THE UNIVERSITY OF MELBOURNE

DEPARTMENT OF ECONOMICS

RESEARCH PAPER NUMBER 943

OCTOBER 2006

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Propensities to Engage in and Punish Corrupt Behavior: Experimental Evidence from Australia, India, Indonesia and Singapore[*]

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March 2006

Abstract

This paper examines cultural differences in individual-decision making in an experimental corruption game. Higher levels of exposure to corruption in daily life may promote a tolerance of corruption that is reflected in norms of behavior. We explore whether, in environments characterized by lower levels of corruption, there is both a lower propensity to engage in corrupt behavior and a higher propensity to punish corrupt behavior. Based on experiments run in Australia (Melbourne), India (Delhi), Indonesia (Jakarta) and Singapore, we find that there is a greater variation in the propensities to punish corrupt behavior than in the propensities to engage in corrupt behavior across cultures. Consistent with the existing corruption indices, the subjects in India exhibit a higher tolerance of corruption than the subjects in Australia. However, the subjects in Singapore have a higher tolerance of corruption than the subjects in Indonesia. We conjecture that this is due to the nature of the recent institutional changes in these two countries. We also vary our experimental design to examine the impact of a more effective punishment system and the effect of the perceived cost of bribery.

JEL Classification: C91, D73, O17, K42.
Keywords: Corruption, Experiments, Punishment, Cultural Analysis

1. Introduction

Corruption is a pervasive phenomenon. Transparency International finds that of the 133 countries evaluated for its 2003 Corruption Perception Index (CPI), seven out of ten countries score less than 5 out of a clean score of 10 and nine out of ten developing countries score less than 5 against a clean score of 10.[1] Corruption is a particularly troubling phenomenon in developing countries because of its negative impact on economic growth. It undermines development by weakening the institutional foundation on which economic growth depends and by reducing the incentives for public and private investment (Klitgaard, 1988; Bardhan, 1997; Mauro, 1995).

Given its large negative impact, much stands to be gained from understanding the causes of corruption and the ways in which it can be reduced.[2] The aim of this paper is to contribute to our understanding of corruption by comparing individual decision-making in a corruption experiment across four different cultures.[3] Individuals' attitudes towards corruption are shaped by their everyday experiences of corruption. These experiences are determined by the social, political, legal and economic systems of the countries they live in. We refer to all the elements that shape individuals' attitudes as culture. Higher levels of exposure to corruption in daily life may promote a tolerance of corruption that is reflected in norms of behavior. A corrupt environment may make it easier to justify one's own corrupt behavior. Hence, corruption may

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[1] See http://www.transparency.org/surveys/index.html#cpi for information on the CPI. Table A1 in the Appendix contains a selective list of country rankings from the 2003 Corruption Perceptions Index (CPI). This Index ranks countries in terms of the degree to which corruption is perceived to exist among politicians and public officials. It reflects the views of analysts and business people around the world, including experts living in the countries evaluated.

[2] Previous studies have discussed the importance of deregulation, civil service reform, inter-governmental competition and an effective legal system in reducing corruption. See, for example, Rose-Ackerman (1978). Glaeser and Goldin (2004) discuss the historical factors that may have helped reduce corruption in the United States.

[3] The fact that countries with similar degrees of development may have significantly different levels of corruption suggests that corruption may at least partially be a cultural phenomenon. For instance, Finland, with a 2002 per capita GDP of 26,495 USD, is ranked 1st in the 2003 edition of the CPI while Italy with a 2002 per capita GDP of 25,568 USD is ranked 35th. Portugal, with a 2002 per capita GDP of 18,434 USD is ranked 25th while Greece with a 2002 per capita GDP of 18,439 USD is ranked 50th.

gain more acceptance as it becomes more widespread and such acceptance of corruption may contribute to its further spread and sustenance (Dey, 1989).

Several papers in the theoretical literature on corruption focus on the cultural transmission of corruption (e.g., Andvig and Moene, 1990; Hauk and Saez-Marti, 2002; Lui, 1986; Sah, 1988; Tirole, 1996). However, empirical investigations of the impact of culture on corruption are harder to find. Existing studies rely on data that is aggregated at the country level (Treisman, 2000 and Paldam, 2002). Experimental methodology provides us with a unique opportunity to explore how *individual* behavior differs across cultures.

The set of actions that fall under the rubric of "corrupt acts" is large. In our paper, we interpret corruption as a situation where two people can act to increase their own payoff at the expense of a third person, the victim. The transaction that takes place between the two people is illegal, so the victim is allowed to punish them. However, such punishment is costly to the victim. Our experimental design allows us to differentiate between the incentive to engage in a corrupt act from which one reaps benefits and the willingness to incur a cost to punish a corrupt act which decreases one's payoff. This distinction enables us to examine whether individuals' behavior differs depending on whether they directly benefit from a corrupt act. The ability to examine punishment behavior is important because as suggested by Fehr and Gächter (2002) and Bowles and Gintis (2002), such "altruistic" punishment by *homo reciprocans,* humans who are willing to punish norm violators even when such punishment is costly to the punishers, may be the primary driving force behind sustaining cooperative norms in a variety of social settings.

Our goal is to explore whether, in environments characterized by lower levels of corruption, there is both a lower propensity to engage in corrupt behavior and a higher propensity to punish corrupt behavior. We report findings from experiments conducted in four countries:

Australia (Melbourne), India (Delhi), Indonesia (Jakarta), and Singapore.[4] We have chosen to run our experiments in two countries that are consistently ranked among the least corrupt countries in the world (Australia and Singapore, with scores of 8.8 and 9.4 out of 10 respectively) and two countries that are consistently ranked among the most corrupt (India and Indonesia, with scores of 2.8 and 1.9 respectively).[5]

The results indicate that there is more variation in the propensities to punish corrupt behavior than in the propensities to engage in corrupt behavior across countries. Specifically, there are no significant differences in the propensities to engage in corrupt behavior, but a significant difference in the propensities to punish corrupt behavior between Australia and India. Hence, the subjects in Australia, a country characterized by a low level of corruption, tend to be more critical of corrupt behavior that they observe in others than they are of corrupt behavior of which they are the direct beneficiary. When we analyse behavior in Indonesia and Singapore, we find results different from what is implied by the reported levels of corruption in these two countries. The subjects in Singapore appear to be more tolerant of corruption than the subjects in Indonesia. We conjecture that this may be due to the recent institutional histories of these two countries.

In addition to examining behavioral differences in a corruption experiment across cultures, we varied our experimental treatment to examine whether the propensities to engage in and punish corrupt behavior vary with the effectiveness of the existing legal system and the cost of corruption. We modelled a more effective punishment system as one that allows the victim to mete out a larger punishment and conducted experiments with both a low and high punishment

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[4] It is important to keep in mind while making cultural comparisons that the experimental sample is from a particular city in a country. Especially in countries as diverse as India and Indonesia, where there are many different cultures which are likely to display different attitudes towards corruption. In these countries, we conducted the experiments in the capital cities, Delhi and Jakarta, which have a population that is representative of the country's population.
[5] See Table A1.

regime. To test for the impact of the cost of corruption, we conducted one treatment with a welfare-enhancing bribe, where the total payoff gains from the bribe exceed the total payoff loss, and another treatment with a welfare-reducing bribe, where the reverse is true.

The rest of the paper is organized as follows. Section 2 describes the related experimental literature. Section 3 explains the experimental design and procedure. Section 4 states the research questions that motivate the analysis presented in Section 5. Section 6 discusses the implications of our results and concludes by suggesting avenues for future research.

2. Previous Experimental Literature on Corruption and Punishment

The experimental literature examining corruption is scarce.[6] Abbink, Irlenbusch and Renner (2002) model corruption as a variant of the two-person trust and reciprocation game, where the participants play the role of a briber or a public official. They find that social welfare considerations have no impact on the level of bribery. However, the introduction of a threat of high penalties when discovered significantly reduces corruption. Abbink (2000) uses a similar design and finds that varying the relative salaries received by those who engage in corruption does not affect its prevalence. Barr, Lindelow and Serneels (2004) focus on the decision-making process of health workers and those appointed to monitor their performance. Using nursing students in Ethiopia as subjects, they find that corruption in the form of the embezzlement of public resources is less likely to take place when service providers have higher incomes and when the risk of being caught and sanctioned is high. Frank and Schulze (2000) focus on the individual determinants of corruptibility and find that economics students are significantly more corrupt than others. They show that this is due to a process of self-selection rather than indoctrination.

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[6] See Abbink (2005) for a comprehensive survey.

