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Three Essays in Empirical and Experimental Development Economics: Pro-social Behavior, Monitoring of Development-Linked Public Goods and Inequality in Sub-Saharan Africa

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Ich versichere, dass ich die eingereichte Dissertation ‘Three Essays in Empirical and Experimental Development Economics: Pro-social Behavior, Monitoring of Development-Linked Public Goods and Inequality in Sub-Saharan Africa’ selbstständig und ohne unerlaubte Hilfsmittel verfasst habe; fremde Hilfe habe ich dazu weder unentgeltlich noch entgeltlich entgegengenommen und werde dies auch zukünftig so halten. Anderer als der von mir angegebenen Hilfsmittel und Schriften habe ich mich nicht bedient. Alle wörtlich oder sinngemäß den Schriften anderer Autoren entnommenen Stellen habe ich kenntlich gemacht.

To Family

(Edeedi & Nana)

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Edward Asiedu
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General Introduction and Overview

Core issues at the heart of development economics as well as agricultural economics are addressed in this dissertation. For the past decade, there has been a rapid transformation in the global agricultural value chain (see Barrett et al., 2012; Reardon et al., 2004; Barrett et al., 2001). The rise in supermarkets, the introduction and rise in certification standards, increased demand for niche produce, etc. are some of the evidence of the rapid changes taking place in the agricultural value chain. These transformations inter alia, have been spearheaded by factors such as economic growth, international market integration, urbanization, and changing consumer behavior (Mergenthaler et al., 2009). Bolwig et al. (2009) observed that increases in demand and production of niche market products such as organic coffee and organic cocoa have led to increases in smallholder farmers' incomes in most developing countries. However, aside the benefits, these value chain transformations have also led to new challenges for developing countries agricultural institutions and organizations (see Reardon et al., 2004).

One of such new challenge is how best to overcome certification barriers or maintain group certification systems. As a requirement for integrating into high-value niche markets (organic and fair-trade markets), smallholder farmers who produce very few acreages of land have to be certified. Faced with the high transaction cost associated with the certification process, especially with external monitoring, smallholder farmers have to form farmer groups or cooperatives. In this regard, Internal Control Systems (ICS) were introduced in farmer groups in many developing countries to help overcome the high external monitoring cost (Preißel and Reckling, 2010). IFOAM defines ICS as a documented quality assurance system that allows the external certification body to delegates the annual inspection of individual group members to an identified unit within the certified group (see IFOAM 2003). The certified farmer group or cooperative in turn selects internal monitors from either the farmer group or from the

village with the responsibility of inspection, monitoring, sanctioning and making recommendations to farmers congruent with the standards. For group certification, once the certificate is obtained by the group there is high tendency for non-compliance or free-riding, which over time could lead to the withdrawal of the group certificate. Thus, the key here for a successful farmer group and to link smallholder farmers to high value chains is the sustainability of strong internal mechanisms in groups to crowd-out anti-social behaviors.

This dissertation takes a much broader approach with much broader implications not just for the certification process, but also for the general provision of public goods in developing countries. Like certification, a similar challenge pertains to anti-social behavior such as free-riding, and the collapse of a number of public goods (community infrastructures) in Sub-Saharan Africa. For example, the provision and maintenance of borehole water in communities, repair and/or maintenance of school buildings and health facilities, maintenance of feeder roads in communities, community cleaning to avoid malaria etc., are some examples of under supplied development-linked public goods (see Björkman and Svensson, 2009). UNIDO report (2008) suggests that mechanisms for the effective delivery of public goods and services should be central in any poverty eradication strategy (see also Besley and Ghatak, 2006). Thus, this dissertation contributes to two important issues in development economics.

The dissertation uniquely combines both empirical and experimental methods (which are much difficult to implement in the field) in the field. Chapter 1 examines corruption (anti-social behavior) across Sub-Saharan Africa. In this chapter, we consider the micro-economic determinants of corruption and provide implications for institutions. The 2004 World Development Report is devoted to putting poor people at the center of monitoring of development-oriented programs in developing countries and also aimed at amplifying the poor's voice in policymaking (Olken, 2007; World Bank 2004). Chapters 2 and 3 contribute

to this question examining the impact of social characteristics of the monitor and the type of sanctioning institution on the provision and maintenance of public goods in developing countries. Specifically, Chapter 2 applies a field experiment and focuses on gender and group norm enforcement in matrilineal and patriarchal societies. Chapter 3 uses a similar experimental design to examine whether the monitor's age has an impact on the level of compliance to public goods provision. The drivers of corruption and the determinants of the effectiveness of monitoring are important questions for development and development programs. This dissertation aims at providing evidence on issues that have been under-studied in the literature and hopes to bring new evidence to bear on the literature. Below are highlights of the three chapters and their main results.

Chapter 1: The first chapter concerns the question of whether or not situational factors alter individual's anti-social behavior. This chapter builds on works by Swamy et al. (2001) and Dollar et al. (1998) who finds that corruption is less severe in groups or institutions where women held a large share of senior positions. Swamy et al. (2001) also finds that women are less likely to indulge in corrupt practices than men. Yet, there seem to be little evidence however on how anti-social behaviors of individuals, in this case corruption, are altered by basic human needs such as the need for food, water services, sanitation services etc. Another important issue that this chapter addresses in detail is whether the observed gender and educational differences in pro-social behavior are mainly due to differences in exposure to the possibility to be corrupt. Thus, this chapter in part examines the robustness of the earlier findings. Using a number of robustness checks including Heckman's two-stage models, the essay examines whether the gender and educational differences in engagement in corruption still holds after correcting for the differences in exposure. The empirical evidence shows that

not only are women less involved in anti-social behavior; but in addition the gender effects hold even when basic needs such as water and sanitation services are at stake. However, basic human needs do narrow the magnitude of the gender and educational differences in corruption. The chapter concludes that even though the findings further underscore the role of women in helping to reduce anti-social behavior, there is the need for stronger institutions as individuals' pro-social motivations may be malleable. This chapter can be viewed as a methodological or empirical addition to the literature on anti-social behavior. Chapters 2 and 3 proceed to examine the impacts of such institutions such as monitoring and sanctioning on compliance.

Chapters 2 and 3: In these two essays we examine the impact of different institutions on pro-social behavior or compliance. There are two strands of literature on institutions that foster pro-social behavior: one that focuses on monitoring as a mechanism and the other that combines monitoring and sanctioning institutions. For example, Björtkman and Svensson (2009) find a positive effect of community-based monitoring of projects on the quality and quantity of primary health care provision in Uganda. Olken (2007) finds that increasing community participation in the monitoring of corruption in Indonesia had little average effect. Based on weekly visits to health facilities in India, Banerjee, Deaton, and Duflo (2004) find no significant impact of monitoring on the attendance of community nurses. On the impact of sanctioning institutions (monetary and non-monetary), a number of experimental papers have found large empirical evidence of its effect (see Andreoni and Gee, 2012; Baldassarri and Grossman, 2011; Fehr and Fischbacher, 2004; Kube and Traxler, 2011; Yamagishi, 1986). Nonetheless, one topic that has received little attention in the growing literature is how the characteristics of the monitor affect the outcome of monitoring and the effectiveness of sanctions. In retrospect, little is known whether the small effect of monitoring on outcomes

observed in the field are due to certain characteristics of the monitors or whether certain characteristics of monitors make them more effective. Thus, should we simply implement monitoring and sanctioning mechanisms to achieve cooperation or should we also care about who monitors or sanctions in the field?

Chapter 2 applies a unique field experiment in Ghana to examine whether the gender of monitors impacts monitoring outcomes. Thus, in effect we examine the role of gender in development. In Chapter 3, we proceed to examine the impact of other social characteristics of monitors. Existing research has shown that gender gap permeates many aspects of our society. Such evidence seems to be more pronounce in developing countries. For example, Agarwal's (2000) study on community environmental programs observed that women participation on management committees is typically low in most developing countries. Matsa and Miller (2011) noted that only few women occupy top positions or are selected into leadership positions. A number of researchers have attributed these differences to differences in risk aversion and competiveness (see Eckel and Grossman, 2008; Croson and Gneezy, 2009; Gneezy et al., 2003; Niederle and Vesterlund, 2007; Gneezy et al., 2009). In this chapter, we examine whether when women are placed in positions of authority or in-charge of monitoring development programs they are systematically different in their ability to use enforcement institutions. We also examine whether when women use enforcement institutions, people respond more or less compared to men. Lastly, we examine in this chapter whether the cultural environment in which women live impacts such outcomes. In a sense, this chapter tries to trace the origin of such gender differences, if any, by examining historical differences in access to resources in matrilineal and patriarchal societies in Ghana. The analysis shows that women monitors in the patriarchal communities are less effective using enforcement institutions whilst in the matrilineal communities are as effective as the men. The data also shows that women and men in the patriarchal communities show similar sanctioning

behaviors. The chapter concludes that, the lower effectiveness of women in monitoring or fostering collective action is driven by factors that are external to the woman, like the culture or general social perception. The evidence squares well with the notion that social cultures against women maybe more responsible for low representation of women in positions of authority.

The chapter provides strong implication not just for monitoring development public goods but also for general public policy. Overall, the chapter argues strongly in favor of "breaking the glass ceiling". However, it argues that policy makers should bear in mind that the placing of women in positions of authority alone i.e. "chipping-away at the glass ceiling" would not in itself automatically lead to superior outcomes but more policy and institutional commitment would be needed in support. The results from this essay together with other papers that compare behavior in matrilineal and patriarchal societies point to a robust relationship between gender, culture, and economic outcomes. The results are also a testament to the presence of strong gender-inequality-differential within countries. This chapter argues that policies that promote the welfare of women (i.e. such as economic participation and decision-making power) especially in developing countries should take into account inequality differences within the countries for effective policy intervention. This chapter adds to the growing literature on monitoring outcomes of development programs and also contributes to the literature on the need for gender empowerment in the development agenda.

In **Chapter 3**, we probe further the findings in Chapter 2 by examining the role of other social dimensions of monitors. In a number of societies, people mandate respect towards the old. We examine whether the provision and monitoring of public goods in developing countries are impacted by the age-status of individuals placed in-charge of monitoring. Using a similar field experiment as in chapter 2, this chapter examines the impact of the monitor's age-status

on monitoring outcomes. We find that, the elderly are more effective as monitors compared to the young. We also find that in smaller communities, the effect is much stronger. The result demonstrates the importance of social consideration in monitoring. The essay concludes that, in inducing cooperation in the field and sustaining public goods, policy makers must understand the social norm that permeates the society in question. This chapter makes a critical contribution to the literature on monitoring of development-based public goods.

