two specifications.

	OLS: Offer Bribe				OLS: Accept Bribe			
	All	High Cor	Low Cor	All	All	High Cor	Low Cor	All
Victim Knows	−0.051 [0.554]	−0.062 [0.564]	−0.027 [0.798]	−0.101 [0.354]	0.017 [0.812]	0.108 [0.602]	−0.046 [0.720]	0.060 [0.768]
Social Judgment	−0.361*** [0.012]	−0.284 [0.166]	−0.421** [0.022]	−0.274 [0.222]	−0.060 [0.546]	0.134 [0.534]	−0.191* [0.090]	0.114 [0.510]
LC*VK				0.077 [0.518]				−0.105 [0.736]
LC*SJ				−0.152 [0.634]				−0.307 [0.164]
Low Corruption				0.134 [0.198]				0.143 [0.408]
Corruption96	−0.058 [0.150]	−0.023 [0.856]	−0.014 [0.962]		0.032 [0.544]	0.184* [0.062]	0.043 [0.794]	
Constant	0.796*** [<0.001]	0.525* [0.082]	0.855** [0.028]	0.625*** [<0.001]	0.844*** [<0.001]	0.207 [.502]	0.956*** [<0.001]	0.806*** [<0.001]
Obs (Clusters)	144 (18)	60 (18)	84 (18)	144 (18)	144 (18)	57 (18)	87 (18)	144 (18)

	Probit: the decision to act corruptly					
	All	High Cor	Low Cor	All	Without US-Only	No first generation
Victim Knows	−0.019 [0.706]	<0.001 [0.992]	−0.035 [0.720]	−0.023 [0.764]	0.008 [0.994]	−0.039 [0.672]
Social Judgment	−0.201** [0.048]	−0.073 [0.592]	−0.290*** [0.004]	−0.078 [0.632]	−0.071 [0.596]	−0.144 [0.444]
LC*VK				−0.017 [0.932]	−0.125 [0.448]	−0.102 [0.628]
LC*SJ				−0.217 [0.254]	−0.334 [0.282]	−0.355 [0.244]
Low Corruption				0.133 [0.224]	0.174 [0.270]	0.181 [0.366]
Public Official	0.101 [.106]	0.125 [0.260]	0.077 [0.226]	0.101 [0.102]	0.136 [0.198]	0.059 [0.572]
Corruption96	−0.007 [.852]	0.084 [0.316]	0.016 [0.902]			
Constant	0.785*** [<0.001]	0.348 [0.186]	0.889*** [<0.001]	0.690*** [<0.001]	0.564*** [<0.001]	0.606*** [<0.001]
Obs (Clusters)	288 (18)	117(18)	171(18)	288(18)	143(18)	124(18)

Control variables are Gender, Raised Religious, Econ or Business Major and whether bribery game was played first or last. Robust standard errors in brackets, clustered at session level and corrected for small number of clusters.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Appendix E. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.jebo.2017.06.004>.

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