Our paper differs from these papers in two main ways. First, to the best of our knowledge, our study is the first to focus on behavioral differences across cultures in a corruption experiment. It thus contributes to a growing experimental literature on cross-cultural comparisons of behavior in other types of experiments.[7] Second, previous studies have modelled punishment as an exogenous lottery. In contrast, punishment is endogenous in our paper and takes place if the victim decides to incur the cost associated with punishment. We are thus able to examine both the incentives to engage in corruption and the incentives to punish corrupt behavior. Understanding punishment behavior is important since societal control of corruption often relies on an individual bringing the act to the attention of enforcement officers.[8] A further advantage of our study is that it benefits from the increased power associated with a large sample of 645 observations, involving 1935 participants.

3. Experimental Methodology

3.1 Design

We have designed a three-person, sequential-move game that focuses on a common bribery problem. Figure 1 contains an extensive-form representation of the game, where all of the payoffs are denoted in experimental dollars. The first player acts as a firm which has the option of initiating a corrupt act by offering a bribe to a government official in order to increase

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[7] See, for example, Carpenter and Cardenas (2004), Croson and Buchan (1999), Roth et al. (1991) and Henrich et al. (2004).

[8] The way we model punishment has some similarities with the literature on the impact of sanctions (formal or informal) on individual behavior. In recent years, there has been a growing interest in this area. Fehr and Gachter (2000) show that the cooperators in a public goods game display a widespread willingness to punish the free riders. Their results reveal that in the presence of formal monetary punishment opportunities, there is less free riding in these games. Masclet et al. (2003) find that nonmonetary sanctions can also lead to high cooperation levels. These papers examine the impact of punishment in a game where the punishment is meted out by those who are directly affected by others' free riding. Fehr and Fischbacher (2004) and Carpenter and Matthews (2004) show that punishment by a third party, whose payoffs are not affected by the norm violation, is another way of deterring non-cooperation. Bowles and Gintis (2002), Fehr, Fischbacher and Gachter (2002), and Casari and Plott (2003) provide further evidence on how punishment can have an impact on behavior and social norms.

its own payoff at the expense of society. We assume the firm can offer a bribe by choosing an amount B ∈ [4,8]. It costs the firm two experimental dollars to offer a bribe and the firm incurs this cost regardless of whether the bribe is accepted. If a bribe is offered, the second player, who we call the official, can either accept or reject the bribe. If the official accepts the bribe (which implies favorable treatment of the firm), then the payoffs of the firm and the official increase by 3B while the payoff of the citizen decreases by B.[9]

The third player is called the citizen and moves last after observing the choices made by the firm and the official. If a bribe has been offered and accepted, the citizen is given a chance to punish the firm and the official for the corrupt transaction by choosing an amount P in punishment. Punishment is costly to the citizen and reduces the citizen's payoff by the amount of the punishment, P. However, it imposes a monetary sanction on the firm and official by reducing their payoffs by 3P. Hence, the net benefit to the firm and the official from the corrupt transaction is 3B - 2 - 3P and 3B - 3P respectively.

We have deliberately chosen to conduct a one-shot game because in a one-shot game the punishment has no economic benefit to the citizen and so the decision to punish is not affected by the anticipation of possible future economic gains. Hence, with a one-shot game, a comparison of the citizens' willingness to punish corrupt acts across different cultures reveals the differences in the tolerance levels for corruption. The citizens who choose to punish in a one-shot game would have even more incentives to punish in a multi-period game since by doing so, they can deter corruption and decrease the harm they suffer.

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[9] The payoff increase that the firm experiences may represent, for example, the benefit from avoiding a regulation. The official's payoff also increases by 3B even though the amount of bribe paid by the firm is B. This is due to a difference in the marginal utility of income. Since the income earned in the public service is likely to be lower than that earned in private firms, the same amount of money can be assumed to have a lower marginal utility value to the firm than to the official. Abbink, Irlenbusch and Renner (2002) make a similar assumption in their paper. As in their paper, this multiplier also has the additional advantage of helping us prevent negative total payoffs.

The one-shot nature of the game also helps us avoid the issues associated with repeated games, such as signalling, reputation formation and serial correlation in decisions. Each subject in our database participated in the experiment only once and played only one role.[10] The subjects playing the three roles were grouped anonymously in the experiment to avoid conscious or unconscious signalling.

We deliberately chose to use emotive terms such as "bribe" and "punishment" in the instructions. This is a deviation from the standard practice of using neutral language in economics experiments. However, since our aim was to simulate a real-life corrupt transaction, we used loaded language. As indicated in Harrison and List (2004), "it is not the case that abstract, context-free experiments provide more general findings if the context itself is relevant to the performance of subjects (p. 1022)."[11]

3.2   Treatments

We conducted the following three treatments to examine whether the effectiveness of the punishment regime and the cost of the bribe affect behavior. Treatment 1 is the low punishment regime, where we restricted the range of the punishment to $P \in [2,8]$. Treatment 2 corresponds to the high punishment regime, where we allowed the citizen to choose a punishment level $P \in [2,12]$.[12] Our goal in designing Treatments 1 and 2 was to observe whether a more effective punishment system decreases the incentives to engage in corrupt behavior and increases the

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[10] One standard response in cases such as these is to have random re-matching of subjects. Kandori (1992) states that it is not clear whether random re-matchings do actually succeed in eliminating supergame effects. However, Duffy and Ochs (2005) consider an experiment with an indefinitely repeated 2-player prisoner's dilemma game and find that contrary to Kandori's theoretical conjecture, a cooperative norm does not emerge in the treatments where players are matched randomly. In the current paper we decided to adopt a conservative stance and have players participate in pure one-shot games to avoid any repeated game effects.

[11] Cooper and Kagel (2003) consider the role of loaded language in signaling games and suggest that the use of a meaningful context might better capture behavior in field settings than the use of neutral language. Abbink and Hennig-Schmidt (2002) however find that the use of words like "bribe" do not make a difference in the corruption game that they study.

[12] These values were chosen to guarantee two things. First, we wanted to ensure that no one obtained a negative payoff. Second, we wanted to make sure that the payoffs were not unduly inequitable. Often, if the payoffs are excessively unequal, it leads to confounding changes in behavior.

incentives to punish corrupt behavior. Both Abbink, Irlenbusch and Renner (2002), and Barr, Lindelow and Serneels (2004) find, in a game with exogenous punishment, that corruption is lower when the risk of penalty is higher. We examine whether the same finding holds in an experiment with endogenous punishment. An alternative way of designing a more effective punishment system would be to increase the multiplier on the punishment level chosen by the citizen. However, we chose to increase the punishment options available to the citizens since we were also interested in examining *"choice set"* effects. Specifically, we wish to observe whether the availability of higher punishment amounts resulted in an increase in the frequency of subjects who chose a punishment level $P \in [2,8]$.

In both Treatments 1 and 2, the bribe is <u>welfare-enhancing</u>, in that the total payoff gains to the firm and the official *exceed* the payoff loss to the citizen. Treatment 3 is a <u>welfare-reducing</u> bribe game, where the combined gains to the firm and the official are *less* than the payoff loss to the citizen. Specifically, in the welfare-enhancing bribe game, each dollar offered as a bribe, if accepted, reduces the payoff to the citizen by \$1 whereas in the welfare-reducing bribe game, it reduces the payoff to the citizen by \$7. Figures 1 and 2 describe the associated payoffs to the three players in the welfare-enhancing bribe game and the welfare-reducing bribe game respectively. We assume that in Treatment 3, as in Treatment 2, a high punishment regime is in effect (i.e., $P \in [2,12]$).

The distinction between welfare-enhancing and welfare-reducing corruption is one that is frequently made in the literature (see, for example, Ali and Isse, 2003; Kaufman and Wei, 1999; Bardhan, 1997; Nas, Price and Weber, 1986; and Lui, 1986). As an example, consider the scenario where a firm would like to import certain goods, but it needs to obtain a license to do so. In order to acquire the license more quickly than might otherwise be the case, the firm has to bribe a government official. Here, although undoubtedly corrupt, the immediate social cost of

this action is possibly not very high. In contrast, consider the case where the same firm manages to bribe its way out of complying with some environmental regulations and dumps toxic waste into the groundwater. Our goal in running Treatments 2 and 3 is to explore whether the tendency to engage in and punish corrupt behavior is different in the latter case, where the cost of bribery is potentially far greater.[13]

A change in the cost of bribery may have the following effects on subject behavior. When the bribe is welfare-reducing, the subjects may think that it is less justified. Moreover, as the harm imposed on the citizen increases, the citizen may choose to punish due to feelings of negative reciprocity. Both of these effects would result in lower bribe amounts and higher punishment amounts being chosen when the bribe is welfare-reducing. Alternatively, if the harm imposed on the citizen is sufficiently large, the citizen may not want to punish and decrease his/her payoff by even more. As a result, punishment may occur less frequently, and if the firms and officials anticipate this, they may act more corruptly. Hence, whether we observe higher levels of bribery and punishment in Treatment 3 than in Treatment 2 depends on the relative magnitude of these effects and cannot be stated a priori.