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Chapter 1

1 Revisiting the role of Gender, Education and Situational Effects in Corruption Behavior: Evidence from sub-Saharan Africa

Edward Asiedu

Abstract: This paper uses unique micro-data information on bribe payments in Africa to re-examine the socioeconomic determinants of corruption. Using a representative sample of over 24,000 adults across countries in Africa, we show that not only are women less involved in paying bribes; but that this holds even when basic needs such as water and sanitation services are at stake. We find that this difference is robust once we control for differences in 'bribe-exposure'. The evidence however shows that basic human needs do narrow the magnitude of the gender differences in corruption. The evidence for education shows that controlling for differences in bribe-exposure completely offsets the educational differences in corruption. These findings further underscore the role of women in helping to reduce corruption and the need for stronger institutions as individuals' pro-social motivations may be malleable.

JEL classification: H10; K42; J16

Keywords: Africa, Corruption, Behavior, Situational Effects, Gender, public policy

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Single author paper.

1.1 Introduction

It is well-known that corruption is widespread in most developing countries, particularly in Africa. This is true in terms of petty corruption but also institutional-level corruption. Using data from the World Bank, Clarke (2011) observed that firms and households paid bribes between $0.6 trillion and $1.5 trillion each year between 1999 and 2003. Data from the United Nations (2012) indicates that over 30 percent of all development aid is lost annually through corrupt practices. In a recent news item on Africa, it is reported that the education of some hundreds of children in Nigeria were hampered when a former state governor stole some $250 million in public funds (Ravelo, 2012). Moreover, recent studies have shown that corruption poses a critical impediment to economic growth and development across the world (Meon and Sekkat, 2005; Powell et al., 2010; Brunetti et al., 1998; Bardham, 1997; Mauro, 1995; Knack and Keefer, 1995; De Sota, 1989; Klitgaard, 1988).[1]

Until recently, most of the empirical research on corruption has focused on the macro-drivers of corruption (see Fisman and Gatti, 2002; Graeff and Mehlkop, 2003; Brunetti and Weber, 2003). For example, Fisman and Gatti (2002) have explored the impact of decentralization on country level corruption. Brunetti and Weder (2003) observed at the country level, the impact of free-press on corruption. The difficulty of collecting good empirical data on is often cited for this state of the literature on corruption (Bardhan, 1997). However, recently new micro-data information has been made available that allows for a more in-depth analysis. This paper uses the Afro-barometer data on Sub-Saharan Africa to examine the socioeconomic drivers of corruption and provide implications for gender empowerment as well as for institutions in sub-Saharan Africa. The existing empirical

[1] The negative impact of corruption on growth, investments, informal economy activities, resource allocation etc. have been widely discussed by Gupta et al (2001) provides evidence that high and rising corruption increases income inequality and poverty.

evidence suggests that females are less likely to be corrupt than men. To the extent that females account for only about 6% of corporate CEOs and top executives (Matsa and Miller, 2011), arguably it is important to understand the extent to which female empowerment could have positive spillovers particularly on corruption. Are these gender effects specific to certain types of corruption activities? Does basic human needs alter the observed gender differences in corruption behavior? We consider particularly the gender and educational differences in bribe-giving and examine whether basic human needs such as the need for water, sanitation, etc., alters such behaviors towards corruption. Moreover, the literature suggests that women are less likely to be employed or less likely to interact with government officials. In our analysis we also employ different approaches to address this potential selectivity problem. This paper can be viewed as a methodological and empirical addition to the literature on corruption and anti-social behavior.

We first observe that, ceteris paribus women are less likely to indulge in corrupt activities. We find that the need for basic needs such as water and sanitation services do not offset the gender gap in corruption behavior. This evidence is robust even when we control for differences in 'bribe-exposure' using different techniques including a Heckman 2-stage procedure, other personal characteristics and country fixed effects. We find that basic human needs however do narrow the magnitude of the gender differences in corruption. Country specific regressions further shows that in a number of countries (60 percent), women are not dissimilar from men when services that benefit the household such as water and sanitation are at stake. In fact in some countries, the sign on the female dummy is positive and in a few significant when basic needs are at stake. The result suggests that, in relative terms, women are more willing or likely to give a gift or do a favor (pay bribes) that benefits the household. In examining education, we find that explicitly controlling for differences in bribe exposure completely bridges the educational differences in corruption observed in previous studies in

which higher educated people tend to be more corrupt. Our finding further underscores the role of women in the fight against corruption in Sub-Saharan Africa, and also the need for stronger institutions as individuals' pro-social motivations may be malleable.

A relatively large body of literature focuses on the effect of corruption on growth and development and on the macro-drivers of corruption. Corruption is argued to increase the cost of doing business, and as such discourages entrepreneurship activities that cause growth (Powell et al., 2010). Similarly, Méon and Sekkat (2005) observe that as the quality of institutions or governance worsens, corruption becomes more detrimental to growth. Corruption is also argued to result in the diversion of public investments from more efficient sectors to unproductive sectors, and thus affecting growth (Mauro, 1998). Mauro (1998) finds specifically that, corruption adversely affects educational spending. Rivera-Batiz (2002) finds that reducing corruption stimulates technological change and spurs economic growth. Sub-Saharan Africa's under-development to a large extent has been attributed to the high incidences of corruption. As an example, in examining how corruption affects economic activities, Beekman et al. (2013) observed households in rural Liberia by directly monitoring the diversion of inputs associated with a development project, and finds that corrupt community leaders cause reduced levels of income generating activities i.e., corruption lead to a 50% reduction in rice planted. Ghura (1998) finds that variation in tax revenue-GDP ratios across Sub-Saharan African countries are influence significantly by the level of corruption. In addition, Gyimah-Brempong (2002) finds that as corruption increases in Sub-Saharan Africa, income inequality also increases considerably. In relation to all these evidence, Gatti et al. (2003) argues that a more in-depth analysis of the micro-drivers of corruption can provide us a more detail guidance for the targeting of anti-corruption policies in such countries.

Relatively fewer papers consider the micro drivers of corruption. Using data from Georgia (formerly part of the Soviet Union), Swamy et al. (2001) shows that officials in

firms owned or managed by men in Georgia are significantly more likely to be involved in bribe-giving than firms managed by women. Dollar et al. (1998) shows corruption to be less severe in countries where women held a large share of parliamentary seats and senior positions.

The few studies that explore the micro-drivers of corruption at the individual agent level mostly relied on hypothetical questions. For example both micro-data studies by Gatti et al. (2003) and Swamy et al. (2001) on individual level behavior towards corruption have respondents answer the question on how justified someone accepting a bribe is in the course of their duty. They find significantly fewer women justifying the acceptance of bribes compare with men. Mocan (2008) in examining bribery behavior across 49 countries across the world find women, the rich and the educated more likely to be involved in corrupt practices. The aggregate nature of cross-country studies tells us little about the relationship between corruption behavior and individual agents, while the hypothetical measures employed at the individual level may also suffers from perception biases and plausible elements of 'cheap-talk' (see also Svensson, 2003)[2].

Despite the growing literature and renewed interest in corruption at the micro-data level and its implications, there still remain open questions. Consistent with evidence from Alesina et al. (2013) who observed that in some societies, the dominant belief is that women should not be allowed to participate freely, and equally to males in activities outside the home, we examine the notion that the increase participation of women (empowerment) and the less privileged (such as the less educated) aside empowerment brings additional benefits to decreasing corruption. Specifically, we consider whether gender differences in corruption are robust to different types of opportunities for corruption. We ask: are the gender

[2] Closely related to our study is that of Mocan (2008) who examined the probability of being asked for a bribe across 49 countries, majority of which are not in sub-Saharan African countries.

differences in corruption persistent once basic needs are at stake? To the best of our knowledge, there is limited research on how situational effects alter these relations i.e., for example situations such as the dire need for water access, sanitation services, health services etc. Differences in bribe exposure have also been argued to explain differences in corruption behavior (see Mocan, 2008). We examines whether controlling for such differences in 'bribe-exposure' completely bridges the gender and educational gaps in corruption.

We also focus on sub-Saharan Africa. Despite corruption being a more serious problem in Sub-Saharan Africa, most of the micro- studies on corruption experiences includes a very small sample of African countries[3]. We therefore argue that the issue of corruption in Sub-Saharan Africa seems to be incompletely dealt with in the literature. In this vein, our paper contributes both to the broader literature on corruption, as well as helps to bridge the gap in research on corruption in Sub-Saharan Africa. Key to our analysis is the large micro data available on Sub-Saharan African countries where gender empowerment challenges and inequality are more pronounced. Specifically, we employ the Afrobarometer survey data that covers 20 countries and involves over 24,000 individuals across Sub-Saharan Africa to explore the additional benefit resulting from gender empowerment. In addition to other estimation methods, we employ the Heckman two–stage procedure to correct for possible selectivity bias associated with differences in corruption exposure.

The rest of the paper is organized as follows. Section 1.2 presents a review of the determinants of corruption. Section 1.3 presents a description of the data. In section 1.4 we present the empirical results. Finally, section 1.5 concludes.

[3] Mocan (2008) included four African countries (Uganda, South Africa, Zimbabwe and Botswana), Swamy et al. (2001) included two African countries (South Africa and Nigeria), Gatti et al., (2003) included one African country (Nigeria). The number of African countries thus has risen from one in 2003 to four in 2008, signifying an ever increasing importance of Africa, but also indicates the void in research and the need to further investigate corruption in Africa.

1.2 Relevant Literature

Several studies have highlighted the factors that influence corruption both at the individual level, as well as at the aggregate country-level. Different theories associate corruption with the level of economic development, cultural traditions, political institutions, government policies, and socioeconomic factors (Treisman, 2000). Specifically, legal, political competitions, press freedom, decentralization, gender, education, religion inter alia are often found to influence corruption behaviors (see Lessmann and Markwardt, 2009; Treisman, 2000; Fisman and Gatti, 2002; Shleifer and Vishny, 1993). Freille et al. (2007) noted that there remains within the literature little systematic research on the robustness analysis of the drivers of corruption.

In this paper our focus is on the socioeconomic dimensions of corruption. The theoretical argument made for the link between gender and corruption is in two-folds: (1) women have lower preference for criminal activities than men, (2) women are less likely to be involved in corrupt practices not because they have lower preference for it but because they are less exposed, i.e. less likely to be employed, less likely to interact with government officials. The data so far have not allowed for a detailed examination of whether the systematic differences between women and men in terms of bribe exposure accounts for the differences in their behavior towards corruption. Among other things, we hope to contribute to this debate. There is also some indicative or reduced-form evidence to suggest that human needs could alter individuals' pro-social behavior (see Ward and Stewart, 2003; Becker, 1993; Zedner, 1991). This informs our hypothesis that women and men may not necessarily be dissimilar in their behavior towards corruption under certain conditions.

