Corruption and culture: An experimental analysis

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A B S T R A C T

Why do some people choose corruption over honesty and others not? Do the social norms and values prevailing in the societies in which they grew up affect their decisions? In 2005, we conducted a bribery experiment and found that, among undergraduates, we could predict who would act corruptly with reference to the level of corruption in their home country. Among graduate students we could not. In 2007, we replicated our result and also found that time spent in the UK was associated with a decline in the propensity to bribe, although this does not explain our inability to predict graduate behaviour. We conclude that, while corruption may, in part, be a cultural phenomenon, individuals should not be prejudged with reference to their country of origin.

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1. Introduction

Why do some people choose corruption over honesty, while others do not? Is it only the economic costs and benefits associated with a corrupt act that are important or do intrinsic motivations also play a determining role? And if intrinsic motivations are important, are they culturally determined?

Intrinsic motivations originate from the internalisation of social norms existing within a society. Norms are "social" when the values underlying the norms are shared, so that deviation from the norm triggers social disapproval and, if the norm is internalised, generates feelings of shame and guilt (see Elster, 1989; Posner and Rasmusen, 1999, and Young, 2008). Thus, cultural values "justify and guide the ways that social institutions function, their goals and modes of operation. Social actors draw on them to select actions, evaluate people and events, and explain or justify their actions and evaluations" (Licht et al., 2007).

It is often argued that values and beliefs are transmitted unchanged from generation to generation through primary socialization, and that they therefore represent a slow-moving component of culture (Guiso et al., 2006). However, social interactions may render cultural values and social norms at least partly endogenous (Akerlof, 1980).[1] Not only do values and beliefs affect adherence to a social norm, but the proportion of people who adhere to the norm affects individuals' beliefs in the values underlying the norm, and, as a consequence, the likelihood that the norm will be internalized by others including future generations. And these strategic complementarities may lead to multiple equilibria characterized by varying levels of adherence to the norm and belief in the underlying values.

Combining these theories with the idea of a social norm that prescribes abstinence from corruption, we can explain why a "culture of corruption" appears to exist and persist in some countries (see Hauk and Saez-Marti, 2002) and not in others. In the former, individuals have not internalised the anti-corruption norm and so the impact of intrinsic motivations on their decision to engage in or abstain from corruption is weak, while in the latter, the opposite applies. If this is the case, all other things being equal, individuals who grow up in societies in which corruption is prevalent should be more likely to act corruptly than individuals who grow up in societies where corruption is rare.

This paper starts by testing this hypothesis using an economic experiment in conjunction with cross-country data on corruption. The idea behind this methodological approach is as follows. Suppose we

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[1] For formal models of endogenous culture see Cavalli-Sforza and Feldman (1981) and Boyd and Richerson (1985).

could take a sample of private citizens and public officials from a number of countries with different levels of corruption, and place them all in exactly the same formal institutional context. Suppose, also, that we could ensure that a given corrupt service was equally valuable to each private citizen and equally costly for each public servant to supply, and that the negative externality resulting from the former paying and the latter receiving a bribe in exchange for the service was equally large for all possible citizen–servant pairs. And finally, suppose that we could eliminate strategic complementarities and, hence, multiple equilibria. Then, if we could predict who would offer and accept bribes with reference to the levels of corruption prevailing in their home countries, it could be taken as evidence in support of our hypothesis.

Our study deviated from this 'ideal design' in two important ways. First, all participants in our study were students so, while they could also be described as private citizens, none were public servants. Second, because a real, formal institutional environment would have been impossible to control perfectly, our study involves two economic experiments based on two specially designed bribery games, one conducted in 2005 and another in 2007. Our experimental partici-pants were Oxford University students originating from 40 different countries including some of the most and least corrupt in the world.

Fisman and Miguel's (2007) investigation into the relationship between parking violations by diplomats in New York City and the level of corruption in their home countries has a similar basis to ours and does not suffer from concerns about external validity as it is not a laboratory experiment. However, their research subjects are rare in type and this raises questions about the generality of their findings. Our initial aim was to seek to replicate Fisman and Miguel's finding for a different type of research subject.

In 2005, we found support for the hypothesis, but only among undergraduates. Among graduate students we found no relationship between the level of corruption in the country where they grew up and their behaviour in the experiment. This conditionality indicates that Fisman and Miguel's finding does not generalize. However, neither did it feature in our original hypothesis. So, drawing on the existing literature we derived two explanations as to why graduates and undergraduates might differ, one relating to selection the other to secondary socialization. Then, in 2007, we designed and conducted a second experiment involving an entirely new sample of students. The principal aim of this second experiment was to provide a clean test of the modified, conditional hypothesis that, among undergraduate but not graduate students, those from more corrupt countries are more likely to engage in bribery within the experiment. At the same time, we collected some data that would allow us to investigate the reasons underlying the conditionality. Our original finding was replicated, the conditional hypothesis was supported, and further analysis provided evidence of secondary socialization but did not rule out selection. We therefore conclude that social norms, values and beliefs internalized during childhood may play a determining role in individuals' decisions about bribery later in life and that corruption is, in part, a cultural phenomenon. However, migration can lead to behavioural change. Moreover, those who select into migration may have different behavioural traits than their co-nationals.

