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Culture and Corruption

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1. Introduction

It's painful to be told your country is corrupt—worse still, that your culture enables or even approves corruption. No wonder there are aggrieved responses from those in supposedly corrupt countries when the Corruption Perceptions Index appears each year. "The concepts are Western and therefore biased, the measures are Western perceptions and therefore invalid, and the effects of supposedly awful corruption can be positive as well as negative." Or even: "The focus on supposed corruption is just an excuse not to help."

The narratives are more complicated. Outrage about corruption turns out to be widespread inside those "supposedly" corrupt countries, as manifested in opinion polls, electoral campaigns, and popular uprisings. Moreover, outrage sometimes elides into cultural condemnation—of one's own culture. And this condemnation in turn may readily translate into hopelessness or calls for wholesale cultural change.

Collateral damage in these proclamations and defenses are analyses of concepts, measures, and cultural links. A more nefarious result may be this: we may lose opportunities to rethink what might be done and to learn from lessons elsewhere.

This paper tries to recast discourse about culture and corruption. It examines the cross-cultural applicability of definitions of corruption, and it assesses the coherence and correlates of widely used cross-cultural measures of perceptions of corruption. It shows that these national-level measures are correlated with certain cultural characteristics. But instead of leaping to condemn or exonerate culture, it proposes that we focus on conflicting cultural norms, not corrupt cultures. It suggests practical ways to make progress in the face of cultural conflicts— by reframing the challenges as structural changes instead of cultural ones.

2. Concepts of Corruption

"Many Brazilians believe that corruption is part of our culture," a Brazilian journalist said in a recent interview, "and that without a big cultural change, we will not be able to fight corruption. Do you agree?"[1]

Brazilians are not alone in linking widespread corruption and cultural degradation. In Uganda, Emmanuel Mwaka Lutukomoi, the Resident Deputy Commissioner of Lira, declares: "We live in a rotten country, rotten districts, rotten offices, with rotten people. Corruption has invaded all public institutions… We have lost the moral sense of shame" (Okot 2016: 2).

In the United States:

> The liberal position is that Washington has been corrupted by crony capitalism, that the system is grinding the faces of ordinary working Americans … and that the answer is more Washington. The conservative position is that Washington has been corrupted by crony capitalism, that the system is grinding the

> faces of ordinary working Americans … and that the answer is to squeeze Social Security and cut taxes for the rich (Crook 2016).

Pope Francis laments that corruption has become "a personal and social statement tied to customs" and "a greater ill than sin."

> The scandalous concentration of global wealth is made possible by the connivance of public leaders with the powers that be… Corruption is a greater ill than sin. More than forgiveness, this ill must be treated. Corruption has become natural, to the point of becoming a personal and social statement tied to customs, common practice in commercial and financial transactions, in public contracting, in every negotiation that involves agents of the State (Pope Francis 2014).

When people complain about corrupted cultures, they have in mind the shared values, beliefs, and norms of a group of people (Alesina and Giuliano 2015). Despondency about corrupted cultures is often based on a perceived exaltation of greed and a diminishing of traditional ideals. And therefore—sometimes explicit in the argument but usually just assumed—without a change in culture (a revaluation of values, a change of mentality), corruption will flourish. In Mexico:

> A President who believes and affirms in public that corruption is fundamentally a cultural problem sends an alarming signal: not much can be done to change it. Worse still: he seems to be saying that he is not even going to try to do anything about corruption, since modifying the culture is not something that can be done in a term of office (Mayer-Serra 2014).

The Latin root of "to corrupt" (*corrumpo*) means to pervert or deprave, to rot or contaminate, and to spoil, including spoiling a virgin. Ancient metaphors included the

turning of the head of the judge, as with her blindfold removed she looks sideways at the bribe-paying party and tips her scales. The UN Convention Against Corruption (art. 19) defines "the abuse of functions" as "the performance of or failure to perform an act, in violation of laws, by a public official in the discharge of his or her functions, for the purpose of obtaining an undue advantage for himself or herself or for another person or entity ... when committed intentionally." Corrupt acts involve the misuse of office for illicit ends—understanding that across contexts "misuse," "office," and "illicit" vary. Corruption is where a market enters where a society says it shouldn't. For example, a society may decide that a good or service should be allocated by popular vote, not by market forces. Or by "merit," seniority, need, or random allotment. Corruption introduces instead an illicit market (Rose-Ackerman 1978: 1-2).

At this level of abstraction,

> corruption is a phenomenon universally understood in a similar manner across cultures… Differences in what is understood as corruption lie in the variation of what counts as (and is the extension of) public goods in cultures, and not variation in whether it is morally wrong to turn a public good into a private good (Rothstein & Torsello 2014, 279, 265).

All governments have laws against bribery, extortion, and related practices. No culture or religion endorses corruption (Alatas 1968). Condemning corruption is virtually universal. In late 2011, a BBC survey of citizens of 23 countries around the world identified corruption as "the topic most frequently discussed by the public."[2] Anthropological fieldwork concurs. "Stories about corruption dominate political and symbolic discourse in Nigeria. Everyday practices of corruption and the narratives they generate are primary

vehicles through which Nigerians imagine and create the relationships between state and society" (Smith 2007: 5-6). An anthropologist working in northern India "was struck by how frequently the theme of corruption cropped up in the everyday conversations of villagers. Most of the stories the men told each other in the evening, when the day's work was done and small groups had gathered at habitual places to shoot the breeze, had to do with corruption…" (Gupta 1995: 375). And it is not just gossipy chatter: in a 2013 poll of 70,000 people in 69 countries, corruption was deemed the world's number one problem (Holmes 2015: xii).