In terms of the correlation between education and corruption in Africa, a variety of arguments has been put forward with varying implications. The first of such theoretical argument is the exposure to bribery argument. Mocan (2008) argues that the highly educated may have more opportunity to interact with government official and therefore are more likely to be corrupt. A number of empirical studies provide support for the positive relationship between education and corruption (see Swamy et al., 2001; Mocan, 2008; Kaffenberger, 2012). These studies do not control for differences in exposure to public officials.[4] However, others argue in the opposite direction and consider that more educated citizens may be better placed to pay more attention to corrupt activities and may be better able to take action against corrupt officials (Glaeser and Saks, 2006, Treisman, 2000). Glaeser and Saks (2006) provide empirical proof in support of this argumentation to show that more educated states in the U.S. have less corruption.[5]

At the country level, Treisman (2000) and Chowdhury (2004) observed the impact of democracy on corruption. They find that the effect of democracy on corruption even though small in the case of Treisman (2000), was robust to the inclusion of controls for economic development and openness to trade. In this paper and consistent with the evidence by Treisman (2000) and Chowdhury (2004), we further examine the role of democracy at the individual level i.e., the effect of individual's preference for democracy on corruption behavior. In addition to democracy and in line with the debate on political connections and economic outcomes, we ask whether the politically affiliated in sub-Saharan Africa are more corrupt. Using a survey on China, Li et al. (2008) finds political connections help private

[4] In studying individuals' corruption perceptions of government institutions and not necessarily corruption experiences, Attila (2011) finds the higher educated having a higher perception of corruption. This result was based on the Afrobarometer data for 12 countries. Kaffenberger (2012) also observe a positive effect of education using the Afrobarometer data. They however did not control for differences in exposure or selectivity bias.

[5] Truex (2011) find similar results for Nepal to the effect that more educated respondents' show less acceptance attitudes towards corrupt behaviors. They however recognize further research is needed to test the strength of these relationships. Thus, the evidence at best can be described as mixed.

entrepreneurs to obtain loans from banks or other state institutions, and afford them more confidence in the legal system. With our unique date on sub-Saharan Africa, we are able to go a step further to assess whether political connections corrupt institutions. Corruption behaviors are most often cited to depend on gender, age, employment status, economic situation, educational attainment and the location of residence (see Mocan, 2008: Gatti et al., 2003; Dollar et al., 2001; Swamy et al., 2001). Using these covariates we examined pro-social behavior towards corruption in the midst of situational factors.

1.3 Data Description and Descriptive Statistics

The Afrobarometer Data

The data used in the analysis is from the 2008 Afrobarometer survey for Africa. The data involves a national representative sample of adult respondents across 20 African countries. The list of countries in the sample and used in our analysis are Benin, Botswana, Burkina Faso, Cape Verde, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. In total, 27,713 individuals were interviewed for their involvement in three different categories of bribes, together with a host of other questions related to democratic preferences. For the purpose of our current econometric analysis we are able to use a total of 24,296 of the respondents.

Table 1.1 provides descriptive statistics of the main variables used in the analysis. Measuring corruption is obviously a tricky one because of its illegality (Brunetti and Weder, 2003). The Afrobarometer survey asked the question: '*In the past year, how often (if ever) have you had to pay a bribe, give a gift, or do a favor to government officials in order to: (A) Get a document or a permit? (B) Get water or sanitation services? (C) Avoid a problem with*

the police?' Even though we agree that people may under state their involvement in corruption due to its illegality, we argue this may hold true especially for western countries where institution and sanctions for norm violation is strongly enforced. The possible responses for the self-involvement in corruption variable are: (1) No experience with this in the past year; (2) Never; (3) Once or twice; (4) A few times; (5) Often; (6) Don't know. Due to the ambiguity of the last option 'don't know', the option is dropped in our analysis. This is because it is not clear whether the respondent doesn't know the number of times or doesn't know of any experience. The proportion of respondents who answered 'don't know' are however quite small in all three cases (<1%). The initial corruption response categories in the Afrobarometer survey are also rescaled for simplicity to take on the values 1 (bribe-giving) if the respondent has positive experience of bribe payment, and 0 otherwise.

From Table 1.1 presents the descriptive statistics. The female and male interviewees in the data are 49.69% and 50.31%, respectively. Based on the re-scale of the corruption measures, we show the mean corruption significant higher for males compared to females (p-value < 0.000; across all the corruption types). The average age of the population is approximately 36 years. The educational variable in the Afrobarometer survey takes on numerical values assigned to each level of education, ranging from 0 "no formal education" to 9 "post-graduate education". Specifically, 19% have no formal education, 18% have some primary education, 15% have completed primary school, 22% have some secondary education, 15% have completed secondary school, and 11% have post-secondary education. The population is distributed across both urban and rural areas: 38% reside in urban areas and 62% reside in rural areas. Religion appears important to majority of the interviewees. Responding to the question on religion "*How important is religion in your life?":* 3% answered "not at all important"; 3% answered "not very much important"; 10% answered "somewhat important"; and 84% responded "very important". We also include two political

economy variables: individual's support for democracy and political affiliation. Seventy one percent of the respondents have a preference for democracy over any form of national governance while 60% of the respondents have a political affiliation. In addition to the demographic characteristics, we also focus on controlling for differences in the exposure to bribery. Seventy percent of the population have made payments for fees for a government service such as education or health care, 26% have made payments for license fees to local government, e.g., for a bicycle, cart, or market stall, 25% have made payments for property rates or taxes, and 47% have made payments for public utility fees, e.g., for water, electricity or telephone.

Table 1.1: Descriptive Statistics

	All (%)	Male (%)	Female (%)
Panel A: Descriptive on corruption activities			
Get a document or a permit			
No experience	21.81	47.84	52.16
Never	63.16	49.07	50.93
Once or twice	8.45	58.89	41.11
A few times	3.59	60.23	39.77
Often	2.48	64.62	35.38
	0.145[#]	0.173[#]	0.117[#]
	(0.352)	(0.379)	(0.321)
Get water or sanitation service (Household needs)			
No experience	23.13	49.12	50.88
Never	67.85	50.15	49.85
Once or twice	4.19	57.93	42.07
A few times	2.38	51.92	48.08
Often	1.98	57.35	42.65
	0.085[#]	0.095[#]	0.075[#]
	(0.279)	(0.293)	(0.264)
Avoid a problem with the police			
No experience	23.10	47.76	52.24
Never	64.68	49.14	50.86
Once or twice	5.62	60.61	39.39
A few times	3.20	62.44	37.56
Often	2.86	67.53	32.47
	0.117[#]	0.146[#]	0.088[#]
	(0.321)	(0.353)	(0.283)
Panel B: Descriptive on other characteristics[a#]			
Female (Dummy for female respondent)	0.496		
	(0.499)		
Age (Years)	36.274	37.720	34.803
	(14.404)	(15.102)	(13.499)
Education (0-9)	3.214	3.436	2.988
	(1.996)	(2.004)	(1.962)
Employment (0-5)	1.574	1.796	1.349
	(1.615)	(1.675)	(1.518)
Household head (dummy)	0.492	0.649	0.333
	(0.553)	(0.519)	(0.542)
Rural (Dummy)	0.619	0.620)	0.618
	(0.486)	(0.485)	(0.486)
Religion (Importance of religion, 0-4)	3.749	3.707	3.792
	(0.657)	(0.715)	(0.590)
Economic Situation (compared to others, 0-5)	2.789	2.806	2.773
	(1.013)	(1.016)	(1.010)
Support for democracy (Dummy equals to one for preference for democracy, zero otherwise)	0.708	0.745	0.671
	(0.455)	(0.436)	(0.470)
Political Affiliation (Dummy for having a political affiliation, zero otherwise)	0.596	0.632	0.559
	(0.491)	(0.482)	(0.497)
Bribe exposure variables			
Payment of fees for a government service such as education or health care (dummy)	0.701	0.713	0.689
	(0.458)	(0.452)	(0.463)
Payment of license fees to local government, e.g., for a bicycle, cart, or market stall (dummy)	0.261	0.301	0.220
	(0.439)	(0.459)	(0.414)
Payments of property rates or taxes (dummy)	0.251	0.286	0.215
	(0.433)	(0.452)	(0.411)
Payment of public utility fees, e.g., for water, electricity or telephone (dummy)	0.471	0.485	0.457
	(0.499)	(0.500)	(0.498)
N	24,294	12,249	12047

Notes: [#] Mean values with standard deviations in parentheses are shown. [a] Female denotes whether respondent is female or male; age denotes chronological age in years; Education denotes whether the respondent has No formal schooling, Informal schooling only, Some primary schooling, Primary school completed, Some secondary school / high school, completed secondary school, Post-secondary qualifications (other than university e.g. a diploma or degree from a polytechnic or college), Some university, Completed university or Post-graduate; employment denotes whether the individual has no job (not looking), no job (looking), part-time (not looking), part-time (looking), full-time job (not looking) or full-time job (looking), religion denotes whether religion not at all important, not very important, somewhat important, or very important; economic situation denotes whether compared to others the individual is much worse, worse, same better or much better.

1.4 Empirical Results

1.4.1 *Severity of different types of corruption across sub-Saharan Africa*

As a first step, we begin our analysis by first presenting information on the severity (proportion of individuals who reported paying bribes or giving gifts) of the three types of bribes in each country in the sample. This is important for individual country policy-targeting. We also rank the countries from most corrupt to least corrupt based on each of the three bribe categories. Specifically, column 1 of Table 1.2 presents the severity of bribery in getting a document or permit in each of the sampled countries. Column 2 presents corruption levels in getting basic human needs such as water and sanitation. Column 3 presents the severity of bribery in the police service across the sampled countries. And column 4 presents the country average corruption level; which is a weighted mean of all three types of bribery for all individuals in the country.

Results from Table 1.2 show dissimilarity in the severity of the different types of corruption across the countries. For example, in Senegal whilst getting a document or government permit is a big problem without paying a bribe, the problem is not that severe for basic needs and bribes to the police. In Cape Verde however, it is more difficult getting basic necessitates like water or sanitation without paying a bribe than dealing with police without paying bribes. In Uganda, the payments of bribes for basic needs are as high as the payment of bribes for government documents or permits as well as bribes to the police. For policy intervention, the data shows that Uganda must target with equal measure all these 3 dimensions of corruption. The data shows that, the biggest challenge for Nigeria for example is to reduce corruption in the police service.

Overall, whilst Kenya, Uganda and Mozambique recoded the highest bribe payments for government's documents or permits; Uganda, Nigeria and Mozambique recorded the

highest bribery for basic needs like water and sanitation. The data shows that bribery to the police is more predominant in Kenya, Uganda and Nigeria in that order. The least corrupt country in terms of getting a government document or permit, and in terms of basic necessities or in bribery to the police is Botswana. The data also indicates that overall bribery in the most corrupt country (Uganda) is more than 16 times that of the least corrupt (Botswana) signaling high variability in corruption within Africa. These comparisons highlight corruption differences across the different types of bribes for policy and developmental targeting.