The paper has eight sections. Following this introduction, in Section 2 we briefly review the most recent literature on the relationship between culture, economic outcomes and corruption; then, in Section 3, we describe the design of the experiment conducted in 2005. In Section 4, we introduce our 2005 subject pool and the measure of corruption in the countries where they grew up that we use in our analysis. In Section 5 we present the results of the 2005 experiment. In Section 6, we describe the 2007 experiment and present the 2007 replication of our 2005 results. In Section 7, we empirically investigate the two possible explanations as to why undergraduate and graduate students differ. Finally, in Section 8, we summarize and conclude.

2. Culture, economics, and corruption

Culture has been variably defined in economics. According to the most restrictive definition culture is a coordination device, i.e. a set of social norms and beliefs that lead a society to a specific equilibrium when multiple equilibria exist (Greif, 1994). More comprehensive definitions encompass "the values, attitudes, beliefs, orientations and underlying assumptions prevalent among people in a society" (Huntington, 2000). We adopt the latter definition.

In recent years, a number of studies have investigated the impact of culture on economic behaviour and outcomes.[2] The standard approach has been to conduct cross-country regressions using various measures of individual attitudes and beliefs drawn from cross-national surveys such as the World Values Survey as proxies for culture. However, reverse causality, measurement bias and omitted variable bias limit the interpretability of results generated by such studies.

More recent studies have endeavoured to overcome these inferential constraints by comparing the behaviour and outcomes of immigrants from different countries who are currently living in the same environment.[3] This allows the researcher to isolate the role of cultural factors from that of country-specific institutional settings. However, this approach may be subject to other confounds including selection into migration and the direct effects of migration on individual values, beliefs, and behaviours.

One partial antidote to the problem of selection is to study many types of immigrant in many types of setting. So, the appropriate response to Fisman and Miguel's (2007) finding that, in New York City, diplomats from highly corrupt countries are significantly more likely to violate parking laws than diplomats from less corrupt countries is to seek to replicate the finding but not among diplomats, not in New York, and not in relation to parking. Thus, we sought to identify a link between culture and corruption, while focusing on a different type of immigrant and using a behavioural experiment to measure individual variations in the tendency to act corruptly.

Cameron et al. (2009) applied a cross-societal, experimental methodology to the study of culture and corruption by engaging a large sample of students in Australia, India, Indonesia and Singapore in a bribery game. However, their results were inconclusive: while they identified a number of cross-cultural variations in corrupt and anti-corrupt behaviour within their experiment, these variations did not correlate with the level of corruption in each country, as measured by Transparency International. For instance, they found that indivi-duals' propensities to bribe were not significantly different in Australia, Singapore and Indonesia, and individuals' propensities to accept a bribe were lower in Indonesia than in less corrupt Singapore.[4]

Our methodology, which could be described as a cross between Fisman and Miguel's (2007) and Cameron et al.'s (2009) is described below.

3. The 2005 bribery game

In 2005, we designed and conducted an experiment involving a very simple bribery game.[5] The game simulates a petty corruption

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[2] See Fernandez (2008) and Guiso, Sapienza and Zingales (2006) for reviews.
[3] See Fernandez (2008) and Algan and Cahuc (2007) for reviews.
[4] They conjectured that the unexpected behavior of the Indonesian and the Singaporean participants might reflect the complex institutional histories of the two countries.
[5] Abbink et al. (2002) and Cameron et al. (2009) provided the starting point for our design. We deviated from their designs by focusing on petty corruption transactions, i.e. those occurring between ordinary citizens and public officials and relating to the provision of basic public services. See Abbink (2006) and Barr and Serra (2009) for reviews of experiments addressing the issue of corruption.

exchange in which a private citizen must decide whether and how much to offer a public servant as a bribe in exchange for a corrupt service, such as a reduction in tax, preferential treatment in a court hearing, or speedier admission to hospital. In turn, the public official has to decide whether, and how much, to accept as a bribe. If a bribe is offered and accepted, the briber–bribee pair benefit, while other members of society incur a cost.[6]

The game involves 15 players, five "private citizens", five "public officials", and five "other members of society". Roles and "private citizen"–"public official" pairings are randomly assigned and play is anonymous and one-shot.

Each "private citizen" receives an initial endowment, Y_c, and may offer a "bribe", b, in exchange for a corrupt service, the value of which to him is V. If he offers a bribe, regardless of its magnitude and whether it is accepted or rejected by the "public official", he incurs a cost E. This represents the expected cost of being caught and punished. We chose to make this cost deterministic rather than stochastic in order to reduce the potential impact of risk preferences on observed behaviour. So, the 'private citizen's' final payoff, F_c, equals: Y_c if he does not offer a bribe; $Y_c - E + V - b$ if he offers a bribe that is accepted; and $Y_c - E$ if he offers a bribe that is rejected.

Each "public official" receives an initial endowment of Y_p. If he accepts a bribe he automatically has to supply the corrupt service and incur a cost, K. This cost represents the sum of the expected cost of being caught and punished, the actual cost of supplying the service, and the cost of any efforts made to reduce capture. Again, we chose to make this cost deterministic rather than stochastic in order to reduce the potential impact of risk preferences on observed behaviour. So, the "public official's" final payoff from the game is: Y_p if he is not offered a bribe or he is offered but does not accept a bribe; and $Y_p - K + b$ if he accepts a bribe.