3.3   Procedure

The experiments were run at the University of Melbourne, the Delhi School of Economics, the University of Indonesia, and the National University of Singapore using third year undergraduate or postgraduate students. In order to minimize the experimenter effects, we made sure that one of the authors (the same one) was present in all the countries where we ran

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[13] The games are welfare-enhancing and welfare-reducing both before and after taking into account the relevant conversion rates. Our approach to the welfare implications of bribery is different from that of Abbink, Irlenbusch and Renner (2002), who examine whether behavior changes when the corrupt act imposes a negative externality (in the form of a fixed monetary damage) on the other participants in the experiment. In contrast, we explore the welfare implications of bribery by varying the harm it imposes on the victim. We analyse how sensitive the citizen's behavior is to the level of harm they experience rather than the level of harm others experience.

the experiment.[14] All the sessions were run as non-computerized experiments. 1935 subjects participated once and only once as a firm, an official, or a citizen.

Each experiment lasted about an hour. At the beginning of each session subjects were asked to come to a large lecture theatre. Each session consisted of at least 30 subjects. These subjects, on entering the room, were randomly designated as either firms, officials or citizens. Each group was located far apart from the others in a recognizable cluster. Thus, each group could see the members of the other groups, but individual subjects were unaware of which three specific subjects constituted a particular firm-official-citizen trio.

At the beginning of each session, each subject received a copy of the game's instructions, which were then read out loud to them. They were also given a number of examples explaining how the payoffs would be calculated for specific bribe and punishment amounts. Then, the subjects playing the role of a firm were asked to decide whether or not to offer a bribe. If they chose to offer a bribe, they also had to choose an amount. The record sheets with the bribe amounts were then collected and distributed by the experimenter to the corresponding officials. After the officials made their decisions, the corresponding citizens were informed about whether a bribe was offered and whether it was accepted. The game ended after the citizens decided whether to punish by choosing a punishment amount. The decisions made by all of the subjects were entered into a spreadsheet which generated their payoffs. The subjects were paid at the end of each session after the payoffs were converted into cash using an appropriate conversion rate, taking into consideration purchasing power parity across the countries where the experiment was conducted.[15] To guarantee parity in the payoffs to the different type of players (firm, official and

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[14] Roth et al. (1991) and Cardenas and Carpenter (2005) discuss the methodological issues arising in multi-site experiments.
[15] The conversion rates in each country were based on 1) the standard hourly wage paid for a student research assistant in each country, and 2) a typical basket of goods bought by students in each country. This is similar to the

citizen), we used a different conversion rate for each type.[16] These conversion rates were public information.

All the subjects filled out a demographic survey, which asked them a series of questions regarding their age, gender, field of study, work experience, income, ethnicity, exposure to corruption, and time spent in other countries. Those in the role of the citizen were also asked to explain the motivation for their decisions.[17]

In addition to the 645 observations that we report on in the paper, we also collected data using a neutral language treatment. We eschewed words such as "bribe" or "punishment" and replaced them with words such as "transfer" and "forego money to reduce others' payoff" respectively.[18]

4.   Research Questions

In the subgame perfect equilibrium of the game outlined in Section 3.1, a payoff-maximizing citizen does not punish. Knowing this, the official accepts the bribe and the firm offers the bribe. Moreover, the firm offers the maximum amount of bribe it can since its payoff is increasing in the amount it offers.

Since there is ample evidence in the experimental literature that punishment takes place even in one-shot games, we expected the citizens' behavior to differ from the theoretical prediction. Hence, we designed our experiment with the following research questions in mind:

procedure used by other researchers who have conducted cross-cultural studies (e.g., Carpenter and Cardenas, 2004 and Cardenas and Carpenter, 2005).

[16] In Australia, the conversion rates were 3 experimental currency = 1 real currency for the firms, 2 experimental currency = 1 real currency for the officials and 1.5 experimental currency = 1 real currency for the citizens. Each subject made on average AU$20. This amount is approximately equivalent to US$15. In India subjects were paid an average of US$11, in Singapore US$13, and in Indonesia US$9.

[17] The instruction, record and survey sheets are available from the authors upon request.

[18] A total of 132 subjects participated in the neutral-language treatment, which resulted in 44 observations. This treatment was conducted at the University of Auckland in New Zealand. New Zealand is culturally very similar to Australia and the University of Auckland has a student body composition that is very similar to that of the University of Melbourne.

(i)   Do subjects in countries with higher levels of corruption offer and accept bribes more frequently, and punish bribery less frequently than subjects in countries with lower levels of corruption?

(ii)   Is there less bribery and more punishment under a high-punishment system?

(iii)   Does increasing the cost of bribery on the victim, have an impact on the propensity to engage in and punish corrupt behavior?

5.   Results

5.1   Overview of the results

Table 1 summarizes the data we collected in terms of the treatments we ran at each location and the number of subjects involved in each treatment.[19] Figure 3 provides a broad overview of our findings, pooling across all locations and treatments. Overall 1935 subjects participated in 645 plays of the game across all treatments since three players (a firm, an official and a citizen) are required to generate one play of the game. As can be seen from Figure 3, in 555 out of 645 (86%) plays of the game a bribe was offered by the firm. The average amount of the bribe for those who chose to bribe was $7.50 (out of a range of 4 to 8). 482 out of 555 (87%) officials who received a bribe chose to accept it. Both the firm's and official's behavior is more or less in accordance with the theoretical predictions. However, the citizens' behavior deviates sharply from the theoretical prediction. 238 out of 482 (49%) citizens who were harmed by the bribe chose to incur a pecuniary cost in order to punish the firm and the official for their actions.[20]

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[19] We do not have data for all three treatments in India, Indonesia and Singapore. Given resource constraints, we allocated the treatments such that we could compare behavior in the different treatments using data collected from at least one low-corruption and one high-corruption country.

[20] Behavior in the neutral-language treatment was closer to the subgame perfect equilibrium outcome. In particular, the bribe and acceptance rates were higher and the punishment rate was lower. The bribe was offered in 39 (88%) of

In the next two subsections, we present our findings in more detail. We first report the results on the cultural effects in Section 5.2. We then consider the impact of the punishment regime and the cost of bribery on individual behavior in Section 5.3.

The reported results are based on t-tests and multivariate regression analysis. We also conducted non-parametric rank sum tests of differences in distribution. Unless noted in the text, the results were the same as the ones in the reported t-tests.[21] We estimated binary probit models for the bribe, acceptance and punishment rates, and ordinary least square models for the bribe and punishment amounts. The regression results control for several aspects of the subjects' backgrounds based on the information collected in the surveys.

5.2 Comparing Behavior in Australia, India, Indonesia and Singapore

We first examine the decisions of the firms and the officials in Section 5.2.1 and then turn to the decisions of the citizens in Section 5.2.2.

5.2.1 Bribe and Acceptance Behavior

We start by comparing the results from Australia and India, where we conducted the low punishment treatment (Treatment 1). India has a significantly higher level of corruption than Australia and we are interested in examining whether this difference is reflected in the bribe and acceptance behavior in the two countries. Table 2 summarises the behavior of the three types of players in each country and the results of t-tests for differences in the means. Panel (i) shows that the bribe rate does not differ across Australia and India (p = 0.63). A bribe was offered in India in 94% of the cases while it was offered in Australia in 96% of the cases. Similarly, we find no significant differences in the bribe acceptance rates. The bribe was accepted in 90% of the cases

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the cases (compared to 86% in the loaded language game). This bribe was accepted in 38 (97%) out of 39 of the cases (compared to 87% in the loaded language game). The most significant difference was in the punishment rates. Out of the 38 citizens in the neutral language game who were in a position to punish, 14 of them (37%) chose to punish (compared to 49% in the loaded language game).

[21] The rank sum test results are available from the authors on request.

in India and in 91% of the cases in Australia. The only significant difference we find between Australia and India is in the bribe amounts. The average bribe amount offered in India is slightly lower than that offered in Australia ($7.37 and $7.70 respectively). This difference is statistically significant according to a test of difference of means (p = 0.03).

Table 4 presents the regression results where we pool all of the data for all of the treatments across all of the countries and control for treatment effects as well as other variables not accounted for in the t-tests. The results confirm the results of the t-tests.[22] Columns 1-6 present the results for the bribe rate, bribe amount and acceptance rate respectively.[23] Of the variables we collected information on in the post-experimental survey, only gender, field of study (whether it is economics), and the percentage of each Australian subject's life that has been spent outside of Australia were found to be significant determinants of subject behavior. The last variable controls for the high number of foreign students that study in Australian universities. The majority of these students come from Asia. This variable is often insignificant in explaining behavior. This is possibly because those who choose to study in Australia are more westernised than their counterparts and/or quickly absorb the social norms of the new environment. In the regressions for the officials' behavior, we also control for the bribe amount.