3. Measures of Corruption

If people everywhere complain about corruption, is corruption equally prevalent across cultures and countries? How would one know? Even when corruption is systemic, most corrupt acts are secretive and stigmatizing. Most people will not admit to them. Even supposedly hard data, such as media stories or cases prosecuted, will be biased in societies where the press and the prosecutors are stifled.

> These major reasons for mistake—the rarity of proof of actual bribery; the abundance of accusations; the misleading impressions given by legal activity in this regard; prejudices of many kinds; the fallacy of the perfectly corrupt man; and the reductionism that eliminates conventions and looks only at function—mean that broad generalizations about the amount of bribery in a society must be made with caution and with caveats and without great confidence in their reliability (Noonan 1984, xiv).

Scholars and policymakers have relied on perceptions of corruption. These may matter for their own sake, as signals of discontent and harbingers of unrest. Data on perceptions usefully track a concept "being put to work":

> Anthropology, it has been said, did not advance until it turned from the study of witchcraft to the study of accusations of witchcraft… Where accusations abound—where sermons on the sin are copious, there prosecutions proliferate, where laws multiply—the idea of bribery is being put to work… The reality of a concept in the society is indicated by its invocation, even thought the extent to which the idea affects official conduct cannot be closely calculated (Noonan 1984: xiv).

One widely used measure is the Corruption Perceptions Index (CPI). It is a composite measure derived from twelve different sources from eleven different institutions that capture perceptions of corruption within the previous two years. The CPI is scaled to measure "freedom from corruption," so higher scores are better.

Statisticians have explicated the qualities of a good composite measure (OECD/EC JRC 2008; Saisana, Saltelli, and Tarantola 2005), and some of these same scholars have examined the CPI.

> The JRC analysis suggests that the new methodology for the Corruption Perceptions Index (CPI), besides being appealing for reasons of transparency and replicability, it is also conceptually and statistically coherent and with a balanced structure (i.e., the CPI is not dominated by any of the individual sources). Despite the high associations between the sources, the information offered by the CPI is shown to be non redundant (Saisana and Saltelli 2012, 21).

Many other measures exist. Besides asking individuals about their experiences or perceptions of corruption, researchers have used numbers of news stories, tweets, and prosecutions (Escresa & Picci 2017). Other research looks at the flip side of corruption, for example government efficiency (Chong, La Porta, Lopez-de-Silanes & Shleifer 2014), perceptions of impartiality (Rothstein & Teorell 2012), and expert and popular perceptions of the rule of law (World Justice Project 2015). Still other researchers have created scales based on the existence and/or implementation of various laws, rules, rights, and institutions in a country (Global Integrity 2013). The PRS Group, a for-profit organization, has created a composite measure of governance, one element of which is the risk of corruption.

Most of these measures of corruption are highly correlated (the following are the author's calculations). For example, the bivariate correlations among the Corruption Perceptions Index, the World Bank's Rule of Law Index, and the World Bank's Absence of Corruption measure all exceed 0.90. The CPI is correlated 0.91 with a composite of three quality-of-government indicators of the PRS Group. The CPI is also highly correlated with answers to two questions in the World Economic Forum's Global Competitiveness Index: Irregular payments and bribes (r=0.90) and Diversion of public funds (r=0.86). A principal component of the Rule of Law index (absent one of its eight components, "control of corruption") is correlated 0.94 with the CPI.

Finally, the CPI is highly correlated with plausible preconditions and with development outcomes (Dimant 2013; Rothstein & Teorell 2014). What about with measures of national culture?

4. Links Between Culture and Corruption

Family Ties

Göran Hydén (1980, 2014) described Africa's "economies of affection" where kinship and tribal obligations inhibit good governance. An African finance minister explained it this way:

> In Africa you have to understand that people do not have a common interest. Without a common interest, there are fights. Social conflict. I don't know if you understand me. In Africa, first comes the family, then the clan, then the province, then the region, and finally the country. But the country is the last thing. (Klitgaard 2013, ch. 13).

Africa is not alone. If it is true that an African proverb says, "Whoever does not rob the state robs his kith and kin," a saying in the former Czechoslovakia was "He who does not steal from the state, steals from his family." From Latin America come accounts of clans and also of *compadrazgo* or fictive kinship that provides networks of support and often corruption (for example, Rivas 2010). Campaigning in India, Narendra Modi argued that he would not be corrupt because he is single, as opposed to other Indians with strong, corrupting family ties. From Egypt and Afghanistan come analyses of the power of family and clan to distort the good governance that many in these countries say they seek (Hessler 2016, Packer 2016). Edward Banfield (1958) created a theory of underdevelopment based on an Italian case study of "amoral familism."

Using the World Values Survey (WVS), Alberto Alesina and Paola Giuliano (2014) created a measure of the strength of family ties. This measure combined three WVS

questions that asked people about their beliefs regarding the importance of the family in an individual's life, the duties and responsibilities of parents and children, and the love and respect for one's own parents. The correlation between strength of family ties and the World Bank's control of corruption measure was -0.54. "These results remain valid if one exploits the correlation between inherited family values and current institutions and level of development, indicating a strong persistence in family values" (Alesina and Giuliano 2014: 177 and Table 10). Seymour Martin Lipset and Gabriel Salman Lenz (2000: 120) also reported strong correlations between their own "familism scale" and corruption.