Table 1.2. Severity of different bribes across countries

	Mean (Rank)			
Country	Getting a Document or Permit	Water & Sanitation	Police	Average corruption overall
Uganda	0.241 (2)	0.223 (1)	0.242 (2)	0.235 (1)
Kenya	0.281 (1)	0.115 (5)	0.263 (1)	0.219 (2)
Nigeria	0.214 (5)	0.154 (2)	0.236 (3)	0.201(3)
Mozambique	0.229 (3)	0.142 (3)	0.154(6)	0.175 (4)
Liberia	0.195 (7)	0.126 (4)	0.174 (5)	0.165 (5)
Zimbabwe	0.228 (4)	0.080 (9)	0.187(4)	0.165 (6)
Burkina Faso	0.148 (8)	0.081 (7)	0.103 (9)	0.110 (7)
Ghana	0.115 (12)	0.086 (6)	0.107 (8)	0.103(8)
Zambia	0.132 (10)	0.050 (14)	0.117 (7)	0.100 (9)
Mali	0.128 (11)	0.062 (11)	0.094 (10)	0.094 (10)
Benin	0.143 (9)	0.065 (10)	0.057 (13)	0.088(11)
Senegal	0.196 (6)	0.039 (15)	0.032 (19)	0.089(12)
Tanzania	0.086 (16)	0.037 (16)	0.094 (10)	0.072 (13)
Cape Verde	0.093 (14)	0.081 (7)	0.035 (17)	0.070(14)
South Africa	0.072 (17)	0.059 (13)	0.065 (12)	0.065(15)
Lesotho	0.102 (13)	0.027 (18)	0.047 (15)	0.059(16)
Namibia	0.067 (19)	0.062 (11)	0.040 (16)	0.056(17)
Malawi	0.067 (18)	0.033 (17)	0.050 (14)	0.050(18)
Madagascar	0.086(15)	0.003 (20)	0.034 (18)	0.041(19)
Botswana	0.014 (20)	0.005(19)	0.025(20)	0.014(20)

[a] Means are decreasing in severity from highest corruption (1) to lowest corruption (20). The corruption indices take on values between 0 and 1 with 0= least corrupt

1.4.2 *Regression results*

The empirical section of this paper is divided in three parts. The first part examines the relationships between socioeconomic characteristics and corruption without including controls for bribe exposure. This we carry out for the basic human needs model as well as the other types of corruptions. In the second part, we examine the relationships between socioeconomic characteristics and corruption, just as before, but in this case including variables to controls for differences in bribe exposure. In the third part, the paper models corruption behavior as a two-step process to take into account the self-selection into exposure to government officials and bribe payments. Heckman procedure is adopted in this section to correct for selection bias (see Heckman, 1979).

We now proceed to present evidence of the relationship between socioeconomic characteristics and corruption in sub-Saharan Africa. Our main interest here is on the coefficients of the gender dummy and the education variable. As a first step, we regress:

$$Corrupt_i = \alpha + \beta_1 * GENDR_i + \beta_2 * EDUC_i + Other\ controls + \delta_{ic} + \varepsilon_i \qquad (1)$$

Where i denotes individual respondent, $GENDR$ indicates gender of respondent, $EDUC$ denotes the educational level of the respondent. The controls are the usual controls in the literature on the micro-level determinants of corrupt behavior (see Gatti et al., 2003; Swamy et al., 2001). The control variables are age, employment, religiosity, an indicator variable that equals one if the respondent lives in a rural location, preference for democracy, political affiliation and a variable that captures economic situation of the individual. Finally, we also include 20 country fixed effects, δ. The regressions are weighted and stratified on the female-male level.

Table 1.3 reports marginal effects from Probit estimation on data from the 24,296 respondents. In the first column, we estimated equation (1) using whether or not the respondents paid bribes (0= no bribe-payment, 1= paid bribes) to get a document or permit as the dependent variable. The coefficient of the female dummy variable is observed to be negative and significant at all conventional levels of significance. Specifically, the marginal effect for the female dummy variable is -4.5 percent; indicating that a woman's likelihood of paying bribes for a government document or permit is 4.5 % points less than that of the likelihood for a man. In the second column, we estimate the same equation (1) but this time using whether or not the respondents paid bribes (0= no bribe-payment, 1= paid bribes) to get basic necessities such as water and sanitation. The estimated coefficient for the female dummy is negative and significant at conventional levels of significance. However, the marginal effect here for the female dummy variable as presented reduces to -1.3 percent. This is somehow consistent with the hypothesis that human needs could alter individuals' pro-social behavior. However the evidence shows that human needs do not completely crowd-out women intrinsic motivation to act pro-socially. In the third column, we estimate equation (1) using whether or not the respondents paid bribes (0= no bribe-payment, 1= paid bribes) to avoid problems with the police. The results are almost similar to the case of paying bribes for documents and permits i.e. that a woman's likelihood of paying bribes to the police is 4.6 % points less than that of the likelihood for a man. Overall the data shows that females are negatively associated with corruption irrespective of the type of corruption even though the magnitudes of the gender differences may differ.

We now turn our attention to the coefficient for the 'education' variable. From column (1), we observe that the estimated coefficient for education, β_2, is positive and statistically significant at all conventional levels. Results in column (2) and (3) are all similar to that of column (1) for the education variable i.e. positive and statistically significant correlation between

education and corruption even after controlling for differences in economic situation. The magnitudes of the marginal effects however differ across the different categories of corruption. The marginal effect is relatively smaller for column 2 (basic human needs model). Our empirical result here which shows a positive relationship between education and corruption somehow contradicts the hypothesis that more educated citizens may be better able to take action against corrupt officials and as such less willing to pay bribes. Mocan (2008) argues that the reason for such contradiction maybe that more educated citizens are more exposed to bribery. To this end, we also report estimates for similar empirical models but in this case with controls for differences in the exposure to bribes. In addition to differences in employability, we control for whether or not in the past year the individual made any of the following payments: (1) payments of fees for government services, (2) payment of fees for government licenses, (3) payments of property rates and taxes, and (4) payments of public utility fees. The resulting estimated coefficients from these regressions are reported in Table 1.4.

Table.1.3 Individual level corruption

	Marginal Effects[6] (Probit)[b] (St.d Error)			
	Getting a Document or Permit (1)	Water & Sanitation (2)	Police (3)	Average corruption overall (4)
Education	0.014***	0.005***	0.009***	0.011***
	(0.002)	(0.001)	(0.001)	(0.001)
Female	-0.045***	-0.013***	-0.046***	-0.037***
	(0.004)	(0.002)	(0.004)	(0.004)
Age	-0.001***	-0.000	-0.001***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Employment	0.007***	0.003**	0.007***	0.006***
	(0.002)	(0.001)	(0.001)	(0.002)
Religion				
Very important	0.009	0.004	0.003	0.004
	(0.014)	(0.009)	(0.011)	(0.008)
Rural	-0.034***	-0.029***	-0.041***	-0.039***
	(0.006)	(0.005)	(0.007)	(0.006)
Economic situation	0.002	0.003*	0.001	0.002
	(0.003)	(0.002)	(0.002)	(0.002)
Support for	-0.013**	-0.017***	-0.009**	-0.015***
democracy	(0.006)	(0.005)	(0.004)	(0.005)
Political Affiliation	0.018	0.010**	0.006	0.013***
	(0.005)	(0.004)	(0.004)	(0.005)
Country dummies	Yes	Yes	Yes	Yes
# Observation	24,296	24,296	24,296	24,296
Prob > F =	0.0000	0.0000	0.0000	0.0000

b The coefficients are the marginal effects. They are adjusted for clustering at the country level. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

In all the specifications in Table 1.4, all the coefficients of the control variables that proxy exposure to bribery follows the prior expectations i.e., they are all positive and highly significant at all conventional levels. The most striking difference after controlling for differences in bribe exposure using the four exposure variables, is that education in the basic human needs model in column 2 becomes marginally significant at the 10% level. In terms of gender, we do not observe much change. The female dummy remains negative and significant at all conventional levels in all specifications after controlling for bribe exposure. Comparing the marginal effects for the female dummy variable with and without controlling for bribe exposure, we observe that whilst in column (1) of Table 1.2 woman's likelihood of paying

[6] We also run reduced form regressions without controls for support for democracy and political affiliations and find qualitatively similar results

bribes for a government document or permit is 4.5 % points less than that of the likelihood for a man, we observe that this likelihood drops to 4.0 % after controlling for differences to bribe exposure. We also observe that, once we control for bribe exposure in Table 1.4 of column (2) woman's likelihood of paying bribes for basic needs like water and sanitation which is 1.3 % points less than that of the likelihood for a man in Table 1.3, drops to 1.0 %. In column (3), the coefficient of the female dummy, similar to column (1) drops to 4.1% from 4.6%. The result suggests that the differences in exposure to bribery do not completely account for differences in corrupt behavior across gender and education. Thus, regardless of which specification is preferred (either Table 1.1 or 1.2), the empirical results for gender and education still holds.

Table .1.4. Individual level corruption (controlling for bribe exposure)

	Marginal Effects (Probit)[c] (St.d Error)			
	Getting a Document or Permit (1)	Water & Sanitation (2)	Police (3)	Average corruption overall (4)
Education	0.011***	0.002*	0.006***	0.007***
	(0.002)	(0.001)	(0.001)	(0.001)
Female	-0.040***	-0.010***	-0.041***	-0.033***
	(0.004)	(0.002)	(0.004)	(0.004)
Age	-0.001***	-0.000	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Employment	0.003*	0.001	0.004***	0.003*
	(0.002)	(0.001)	(0.001)	(0.001)
Religion				
Very important	0.005	0.000	-0.002	-0.001
	(0.014)	(0.008)	(0.011)	(0.008)
Rural	-0.017***	-0.014***	-0.022***	-0.020***
	(0.006)	(0.004)	(0.005)	(0.005)
Economic situation	0.000	0.002	0.000	0.000
	(0.003)	(0.002)	(0.002)	(0.002)
Support for democracy	-0.014**	-0.016***	-0.009***	-0.016***
	(0.006)	(0.005)	(0.004)	(0.004)
Political Affiliation	0.016***	0.009***	0.005	0.012***
	(0.004)	(0.004)	(0.003)	(0.004)
Bribe exposure				
Payment of fees for gov't services	0.032***	0.017***	0.024***	0.023***
	(0.005)	(0.004)	(0.005)	(0.004)
Payment of fees for gov't License	0.043***	0.018***	0.037***	0.045***
	(0.005)	(0.004)	(0.005)	(0.007)
Payments of property rates and taxes	0.044***	0.019***	0.036***	0.048***
	(0.007)	(0.005)	(0.004)	(0.008)
Payment of public utility fees	0.026***	0.035***	0.031***	0.038***
	(0.006)	(0.006)	(0.004)	(0.007)
Country dummies	Yes	Yes	Yes	Yes
# Observation	24,296	24,296	24,296	24,296
Prob > F =	0.0000	0.0000	0.0000	0.0000

[c] The coefficients are the marginal effects. They are adjusted for clustering at the country level. We also run reduced form regressions without controls for support for democracy and political affiliations and find qualitatively similar results*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