In Australia, Indonesia and Singapore we conducted both the welfare-enhancing and welfare-reducing treatments (Treatments 2 and 3). Table 2, Panels (ii)-(vii) compare the means of behavior across the Australian, Indonesian and Singaporean subjects within each treatment.

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[22] We report the results for the pooled regression model only. Unless mentioned in the text, these results were consistent with the regression results based on data from specific countries or treatments of interest. For example, we get the same results for the comparison of behavior in Australia and India if we estimate the regressions by using the data for Treatment 1 in Australia and India only.

[23] We also estimated ordered probit models for positive bribe amounts. These recognise that the dependent variable is not continuous. The results were very similar to the reported results from the estimation of ordinary least squares models. We could also have estimated tobit models. However, tobits models confound the determinants of the choice of whether to bribe with the choice of how much to bribe, which poses a problem since we are interested in examining the two decisions separately and the results indicate that the determinants of the two decisions differ.

As in the case of India we find that the propensities to bribe, the bribe amounts, and the propensities to accept in Indonesia are all similar to those in Australia. This is true for both treatments although the point estimates are more similar for Treatment 2 than for Treatment 3.[24] In Treatment 3, they suggest a *lower* tolerance of corruption in Indonesia, where a smaller percentage of the subjects offered (78% in Indonesia versus 88% in Australia) and accepted bribes (79% in Indonesia versus 89% in Australia). However, these differences are not statistically significant (p = 0.13 in both cases). The regression results in Table 4 also indicate that the Indonesian subjects do not differ from the Australian subjects in terms of their propensities to offer and accept bribes although the bribe amount is marginally smaller in Indonesia as compared with that in Australia (significant at the 10% level).

Comparing Australia and Singapore, Table 2 shows no significant difference between the behavior of the firms and officials in each of the treatments. This is in accordance with our expectations since Singapore is consistently ranked as a very low-corruption country. However, the regression results do identify a difference between Australia and Singapore. Table 4 shows that once we control for other variables, the Singaporean subjects have a higher probability of offering bribes than the Australian subjects (significant at the 5% level). They are also more likely to accept bribes as compared to the Australian subjects (significant at the 10% level).[25]

The bribe and acceptance rates are also higher in Singapore than they are in Indonesia. As shown in Table 2, Panels (vi-vii), the differences in the bribe rates are not statistically significant, but the differences in the acceptance rates are statistically significant in both Treatments 2 and 3 (p = 0.10 and p = 0.01 respectively).

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[24] We discuss how subject behavior varies across welfare-enhancing and welfare-reducing treatments in Section 5.3.2.

[25] Separate regressions by treatment show that this result is driven by behavior in Treatment 2.

In summary, we find that the Australian, Indian and Indonesian subjects display quite similar propensities to offer and accept bribes. The Singaporean subjects are about 8 percentage points more likely to offer and accept bribes than the Australian subjects.

The coefficients on the other control variables in the regressions show that the subjects who study economics have a higher probability of accepting bribes. This result is consistent with the findings of Frank and Schultz (2000). The Australian subjects' probability of offering a bribe increases with the time they have spent outside of Australia. The probability of offering a bribe is higher for men than for women (significant at the 10% level). Men also accepted bribes more frequently although this difference is not statistically significant.[26]

5.2.2 Punishment Behavior

We find larger differences between the four locations when we consider the punishment behavior. Comparing Australia and India within Treatment 1, Table 2, Panel (i) shows that only 24% of citizens chose to punish in India compared to 53% in Australia (p = 0.0001). The amounts that these citizens handed out in punishment were also significantly different. In Australia, among the subjects who chose to punish, the average punishment amount was $5.40 while in India it was $3.71 (p = 0.01). These results are confirmed in Table 4. We estimated probit models for the punishment rates and ordinary least squares models for the punishment amounts given out by the citizens for positive punishment amounts, controlling for the treatments, the bribe amount, and other variables as discussed in the previous subsection.[27] The regression results show that the Indian subjects are 25 percentage points less likely to punish as

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[26] Recent empirical papers that have analyzed the link between gender and the level of corruption find that there exist systematic gender differences in attitudes towards corrupt behavior. For example, Swamy et al. (2001) and Dollar et al. (2001) suggest, on the basis of survey evidence, that women are less tolerant of corruption. We report our findings from experiments in Alatas et al. (2005).

[27] Similar to the regressions on bribe amounts, we also estimated ordered probits for positive punishment amounts, which recognise that the dependent variable is not continuous. The results are very similar to the reported ordinary least squares results.

compared to the Australian subjects. This is in accordance with our expectation that in environments characterized with higher levels of corruption, individuals are less willing to condemn corrupt acts.

The punishment behavior in Indonesia also differs from that in Australia, but suggests a *lower* tolerance of corruption. Table 2, Panels (ii) and (iii) show that a greater percentage of the subjects in Indonesia chose to punish under both Treatments 2 and 3 (73% versus 62% in Treatment 2 and 60% versus 42% in Treatment 3). However, only the difference observed in Treatment 3 is significant (at the 10% level). The regression results in Table 4 show that when we pool the treatments together, the difference between the Australian and Indonesian subjects becomes insignificant. The punishment amounts do not differ significantly either.

Table 2, Panels (iv)-(vii) show that the Singaporean subjects punished significantly less frequently than both the Australian and Indonesian subjects in Treatment 2 ($p = 0.04$ and $p = 0.01$ respectively). However, in Treatment 3 there are no significant differences in the punishment rates observed in the three locations. The punishment amounts do not differ significantly in either treatment in these pairwise country comparisons.

When we pool the treatments together in the regression analysis, we find that there are no significant differences between the Australian and Singaporean subjects. This is because the coefficient on the Singapore dummy averages the differences between the two countries in the punishment rates across the two treatments. However, we find that the Singaporean subjects are 17 percentage points less likely to punish than the Indonesian subjects ($p = 0.03$), and 20 percentage points more likely to punish than the Indian subjects ($p = 0.05$). The largest difference is found between the punishment behavior of the Indian and Indonesian subjects. The

Indonesian subjects are 35 percentage points more likely to punish than the Indian subjects and this difference is strongly statistically significant (p = 0.001).[28]

In summary, when we compare the punishment behavior in the four locations, we find that, as expected, the Indian subjects are much less likely to punish than the Australian subjects. The Indonesian subjects however display a much lower tolerance of corruption than expected given the high level of corruption that exists in this country. In contrast, the Singaporean subjects appear to be more tolerant of corruption than expected. They punish less than both the Australian (in Treatment 2) and Indonesian subjects, and more than the Indian subjects.[29]

One can think of "culture" as having two components – one that represents those customs and values that ethnic and religious groups transmit relatively unchanged from generation to generation and another that reflects the values embedded in the current institutions of the society the individual lives in.[30] It is difficult to differentiate between these two influences, but our data allows us to explore this issue by controlling for ethnicity. Almost all of the Singaporean sample in our data is ethnic Chinese. Indonesia has a Chinese minority who are over-represented in Jakarta. Of our Indonesian sample, 11.4% are ethnic Chinese. Table 5 presents regression results where we control for the Chinese ethnicity in Indonesia and test whether the behavior of the Chinese subjects in Indonesia differs from the behavior of the rest of the Indonesian subjects and from the behavior of the Singaporean subjects. It shows that Chinese Indonesians punished more frequently than other Indonesians, but that this difference is not statistically significant. However, they were on average 42.4 percentage points more likely to punish than their

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[28] These findings are from an unreported regression equivalent to that in Table 4, Panel A, but with dummies for India, Singapore and Australia (omitting the Indonesian dummy), and with dummies for India, Indonesia and Australia (omitting the Singapore dummy).

[29] The punishment regression results also reveal that the students majoring in economics have a significantly lower probability of punishing. Although men in our sample punished less often, the gender difference is not statistically significant. However, of the subjects who punish, men punish by higher amounts than women (significant at the 10% level).

[30] The first of these two components is how culture is defined in Guiso, Sapienza and Zingales (2006).

18

Singaporean counterparts (p = 0.03).[31] These results imply that the subjects' punishment behavior is affected by the values embedded in the institutions of the society in which they live rather than their ethnic background.[32]

To gain some insight into whether the subjects' reasons for punishing differ across the four locations, we examined the citizens' responses to the question about why they chose to punish/not to punish in the survey given to them after the experiment. Table 6 shows our categorization of their responses. We categorized the stated reasons for punishment into four groups: moral responsibility, reduction of corruption, fairness, and negative reciprocity. Similarly, the reasons for not punishing were categorized into three groups depending on whether the subject is profit maximizing, believes that it is difficult to change the system, and thinks that the bribe may be necessary. These categories were not mutually exclusive, so the same person may have been counted in more than one category. We chose to create non-exclusive categories because often it was not possible to determine one single reason for the citizens' behavior from the statements provided in the surveys.