Individualism

A popular cultural variable is individualism-collectivism (Gorodnichenko &. Gerard 2011, 2017), or the closely related independent-interdependent (Markus & Kitayama 1991, Markus & Conner 2013). Geert Hofstede and colleagues (2010) created a widely used country-level measure of individualism.[3] The higher a country scores on this measure, the better is its score on the Corruption Perceptions index (r=0.64).

Hierarchy

Hofstede et al. also created a measure of "power distance," a country's cultural tendency toward hierarchy.[4] This measure correlates -0.63 with "freedom from corruption."

From Tradition to Reason and from Survival to Self-Expression

Since the 1980s, the World Values Survey (WVS) has surveyed individuals in countries around the world about demographics, economic status, and values and beliefs. In a data reduction exercise, Ronald Inglehart and Christian Welzel empirically derived two

main “cultural dimensions” for each country.[5] One dimension moves from “tradition to reason.”

> Traditional values emphasize the importance of religion, parent-child ties, deference to authority and traditional family values. People who embrace these values also reject divorce, abortion, euthanasia and suicide. These societies have high levels of national pride and a nationalistic outlook. Secular-rational values have the opposite preferences to the traditional values. These societies place less emphasis on religion, traditional family values and authority. Divorce, abortion, euthanasia and suicide are seen as relatively acceptable.
>
> The second composite runs from “survival mode to individual expressiveness.”
>
> Survival values place emphasis on economic and physical security. This variable is linked with a relatively ethnocentric outlook and low levels of trust and tolerance. Self-expression values give high priority to environmental protection, growing tolerance of foreigners, gays and lesbians and gender equality, and rising demands for participation in decision-making in economic and political life.

These two dimensions alone turn out to explain 62 percent of the variance in the 2014 Corruption Perceptions Index.

Deeper Causes of Some Cultural Differences?

These cultural correlations may have deep roots. Some regions of the world historically suffered from greater diversity and intensity of pathogens, as a consequence of their high ultraviolet exposure, heat, and humidity. Gillman and Wright (2013) show that warmer, wetter climates near the equator increase evolutionary rates and species

production through shorter generation times and faster mutation rates. One consequence: more and more rapidly evolving pathogens (Keesing *et al.* 2010).

The prevalence and rapid evolution of contagious diseases led to genetic, behavioral, and cultural adaptation. Among the cultural adaptations were harsh in-group discipline and bellicose out-group behavior, ethnocentrism, and xenophobia (Thornhill & Fincher 2014). Individualism decreases in proportion to the pathogen burden (Fincher, Thornhill, Murray, & Schaller 2008; Chiao & Belinsky 2010).

> In regions characterized by a higher prevalence of infectious diseases, cultures are more highly collectivistic. The intriguing implication is that cultural differences in individualism and collectivism—differences that are fundamental to so much research in cultural psychology—may exist in part because of regional differences in the prevalence of disease-causing pathogens (Murray & Schaller 2016: 110).

The final step leads from cultural variables to corruption:

> The in-group favoritism inherent to collectivist societies is likely to engender corruption, nepotism and clientelism in the public sphere. In individualist societies, the relative weakness of in-group pressures and an emphasis on personal achievement and worth will contribute towards a more meritocratic and efficient public sector (Kyriacou 2016: 1).

Figure 1 about here.

Figure 1 displays the hypothesized evolutionary impacts, wherein climate affects the disease environment, which in turn leads to cultural adaptations, which in turn affect corruption today. Appendix 1 provides new, suggestive evidence for this theory.

Suggestive, but a full model would of course consider other causes. Genetic responses to disease environments might themselves trigger behaviors conducive to strong family ties, more collectivism, more traditional behavior, and more emphasis on survival (Fedderke, Klitgaard & Napolioni 2017). Corruption itself may cause cultural changes. For example, if a country becomes more corrupt, it may become more collectivist and more toward the traditional end and more toward the survival end of those two scales. People may revert to family ties:

> [H]uman beings are born with a suite of emotions that fortify the development of social relationships based on cooperation with friends and family. To behave differently—to choose, for example, a highly qualified employee over a friend or relative, or to work in an impersonal bureaucracy—is socially constructed behavior that runs counter to our natural inclinations. It is only with the development of political institutions like the modern state that humans begin to organize themselves and learn to cooperate in a manner that transcends friends and family. When such institutions break down, we revert to patronage and nepotism as a default form of sociability. (Fukuyama 2014: 88-9)

Policies matter, too. Public policies may abet economic development, freer trade, more exchanges of information, greater travel and intercultural contact, and more gender equity. Some of these changes may lead to less traditionalism, less emphasis on survival, less hierarchy, and more individualism—and therefore to less corruption. Second, policies matter directly to corruption (more on this below).

Alas, full causal models are usually impossible. Insufficient theory, weak data, endogeneity, competing estimation techniques, and deep heterogeneity: these many

challenges reduce our confidence that econometric models will lead to valid predictions (Fedderke and Klitgaard 1998; Salimans 2012; Söderbom et al. 2014).

But correlations between culture and corruption have led to popular vilifications: "This culture has been corrupted—nothing can be done without wholesale cultural change." Let us now consider an alternative line of reasoning. Culture matters to corruption when cultural norms conflict. Under such conditions, corruption can be reduced by changing structures, information, and incentives—without trying to engineer cultural change.