1.4.3 *Robustness Check*

Alternatively and as a robustness check for our previous results, we formulate the corruption outcome as a two-stage process and estimate using the Heckman procedure (see Heckman, 1979). We assume that indulging in corrupt practices is non-random, and as such an individual's corruption behavior will first depend on the individual's level of exposure to

corruption. We employed the two-stage Heckman procedure to address this possible selectivity. The two-stage Heckman approach employed involves the estimation of a 'corruption-exposure' selection model (i.e. which captures the probability of exposure) at the first stage and then a corruption equation at the second stage. Since both the first and second stages are probability models, we estimate a special application of the Heckman model (heckprob). To implement the procedure we construct an individual level index for the level of exposure to government official based on our four exposure variables i.e. payment of fees for government services, payment of fees for government license, payments of property rates and taxes, and payment of public utility fees. Since each exposure variable is a dummy, our index ranges from 0 for no exposure to 4, exposures to all four variables. The dummy for the level of exposure takes on the value 1 if the index is greater than 0.5 and 0, otherwise.[7]

The first-stage selection model can be specified as:

$$P(E_i > 0) = F(\gamma Z_i + u_i) \tag{2}$$

where E_i is a dummy variable denoting the level of interactions with government officials: $E_i = 1$ if an individual has a higher level of interaction (>0.5) and $E_i = 0$, otherwise. Z is a vector of regressors, γ is a vector of parameters, u is the error term. $F(\cdot)$ refers to the cumulative distribution function. Equation (2) can be considered as the unobserved exposure (selection) process. Variables captured in the exposure model include age, education, gender, support for democracy, political affiliation, urban area and household head (exclusion restriction). The definition and summary statistics of the individual characteristics used in the model are the same as define in Table 1.1.

The bribe equation at the second-stage can be specified as:

[7] The results are found to be qualitatively similar when we change the degree of exposure from greater than 0.5 to greater or equal to 0.5. We find that at weaker thresholds i.e. exposure to any at all (threshold greater that zero) education is significant in some models. See appendix for these results.

$$C_i = \beta X_i + v_i \tag{3}$$

$$(u_i v_i) \sim N(0, 0, \sigma_u^2, \sigma_v^2, \rho_{uv})$$

where X_i is a vector of regressors, β is a vector of parameters, v is the error term, and $v\ and\ u$ are assumed non-independent. The vector of regressors in the bribery model includes variables also specified in the selection model but with the exception of the household head variable which is specific to the selection model. We however include religion, economic condition and country specific dummies as additional explanatory variables in the bribery equation.

For the empirical estimations, we employ the standard two-step Heckman approach in which we estimate the probit exposure (selection) model in the first stage, and then include the inverse Mills ratio (the ratio of the probability density function to the cumulative distribution function) obtained at the first stage as an additional explanatory variable for the second stage regression model to correct for the selectivity. The Heckman procedure yields consistent and asymptotically efficient estimates as they account for possible selectivity (Heckman, 1979).

Table 1.5 presents estimated coefficients for the corruption equation from the two-step Heckman procedure. Of particular interest here are the coefficients of the female dummy and the educational attainment variable, but we first show results for the role of democracy and political affiliation variable on corruption behavior. Interestingly, the estimates from the two-stage Heckman procedure as presented in Table 5 shows that 'support for democracy' and 'political affiliations' are important determinants of corruption behavior in Sub-Saharan Africa. The dummy variable for 'support for democracy' carries a negative in all four models and significant at the 10 percent level of significance. However, we find the political

affiliation dummy to be positive and significant across all the models. This implies that while people who support democracy in Sub-Saharan Africa are less likely to be involved in corrupt activities, in contrast, people who have stronger political affiliations are more likely to be involved in corruption. Support for democracy in this case could be a reflection of the rule of law inherent in the democratic process. In terms of political affiliation, the results provide suggestive evidence on how political affiliations in Sub-Saharan Africa undermines institutions especially institutions against corruption.

From columns (1) – (4) of Table 1.5, we find that when we explicitly account for first-stage selectivity bias, the dummy for the educational variable is now no longer significant in all models. This result implies that the educational differences observed in corruption behavior in models without controlling for selectivity can be misleading. In terms of gender, however, we find that accounting for selection bias does not completely bridge the gender gap in corruption. The coefficient of the female dummy remains negative and significant at conventional levels. This result holds regardless of the type of corruption. Comparing the results of the Hackman models in Table 5 with the standard probit models in Tables 3 and 4, we observe sharp differences in the magnitudes of the gender differences. The Heckman marginal estimates for the female dummy are much smaller compared with the standard probit marginal estimates. For example, the gender gap in corruption for getting a government documents or permits reduces from 4.5% points to 3.4 % points after explicitly accounting for the first-stage selectivity. Column 2 reports the estimates for the basic needs model. In terms of basic human needs such as water and sanitation services, the gender differences reduces from a 1.3 % point gap to 0.7% point gap (almost 50% reduction) upon controlling for the selectivity. Comparing the marginal effects across the different types of corruption, we find that the gender gap is about 2.9 % point lower when basic human needs at stake. The gender

gap, however, even though smaller when basic human needs such as water and sanitation services are at stake, remains negative and significant at conventional levels.

Table .1.5 Individual level corruption (Heckman-two-stage Model)

	Marginal Effects (Probit)[f] (St.d Error)			
	Getting a Document or Permit (1)	Water & Sanitation (2)	Police (3)	Average corruption overall (4)
Education	0.005	0.001	0.003	0.005
	(0.004)	(0.002)	(0.004)	(0.003)
Female	-0.034***	-0.007**	-0.039***	-0.030***
	(0.006)	(0.003)	(0.005)	(0.005)
Age	-0.002***	-0.001**	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Employment	0.006***	-0.003**	0.007***	0.006***
	(0.002)	(0.001)	(0.001)	(0.002)
Religion				
Very important	0.009	0.004	0.003	-0.004
	(0.014)	(0.009)	(0.004)	(0.008)
Rural	0.002	-0.008	-0.017	-0.018
	(0.015)	(0.009)	(0.013)	(0.013)
Economic situation	0.002	0.003	0.001	0.002
	(0.003)	(0.002)	(0.002)	(0.002)
Support for democracy	-0.017***	-0.019***	-0.011***	-0.017***
	(0.006)	(0.009)	(0.004)	(0.005)
Political Affiliation	0.015***	0.008***	0.004	0.011***
	(0.005)	(0.004)	(0.004)	(0.004)
Inverse Mills Ratio	-0.103***	-0.058***	-0.062***	-0.062***
	(0.039)	(0.022)	(0.028)	(0.028)
Country dummies	Yes	Yes	Yes	Yes
# Observation	24,296	24,296	24,296	24,296
Prob > F =	0.0000	0.0000	0.0000	0.0000

[f] The coefficients are the marginal effects. They are adjusted for clustering at the country level. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

We now proceed to check the sensitivity of our results to possible outlier observations. We individually and jointly eliminate the two countries with the highest and lowest levels of corruption for basic needs[8] (see Table 1.6 for results). In doing this, we find the magnitude or significance of the coefficient on gender is not affected significantly. Finally, even though we find and confirm an overall robust gender differences in corruption even when basic human

[8] Uganda and Nigeria are the highest, whereas lowest is Botswana and Madagascar. See Deininger and Squire (1998) for a similar approach.

needs are at stake, it does not necessarily imply the same for all the individual countries. One way to assess this issue is to run country-specific regression specifications including dummies controlling for unobserved regional characteristics. Table 1.7 reports these results. Doing so, we find that for 80% of the countries the sign on the 'female' variable is negative for basic human needs, signifying that for majority of the countries females are negatively associated with corruption even when basic human needs such as water and sanitation services are at stake. We find however the gender gap in corruption when basic human needs are at stake is narrowed and disappears in 40 % of these countries. In a few countries, the gender effect is even positive when basic needs are at stake and not significant in many cases.

1.5 Conclusion

In recent times, the issue of corruption has become very important especially for developing countries. Recent studies have shown that corruption poses a critical impediment to economic growth and development. This paper adds to the small but growing literature on the drivers of corruption around the world using a unique micro data set on self-reported gift-giving or bribe payments in Africa. Overall, we find a strong and negative association between women and corruption in Africa. Specifically, we find that women are less involved in paying bribes and that this gender gap in behavior holds across different types of bribes including basic needs. We find however that when basic human needs such as water and sanitation services are at stake, the magnitude of the gender differences in corruption is much smaller. We find these results robust to controlling for various differences in 'bribe-exposure' i.e. differences in employment and the extent of interactions with government officials, and employing techniques to address selectivity. Overall the results are consistent with the views that increasing women visibility or economic participation in Africa could help reduce corruption on the continent. The results however also suggest that people's pro-social motivation could

be crowded-out by their need for survival, and as result there is the need for stronger institutions, structural change or modernization in service delivery in Sub-Saharan Africa to help combat corruption.

Lastly, we have also presented suggestive evidence to show the additional benefit of democracy in Sub-Saharan Africa. We find evidence that individuals who support democracy in Sub-Saharan Africa are less likely to be involved in corruption. Controlling for differences in exposure using the Heckman two-stage procedure did not change this result. For the case of political affiliations, we find that political affiliation is bad news for corruption reduction in Sub-Saharan Africa. In all the models estimates, the coefficient of the political affiliation variable shows a positive effect of political affiliation on corruption. Overall, these findings provide additional support for the need for democratic principles in Sub-Saharan Africa, but also caution that gains from democracy could be eroded by strong political affiliations.

Table.1.6 Sensitivity results under basic needs

	Highest (1)	Lowest (2)	Both (3)
Education	0.001	0.002*	0.001
	(0.001)	(0.001)	(0.001)
Female	-0.011***	-0.012***	-0.013***
	(0.001)	(0.002)	(0.002)
Country dummies	Yes	yes	yes
Exposure dummies	Yes	yes	yes
# Observation	20043	22038	17785
#Countries	18	18	16

Notes: Column 1 drops two countries with the highest level of corruption for basic needs, Column 2 drops that for the lowest two countries and column 3 drops both the highest two and lowest two countries. Table shows marginal effects from probit estimates with Standard errors in parentheses.