The reasons given reflect both the current levels of corruption in the respective countries and the extent of concern over the problem. In general, in countries where we observed higher rates of punishment, the proportions of subjects who gave moral responsibility or reduction of corruption as their reasons for punishment were higher. This implies that the punishment rates we observed reflect the attitudes of the subjects towards corruption. For example, of the citizens who got a chance to punish, a greater proportion of citizens in Indonesia stated that they saw

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[31] 0.285 + 0.090 - (-0.049) = 0.424
[32] These results are further borne out by results from unreported regressions which control for a number of different Indonesian ethnic groups and find no significant differences in behavior. We included controls for other sizeable ethnic groups (other than the Malay and the Javanese). These included controls for the Batak, the Sundanese, and the Betawi. Although the sample sizes are small, we also compared the behavior of Indians in Singapore with the Indians in India, and the ethnic Malays in Singapore with the Malays in Indonesia. In each case the subjects acted in accordance with their country's participants rather than their ethnic group.

punishing as a moral responsibility (39% in Indonesia versus 14% in India, 20% in Singapore, and 32% in Australia), or as a way to reduce corruption (20% in Indonesia versus 8% in India, 8% in Singapore, and 18% in Australia). Also, less of those who chose not to punish in Indonesia cited individual payoff maximisation as their reason (27.0% in Indonesia as compared to 67.7% in India, 48.5% in Singapore and 43% in Australia). More often, they stated a concern with the existing level of corruption in their country, and explained their behavior by arguing that it is necessary to bribe in the environment in which they operate or that it is difficult to change the corrupt system.

Table 6 also shows that the citizen subjects in Singapore, when compared to those in Australia and Indonesia, were driven to a much greater extent by personal considerations rather than moral responsibility or an attempt to reduce corruption while choosing to punish. A relatively low proportion of those who punished in Singapore reported doing so for reasons of moral responsibility or to reduce corruption. They were more likely to give reasons of fairness or negative reciprocity.

The difference between the punishment rates in the neutral language and loaded language treatments further illustrates that the subjects' decisions were informed by their attitudes to real life corruption. Only 37% of the citizens in the neutral language game punished as compared to 49% in the loaded language game.

5.3   Treatment Comparisons

We next analyse how sensitive subject behavior is to the effectiveness of the punishment regime and the cost of bribery.

5.3.1   Low versus High Punishment Regimes (Treatment 1 versus Treatment 2)

By varying the punishment regime, we are able to examine whether the existence of legal institutions which allow citizens to punish those that engage in corrupt behavior more effectively reduces the prevalence of corruption.

Table 3, Panel A(i) presents the means summarising the behavior of the three types of players and the results of the t-tests for differences in means across Treatments 1 and 2 in Australia. The results show that when the citizens are given the opportunity to punish the firms and officials more harshly, i.e., when $P \in [2,12]$ as in Treatment 2 as opposed to $P \in [2,8]$ as in Treatment 1, the possibility of a greater punishment affects the firms' behavior. 96% of the firms offered a bribe in the low punishment treatment while only 79% did in the high punishment treatment. This difference is statistically significant ($p = 0.01$). The average bribe amount offered, however, does not differ across the two treatments ($7.70 versus $7.65). Thus, those firms who did offer a bribe behaved in a similar manner in both of the treatments, but many more firms seemed to have perceived the threat of punishment by the citizens as being greater in the high punishment regime and, therefore, preferred to refrain from offering a bribe.

The reaction from the government officials is similar. The propensity to accept a bribe is lower when there is the possibility of a more hefty punishment (81% versus 91% with a p-value of 0.05). These findings for the firms and officials are consistent with the results in Abbink et al. (2002) and Barr et al. (2003), who observe that imposing higher penalties reduces corrupt behavior. The citizens' behavior reveals that the fear of greater punishment is not without a basis. Under the high punishment regime more citizens chose to punish (62% versus 53%) with the average amount being slightly higher (6.0 versus 5.4) although these differences are not statistically significant. These results are consistent with the coefficient on the Treatment 1 dummy in Table 4.

Figure 4 shows the distribution of the punishment amounts chosen by the subjects in Treatments 1 and 2 in Australia. It reveals that a larger percentage of subjects chose a punishment level P ∈ [2,7] in Treatment 2. For example, of the subjects who got a chance to punish, 14% of them chose a punishment of $2 in Treatment 1 while 20% of them chose a punishment of $2 in Treatment 2. It is also interesting to observe how the percentage of subjects who chose P = $8 differs across the two treatments (21% in Treatment 1 versus 0.05% in Treatment 2). This difference suggests that in Treatment 1, some of these subjects chose $8 because they could not choose a higher amount.

5.3.2 Welfare-Enhancing versus Welfare-Reducing Bribe Games (Treatment 2 versus Treatment 3)

The final question we address is whether behavior differs when the bribe is perceived as being harmful, i.e., when the payoff loss to the citizen exceeds the total payoff gain to the firm and the official. As discussed in Section 3.2, one would expect those subjects who are sensitive to the perceived cost of bribery to offer and accept bribes less frequently and to punish more frequently in Treatment 3.[33] On the other hand, those citizen subjects who feel impoverished and disempowered as a result of the high cost of bribery may choose to punish less and those firms and officials that expect this may offer and accept bribes more frequently.

Treatments 2 and 3 were conducted in Australia, Indonesia and Singapore. We find no significant differences in the propensities to engage in and punish corrupt behavior across the two treatments in Indonesia and Singapore.[34] In contrast, there are significant differences between the subject behavior in the two treatments in Australia. In general, the results are more

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[33] It was clear from the survey responses that we collected and the questions we received after the experiments that for some of the subjects the purpose of the bribe, i.e., whether it was for a "good" purpose, mattered.

[34] The point estimates show that the bribe rate was higher in the welfare-enhancing treatment than in the welfare-reducing treatment in both countries. The punishment rate was lower in the welfare-enhancing treatment in Singapore and in the welfare-reducing treatment in Indonesia. However, t-tests, Wilcoxon rank sum tests, and regression analysis show that none of these differences are statistically significant.

in accordance with what one would expect under the second scenario stated above. Specifically, the frequency with which a bribe was offered was higher in the welfare-reducing game (88% versus 79%) although this difference is significant only at the 10% level. The frequency with which the bribe was accepted was also higher in the welfare-reducing game (89% versus 81%), but this difference is not statistically significant. There are no significant differences in the amount of the bribe offered ($7.57 in Treatment 3 versus $7.65 in Treatment 2).

As far as punishment is concerned, the citizens in Australia had a significantly lower propensity to punish in the welfare-reducing game (42% versus 62%, p = 0.02). Hence, when the bribe had a larger negative impact on the payoff of the citizen, relatively more citizens did not want to forego even more money in order to punish the firm and the official. Interestingly, while fewer citizens punished in the welfare-reducing bribe game, those who did punish punished by considerably larger amounts ($7.74 versus $5.98, p = 0.06). This suggests that while the larger harm imposed on the citizen by the bribery discouraged some citizens from choosing to punish, those that did punish felt particularly affronted by the corrupt behavior. They chose to punish by higher amounts either because of a concern for the welfare-reducing aspect of corruption or because of feelings of negative reciprocity.

The coefficients on the Treatment 3 dummy in Table 4 capture the average treatment effect across the three countries. Only the coefficient in the punishment amount regression is significant.[35]

In summary, when we consider the impact of the cost of bribery on subject behavior, we find that the results are culture-specific. In Australia, when the cost of bribery was higher, the propensity to engage in corrupt behavior was higher, the propensity to punish corrupt behavior

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[35] However, the t-test results are consistent with unreported regression results examining treatment effects separately for each country.

was lower, and the punishment amounts were higher. These results imply that subject behavior was shaped more by changes in individual payoffs rather than changes in social welfare. In Indonesia and Singapore, there were no significant differences in subject behavior across the two treatments. This result is consistent with that in Abbink, Irlenbusch and Renner (2002), who find that social welfare considerations have no impact on corrupt behavior. The difference in behavior between the Australian subjects and those in the other two countries could be because subjects in Indonesia and Singapore have more immediate experiences of the negative impact of corruption and are, therefore, relatively more willing to condemn it in the welfare reducing treatment.

6.   Discussion

We have analysed the propensity to engage in and to punish corrupt behavior in the context of a three-person sequential-move game in four different cultures. We find significant cross-cultural variation in the propensity to punish corrupt transactions, but little variation in the propensity to engage in them. This finding suggests that people may be more ready to sanction behavior socially regarded as immoral when they see it in others or when they are victimized by it. It is in line with the arguments made in previous studies that the extent to which individuals care about other regarding preferences like fairness or morality may depend on whether they are predators or potential victims (Bolton and Ockenfels, 2000 and Fehr and Schmidt, 1999).