Finally, each "other member of society" receives an initial endowment of Y_o and for every bribe offered by a "private citizen" and accepted by a "public official" he incurs a cost, h. So, each "other member of society's" final payoff from the game is $F_o = Y_o - N_c h$, where $N_c \in \{1, 2, 3, 4, 5\}$ is the number of "private citizen"–"public official" pairs who offer and accept bribes. That each act of bribery affects all five "other members of society" could have introduced interdependence between individuals' decisions within sessions, since some individuals may engage in or abstain from corruption conditional on their expectations concerning the number of other briber–bribee pairs choosing to act corruptly. Alternatively, we could have followed Cameron et al. (2009) and had each act of bribery affect only one, distinct 'other members of society'. We decided to adopt the former because, in the real world, bribery often harms many (often unidentifiable) individuals.[7]

3.1. Predictions

If all "public officials" and "private citizens" are selfish, this game has a single subgame perfect equilibrium. Each "public official" will accept any bribe that leaves him better off, i.e., he will accept any $b > K$, and will be indifferent between accepting and rejecting when $b = K$. Assuming "private citizens" know this, they will all offer bribes of $(K + \mu)$, where μ is a small positive amount. All bribes $(= K + \mu)$ will be accepted, so each "other member of society" will suffer the maximum possible negative externality of $5h$.

However, if subjects in the "public official" and "private citizen" roles bring internalized anti-corruption norms with them into the experiment, they may choose to abstain from engaging in bribery

despite the positive monetary payoff. And, if the likelihood of an individual internalizing an anti-corruption norm depends positively on the level of corruption in the society in which they grew up, we should see a positive relationship between the level of corruption in a student's home country and the likelihood of them engaging in bribery in the experiment.

3.2. Implementation

We implemented this bribery experiment during the final quarter of 2005 in seminar rooms in the Department of Economics, Oxford University. We conducted 13 experimental sessions, each involving 15 participants, giving a total of 195 experimental participants. The games were played using a fictitious currency called a Gilpet (G1 = £0.20 ≈ $0.30), and we set $Y_c = Y_p = $ G35, $Y_o = $ G25,[8] $V = $ G16, $E = $ G1, and $K = $ G5. The bribe could range between G1 and G20.[9] We varied the cost incurred by "other members of society", h, across sessions; in six sessions $h = $ G1 and in seven sessions $h = $ G4. Finally, the game was presented in abstract form, i.e., making no reference to "private citizens", "public servants", bribery, and corrupt services, in six of the sessions, and in framed form in seven sessions. While pertinent to the issue of whether intrinsic motivations affect individual behaviour, the effects of these treatments do not speak directly to our hypothesis and, for this reason we control for but do not provide an analysis of them below.[10] When conducting robustness checks of our main result, we also control for possible interaction effects between the framing of the game and the internalized anti-corruption norms of our experimental participants.

In every session the participants were seated at well-spaced desks, and received two tables showing how various possible decision combinations would lead to particular final payoffs for each player-type. The participants expressed their decisions on specially designed forms, which they completed behind privacy screens designed to ensure that their decisions could not be observed. No talking was allowed.

The subjects in the "public official" role, instead of responding only to the particular bribe offered to them, had to state what they would do (accept or reject) if they were offered each of the possible bribes, $b \in \{G1, G2, G3, \ldots G20\}$, while knowing that whichever one of their responses turned out to be pertinent would determine their earnings. This full strategy elicitation enabled us to identify 'public officials' who would reject any possible bribe and the minimum acceptable bribes for the others. Put another way, the application of the strategy elicitation improved comparability as it ensures that each individual placed in the public official role responded to the same set of possible stimuli. Had their responses been directly elicited the actual stimuli applied to each bribee would have varied in accordance with the offer made by his or her briber.[11]

Once the game was complete, the participants' payoffs were calculated at the front of the seminar room and a show-up fee of £3

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[6] The decision to have passive players rather than other briber–bribee pairs suffer the costs of corruption follows Abbink (2005). In this way, we exclude negative reciprocity from the motivations behind individuals' engagement in corruption.

[7] Below, we check if our results are robust to clustering the data by experimental session in order to account for this possible within-session interdependency.

[8] Other members of society received a lower initial endowment than citizens and officials in order to simulate situations where some recipients of public services do not have the resources necessary to engage in bribery.

[9] Treating play as sequential, the subgame perfect equilibrium bribe is therefore equal to G6.

[10] For an investigation into the effects of externalities and framing in bribery game see Barr and Serra (2009).

[11] Whether and to what extent the strategy elicitation affects observed behaviour is the subject of an ongoing debate. The empirical evidence is mixed. While Güth, Huck and Mueller (2001), Schotter et al. (1994) and Brosig, Weimann and Yang (2003) find that strategy elicitation induces significantly different behavior to direct elicitation, using different experimental designs, Cason and Mui (1998), Brandts and Charness (2000) and Oxoby and McLeish (2004) find no differences. The complexity of the experiment may be a crucial factor: the difference increases with the complexity of the game (Brandts and Charness, 2000). Our game is simple so any effect is likely to be small. For a recent survey of experimental comparisons of strategy versus direct-response method, see Brandts and Charness (2009).

Fig. 1. Distribution of the level of corruption in the participants' home countries.

Table 1
Home country experiences of and attitudes towards corruption.