Table 1.7 Results from estimations of country specific regressions with regional dummies

	Basic Human Needs		Getting a Document or Permit		Police	
	Coefficient on gender	t-value	Coefficient on gender	t-value	Coefficient on gender	t-value
Countries with a negative and significant gender difference in bribery for basic human needs						
Botswana	-0.007575	(2.48)	-0.008560	(1.51)	-0.017932	(1.92)
Cape Verde	-0.014493	(1.69)	-0.003710	(0.28)	-0.010114	(1.84)
Ghana	-0.020056	(3.02)	-0.048523	(3.16)	-0.084713	(6.07)
Kenya	-0.038336	(2.28)	-0.139652	(5.84)	-0.194897	(8.75)
Lesotho	-0.010366	(1.93)	-0.027728	(2.94)	-0.026457	(6.57)
Mali	-0.017423	(2.51)	-0.089989	(6.29)	-0.054149	(3.95)
Uganda	-0.057523	(3.76)	-0.097834	(6.81)	-0.094338	(6.62)
Zambia	-0.012205	(2.33)	-0.019825	(1.02)	-0.030545	(3.68)
Countries with a negative and but 'not' significant gender difference in bribery for basic human needs						
Benin	-0.011826	(0.64)	-0.042240	(3.13)	-0.037250	(2.94)
Madagascar	-0.000274	(0.15)	0.023121	(3.15)	-0.004621	(0.91)
Malawi	-0.002113	(0.41)	-0.03828	(4.46)	-0.042679	(11.02)
Mozambique	-0.026444	(1.24)	-0.110931	(4.13)	-0.051457	(2.44)
Senegal	-0.011613	(0.97)	-0.060006	(3.25)	-0.013093	(1.31)
Tanzania	-0.011529	(1.61)	-0.056022	(3.55)	-0.090849	(7.20)
Zimbabwe	-0.001898	(0.21)	-0.050054	(2.23)	-0.059931	(3.03)
*Countries with a positive gender difference in bribery for basic human needs**						
Burkina Faso	0.003437	(0.33)	-0.017759	(1.08)	-0.037420	(2.95)
Liberia	0.020103	(1.90)	0.0124158	(0.64)	-0.016681	(0.76)
Namibia	0.000011	(0.00)	-0.023885	(2.59)	-0.007927	(0.87)
Nigeria	0.006025	(0.55)	-0.161168	(2.68)	-0.059858	(2.93)
South Africa	0.000870	(0.18)	0.0179561	(3.06)	0.004480	(0.61)

*Running a linear probability model, the gender effect in Liberia for basic human needs disappears.

1.6 Appendix to Chapter

Heckman two-stage Model (varying exposure thresholds)[h]

	Exposure greater than zero				Exposure greater or equal to 0.5			
	Getting a Document or Permit (1)	Water & Sanitation (2)	Police (3)	Average corruption overall (4)	Getting a Document or Permit (1)	Water & Sanitation (2)	Police (3)	Average corruption overall (4)
Education	0.006*	0.000	0.004	0.006**	0.003	-0.002	0.002	0.005
	(0.003)	(0.002)	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)	(0.004)
Female	-0.039***	-0.010***	-0.042***	-0.034***	-0.035***	-0.008***	-0.040***	-0.032***
	(0.005)	(0.002)	(0.004)	(0.005)	(0.005)	(0.003)	(0.004)	(0.005)
Age	-0.002***	-0.001**	-0.001***	-0.001***	-0.002***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment	0.006***	0.003**	0.007***	0.006***	0.006***	0.003**	0.007***	0.006***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Religion								
Very important	0.009	0.004	0.003	0.004	0.009	0.003	0.003	0.004
	(0.014)	(0.009)	(0.011)	(0.008)	(0.014)	(0.009)	(0.011)	(0.009)
Rural	-0.004	-0.013*	-0.021**	-0.023**	0.021	00.001	-0.005	-0.010
	(0.012)	(0.008)	(0.009)	(0.010)	(0.021)	(0.013)	(0.016)	(0.018)
Economic situation	0.002	0.003**	0.001	0.002	0.002	0.003**	0.001	0.002
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Support for democracy	-0.020***	-0.020***	-0.013***	-0.018***	-0.022***	-0.021***	-0.014***	-0.019***
	(0.006)	(0.006)	(0.004)	(0.005)	(0.007)	(0.006)	(0.005)	(0.006)
Political Affiliation	0.011**	0.006	0.001	0.009*	0.012**	0.007*	0.002	0.010**
	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Inverse Mills Ratio	-0.222***	-0.117***	-0.142***	-0.123***	-1.171***	-0.092**	-0.110**	-0.092*
	(0.079)	(0.044)	(0.063)	(0.056)	(0.064)	(0.036)	(0.051)	(0.048)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Observation	24,296	24,296	24,296	24,296	24,296	24,296	24,296	24,296
Prob > F =	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

[h] The coefficients are the marginal effects and standard errors in parenthesis. They are adjusted for clustering at the country level. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

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Chapter 2

2 The weaker sex? Gender differences in punishment across Matrilineal and Patriarchal Societies

Edward Asiedu, Marcela Ibanez

Abstract: This paper investigates the hypothesis that women are underrepresented in leadership roles due to a lower ability to influence others. By comparing societies that differ in the inheritance rights of men and women, we trace the origins of such difference. The results of a public good game with third party punishment indicate that in patriarchal societies there are persistent gender differences in social influence while in matrilineal societies these differences are smaller. While in the patriarchal society sanctioning behavior is not different across genders, cooperation is lower in groups with a female monitor than a male monitor. In contrast, in the matrilineal society male monitors sanction more often than female monitors, though cooperation does not depend on the gender of the monitor.

Keywords: Gender, norm enforcement, culture, inequality, collective action

JEL classification: C92, C93, D03, J14, J16

Joint paper with Marcela Ibanez.

2.1 Introduction

Although the gender gap in education and labor market is narrowing, women continue to be underrepresented in leadership positions (Agarwal, 2000; Matsa and Miller, 2011). Common explanations on this phenomena consider gender differences in risk aversion (Schubert et al., 2000; Eckel and Grossman, 2002; Gysler et al., 2002; Fehr-Duda et al.,2006; Croson and Gneezy, 2009; Ertac and Gurdal, 2012), competitiveness (Gneezy et al., 2003; Gneezy and Rustichini, 2004; Gupta et al., 2005; and Niederle and Vesterlund, 2007) and self-confidence (Barber and Odean, 2001; Kamas and Preston, 2012). An alternative explanation that has received less attention in the economics literature is that women could have lower ability to influence others than do men. In this paper we investigate gender differences in social influence comparing how the gender of the third party punisher affects cooperation in the group. Particularly, we consider whether female monitors are less likely to use sanctions to promote pro-social behavior than male monitors and consider whether the gender of the monitor affects cooperation.

A relevant policy question is what causes gender differences in social influence. This paper tests the hypothesis that the social environment shapes the beliefs and values regarding the appropriate role of women in society. Specifically, our hypothesis is that access to resources determines the status that women occupy in society and shape gender roles (Cole *et al*, 1992).

To investigate the drivers of gender differences in the use of sanctions and on the ability to influence, we conducted an artefactual field experiment in two different societies in Ghana. In particular, we compare the patriarchal Ewe city of Ho of the Volta region of Ghana and the matrilineal Ashanti city of Kumasi in the Ashanti region of Ghana. Prior to 1985, when a legal reform that promoted gender equality was passed, there were marked differences in the inheritance system across these two societies. While in the patriarchal societies men were in

charge of family life: they controlled property, were the legal guardians of children, and even had the right to restrict their wives' public activities (Htun and Weldon, 2011), in matrilineal societies, a woman's inheritance was acquired through the woman's lineage giving women a relatively higher status (Fenrich and Higgins, 2001; Kutsoati and Morck, 2012). Besides, unlike patriarchal societies, in the matrilineal society both daughters and sons inherited from their parents. While it has been almost 30 years since these laws were launched, customary inheritance systems continue being widely used (Gedzi, 2012; Hacker, 2010). This context provides us with a unique platform to examine the role of access to economic power on persistent gender disparities on social influence.

Our experimental design is based on Fehr and Fischbacher (2004) and considers a public good game with third party punishment. We use a 2x2x2 design that exogenously vary the gender of the third party punisher (male and female), the sanctioning technologies available for them (monetary and non-monetary sanctions) and the type of society (matrilineal and patriarchal). We compare sanctioning behavior by male and female monitors across sanctioning technologies and societies and consider the effect of the identity of the third party punisher on contributions to the public good game. Research from social psychology indicates that women tend to be less effective when using styles of communication that do not correspond to their gender stereotype. Hence, we expect that the type of sanctioning mechanism used would affect the social influence of female monitors, but not from male monitors. In particular, we expect that women would be more influential using non-monetary sanctions than monetary sanctions.

Traditional economic models focus on individual behavior and do not take into account the utility that individuals derive from the utility or the actions of others. Yet empirical evidence largely supports positive social interaction or peer effects (Manski, 1993; Conley and Udry, 2010; Jackson, 2010; Aral and Walker, 2012; Bond et al. 2012). To understand the

role of social influence on decision making, behavioral economists consider how behavior of the "first mover" or leader affects the behavior of the followers.[9] For instance, in charity experiments, information on the value given by the previous donor affects donations of subsequent players (Potters et al., 2001; Alpizar et al., 2008; Alpizar and Martinsson, 2012). In the context of a public good game, it is shown that the decisions of the leader affects contributions of following players (Clark and Sefton, 2001; Meidinger and Villeval, 2002; Moxnes and van der Heijden, 2003; Potters et al., 2007). In the context of a modified trust game with one trustee and two trustees, Regner and Riener (2014) find that the behavior of the leading trustee influences the moral justification used by the follower for not reciprocating the help received. While this literature provides important indications of social influence in a controlled environment, they do not consider how the degree of social influence depends on personal and socioeconomic characteristics of the people involved.

Different characteristics of the agents involved in economic exchange have been shown to affect the outcome of economic interactions. For instance, it is shown that social distance defined as emotional proximity affects trust, cooperation and solidarity (see Bogardus, 1928; Berg et al., 1995; Buchan et al., 2006; Charness and Gneezy, 2008; Leider et al., 2009). Social preferences have also been shown to vary according to the feeling of identification that agents have with each other, or the extent of their shared identity (Akerlof and Kranton, 2000). Empirical evidence largely supports in-group favoritisms and out-group discrimination (Akerlof and Kranton, 2000; Bernhard et al., 2006; Goette et al., 2006). Another dimension that has been shown to affect social interactions is status or the relative ranking of persons in a society (Ball et. al., 2001). People with higher status seem to receive preferential treatment. Compared with low status individuals, high status individuals achieve better outcomes in bargaining games (Ball and Eckel, 1996, 1998), double auctions games (Ball et al, 2001), and

[9] For an extensive literature review of the social psychology literature on social influence see Carli (2001).

dictator games with third party punishment (von Essen and Ranehill, 2011). Additionally, evidence suggests that status affects the degree of social influence in persuading others to follow advice (Moore, 1968), donate (Kumru and Vesterlund, 2010) or contribute in a public good game (Eckel et al., 2010).