More specifically, a comparison of the Australian and Indian results suggests that although exposure to high levels of corruption may not change the propensity to engage in corrupt behavior, it is associated with a greater tolerance of corrupt behavior in the sense of lower punishment rates. In Indonesia, another country with a high level of corruption, both the tendency to engage in *and* the willingness to punish corrupt behavior does not differ much from Australia. Although we are not able to identify the cause of this effect with certainty, we

24

conjecture that this is due to the type of corruption that exists in Indonesia and the recent institutional changes that have occurred in this country. Corruption in Indonesia has traditionally been more centralized (controlled largely by the Suharto family, the military leaders, and the ethnic Chinese-run conglomerates) while corruption in India is more fragmented (Bardhan, 1997, p. 1325). The introduction of democracy in 1998 and the increased press freedom have resulted in this highly visible and identifiable type of corruption that exists in Indonesia to receive a lot of negative media attention – more than in the past and more than in India.[36,37] There have been several attempts (some successful) to prosecute high profile cronies of the previous government who were engaged in corruption to the scale of billions of dollars. Although there is no doubt that corruption remains high in Indonesia, our results suggest that these institutional changes may have resulted in an increase in aversion to corruption in the Indonesian society.[38] If true, this attitudinal change could be the basis necessary for future successful anti-corruption programs. The current president was elected largely on an anti-corruption platform.

Our Indonesian and Indian results are in line with the outcome of a survey done by Transparency International on how optimistic people are that corruption will fall in their country

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[36] That corruption receives more attention in Indonesia than in India is borne out by the percentage of newspaper articles that are devoted to the topic. In the time period April to June 2004, approximately 2 per cent of the total number of articles in *Times of India* relate to domestic corruption. In Indonesia nearly 9 percent of the articles in *The Jakarta Post* discussed corruption issues during this same time period. As a proportion of the number of articles on political issues, nearly 5 percent in India were on corruption as compared to 11 percent in Indonesia. The methodology we used to calculate these numbers is similar to the one used in Glaeser and Goldin (2004).

[37] India is of course a functioning democracy with a free press, but the relatively smaller scale of high-level corruption in India has not galvanized society to forcefully oppose corruption. Further, corruption was not a major issue at the time when democracy was introduced in India. In contrast, corruption was one of the major causes of the downfall of President Suharto and the advent of democracy in Indonesia.

[38] Our conjecture is supported by Ferraz and Finan (2005) and Brunetti and Weder (2003). Based upon the results of Brazil's recent anti-corruption program, Ferraz and Finan (2005) show that the media can enable voters to hold corrupt politicians accountable and to reward non-corrupt politicians by reducing informational asymmetries. In a study that involves a large cross-section of countries, Brunetti and Weder (2003) find evidence of a significant negative relationship between press freedom and corruption. Gentzkow, Glaeser and Goldin (2004) also discuss how the rise of the informative press may have been one of the reasons why corruption declined in the US.

in the next three years. Of the 45 countries included in the survey they find that Indonesians (and Colombians) are the most optimistic while Indians are among the most pessimistic.[39]

A comparison of the Indian and Singaporean results reveals that the punishment rates are higher in Singapore than in India. This finding is in line with our expectation that the existing level of corruption affects the attitudes towards corruption. However, there is a relatively high propensity to engage in and a low propensity to punish corrupt behavior in Singapore as compared to Australia. This suggests that attitudes towards corruption may take a long time to change. Half a century ago the level of corruption in Singapore was comparable to that in India and Indonesia. It has successfully eradicated corruption by the imposition of strict and heavily-enforced anti-corruption legislation. A possible explanation for our results is that although the strict top-down approach in Singapore for the last few decades has made Singaporeans less tolerant of corruption (e.g., vis-à-vis Indians), the attitudinal change that accompanies such an approach occurs slowly.[40]

Our paper is a first attempt to study an extremely complex phenomenon. One possible response to our findings is that the cross-cultural variation in our results merely reflects the differing propensities to punish across cultures, rather than the attitudes to corruption.[41] While this is an issue worthy of additional research, for a number of reasons we believe that our results reflect attitudes to corruption rather than punishment per se. First, as discussed in Section 5.2.2, the reasons subjects give for punishing/not punishing reveal that the majority of subjects

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[39] See http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN016537.pdf.

[40] That attitudes take time to change was acknowledged by one of the most successful anti-corruption bodies, the Independent Commission Against Corruption (ICAC), which was formed in Hong Kong in 1974. Their declared goals were: "To change people's behavior so that they will not engage in corrupt behavior initially for fear of detection (deterrence), later because they cannot (prevention), and yet later because they do not wish to (attitude change)." The main difference between the ICAC and the previous approaches was that the ICAC combined new incentives with a change in values. Its success has made Hong Kong an example of how promoting ethical values against corruption can work.

[41] Even if this were the case, the results would still be relevant to anti-corruption policy making because a society's low propensity for punishment makes it vulnerable to corruption.

specifically consider the seriousness of corruption as a blight on society and often refer to the level of corruption in their country. More than 50% of all survey responses refer explicitly to real life corruption in their answers. Second, our results are consistent with a number of other data sources. As mentioned above, Transparency International finds Indonesia to be one of the most optimistic countries in regard to lowering corruption in the future. India is found to be one of the most pessimistic. The World Values Survey finds that more Singaporeans say that accepting a bribe could be justified under certain circumstances (than in the other countries in our study).[42] Third, evidence from other experimental work on Indonesia using the ultimatum game has found no difference in the propensity to punish between subjects in Indonesia and the US (Cameron, 1999). Fourth, punishment rates in our subject pool are lower in the neutral language treatment than in the loaded language treatment.

Some other avenues for future research are the following. First, the results from Indonesia and Singapore suggest that it would be valuable to do further research to define more precisely the role institutional change plays in changing attitudes towards corruption. One way to do this is to investigate how attitudes towards corruption change over time in a given location. Second, it would be useful to develop theoretical models to understand the mechanism through which institutional change may help reduce corruption. Third, further experimental research involving other countries with different levels of corruption would also be valuable, particularly since our results suggest that the existing corruption indices might not be fully capturing how individuals behave in corrupt environments.

In general, the differences between our results and what one would expect to observe in these countries based on the existing corruption indices suggest that experiments can be used as

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[42] The World Values Survey is a worldwide survey of socio-cultural and political change, conducted by an international network of social scientists. See http://www.worldvaluessurvey.org/. In response to the survey, 22.4% of Singaporeans stated that accepting a bribe could be justified under certain circumstances, compared to 18.6% of Indians, 17.9% of Indonesians, and 14.1% of Australians.

an alternative methodology for eliciting attitudes towards corruption. Corruption is difficult to measure because it is illegal. The most frequently used measures of corruption, such as the Transparency International Corruption Index, measure people's perceptions of corruption in the recent past.[43] Policy makers value more forward-looking measures that assess individuals' propensity to support anti-corruption policies in the future. Our study suggests that experimental methodology can provide such information.

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[43] See "Digging for Dirt," *The Economist*, March 18, 2006. Several people have raised concerns about the reliability of these measures. See, for example, Olken (2005). There exists a small recent literature that attempt to measure corruption more objectively. See, for example, Svensson (2003) and Hsieh and Moretti (2005).