Variable	Scale	Means	Correlation with TI
Corruption in health	(common, 1 = not, 4 = very)	1.897	0.694***
Corruption in public appointments	(common, 1 = not, 4 = very)	1.835	0.781***
Corruption in police	(common, 1 = not, 4 = very)	2.325	0.639***
Corruption in politics	(significance, 1 = none, 4 = high)	2.677	0.634***
Corruption in business	(significance, 1 = none, 4 = high)	2.441	0.506***
Corrupt culture and values	(significance, 1 = none, 4 = high)	2.103	0.546***
Corruption in personal life	(significance, 1 = none, 4 = high)	1.467	0.463***
Bribe-giving justifiable	(1 = never, 4 = always)	1.323	0.146**
Bribe-taking justifiable	(1 = never, 4 = always)	1.338	−0.004

Note: The last column reports Pearson's correlation coefficients; *** indicates that the pair-wise correlation is significant at the 1% level; ** indicates that the pair-wise correlation is significant at the 5% level.

($\approx$\$4.50) was added.[12] In the meantime, the participants filled out a questionnaire about themselves and their home countries. The instructions used for the bribery game can be found in Appendix A.[13]

4. Participants

Our 195 participants were all students at the University of Oxford. Some signed up for the study at a stall set up by us at the Annual Freshers' Fare, an event at the start of each academic year designed to facilitate recruitment by student societies and other activity-based groups. The remainder contacted us by e-mail having seen promotional posters and leaflets advertising the study or received an e-mail through their school or college mail list. No attempt was made to target particular students on the basis of their nationality.

Out of the 130 participants who assumed active roles in the experiment, just over half were female, 68% were graduate students, and their ages ranged from 18 to 44 years, with the average age being just under 24 years. According to Chi-squared and t-tests, none of the characteristics vary significantly across the assigned roles.

The University of Oxford attracts students from all over the world and this was reflected in our sample. While approximately one third of the participants were British, the remaining two thirds came from 33 other countries, which, according to Transparency International, differ significantly with respect to the level of corruption.[14]

For the purpose of our cross-cultural analysis, we constructed a corruption index, TI, for each of the students in our sample equal to 10 minus the value of the Corruption Perception Index (CPI) assigned by Transparency International to the students' home country in the year that they left that country.[15] Higher values of TI correspond to higher levels of corruption. For students whose countries had not yet been assessed by Transparency International at the time they left, we use the corruption index for the first available year. For British students, we use the corruption index corresponding to the year in which the study was conducted.[16]

Fig. 1 plots the distribution of TI for our 130 participants. The dominant mode reflects the large proportion of British students in the sample (the UK had a TI of 1.4 in 2005); the secondary mode reflects the proportion of students coming from highly (but not the most) corrupt countries, such as China and Argentina.

We chose to base our country-level measure of corruption on Transparency International's CPI because it is widely cited and highly respected. However, the CPI is based on surveys of elite business-people and assessments by country analysts, and thus may not be a good indicator of the levels of corruption in the environments in which the students in our study spent their childhood.[17] To explore this issue, we asked the students about their own perceptions of corruption in their home countries. In addition, we asked them whether they thought bribery could ever be justified.[18] The means for each of the resulting variables, as well as the correlation coefficients between each and TI are presented in Table 1.

The correlations between TI and the students' perceptions of how common bribery and nepotism are in public health service provision, public appointments and the police in their own countries are all positive and highly significant (1% level). The same is true of their perceptions of the impact of corruption on politics, business, culture and values, and their own personal lives. However, the correlation is weaker, and the mean response lower, in the case of the latter. The correlation with how justifiable the participants deemed the giving of bribes to public officials to be is weaker again, although still significant, and there is no correlation with how justifiable they thought bribe-taking by public officials.

Because these data were collected directly after the completion of the game, we cannot use them to identify a causal link running from the level of corruption prevailing in the participants' home country to their behaviour in the experiment. However, the correlations suggest that an analysis based on a reduced form in which we use TI as a proxy for the causal variable of interest will have at least some power.

5. Results

The following analysis focuses on individuals' decisions to engage in or abstain from corruption, and not on the size of the bribe. This is because we do not have any predictions about the relationship between individuals' internalized anti-corruption norms and the size of the bribe offered or accepted in the game.[19]

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[12] The average participant took home £9.53, including their show-up fee. Sessions lasted approximately 50 min.

[13] All visual aids, tables, and forms designed for and used during the experiment are available from the authors.

[14] Countries represented in the sample: Argentina, Australia, Bangladesh, Barbados, Belarus, Canada, China, Germany, Greece, Hong Kong, India, Italy, Kazakhstan, Malawi, Malaysia, Mauritius, New Zealand, Norway, Peru, Philippines, Poland, Portugal, Romania, Russia, Singapore, Slovenia, South Africa, South Korea, Sweden, Switzerland, UK, Ukraine, USA, Zimbabwe.

[15] We subtract from 10 because Transparency International's CPI, takes a higher value the lower the level of corruption. It too takes values between zero and 10. So, by subtracting the CPI from 10 we are simply inverting the scale.

[16] All but two of the foreign students left their home countries at the age of 18 or older. The two exceptions left at 9 and 11 years. We treat these two as British in the analysis.

[17] For further details on the construction of Transparency International's CPI, see Lambsdorff (2004).

[18] The precise wording of the questions can be found in the Supplementary materials.

[19] Tobit and OLS regressions indicate no significant relationship between internalized anti-corruption norms, proxied by the level of corruption in the participants' home countries, and the size of the bribe offered or accepted in the game.