Complementary to the above research on social influence, we consider how gender of the parties affects social influence. Research in social psychology, concludes that in most societies women are less influential than men (Carli, 2001). They argue that as women have lower status than men and are expected to be more communal, people generally expect that men have more right to act as authorities than women do. Factors such as the gender composition of the individuals in an interaction; agents' competences as dominance; warmth and communality; and the gender-typing of the task are found to mediate the effect of social influence. Some economic experimental papers provide evidence on gender differences in the ability to exert influence on others. In the context of a choice experiment, Carlsson et al. (2012) find that when married couples fill the questionnaire together, the joint decision is closer to those that men take when filling the questionnaire alone than those taken by women. Similar results are obtained regarding individual and joint elicitation of risk preferences (see de Palma et al, 2011; Carlsson et al, 2013). In the literature on charities, it has been shown that women are more effective in eliciting donations than men (see Landry et al, 2006). It has been shown that information on donations from women increase subsequent donations (Reinstein and Riener, 2012). Grossman et al., (2012) show that information on the gender of the leader decreases a woman's willingness to become the first mover in a sequential public good game. However, they find no significant gender differences in terms of influence on followers. Although the aforementioned literature identifies some important areas in which social influence of men and women differs, relatively little research has been done on differences in the use of sanctions. One notable exception is Barr and Kinsey (2002) who

investigate gender differences in giving criticisms to contributions of other group members. They find that there are no gender differences in sanctioning behavior across villagers in Zimbabwe. However, her results indicate that women are more effective in imposing sanctions and inducing higher cooperation. Our analysis complements this work examining how cultural factors affect sanctioning behavior.

Recent experimental papers have explored the role of culture in shaping individual attitudes. This studies conclude that gender differences in competitiveness and risk aversion could be explained by the social environment (Lawrence, 2006; Barres, 2006; Gneezy et al, 2009; Cardenas et al., 2012; Booth and Nolen, 2012; Gong and Yang, 2012). Our study complements and extends the above studies by exploring the role of culture in explaining gender differences in the use of sanctions and social influence.

Our results indicate that gender differences in the use of sanctions and ability to influence depend on inheritance systems. In the patriarchal society, we find no significant differences in sanctioning behavior between male and female monitors independently of the type of sanctioning instrument used. However, the degree of social influence, measured by contributions to the public good game is lower in groups with a female monitor compared to groups with a male monitor. This result indicates that discrimination against women persists in patriarchal societies. In contrast, male monitors tend to sanction more often than female monitors in the matrilineal society. This seems to indicate that men use power to counterbalance the higher status of women. We do not, however, find significant differences in cooperation according to the gender of the punisher. Several model specifications, accounting for unconditional, conditional and dynamic effects robustly parallels the above findings.

The remainder of the paper is organized as follows. Section 2.2 provides a background of the two societies in which the experiments were conducted. Section 2.3 describes the

experimental design. Section 2.4 presents the hypothesis of the study. Section 2.5 presents the experimental procedure. Section 2.6 presents the results. We finish with some concluding remarks.

2.2 Local Background

Historically, many Sub-Saharan African groups upheld the notion that men were in charge of family life: they controlled property, were the legal guardians of children, and had the right to restrict their wives' public activities (Htun and Weldon, 2011). In these typical patriarchal groups, land inheritance is mostly traced through the father-line. Men tend to inherit from their fathers when they pass away, with little role for female children and female spouse in inheritance (see Adei, 2009; Takyi and Obeng-Gyimah, 2007). This form of inheritance system gives males, irrespective of their age, more power and authority than women. The Ewe tribe in Ghana located in the Volta region is historically a typical example of a patriarchal society.

However, there are societies in Africa in which inheritance is acquired through the woman's lineage. One typical example is the Ashanti matrilineal society in Ghana. The Ashanti tribe of Ghana which used to stretch across some parts of West Africa prior to colonization is an African society that operates under the matrilineal family system. Under the matrilineal system, the line of descent is traced through the female. In the Ashanti matrilineal society, when a man dies, his sister's children inherit his wealth instead of his own children. Women in the Ashanti society or extended family system are thought of to be more influential and thus have some control over land use rights. Evidence from matrilineal societies in Ghana shows that women in these societies prefer to pass on their lands rights to their daughters instead of their sons (Amanor, 2001).

In the quest to promote sex equality and expand individual rights, family laws in many countries were liberalized during the 20th century (Htun and Weldon, 2011). Ghana implemented various reforms to the family laws in 1985.[10] Included in these laws is the provision that male and female children had equal rights to their parent's wealth. The law further indicates that in the case where two or more persons are entitled to the same object or monies, they shall divide it among themselves in equal shares independent of the gender of the persons involved (Woodman, 1985). Under the interstate succession law, wives who would not have received anything directly from their husband's wealth under traditional customs receive a specific amount under this law. The Head of Family Law, also known as the Accountability Law, determines that husbands do not have economic power over their spouses. While these laws provide some form of protection for wives, its application has been limited and customary inheritance systems continue in many areas. Legal reforms provide less protection for women in general, which could imply that cultural norms that discriminate against different genders still persist.

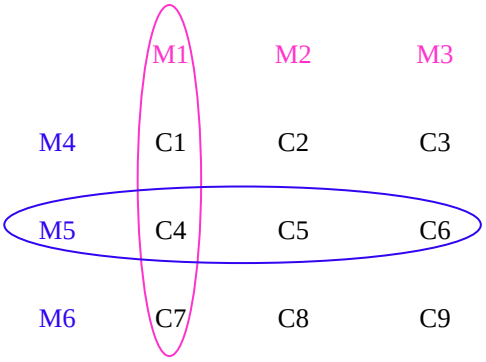
2.3 Experimental Design

Our experiment is based on a public good game with third party punishment. Upon arrival to the experimental session, participants are randomly allocated the role of contributors (C) or third party punishers or monitors (M). Each contributor is randomly and anonymously matched in two independent groups simultaneously with two different contributors in each group. Using numbers to represent each contributor, Figure 2.1 shows membership in the two matching groups. Each contributor belongs simultaneously to the two groups that are formed by joining the vertical and horizontal lines. For instance, contributor 4 forms one group with

[10] Woodman (1985) presents a summary of the main reforms implemented in the Intestate Succession Law, 1985 (P.N.D.C.L. 111); the Customary Marriage and Divorce (Registration) Law, 1985 (P.N.D.C.L. 112); the Administration of Estates (Amendment) Law, 1985 (P.N.D.C.L. 113); and the Head of Family (Accountability) Law, 1985 (P.N.D.C.L. 114).

contributors 1 and 7 and monitor 1 and forms another group with contributors 5 and 6 and monitor 5.

Figure 2.1 Matching groups



Contributors receive an endowment of 250 pesewas (Gh₵) for each group and have to simultaneously decide the proportion they want to contribute to the public account (c_i) in each of the two groups.[11] Each pesewa invested in the public account yields a payoff of b=2/3 pesewas (Gh₵) to each group member. The amounts not contributed are deposited in the subject's private account which yields a return of one pesewa.

Each of the matching groups is randomly assigned one external monitor. Monitors receive a fix payment of 500 pesewas (Gh₵). Their task is to observe contribution decisions and decide whether to punish group members. The monitor is external to the group and does not contribute to the public account, nor does she receive any payment from the public account. Therefore, the monitor does not have any private incentive to induce cooperation.

Similar to Masclet et al (2003), we use two punishment technologies: social sanction or non-monetary sanction and monetary sanction. Under the social sanction technology, the

[11] 100 pesewas is equivalent to 1 Gh₵. 2.5 Gh₵ is synonymous to $2.5 whilst 25pesewas is synonymous to 25cents.

central monitor can send a sad face to show disapproval for group members' contributions. Social sanctions are costless for both sender and recipient (*v=p=0*). Under the monetary punishment, the central monitor spends 8.33 pesewas to reduce the monetary payments of recipients by 25 pesewas (1:3) (p=1/3*v; v=25*).[12] In this design, a monitor can send a maximum of only one sad face or monetary sanction to each subject in the group to show disapproval of contributions in each round. In summary, the pay-off for the monitor is given by:

$$\pi_i = 500 - \sum_i^n p_i \, S \tag{1}$$

While the payoff for group members is given by:

$$\pi_i = \sum_{j=1}^{2} 250 - c_{ij} + \frac{2}{3}\sum_{i \neq j}^{3} c_{ij} - vS_{ij} \tag{2}$$

where i and j refer to the participant and group s(he) belongs, respectively, and $S \in \{0,1\}$ indicates whether player i was sanctioned or not.

In our experiment, each contributor is exposed simultaneously to two monitors; one male and one female. Following Figure 2.1, monitors 1, 2 and 3 are women (pink) while monitors 4, 5 and 6 are male (blue). To make the gender of the monitors clear during the experiment, we sit female monitors in the front, and male monitors in the second row. In addition, contributors made their decisions using pink and blue cards that were received by female or male monitors, respectively. While the composition of the group is known to the experimenter, subjects do not know the exact identities of the other two members of their groups. We keep the matching group and roles constant over the experiment.

[12] We used a 1:3 constant sanctioning cost scheme across all rounds. The constant 1:3 sanctioning scheme simplifies the experimental structure for the non-student population in our experiment. Similar applications of the constant sanctioning cost scheme across rounds can be found in Sefton et al. (2007) and Baldassarri and Grossman, (2011).

This public good game is repeated over 10 rounds. After each round, contributors receive feedback on whether they were sanctioned or not. They also receive information on group contributions and payoffs for that round. At the end of the 10 rounds, one round is randomly selected for payment. This approach as argued by Fischbacher et al. (2001) gives subjects a monetary incentive to take all the decisions seriously and to ensure that potentially all decisions can become contributions to a public good.

Table 2.1 summarizes the treatments used in the experiment. Our design combines a within and between subject design. Each contributor is simultaneously exposed to a female and a male monitor. Yet each participant is exposed to only one type of sanction: non-monetary or monetary. Furthermore, we included a control group in which there are no monitors and no opportunities for sanctioning. Finally, we explore exogenous variation in the social environment and conduct the experiments in the patriarchal and matrilineal Volta and Ashanti regions.

Table 2.1. Experimental design

	Patriarchal Society		Matrilineal Society	
Type of Sanction	Female Monitor	Male Monitor	Female Monitor	Male Monitor
Non-Monetary	No_Mon_FP	No_Mon_MP	No_Mon_FM	No_Mon_MM
Monetary	Mon_FP	Mon_MP	Mon_FM	Mon_MM
No Sanction	Control_P		Control_M	

The above game could be solved recursively. The monitor has to decide whether to sanction or not. Yet, as monetary sanctioning are costly, the optimal response is not to sanction. As the expected cost of sanctions is zero, the expected marginal pay-off of the

public good is the same with social and monetary sanctioning. In both cases, individually it is optimal not to contribute to the public good as the marginal return from contributions are lower than the return from investing in the individual account: $\partial\pi_i/\partial c_i^1 = \partial\pi_i/\partial c_i^2 - 1 + b < 0$. However, since $0 < b < 1 < nb$, the social optimum is to contribute all endowments into the group account: $\partial\pi_i/\partial c_i^1 = \partial\pi_i/\partial c_i^2 = -1 + nb > 0$.