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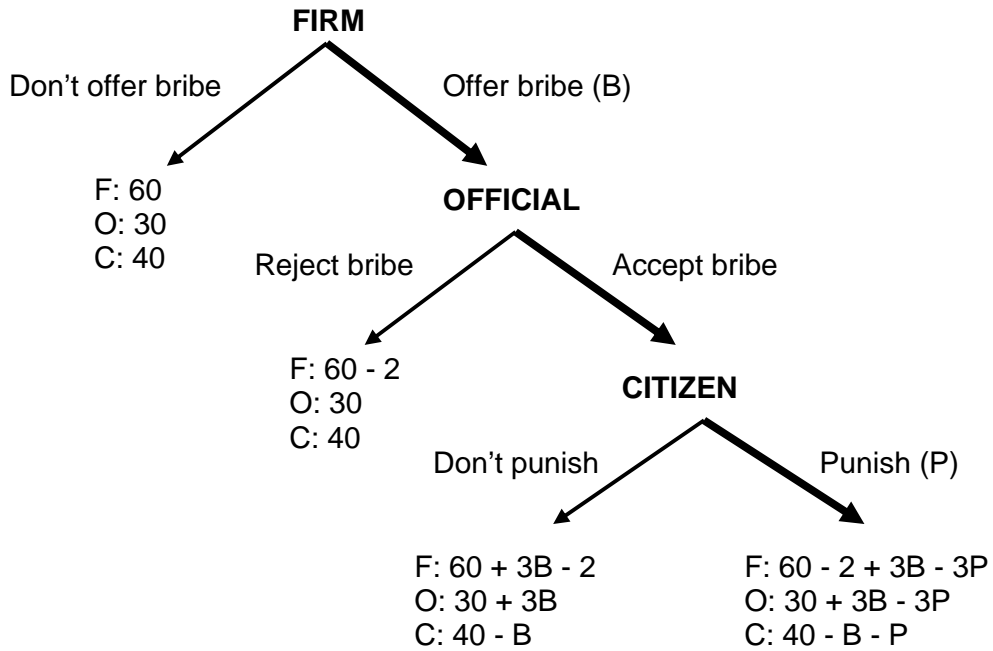
Figure 1: The Welfare-Enhancing Bribe Game
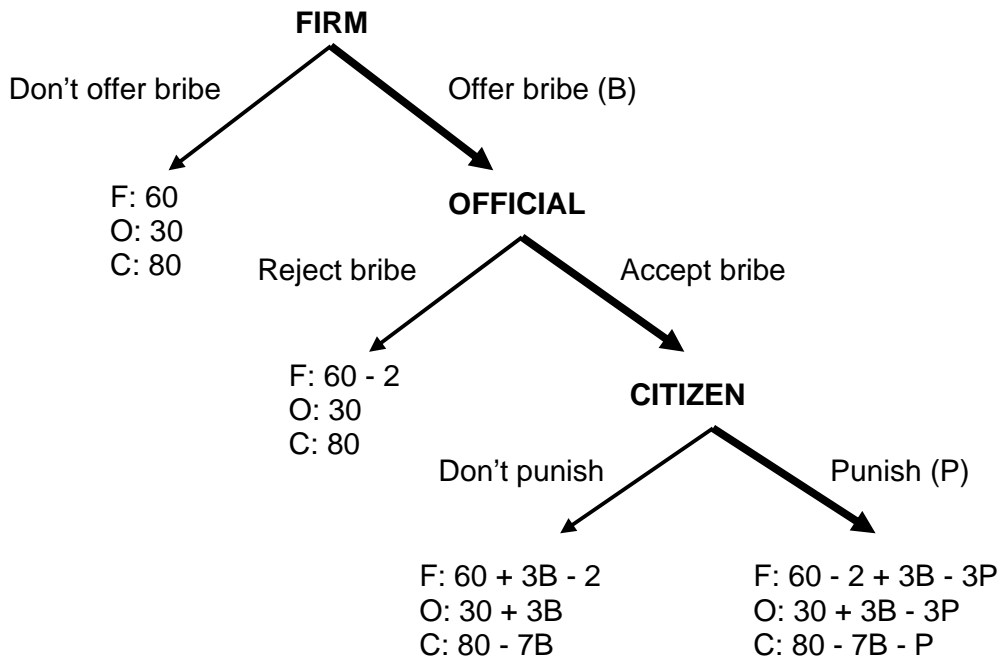
FIRM

Don't offer bribe   Offer bribe (B)

F: 60
O: 30
C: 40

OFFICIAL

Reject bribe   Accept bribe

F: 60 - 2
O: 30
C: 40

CITIZEN

Don't punish   Punish (P)

F: 60 + 3B - 2   F: 60 - 2 + 3B - 3P
O: 30 + 3B   O: 30 + 3B - 3P
C: 40 - B   C: 40 - B - P

Figure 2: The Welfare-Reducing Bribe Game

FIRM

Don't offer bribe   Offer bribe (B)

F: 60
O: 30
C: 80

OFFICIAL

Reject bribe   Accept bribe

F: 60 - 2
O: 30
C: 80

CITIZEN

Don't punish   Punish (P)

F: 60 + 3B - 2   F: 60 - 2 + 3B - 3P
O: 30 + 3B   O: 30 + 3B - 3P
C: 80 - 7B   C: 80 - 7B - P

Figure 3: Overview of the Results

FIRM [n = 645]

Don't offer bribe
[n = 90, 14.0%]

Offer bribe (B)
[n = 555, 86.0%]

OFFICIAL

Reject bribe
[n = 73, 13.2%]

Accept bribe
[n = 482, 86.9%]

CITIZEN

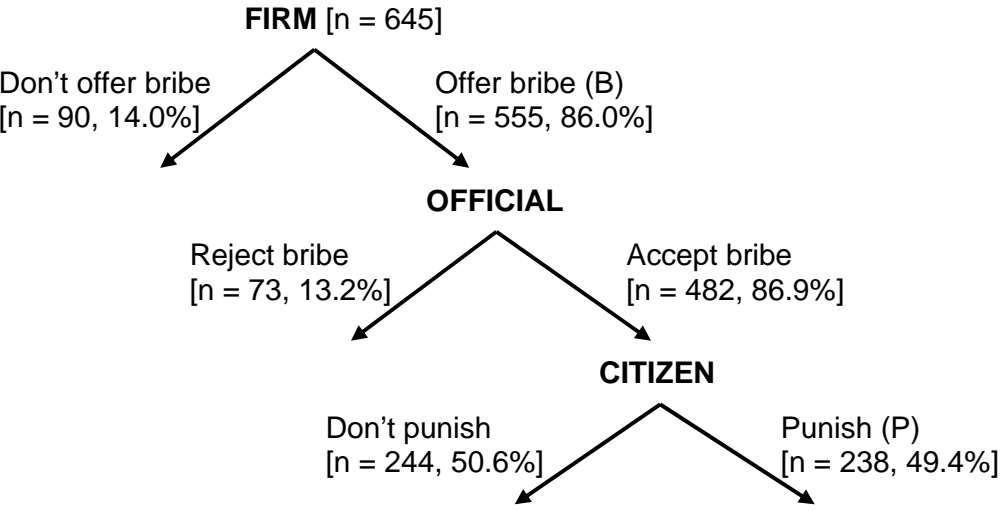Don't punish
[n = 244, 50.6%]

Punish (P)
[n = 238, 49.4%]

Figure 4: Distribution of Punishment Rates in Treatments 1 and 2 in Australia
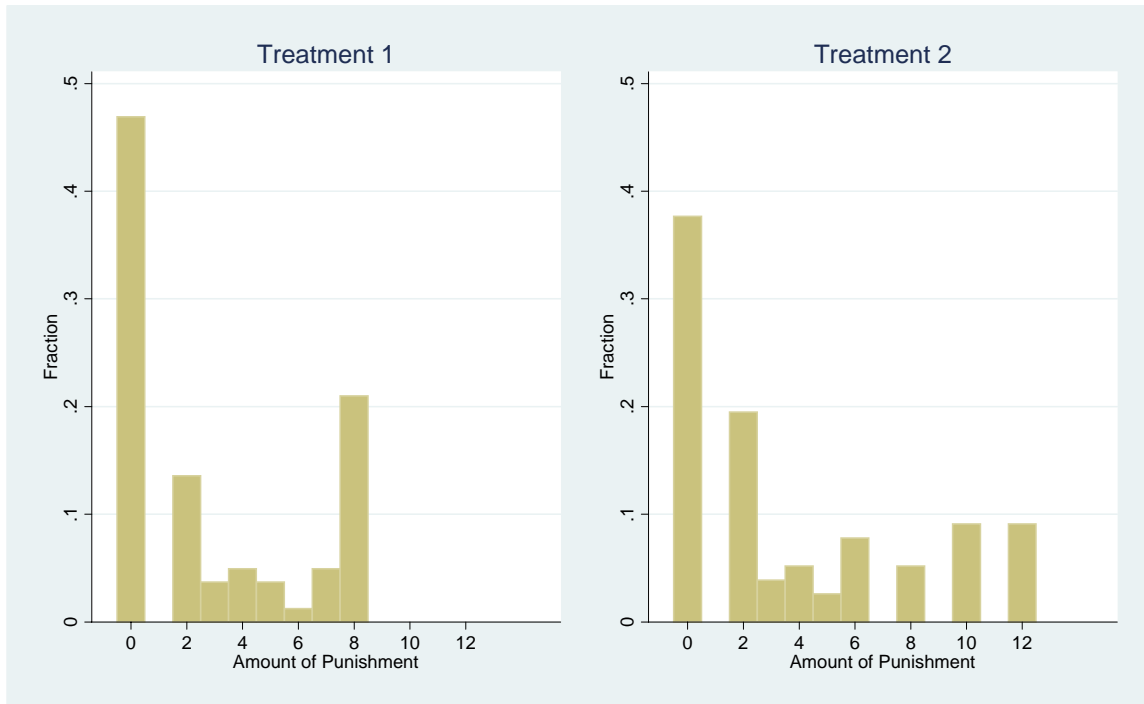
Table 1: Experimental Design