Table 2
Probit analyses of engagement in bribery in the 2005 experiment.

Sample	Private citizens		Public officials		Pooled sample
Dependent variable	Offered a bribe		Accepted a bribe		Engaged in bribery
	(1)	(2)	(3)	(4)	(5)
TI	0.002	0.490**	0.001	0.083*	0.198**
	(0.028)	(0.230)	(0.019)	(0.044)	(0.084)
TI*graduate		−0.490**		−0.095**	−0.204***
		(0.228)		(0.040)	(0.079)
Graduate		0.999***		0.029	0.213
		(1.05E−04)		(0.148)	(0.187)
Treatment dummies	Yes	Yes	Yes	Yes	Yes
Role dummy	–	–	–	–	Yes
Age and gender	Yes	Yes	Yes	Yes	Yes
Observations	65	65	65	65	130

Note: Robust standard errors, in brackets, have been adjusted to account for clustering within sessions. We report marginal effects of continuous variables and the effect of a change from 0 to 1 for dichotomous variables. * Significant at 10%; ** significant at 5%; *** Significant at 1%.

Of the 65 students assuming the "private citizen" role, 17 (26.2%) chose not to offer a bribe, while the remaining 48 (73.8%) offered some positive amount.[20] Of the 65 students assuming the "public servant" role, 12 (18.5%) chose strategies indicating that they would not accept a bribe of any amount, while the remaining 53 (81.5%) indicated that they would accept bribes above some threshold.[21]

In Table 2 we report the marginal effects and corresponding standard errors and significance levels relating to five Probit estimations. The estimates in the first two columns relate to the sample of students who assumed the "private citizen" role in the experiment and take a dummy variable equal to one for those who offered a bribe and zero otherwise as the dependent variable. The estimates in the third and fourth columns relate to the sample of students who assumed the "public official" role and take a dummy variable equal to zero for those whose strategy indicated that they would not accept any bribe and one otherwise as the dependent variable. The model in the fifth column relates to the two samples pooled and takes a dummy variable equal to one for those who either offered a bribe or indicated that they would accept at least some bribes and zero otherwise. All standard errors have been adjusted to account for possible non-independence within sessions. In addition to the explanatory variables of interest, all the presented Probit estimations included two dummy variables relating to treatments applied during the experiment and the age and gender of the subjects as control variables. The analysis of the pooled sample also includes a dummy variable indicating the role assumed by the student in the game.

The first and third columns of Table 2 present tests of our original hypothesis as it applies to the "private citizen" and "public official" roles respectively—that those who grew up in more corrupt environments would be more likely to offer or accept bribes in the experiment. The size and insignificance of the estimated coefficients on *TI* in these columns indicates that this hypothesis is not supported.

However, moving out of hypothesis-testing mode and into exploratory mode, we found that if we interacted *TI* with a dummy

equal to 1 for graduate students and 0 for undergraduate students and include both this interaction term and the graduate dummy in the Probit analyses, the estimates reported in columns 2 and 4 were returned. These suggest that, while there is no relationship between the level of corruption in graduate students' home countries and the likelihood of them engaging in bribery in the game (in both columns the sum of the marginal effect of *TI* and the interaction term is very small and statistically indistinguishable from zero), for undergraduates such a relationship *might* exist.

In the fifth column we pooled the data across roles.[22] The pooled analysis returns the same finding: undergraduate behaviour in the experiment can be explained with reference to the level of corruption in their country of origin, while graduate behaviour cannot.

5.1. Discussion of the 2005 results

Our results for undergraduate students support the hypothesis that individuals who grow up in societies in which corruption is prevalent are more likely to act corruptly than individuals who grow up in societies where corruption is rare and, thus, concur with the finding of Fisman and Miguel (2007). However, the hypothesis is not supported for the graduate students who make up the majority of our sample. This calls into question the generality of Fisman and Miguel's finding and suggests that the confounds associated with studying immigrants in order to deduce the effects of culture on corrupt behaviour warrant further investigation.

As mentioned in Section 2, two types of confound may be particularly important. First, socialization into the cultural values, beliefs and social norms prevailing in their new country of residence may weaken the impact of immigrants' native cultures on their behaviour. Second, immigrants are unlikely to constitute a representative sample of the population in their home country; they have selected into migration quite possibly because their preferences, values and beliefs differ from those prevailing in their native lands. The first of these confounds would explain our findings if graduates have spent more time away from "their own" cultures. The second may be pertinent if the selection processes for undergraduate and graduate students are different. Stolzenberg (1994) found that, in the US, socio-economic background was a strong predictor of enrolment in undergraduate but not graduate programmes and proposed that this may be because undergraduate enrolment reflects parents' aspirations, whereas graduate enrolment reflects those of the students. Further, among immigrant students, the decision to continue on to graduate studies may reflect a desire not to return home, possibly because of either a prior or newfound disagreement with the prevailing values, beliefs, and social norms.

Given our inductive analysis of the experimental data from 2005 and having derived two possible explanations as to why undergraduates and graduate students might differ, in 2007, we decided to try and replicate our finding and distinguish empirically between the explanations. We designed and ran a new experiment involving a slightly different game and an entirely different sample of graduate and undergraduate students. Further, with the aim of identifying the

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[20] 18% offered the subgame perfect equilibrium of G6, while 50% offered a higher bribe: 37% offered a bribe of G10, thereby dividing the net total private return to corruption equally between themselves and the 'public official'; one percent made an offer of G11; and 10% made offers between G6 and G10. Only 6% made offers below the subgame perfect equilibrium, possibly in error. A figure showing the full distribution of bribes offered is presented in the Supplementary Materials.