5. Cultural Conflicts, Not Cultural Corruption

"What do you do if you have to be the big fish?"

I didn't know how to answer that one.

The question came after a two-day workshop on fighting corruption with 60 South Sudanese leaders from government, the liberation army, and civil society, in 2004. We had discussed the principle of the big fish: early on, successful anti-corruption campaigns fry some big fish or offenders, including from your own party.

When the workshop closed, I invited everyone for a drink. As we mingled in the dusk, we were tired and stimulated, drained and inspired, confused and celebratory. We ate dinner. I wandered from table to table. The participants were talking about government and corruption and the tasks ahead.

It is at this point that the head of prisons looks at me and asks, "What do you do if you have to be the big fish?"

Puzzled, I ask what he means.

He inquires softly, "How did you pay for the drinks you invited us to tonight?"

I paid for it from my own pocket.

"What if you didn't have a deep-enough pocket?"

Then I get it. His role creates expectations. He must occasionally or even often provide hospitality or more—help or support or subsistence. Where should he come up with the resources? Unsaid is "without being corrupt." (Klitgaard 2013, ch. 18).

The question posed by the head of prisons is not a cultural condemnation. Neither he nor anyone else at the South Sudan workshop was saying, "In our culture it's okay to put yourself and your family above your obligations to serve in the public interest." Rather, his question poses a cultural conflict. Public servants have a role-related obligation to be impartial and not corrupt. They may also experience a kinship-related obligation to favor family and friends, even when it entails corruption.

Even in quite corrupt settings, citizens and public officials affirm values of impartial public service and scorn bribery. A study of villages in Kerala and Madhya Pradesh, India, concluded that "corruption is not accepted by most people in the survey; most respondents favor a rule-governed bureaucracy within a democratic setting, regardless of whether the society is plagued by corruption or not" (Widmalm 2005: 774). Half of Mexicans surveyed admitted to having been asked to pay a bribe, and almost four-fifths agreed that "politicians are corrupt." But 87 percent said politicians should be held accountable, and 80 percent "believed that citizens should obey the law without exception" (Morris and Klesner 2010, 1267-68).

The head of prisons confronts competing cultural norms, which may lead him to take actions others, and importantly he himself, perceive to be corrupt. Even when officials

and citizens also value impartiality in public service, strong ties to kin and clan may lead to pressures for favoritism.

One approach is to try to change South Sudan's culture, so that (for example) the strength of family ties is attenuated, power distance is reduced, collectivism is loosened, and an overarching identity can overcome cultural diversity. Another approach is to change the decision context faced by the head of prisons (and other officials, in their contexts), including his ability to convey favoritism and his calculations of the risks and rewards of doing so.

Corruption is a crime of calculation. As the Auditor General of Uganda puts it, "Someone will ask, 'Will it pay?' If it will, one will steal. If it won't pay, one won't steal. It should be too expensive to steal. This is why corruption is happening on a grand scale" (Human Rights Watch 2013: 1). The task is to change structures, information, and incentives to reduce scope of corruption.

Consider a checklist for policy design regarding corruption.[6]

Exhibit 1 about here

Exhibit 1 mentions values, but it sets aside the challenge of changing the national norm of helping one's family and friends. Instead, it addresses the decision frame in which the official is found.

Let us now consider a second cultural conflict, in which people may pay bribes even when they loathe bribery. In countries experiencing systemic corruption, people may decry corruption in the morning, pay a bribe to get a needed service in the afternoon, and then in the evening complain that corruption has become part of their culture. In Nigeria,

> People frequently condemn corruption and its consequences as immoral and socially ruinous, yet they also participate in seemingly contradictory behaviors that enable, encourage, and even glorify corruption… In many instances, ordinary Nigerians see themselves as complicit in corruption, and indeed it is this awareness of collective responsibility for corruption that fuels hopes for change, even as it paradoxically perpetuates cynicism and a sense of intractability (Smith 2007: 5, 6).

In India,

> a highly placed official who fails to help a close relative or a fellow villager obtain a government position is often roundly criticized by people for not fulfilling his obligations to his kinsmen and village brothers. On the other hand, the same people often roundly condemn any official of another caste or village who has done precisely that as being 'corrupt' and as guilty of 'nepotism' (Gupta 1995: 397n46).

In these situations, we may talk metaphorically of a culture of corruption as when "Good people, trapped in a corrupt structure, become corrupted as they do their best within the given economic, legal, institutional structure" (Light 2013: 3). In fact, in many cases where corruption becomes the expectation, people have excellent individual ethics. Given what everyone else is doing, it may be almost imperative to bribe, to be dishonest, to cheat. Do values therefore erode? Perhaps. But are stronger ethics likely to solve the structural problem? No.

A corrupt equilibrium can be understood as an n-person Prisoners' Dilemma where many people may wish they didn't have to participate but where individual maximizing logic drives them to do so. Once corrupt behavior is embedded, each individual may have little choice but to go along. The logic of calculation and equilibrium suggest solutions that

go beyond efforts to change a culture's norms and values. The principles of change resemble other situations of collective action (Olson 1971; Poteete, Janssen & Ostrom 2010). They include a variety of ways to "subvert" a corrupt equilibrium, including "frying big fish," taking two or three highly visible steps that people can perceive as progress, and reforming institutions to raise the risks and lower the rewards from corrupt behaviors (Klitgaard 2000; Pieth ed. 2012; Klitgaard 2015). The literature on strategic change is also relevant (for example, Heath & Heath 2010).