	Low Punishment / Efficiency-enhancing (Treatment 1)	High Punishment/ Efficiency-enhancing (Treatment 2)	High Punishment/ Efficiency-reducing (Treatment 3)
Australia (N = 888)	N = 279 Games = 93	N = 363 Games = 121	N = 246 Games = 82
India (N = 309)	N =309 Games = 103	--	--
Indonesia (N = 360)	--	N = 180 Games = 60	N = 180 Games = 60
Singapore (N = 378)	--	N = 195 Games = 65	N = 183 Games = 61
Total (N = 1935)	N = 588 Games = 196	N = 738 Games = 246	N = 609 Games = 203

Table 2: Differences in Means (t-tests) - Cultural Effects

(i)	Australia (Treatment 1)	India (Treatment 1)	p-value
% of firms bribing	95.70	94.17	0.63
Bribe amount (if >0)	7.70	7.37	0.03
% of officials accepting	91.01	89.69	0.76
% of citizens punishing	53.09	24.14	0.0001
Punishment amount (if >0)	5.40	3.71	0.01
(ii)	Australia (Treatment 2)	Indonesia (Treatment 2)	p-value
% of firms bribing	78.51	80.00	0.82
Bribe amount (if >0)	7.65	7.50	0.30
% of officials accepting	81.05	77.08	0.58
% of citizens punishing	62.34	72.97	0.27
Punishment amount (if >0)	5.98	5.59	0.69
(iii)	Australia (Treatment 3)	Indonesia (Treatment 3)	p-value
% of firms bribing	87.80	78.33	0.13
Bribe amount (if >0)	7.57	7.32	0.16
% of officials accepting	88.89	78.72	0.13
% of citizens punishing	42.19	59.46	0.10
Punishment amount (if >0)	7.74	7.36	0.76
(iv)	Australia (Treatment 2)	Singapore (Treatment 2)	p-value
% of firms bribing	78.51	86.15	0.21
Bribe amount (if >0)	7.65	7.63	0.83
% of officials accepting	81.05	89.29	0.18
% of citizens punishing	62.34	44.00	0.04
Punishment amount (if >0)	5.98	7.23	0.21
(v)	Australia (Treatment 3)	Singapore (Treatment 3)	p-value
% of firms bribing	87.80	83.61	0.48
Bribe amount (if >0)	7.57	7.59	0.90
% of officials accepting	88.89	96.08	0.15
% of citizens punishing	42.19	57.14	0.12
Punishment amount (if >0)	7.74	7.11	0.58
(vi)	Indonesia (Treatment 2)	Singapore (Treatment 2)	p-value
% of firms bribing	80.00	86.15	0.36
Bribe amount (if >0)	7.50	7.63	0.48
% of officials accepting	77.08	89.29	0.10
% of citizens punishing	72.97	44.00	0.01
Punishment amount (if >0)	5.59	7.23	0.19
(vii)	Indonesia (Treatment 3)	Singapore (Treatment 3)	p-value
% of firms bribing	78.33	83.61	0.46
Bribe amount (if >0)	7.32	7.59	0.19
% of officials accepting	78.72	96.08	0.01
% of citizens punishing	59.46	57.14	0.83
Punishment amount (if >0)	7.36	7.11	0.84

Table 3: Differences in Means (t-tests) - Treatment Effects

A. Australia

(i)	Treatment 1	Treatment 2	p-value
% firms bribing	95.70	78.51	0.0003
Bribe Amount (if >0)	7.70	7.65	0.69
% officials accepting	91.01	81.05	0.05
% citizens punishing	53.09	62.34	0.24
Punishment Amount (if >0)	5.40	5.98	0.40

(ii)	Treatment 2	Treatment 3	p-value
% firms bribing	78.51	87.80	0.09
Bribe Amount (if >0)	7.65	7.57	0.49
% officials accepting	81.05	88.89	0.17
% citizens punishing	62.34	42.19	0.02
Punishment Amount (if >0)	5.98	7.74	0.06

B. Singapore

(iii)	Treatment 2	Treatment 3	p-value
% firms bribing	86.15	83.61	0.69
Bribe Amount (if >0)	7.63	7.59	0.83
% officials accepting	89.29	96.08	0.19
% citizens punishing	44.00	57.14	0.19
Punishment Amount (if >0)	7.23	7.11	0.92

C. Indonesia

(iv)	Treatment 2	Treatment 3	p-value
% firms bribing	80.00	78.33	0.82
Bribe Amount (if >0)	7.50	7.32	0.40
% officials accepting	77.08	78.72	0.85
% citizens punishing	72.97	59.46	0.22
Punishment Amount (if >0)	5.59	7.36	0.18

Table 4: Multivariate Regression Results - Cultural Effects

A. Australia vs. India vs. Indonesia vs. Singapore, All Treatments, Pooled Regression (Australia and Treatment 2 are the reference dummies.)

	Bribe (0/1)			Bribe Amount			Accept (0/1)			Punish (0/1)			Punishment Amount		
	1	**2**		**3**	**4**		**5**	**6**		**7**	**8**		**9**	**10**	
	M. Effect♣	p-value		Coeff	p-value		M. Effect♣	p-value		M. Effect♣	p-value		Coeff	p-value	
Treatment 1	0.135	0.003	△	0.028	0.83		0.075	0.09	#	-0.044	0.56		-0.906	0.23	
Treatment 3	0.021	0.46		-0.091	0.34		0.048	0.13		-0.078	0.18		1.148	0.05	*
India	0.026	0.71		-0.424	0.02	*	-0.013	0.84		-0.248	0.01	△	-2.602	0.02	*
Indonesia	0.037	0.41		-0.300	0.08	#	-0.043	0.45		0.123	0.18		-1.249	0.16	
Singapore	0.080	0.05	*	-0.085	0.61		0.086	0.07	#	-0.049	0.57		-0.512	0.56	
Male	0.049	0.06	#	0.064	0.42		0.025	0.38		-0.062	0.19		0.900	0.08	#
Econ major	0.039	0.19		0.099	0.25		0.062	0.05	*	-0.159	0.003	△	0.045	0.94	
% life out of Australia	0.102	0.05	*	-0.122	0.47		0.001	0.63		-0.019	0.83		-1.323	0.12	
Bribe amount							0.009	0.53		-0.010	0.70		0.337	0.25	
Const				7.693	0.00	△							4.149	0.07	#
R-squared	0.063			0.01			0.047			0.069			0.066		
N	643			553			554			481			238		

♣ We report marginal effects for the probits. * (#, △) denotes statistical significance at the 5% (10%, 1%) level.

Table 5: Multivariate Regression Results - Controlling for Chinese Ethnicity

	Punish (0/1)	
	M. Effect	p-value
Treatment 1	-0.0115	0.35
Treatment 3	-0.0489	0.31
India	-0.243	0.01
Indonesia	0.090	0.33
Chinese Indonesian	0.285	0.13
Singapore	-0.049	0.57
Male	-0.068	0.15
Econ Major	-0.172	0.00
% life out of Australia	-0.168	0.084
Bribe amount	-0.0115	0.666
Test: Indonesian + Chinese Indonesian= Singapore		0.027
R-squared	0.073	
N	481	

Table 6: Survey Responses: Reasons for Punishing/Not Punishing
(as a percentage of those who had a chance to punish)

A. Reasons for punishing

	Overall	Location			
		Australia	India	Indonesia	Singapore
Moral responsibility	27.4%	32.0%	13.8%	39.2%	20.2%
reduce corruption	14.3%	17.6%	8.0%	20.3%	8.1%
fairness	13.5%	12.2%	4.6%	23.0%	15.2%
Negative reciprocity	11.0%	9.9%	0.0%	21.6%	15.2%

B. Reasons for not punishing

profit maximizing	45.9%	43.0%	67.7%	27.0%	48.5%
difficult to change the system or ineffective punishment system	9.5%	5.0%	16.1%	16.2%	9.1%
bribe may be for a good purpose or may be necessary	1.5%	1.8%	0.0%	4.1%	0.0%

Appendix

Table A1: The 2003 Corruptions Perceptions Index

RANK	COUNTRY	SCORE
1.	Finland	9.7
2.	Iceland	9.6
3.	Denmark New Zealand	9.5
5.	**Singapore**	**9.4**
…		
7.	Netherlands	8.9
8.	**Australia**	**8.8**
…		
11.	United Kingdom	8.7
…		
18.	Ireland USA	7.5
…		
25.	Portugal	6.6
…		
35.	Italy Kuwait	5.3
…		
50.	Costa Rica Greece South Korea	4.3
…		
83.	**India** Malawi Romania	**2.8**
86.	Russia Mozambique	2.7
…		
122.	**Indonesia** Kenya	**1.9**
…		
133.	Bangladesh	1.3

Source: Transparency International