[21] 40% indicated that they would accept the subgame perfect equilibrium bribe of G6 and a further 6% would accept the break-even bribe of G5. Of the remaining 35%: only 11% chose a minimum acceptable bribe of G10; 6% indicated minimum bribes above G10; and 18% chose minimum bribes between G6 and G10. A figure showing the full distribution of minimum acceptable bribes is presented in the Supplementary materials.

[22] This could raise concerns. First, we applied strategy elicitation to the "public official" role and direct elicitation to the "private citizen" role. However, had we not applied the strategy method we would have only known whether each "public official" would reject or accept the bribe they were actually offered rather than knowing whether they would have rejected any bribe. Arguably, the latter is more compatible with the "private citizens" decision to offer a bribe of their choosing or offer no bribe. Second, there is a difference in the maximum possible payoff to engaging in bribery across the roles: a "public official" who accepts the largest possible bribe of G20 would receive a final payoff of G50; while a "private citizen" who pays the smallest bribe that stands a non-zero chance of being accepted, i.e., a bribe of G5, which leaves "officials" indifferent between accepting and rejecting, would receive a final payoff of G45. However, against these concerns must be weighed the potential advantage of greater degrees of freedom, an important concern given that only 32%, i.e. 42, of our subjects are undergraduates.
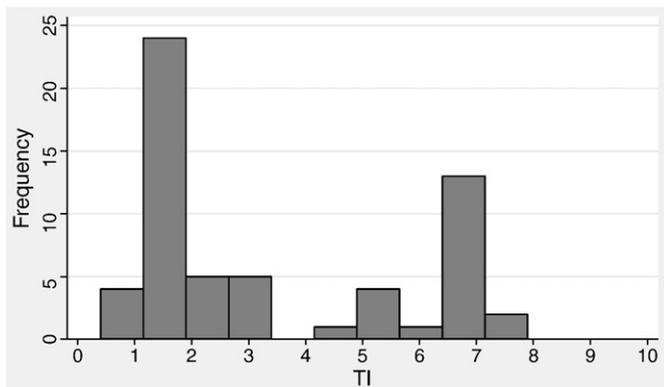
Fig. 2. Distribution of the level of corruption in the participants' home countries in the 2007 sample.

Table 3
Perceptions of and attitudes toward corruption of participants in the 2007 game.

Variable	Scale	Mean or proportion	Correlation with *TI*
Corruption in health	(common, 1 = not, 4 = very)	2.000	0.804***
Corruption in public appointments	(common, 1 = not, 4 = very)	2.433	0.671***
Corruption in police	(common, 1 = not, 4 = very)	1.983	0.688***
Corruption in politics	(significance, 1 = none, 4 = high)	2.800	0.617***
Corruption in business	(significance, 1 = none, 4 = high)	2.516	0.607***
Corrupt culture and values	(significance, 1 = none, 4 = high)	2.233	0.546**
Corruption in personal life	(significance, 1 = none, 4 = high)	1.567	0.629***
Bribe-giving justifiable	(1 = never, 4 = always)	1.517	0.309**
Bribe-taking justifiable	(1 = never, 4 = always)	1.117	0.081

Note: The last row reports the Pearson's correlation coefficients; *** indicates that the pair-wise correlation is significant at the 1% level; ** indicates that the pair-wise correlation is significant at the 5% level. TI is the level of corruption in the students' home country in the year they left, as measured by Transparency International.

mechanism driving our finding, we re-contacted by e-mail all the participants in the 2005 experiment to gather information on the year they left their home countries and the year they arrived in the UK. We asked the same questions to the participants in the 2007 experiment.

6. The 2007 experiment

6.1. Experimental design and implementation

The 2007 experiment involved a game in which the "public servant" demanded a bribe in exchange for a corrupt service and the "private citizen" had to indicate which, if any, bribe amounts he or she would be prepared to pay. So, in this case, the decision of the "public servant" was elicited directly and the decision of the "private citizen" was elicited using the strategy method. All the other parameters of the game were left unchanged: both the "official" and the "citizen" were initially endowed with G35; engaging in corruption generated a cost $K = $G5 to the "official", and both a cost $E = $G1 and a monetary benefit $V = $G16 to the "citizen"; "other members of society" were initially endowed with G25 and, as in one of the treatments applied in 2005, if a bribe was demanded and paid each "other members of society" suffered a cost of G4; the bribe could range between G1 and G20, and the game was played by five "private citizens", five "public officials" and five "other members of society".[23]

We conducted six sessions of the 2007 bribery game, involving 15 students in each. In three of the six sessions, we employed an abstract frame, and in the remaining three sessions we employed a corruption frame. The sessions were conducted in the same manner and in similar venues to the sessions held in 2005. Roles and "private citizen"–"public servant" pairings were randomly assigned and play was anonymous and one-shot.

The switch in the identity of the first mover renders the subgame perfect equilibrium bribe in the sequential version of the 2007 game different to that in the sequential version of the 2005 game.[24] However, theory still predicts that selfish officials will demand a bribe, now equal to $(V - E - \mu)$, selfish citizens will be willing to pay the bribe demanded, and "other members of society" will suffer the largest possible cost of G20.