Singapore is an excellent example. In the 1960s, it moved from an equilibrium of corruption to one of remarkably good governance, without notably changing national cultural characteristics such as family ties, individualism, or power distance (Klitgaard, 1988, ch. 4). Other valuable examples are Colombia in the late 1990s, Georgia in 2004, the Philippines under Benigno Aquino III, Qatar, and Rwanda (Alam et al. 2012; Klitgaard 2015). Some would include Indonesia, which moved in the first decade of the 21st century from about the 6th percentile to the 40th percentile on the Corruption Perceptions Index.

A number of cities have also made impressive progress against corruption, such as Bogotá and Medellín, Colombia; Campo Elias, Venezuela; Naga City, the Philippines; La Paz, Bolivia; and Mandaue, the Philippines (Devlin and Chaskel, 2010a, 2010b; González de Asís, 2000; Puatu, 2012; Klitgaard, MacLean-Abaroa & Parris, 2000; Klitgaard and Smith 2017). Craiova, Romania and Martin, Slovak Republic, won the United Nations Public Service Awards in 2011 for their reforms against corruption.

These cases reveal the intersection between economic analysis of corrupt equilbriums (organizational structures, information, incentives, and Prisoners' Dilemmas) and political acumen (not trying to do everything at once, building momentum, frying big

fish, fostering collaboration with business and civil society). Their structural approaches bracket out changing values and beliefs. It is not that corruption isn't connected with cultural values and moral dilemmas—it is. Rather, the point is that effective anti-corruption strategies don't need to rely on the daunting task of cultural change.

6. Conclusions

In many areas of the social sciences, we confront situations where culture matters. Indeed, culture is sometimes "blamed" for poverty or dictatorship, anomie or hypercompetitiveness, the subjugation of women or the inefficiency of agriculture. Correlations may well exist, and so may theories that "explain" the deep roots of cultural patterns. The conclusion may seem inescapable and fatalistic: "What can one do if culture is to blame?"[7] Or utopian: "We must aim for a change of mentality, a cultural revolution, a transformation of values."

This paper suggests a different approach. First, examine the relevant concepts and measures and see if they are in fact applicable across cultures. In the case of corruption, we saw how concepts and measures are contestable and inexact. And yet, across cultures people describe and decry similar acts as "corrupt." Across countries many measures of corruption are statistically coherent, and they are correlated with each other and with theoretically attractive precursors and consequences. Even though we found statistical support for an evolutionary theory linking climate, disease, culture, and corruption, we also discovered what is common in cross-country empirical work: theory uncertainty, model uncertainty, and specification uncertainty, plus a small number of observations, a large number of possible causes and confounders, and limited data (especially over time). As a result, causal modeling linking culture to corruption is precarious.

Second, look for conflicting cultural norms, rather than corrupt cultures. We examined two conflicts: family ties vs. impartial public service, and a corrupt equilibrium where citizens bribe even though they oppose bribery. We asked how the public servant's choices could be constrained and incentivized, limiting the scope for corruption and nepotism. Beyond individual agents, we turn to structures. How do systematically corrupted systems work, and how they might be undermined?

Third, insofar as national cultures go, take them into account without trying to change them. Ask how anti-corruption initiatives can take advantage of our cultural contexts. Emphasize our religion (all religions condemn bribery) and our relevant traditional values. Use our indigenous institutions to help design, implement, and monitor reforms. And restate the reforms we desire in language that appeals in our culture, not necessarily in the language of economics or Western philosophy or agencies of international development.

Finally, if we are outsiders we should begin with local people's complaints. We should immerse ourselves in their outrage over corruption, their stories of dysfunction, and their desire to do better. And we should simultaneously recognize the contradictions in our own societies. Recall our own n-person Prisoners' Dilemmas of disappointing conformity to things we really don't admire. Recall our own examples of stigma and self-stigma. We may thereby be able to think more creatively and practically, and act more humbly and humanely.

Appendix 1

Exploring Links: Climate, Pathogen Prevalence, Culture, and Corruption

Data

Corruption

As noted in the body of the paper, CPI is Transparency International's Corruption Perceptions Index in 2014. Higher scores reflect lower corruption (more "freedom from corruption").

Culture

The several cultural variables analyzed here are explained in the body of the paper. Briefly:

- Trad-Rat is a composite cultural dimension from "tradition to reason," derived from five questions on the World Values Survey (Inglehart and Welzel n.d., expanding on Inglehart and Baker 2000).
- Surv-Exp is a composite cultural dimension from "survival to self-expression," derived from five questions on the World Values Survey (Inglehart and Welzel n.d., expanding on Inglehart and Baker 2000).
- Indiv is a country's average level of Individualism (as opposed to collectivism) (Hofstede et al. 2010).
- Power is a country's average level of Power Distance, a measure of acceptance of hierarchy (Hofstede et al. 2010).

Historical Pathogen Burden

HPB is a nine-item composite from Murray and Schaller (2010). Building on Gangestad and Buss (1993), they employed epidemiological atlases to estimate the historical prevalence of nine pathogens detrimental to human reproductive fitness (leishmanias, trypanosomes, malaria, schistosomes, filariae, leprosy, dengue, typhus, and tuberculosis). Each of the nine disease indices was converted to a z-score. Then a grand mean z-score was calculated for the nine items (so that the resulting country score is not itself a z-score). To my knowledge, these data have not been used in studies of corruption.