6.2. The role of culture: a modified hypothesis

As in the 2005 experiment, if subjects bring internalized anti-corruption norms with them into this new experiment, they may

choose to abstain from engaging in bribery despite the positive monetary payoff. And, if the likelihood of an individual internalizing an anti-corruption norm depends positively on the level of corruption in the society in which they grew up, we may see a positive relationship between the level of corruption in a student's home country and the likelihood of them engaging in bribery in the experiment. However, owing to either secondary socialization or selection, we do not expect this reasoning to apply to graduates to the same degree as undergraduates.

6.3. The participants in the 2007 bribery game

The 90 participants in 2007 were all Oxford University students. All of them contacted us by e-mail having seen promotional posters and leaflets advertising the study or received an e-mail through their school or college mail list. As before, no attempt was made to target students on the basis of their nationality. None of them had been involved in the 2005 experiment. The 2007 sample contained smaller percentages of graduate students (55% vs. 68% in 2005) and female students (40% vs. 50%). The average age was the same in the two years. Approximately one third of the 2007 sample was British. The remainder hailed from 21 other countries.[25]

Fig. 2 presents the distribution of *TI*, the level of corruption in the students' countries of origin in the year they left. As in 2005, the dominant mode reflects the proportion of British students in the sample and the secondary mode reflects the proportion of students coming from highly (but not the most) corrupt countries, such as China and India.

Table 3 shows that, as in 2005, the students' perceptions of how common bribery and nepotism are in public health service provision, public appointments and the police in their home countries are all positively and significantly correlated with the *TI* corruption index. The same applies to the students' perceptions of the impact of corruption on politics, business, culture and values in their home countries, and on their own personal lives. However, also as in 2005, the correlation with how justifiable the participants thought bribe-giving is weaker, and there is no correlation with how justifiable they thought bribe-taking by public officials.

6.4. Results

In 2007, of the 30 students assuming the "public official" role, 6 (20%) chose not to demand a bribe, while the remaining 24 (80%)

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[23] The game instructions can be found in The Supplementary materials.
[24] The subgame perfect equilibrium in the sequential version of this game is equal to G14. See Section 3.2 above for a discussion about strategy elicitation.

[25] Countries represented in the 2007 sample: Arab Emirates, Argentina, Australia, China, Germany, Ghana, Hong Kong, India, Ireland, Israel, Italy, Kazakhstan, Netherlands, New Zealand, Philippines, Singapore, Slovak Republic, South Africa, South Korea, Switzerland, UK, USA.

Table 4
The decision to engage in bribery in 2007.

Sample	Public officials 2007	Pooled sample: 2007	Pooled sample: 2005 and 2007
Dependent variable	Demanded a bribe	Engaged in bribery	Engaged in bribery
	(1)	(2)	(3)
TI	0.089*	0.099*	0.119***
	(0.048)	(0.057)	(0.042)
TI*graduate	−0.083**	−0.098**	−0.125***
	(0.042)	(0.041)	(0.039)
Graduate	0.122	0.147	0.133
	(0.157)	(0.142)	(0.116)
Treatment dummies	Yes	Yes	Yes
Role dummy	–	Yes	Yes
Year dummy	–	–	Yes
Age and gender	Yes	Yes	Yes
Observations	30	60	190

Note: Robust standard errors, in brackets, have been adjusted to account for clustering within sessions. We report marginal effects of continuous variables and the effect of a change from 0 to 1 for dichotomous variables. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5
Selection or socialization?

	Full sample	Non-British sample	Full sample	Non-British sample
	2005–2007	2005–2007	2005–2007	2005–2007
	(1)	(2)	(3)	(4)
TI	0.119***	0.112*	0.111**	0.082*
	(0.042)	(0.057)	(0.048)	(0.051)
TI*graduate	−0.125***	−0.114*	−0.117***	−0.100**
	(0.039)	(0.054)	(0.037)	(0.044)
Graduate	0.133	0.124	0.096	0.033
	(0.116)	(0.28)	(0.11)	(0.18)
TI*years in UK			−0.001	0.007
			(0.005)	(0.004)
Years in UK			−0.001	−0.0364**
			(0.009)	(0.019)
Treatments	Yes	Yes	Yes	Yes
Role dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Age and gender	Yes	Yes	Yes	Yes
Observations	190	121	187	118

demanded some positive amount.[26] Of the 30 students assuming the "private citizen" role, 5 (16.7%) chose strategies indicating that they would not pay any bribe, while the remaining 25 (83.3%) indicated that they would pay bribes below some threshold.[27]

Table 4 presents Probit estimations relating to the sample of students assuming the "public servant" role in 2007 (first column) and the pooled sample of all students assuming an active role in 2007 (second column). We do not present estimates for the sample of students assuming the "private citizen" role because, for this sample, the estimation failed owing to a lack of variation in TI across the undergraduate students. Out of the ten undergraduates randomly assigned to the "private citizens" role, eight were British, with TIs equal to 1.6, and two were German, with TIs equal to 1.8 and 2.1. The estimations based on the 2007 data contain the same controls and were conducted using the same methodology as those presented in Section 5 above.

The signs and significance of the marginal effects reported in both columns accord with our earlier finding and support our modified hypothesis. Once again, we can predict whether an undergraduate will engage in bribery in the experiment with reference to the level of corruption in their country of origin, while for graduate students no such prediction is possible.

Finally, in the interest of increasing the degrees of freedom in our analysis still further while remaining circumspect about issues of comparability, in the third column of Table 4 we present the estimated marginal effects and corresponding standard errors and significance levels for a Probit model based on a sample pooled across both roles and the two experiments. Here, once again, the same pattern emerges.[28]

7. Selection or socialization?

In this section we endeavour to distinguish between the two possible explanations as to why undergraduates conform to their home-country cultures and graduate students do not. If the extent to which a migrating individual has assimilated the culture of their host country is proportional to the length of time they have spent in that country and if this is driving our results, the marginal effect of the interaction between TI and graduate should lose significance when years spent in the UK and years spent in the UK interacted with TI are included in the model.

The first column of Table 5 presents, once again, the Probit analysis pertaining to our modified hypothesis for the full sample pooled across 2005 and 2007. In the second column we restrict the sample to non-British students to rule out the possibility that a simple immigrant effect is driving our results. Our main result holds when we restrict the sample to non-British students.

The estimations in columns 3 and 4 include years spent in the UK and its interaction with the TI index as additional predictors.[29] Columns 3 and 4 report the results for the full and the non-British samples respectively. The marginal effect of the interaction between years spent in the UK and TI is never significant. However, within the non-British sample, as years spent in the UK increase the propensity to engage in corruption declines. Given that the UK is relatively uncorrupt, i.e., it has a low TI, this can be taken as evidence that some secondary socialization is taking place. However, note that the coefficients on TI and TI interacted with graduate retain their sign and significance. This indicates that socialization is not driving the distinction between undergraduate and graduate students and this suggests that selection also plays a role.

We endeavoured to directly test the "selection" explanation by asking participants whether they were financing their studies in Oxford through a scholarship or family savings, the idea being that rich households in highly corrupt countries are more likely to have engaged in corruption. Neither a dummy variable indicating scholarship funding nor its interaction with TI is significant when added to the models and our main result is left unaffected.[30]

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[26] Only 10% of the "public officials" demanded the subgame perfect equilibrium of G14, whereas 43% demanded a bribe equal to G10, and the remaining 30% demanded a bribe either lower or higher than G10. A figure showing the full distribution of bribes demanded is presented in the Supplementary materials.

[27] 36% would pay any bribe lower than or equal to the subgame perfect equilibrium of G14 and 6% would also pay the break-even bribe of G15. The remaining 40% would pay bribes up to maxima between G3 and G12. A figure showing the full distribution of maximum payable bribes is presented in the Supplementary Materials.

[28] Our results are robust to the inclusion of four additional country-of-origin variables that are correlated with the TI index. The four variables are: per capita GDP; an index of generalized trust; a measure of "survival versus self-expression values"; a measure of "traditional versus secular values". The second, third and fourth variables are drawn from the World Values Survey. Further analysis indicates that, as expected, the effect of the undergraduates' cultural background on the behaviour in the game is stronger when the game is framed as a corruption scenario, although not significantly stronger. See the Supplementary materials for the estimations and additional comments.

[29] Three observations are lost from the 2005 sample because we were unable to contact the subjects via e-mail.

[30] However, Vicente (2007) shows that, in corrupt countries, the allocation of scholarship funding may also be corrupt.

8. Summary and conclusion

In 2005, we took a sample of individuals living and studying in Oxford but originating from 34 countries with markedly different levels of corruption, presented them with a corruption decision associated with an exogenously defined set of monetary costs and benefits, and found that, among the undergraduates, we could predict who would and who would not engage in corruption with reference to the level of corruption prevailing in their home country. However, among graduates we could not. This was not consistent with our original hypothesis that we would be able to make such a prediction for our entire subject sample and called into question the generality of Fisman and Miguel's finding that New York-based diplomats are more likely to violate parking regulations if they are from more corrupt countries. So, we sought and found independent justifications for modifying our hypothesis, one based on the notion that graduate students may have spent longer in the UK and may have undergone more secondary socialization as a consequence, and one based on the notion that the selection processes for immigrant undergraduate and graduate students are different. Then we endeavoured to replicate the finding, thus providing a clean test of the modified hypothesis, and distinguish between the two possible explanations for the conditionality of the hypothesis.

In 2007, we took a different sample of individuals living and studying in Oxford but originating from 22 countries with markedly different levels of corruption, presented them with a similar set of costs and benefits associated with corruption, and found, once again, that among undergraduates we could predict who would and who would not engage in bribery with reference to the level of corruption prevailing in their home country, while among graduates we could not. We also found that time spent in the UK was associated with a decline in the propensity of an individual to engage in bribery within the experiment. However, this tendency did not account for the difference between undergraduate and graduate students.

Our replicated finding indicates that variations in some but not all individuals' propensities to engage in bribery reflect the values and social norms that prevail in the societies in which they grew up. This leads us to conclude that corruption is, in part, a cultural phenomenon. However, the null finding for graduate students and the finding that time spent in the UK was associated with a decline in the propensity to engage in bribery indicate, first, that Fisman and Miguel's (2007) conclusions should not be viewed as applying generally to all immigrants and, second, that individuals' norms, values and beliefs relating to corruption may change following a change in context. While corruption may, in part, be a cultural phenomenon, individuals should not be prejudged with reference to their country of origin.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.jpubeco.2010.07.006.

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