Climate

UVR refers to the World Health Organization-derived ultraviolet (B) exposure rating. This measure reflects biological exposure per square meter (BD/m^2), with the continuous measure scaled by dividing each averaged ultraviolet radiation dose by half of the interquartile range (Herman *et al.,* 1999). The data are from an earlier version of Andersen, Dalgaard, and Selaya (2016). Andersen, Dalgaard, and Selaya (2016) showed that societies more exposed to UVB have higher rates of eye problems, including cataracts, which is the leading cause of blindness worldwide. The authors noted that countries with higher UVR tend to be poorer and were later in undergoing the fertility transition. To my knowledge, these data have not been used in studies of culture or corruption.

Data on mean temperature and mean rainfall come from Ashraf and Galor 2013.

Summary Statistics

Table 1 about here

Table 1 shows the summary statistics and Table 2 the zero-order correlations among three climatic variables, a measure of the historical disease environment, three

measures of culture, and a measure of corruption. Note that all the variables—climate (except for rainfall), disease environment, and culture—are significantly correlated with the Corruption Perceptions Index in 2014.

Table 2 about here

Multivariate Analysis

Multiple regression analysis has been used to gauge the independent effects of climate and infectious diseases on cultural variables such as individualism (for example, Murray and Schaller 2010). Table 3 shows a regression with the Corruption Perceptions Index as the outcome variable and the three climatic variables, the measure of the historical pathogen burden, and the four cultural measures as predictor variables.

Table 3 about here.

Table 3 has an interesting interpretation: about three-quarters of the variance in corruption perceptions across countries can be explained by climate, historical pathogen burdens, and four cultural variables.

Table 4 estimates the scheme in Figure 1 using path analysis. First, the disease environment is regressed against the climatic variables. Then the various cultural variables are regressed separately against the disease environment predicted by the climatic variable. Finally, corruption is regressed against these predicted cultural variables as well as the predicted disease environment and the climate variables.

Table 4 about here.

Figure 2 about here

The results, displayed also in Figure 2, are consistent with the theory that the effects on corruption of climate and disease environments are evolutionary, based on their long-

term effects on the two cultural constellations "traditional-rational" and "survival-self-expression," power distance, and (to a lesser extent) on individualism. In this model, neither the climatic variables nor the historical disease environment have significant *direct* effects on corruption (their path coefficients or beta weights in the final part of Table 4 are not statistically significant).

Exhibit

Exhibit 1

Measures to Control Corruption: A Framework for Policy Analysis

A. Select agents for "honesty" and "capability"
   1. Screen out the dishonest (past records, tests, predictors of honesty)
   2. Exploit outside "guarantees" of honesty (networks for finding dependable agents and ensuring they stay that way)

B. Change the rewards and penalties facing agents (and clients)
   1. Shift rewards
      a. Raise salaries to reduce the need for corrupt income
      b. Reward specific actions and agents that control corruption
      c. Use contingent contracts to reward agents as a function of their eventual success or failure (analogies: forfeitable nonvested pensions, performance bonds)
      d. Use nonmonetary rewards (transfers, training, travel, publicity, praise)
   2. Penalize corrupt behavior
      a. Raise the general levels of formal penalties
      b. Increase the principal's authority to punish
      c. Calibrate penalties in terms of deterrence (as a function of the size of the bribe and the size of the illicit profit)
      d. Use nonformal penalties (transfers, publicity, loss of professional standing, blackballing)

C. Gather and analyze information in order to raise the chances that corruption will be detected
   1. Improve auditing systems and management information systems
      a. Provide evidence that corruption has occurred (red flags, statistical analyses, random samples, inspections)
      b. Assess the organization's vulnerability to corruption
   2. Strengthen "information agents"
      a. Beef up specialized staff (auditors, investigators, surveillance, internal security)
      b. Create a climate where agents will report improper activities (e.g., whistle-blowers)
      c. Create new units (ombudsmen, special audit committees, anticorruption agencies)
   3. Use information provide by third parties (media, banks)
   4. Use information provided by clients and the public
   5. Change the burden of proof, so that the potentially corrupt have to demonstrate their innocence

D. Restructure the principal-agent-client relationship to remove the corruption-inducing combination of monopoly power plus discretion plus little accountability
   1. Induce competition in the provision of service (private sector, among government agents)
   2. Reduce agents' discretion

    a. Define objectives, rules, and procedures more tightly
    b. Have agents work in teams and subject them to hierarchical review
    c. Divide large decisions into separable tasks
3. Rotate agents functionally and geographically
4. Change the organization's mission, product, or technology to render them less susceptible to corruption
5. Organize client groups, to render them less susceptible to some forms of corruption and to create an anticorruption lobbying force

E. Change attitudes about corruption
1. Use training, educational programs, and personal example
2. Promulgate a code of ethics (civil service, particular organizations)
3. Change the organizational culture

Source: Klitgaard (1988): 94-5.

Tables

Table 1

Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
CPI	**50.94203**	**19.75057**	**16**	**92**
Trad_Rat	**-.2685507**	**1.049967**	**-2.06**	**1.96**
Surv_Exp	**.0553623**	**1.01213**	**-1.68**	**2.35**
Indiv	**42.42029**	**22.62638**	**6**	**91**
Power	**62.11594**	**21.18791**	**11**	**100**
HPB	**-.0469565**	**.667474**	**-1.31**	**1.16**
UVR	**160.7264**	**81.86526**	**33.44367**	**298.4733**
Temp	**14.96196**	**8.561791**	**-7.475**	**28.225**
ln_Rain	**6.777005**	**.720874**	**3.931826**	**7.963808**

Note: N = 69 countries. CPI = Corruption Perceptions Index 2014 (see text). Trad_Rat = traditional-rational (see text). Surv_Exp = survival-self-expressive (see text). Indiv = individualism (see text). Power = power distance (see text). HPB = historical pathogen burden (see Annex 1 for details). UVR = ultraviolet (B) exposure rating (see Annex 1 for details). Temp = mean temperature. ln_Rain = log of mean rainfall.

Table 2

Correlations

	CPI	Trad_Rat	Surv_Exp	Indiv	Power	HPB	UVR	Temp	ln_Rain
CPI	**1.0000**								
Trad_Rat	**0.5700**	**1.0000**							
Surv_Exp	**0.6625**	**0.1570**	**1.0000**						
Indiv	**0.7091**	**0.5170**	**0.5197**	**1.0000**					
Power	**−0.6979**	**−0.3530**	**−0.5615**	**−0.6461**	**1.0000**				
HPB	**−0.6363**	**−0.5654**	**−0.3830**	**−0.6534**	**0.4756**	**1.0000**			
UVR	**−0.6176**	**−0.7241**	**−0.2325**	**−0.6566**	**0.3978**	**0.8385**	**1.0000**		
Temp	**−0.5528**	**−0.6892**	**−0.2313**	**−0.6299**	**0.3769**	**0.8015**	**0.9263**	**1.0000**	
ln_Rain	**−0.0328**	**−0.0159**	**0.1359**	**−0.3105**	**0.1798**	**0.1657**	**0.2352**	**0.2565**	**1.0000**

Table 3

Multiple Regression with Beta Weights

Source	SS	df	MS		
Model	20312.7359	8	2539.09199	Number of obs =	69
Residual	6213.03219	60	103.550537	F(8, 60) =	24.52
				Prob > F =	0.0000
Total	26525.7681	68	390.084825	R-squared =	0.7658
				Adj R-squared =	0.7345
				Root MSE =	10.176

CPI	Coef.	Std. Err.	t	P>|t|	Beta
Trad_Rat	4.139102	1.849716	2.24	0.029	.2200403
Surv_Exp	7.022143	1.732175	4.05	0.000	.3598542
Indiv	.1034457	.0971229	1.07	0.291	.1185081
Power	-.2459613	.0834686	-2.95	0.005	-.2638612
HPB	-1.478152	3.738559	-0.40	0.694	-.0499544
UVR	-.0912572	.0478838	-1.91	0.061	-.3782573
Temp	.5435811	.3915465	1.39	0.170	.2356402
ln_Rain	1.171835	2.079906	0.56	0.575	.0427707
_cons	61.07821	17.11787	3.57	0.001	.

Table 4

Path Analysis

HPB	Coef.	Std. Err.	t	P>|t|	Beta
UVR	.0068366	.0005428	12.60	0.000	.8385012
_cons	-1.145774	.0977551	-11.72	0.000	.

n = 69 R2 = 0.7031 sqrt(1 - R2) = 0.5449

HPB	Coef.	Std. Err.	t	P>|t|	Beta
Temp	.0624841	.0056956	10.97	0.000	.8014933
_cons	-.9818411	.098007	-10.02	0.000	.

n = 69 R2 = 0.6424 sqrt(1 - R2) = 0.5980

HPB	Coef.	Std. Err.	t	P>|t|	Beta
ln_Rain	.1534041	.1115562	1.38	0.174	.1656769
_cons	-1.086577	.7602205	-1.43	0.158	.

n = 69 R2 = 0.0274 sqrt(1 - R2) = 0.9862

Trad_Rat	Coef.	Std. Err.	t	P>|t|	Beta
HPB	-.8893875	.1585127	-5.61	0.000	-.5653922
_cons	-.3103133	.105297	-2.95	0.004	.

n = 69 R2 = 0.3197 sqrt(1 - R2) = 0.8248

Surv_Exp	Coef.	Std. Err.	t	P>|t|	Beta
HPB	-.5807347	.1711285	-3.39	0.001	-.3829797
_cons	.028093	.1136774	0.25	0.806	.

n = 69 R2 = 0.1467 sqrt(1 - R2) = 0.9238

Indiv	Coef.	Std. Err.	t	P>|t|	Beta
HPB	-22.15046	3.134943	-7.07	0.000	-.6534343
_cons	41.38018	2.082484	19.87	0.000	.

n = 69 R2 = 0.4270 sqrt(1 - R2) = 0.7570

Power	Coef.	Std. Err.	t	P>|t|	Beta
HPB	15.09651	3.411439	4.43	0.000	.475579
_cons	62.82482	2.266155	27.72	0.000	.

n = 69 R2 = 0.2262 sqrt(1 - R2) = 0.8797

CPI	Coef.	Std. Err.	t	P>|t|	Beta
Trad_Rat	4.139102	1.849716	2.24	0.029	.2200403
Surv_Exp	7.022143	1.732175	4.05	0.000	.3598542
Indiv	.1034457	.0971229	1.07	0.291	.1185081
Power	-.2459613	.0834686	-2.95	0.005	-.2638612
HPB	-1.478152	3.738559	-0.40	0.694	-.0499544
UVR	-.0912572	.0478838	-1.91	0.061	-.3782573
Temp	.5435811	.3915465	1.39	0.170	.2356402
ln_Rain	1.171835	2.079906	0.56	0.575	.0427707
_cons	61.07821	17.11787	3.57	0.001	.

n = 69 R2 = 0.7658 sqrt(1 - R2) = 0.4840

Figures

Figure 1

Climate, Infectious Disease, Cultural Adaptations to Disease, and Corruption

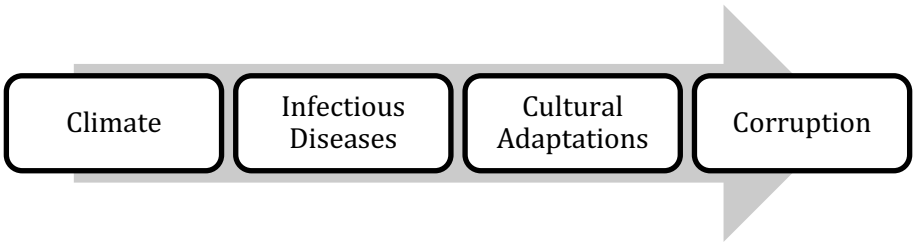
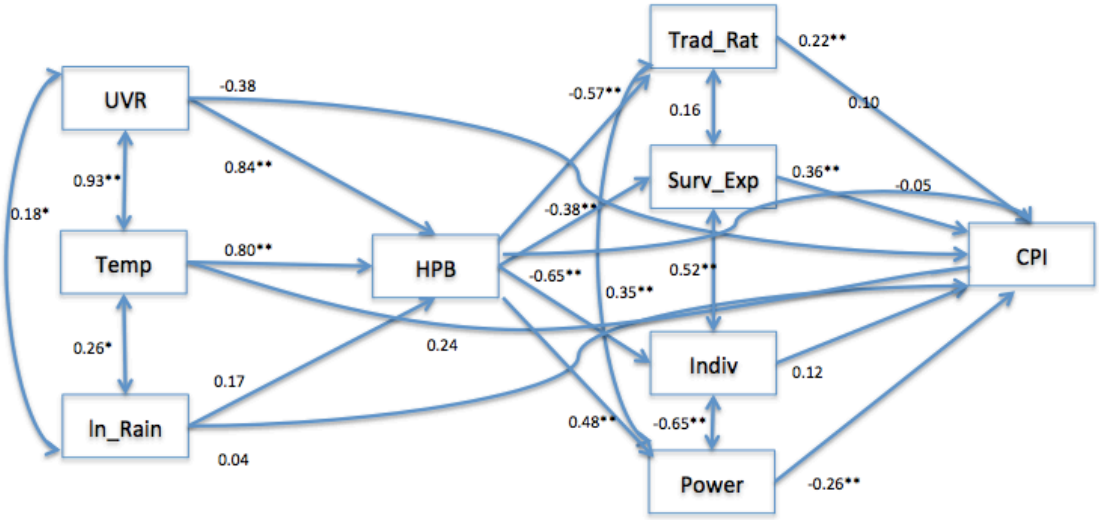


Figure 2

Climate Affects the Historic Disease Burden, Which Then Affects Cultural Variables, Which In Turn Affect Corruption



Note: N = 69 countries. ** significant at p<0.01. * = significant at p<0.05. Other paths are not significant at p<0.10.

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Endnotes

[1] Personal communication. The subtitle of her published article included this even stronger question: "A trapaça está enraizada no nosso DNA?" ("Is cheating rooted in our DNA?") (Bublitz 2016).

[2] http://www.globescan.com/news-and-analysis/press-releases/press-releases-2011/94-press-releases-2011/126-unemployment-rises-as-qmost-talked-aboutq-problem-global-poll.html

[3] Individualism is "…defined as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. Its opposite, collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty. A society's position on this dimension is reflected in whether people's self-image is defined in terms of 'I' or 'we.'" https://geert-hofstede.com/national-culture.html

[4] "This dimension expresses the degree to which the less powerful members of a society accept and expect that power is distributed unequally. The fundamental issue here is how a society handles inequalities among people. People in societies exhibiting a large degree of Power Distance accept a hierarchical order in which everybody has a place and which needs no further justification. In societies with low Power Distance, people strive to equalize the distribution of power and demand justification for inequalities of power". https://geert-hofstede.com/national-culture.html

[5] See http://www.worldvaluessurvey.org/WVSContents.jsp?CMSID=Findings. This is a statistical updating of Inglehart & Baker (2000).

[6] Checklists may sound like something in books "for dummies," but Atul Gawande reminds us in *The Checklist Manifesto* that they are used in sophisticated, high-tech settings: "Checklists…are not comprehensive how-to guides, whether for building a skyscraper or getting a plane out of trouble. They are quick and simple tools aimed to buttress the skills of expert professionals" (Gawande 2010: 128). "If our goal is to be of practical use to policymakers, we academicians would do better to derive rough-and-ready frameworks and checklists instead of calculating theoretically 'optimal' policies under highly restrictive and unrealistic conditions. We might think of our job as stimulating creativity, making sure promising options are not overlooked, and highlighting trade-offs—a much humbler stance than many social scientists and policy advisers are used but, I think, the correct one" (Klitgaard 1988: 95-6).

[7] José Atilano Pena López and José Manuel Sánchez Santos (2014) found that Hofstede's individualism and power distance were significant predictors of the 2001 Corruption Perceptions Index in 60 countries. They concluded, "Since corruption depends on cultural variables, public intervention capabilities are greatly reduced, at least in the short term" (705).