It has been consistently found that behavior in the public good game differs systematically from the predictions of rational decision making. Our experimental design allows us to explore whether the deviation from the predicted behavior can be related with personal characteristics of the monitor. Moreover, we explore how culture mediates these effects. In the next section, we present the main hypothesis of the study.

2.4 Hypothesis

Evidence supports the positive effect of sanctions on cooperation. It has been shown that when contributors have the possibility to sanction other group members, cooperation is higher (Fehr and Gächter 2000; Carpenter, 2007, Masclet et al., 2003). The presence of a third party punisher has also been shown to lead to higher contribution levels (Baldassarri and Grossman, 2011; Kube and Traxler, 2011). Hence, our first hypothesis is:

Hypothesis 1: Contributions are higher in treatments where there is a third party monitor compared with the control treatment without it.

Sociological literature has found that status affects behavior in various ways (Berger et al, 1972). For example, Hoff et al. (2011) observe that lower status individuals exhibit a much lower willingness to sanction violation of norms. Our second hypothesis is:

Hypothesis 2: Status of genders in society is reflected in sanctioning use. High status individuals are more likely to use sanctions than low status individuals.

Empirical evidence suggests that people behave more generously towards a high status person than a low status person. For instance, Kumru and Vesterlund (2010) find that contributions are larger when high status individual contribute prior to (rather than after) a low status individual. Similar results are provided by Ball and Eckel (1996) on the context of a bargaining game. In a market auction, Ball et al. (2001) find that when buyers have a higher status than sellers, equilibrium market prices are lower. Based on this evidence, we expect:

Hypothesis 3: Contributions will be higher when interacting with high status monitors, than low status monitors.

Sociological literature argues that one method in which individuals maintain their high status is to disobey individuals who impose sanctions on them. Thus, people of higher status are believed to have the right to make demands of those of lower status, and people of lower status are expected to comply with these demands (Eagly, 1983). Henrich and Gil-White (2001) further argue that high status entails greater access to desirable things and that access is not actively resisted by low status individuals. Hence, one would expect that in patriarchal societies, males, the high status gender, would be less responsive to female than to male monitors, while the opposite would be true in the matrilineal case.

Hypothesis 4: The higher gender status contributes less to monitors from the lower gender status than to monitors from high gender status.

It has been argued that access to resources and income affects the relative status that people receive in the social hierarchy (Cole et al., 1992; Corneo and Jeanne, 2001). Hence,

inheritance systems that favor one gender over the other in terms of control of resources gives that gender a relatively higher status than the other.

Hypothesis 5: We expect that the inheritance system will mediate the status that men and women have in the society. In societies where inheritance systems favor men like patriarchal societies in Ghana, men would have higher status than women. In matrilineal societies in which the right of men and women to inherit is more equal, differences in status across genders would be smaller.

Sociological literature indicates that the ability to influence others is mediated by gender stereotypes (Carli, 2001). If women use styles of communications that do not conform to what people expect from them, they are less influential. Women who used more direct and persuasive messages are less effective in influence than indirect messages while the opposite was true for men (Burgoon et al, 1975; Carli, 1990). The expression of disagreement by women tended to evoke more negative reactions than when such behavior is expressed by men. This lead to our final hypothesis:

Hypothesis 6: We expect that women would be more influential and elicit higher levels of contribution when using non-monetary sanctions than monetary sanctions.

2.5 Experimental Procedure

Our field experiments were conducted during the summer of 2012 in different locations in the city of Ho, the capital of the patriarchal Volta Region in the eastern part of Ghana (a region where the *Ewe tribe lives*) and the city of Kumasi, the capital of the matrilineal Ashanti region in the middle of Ghana. The experiment was conducted in five randomly selected areas in each city.

We recruited participants prior to the experiments. The workshop was announced during regular meetings of the association of assembly men and women with their communities. People volunteered to participate and when the number of volunteers was high, a lottery was played to select who would participate. Participants were notified of the venue and time of the next experimental session either in person or by a telephone call. The experimental sessions were normally conducted in the local school or at community centers.

In total, 156 subjects participated in the experiment. In a typical session, there were 15 subjects. 9 subjects were randomly matched in 6 different groups while the remaining 6 participants were given the role of external monitors. Overall, 1,440 contribution decisions were made. Group assignments remained the same for the entire duration of the session (partner's protocol). Each subject participated in only one session. A session lasted approximately 3 hours (on average) with an average earning of 7Gh₵ (€3)[13].

2.6 Results

2.6.1 *Demographic characteristics of monitors and non-monitors*

Table 2.2 summarizes demographic characteristic and community participation variables for both monitors and non-monitors in the experiment across the two locations. There are equal numbers of female and male monitors under the gender treatments across the two localities. Unlike the student population sample used in many experiments, the average age of most participants in this study falls within an older age range of 30 to 45 years. Our participants have on average 3 years of schooling. Overall, there were more male participants in the experiment than female participants across both localities. Lastly, subjects in the Ashanti location appear slightly more religious than subjects in the Volta location.

[13] Daily wage at the time was 4.48 Gh₵. The average earnings were close to two days of work.

Table 2.2 Demographic Characteristics (Volta And Ashanti)

Subjects Characteristics	Pooled (Mean) (Std. Dev.)	Volta (Patriarchal) (Mean) (Std. Dev.)	Ashanti (Matrilineal) (Mean) (Std. Dev.)
1. Monitor			
Age	35.2	39.8	30.5
	(14.4)	(16.5)	(10.0)
Educational Level	3.5	3.6	3.3
	(1.1)	(1.1)	(1.1)
Gender	1.5	1.5	1.5
	(0.5)	(0.5)	(0.5)
Marital status	1.7	1.7	1.8
	(0.8)	(0.6)	(0.9)
Hours spent in church/mosque	4.9	4.3	5.6
	(6.8)	(2.7)	(9.1)
2. Non-Monitor			
Age	37.3	40.9	33.7
	(15.6)	(17.6)	(12.3)
Educational Level	3.5	3.6	3.3
	(1.1)	(1.1)	(1.1)
Gender	1.6	1.6	1.6
	(0.5)	(0.5)	(0.5)
Marital status	1.7	1.6	1.7
	(0.8)	(0.8)	(0.8)
Hours spent in church/mosque	5.7	4.6	6.7
	(8.0)	(5.6)	(9.6)
N	156	78	78

Note: Age denotes actual age in years; educational level (1-6) denotes: (1) No education, (2) Primary School, (3) Some high school, (4) Completed high school, (5) Undergraduate university, (6) Postgraduate university; Not together for any reason, (6) Married with more than one spouse; Gender (1-2) denotes: 1 if female, 2 if male

2.6.2 *Use of sanctions and gender*

The descriptive statistics of the number of sanctions imposed by male and female monitors is presented in Table 2.3. We find that contrary to the predictions, both monetary and non-monetary sanctions are used. In about 10 percent of the decisions monitors imposed sanctions. As expected, non-monetary sanctions are more frequently used than monetary sanctions. However, we find that the extent to which sanctions are used vary across locations.

In the Ashanti matrilineal society where women have more economic power and influence, we observe that female monitors sanction significantly less than male monitors (overall, Wilcoxon rank sum test $Z = 4.192$, $p < 0.000$). This result is independent of whether the sanctioning mechanism is costly (monetary) ($Z = 2.198$, $p = 0.028$) or not (social sanctioning) ($Z = 4.643$, $p < 0.000$).

Table 2.3 Sanctioning Behavior (Gender Treatment)[a]

	Volta (Patriarchal) Total Mean (Std. Err.)			Ashanti (Matrilineal) Total Mean (Std. Err.)		
Gender	Pooled	No_Mon	Mon	Pooled	No_Mon	Mon
Female	41	25	16	26	18	8
	0.114	0.139	0.089	0.072	0.100	0.044
	[0.017]	[0.026]	[0.021]	[0.014]	[0.022]	[0.015]
Male	37	25	12	68	49	19
	0.103	0.139	0.067	0.189	0.272	0.106
	[0.016]	[0.026]	[0.019]	[0.021]	[0.033]	[0.023]
Total	78	50	28	94	67	19
Significance	-	-	-	***	***	**

[a] Standard errors in parentheses. *$p < 0.1$**$p < 0.05$, ***$p < 0.0.1$, two- tailed tests

In the patriarchal Volta locality, we observe that female monitors sanction more than male monitors when the sanctioning mechanism is costly (monetary). However, this difference is not statistically significant (Wilcoxon rank sum test $Z = 0.786$, $p = 0.432$, two-tailed). There also seem to be no significant differences in social sanctioning between female and male monitors when the sanctioning mechanism is non-monetary (social) sanctioning. Pooling the sanctions across the two different sanctioning mechanisms, we still do not observe significant differences in sanctioning between female monitors and male monitors (Wilcoxon rank sum test $Z = 0.479$, $p = 0.632$, two-tailed). Thus, women monitors in the Volta location (patriarchal society) punishes as much as male monitors. We reject the general hypothesis that females are less likely than male to punish norm violators.

The simple descriptive analysis does not consider that differences in sanctioning behavior could also be due to differences in compliance. Hence, in the next section we use econometric analysis to control for this effect. To account for other factors that could affect sanctioning, we run a panel probit model.

Probit regression estimates

(1) $Sanction\ by\ monitor_{g,t} = \alpha_0 + \beta FemaleMonitor_{g,t} + \gamma' X_{g,t} + \varepsilon_{g,t}$

where the dependent variable equal 1 if the monitor gave a sanction to a group member g and period is t. The indicator dummy variable $FemaleMonitor$ equals 1 if the monitor is a female; the $X_{g,t}$ depending on the model includes controls for current period contribution and lagged contribution.

Table 2.4 presents the results of the estimations in each of the societies under consideration. We find that irrespective of model specification, female monitors in the matrilineal locality are significantly less likely to sanction compared with male monitors. In the patriarchal case, however, we do not observe significant differences in the likelihood of sanctioning between female and male monitors. Consistent with theory, we also observe from Table 2.4 that the higher the contributions, the lower the likelihood of receiving sanctions in both societies.

Table 2.4. Panel Probit Regressions for Sanctioning Behavior

Independent Variables	Volta (Patriarchal) Mean (Std. Err.)		Ashanti (Matrilineal) Mean (Std. Err.)	
	Model 1	Model 2	Model 1	Model 2
Monetary	-0.386**	-0.523**	-0.650***	-0.746***
	(0.183)	(0.243)	(0.195)	(0.229)
Female	-0.145	-0.268	-0.958***	-1.051***
	(0.157)	(0.211)	(0.177)	(0.221)
Female × Monetary		0.007		0.279
		(0.235)		(0.345)
Contribution	-1.588***	-1.596***	-1.553***	-1.556***
	(0.162)	(0.163)	(0.178)	(0.178)
Lagged contri.	-0.142	-0.140	-0.034	-0.035
	(0.147)	(0.148)	(0.146)	(0.146)
Period	0.103***	0.104***	-0.088***	-0.088***
	(0.03)	(0.03)	(0.029)	(0.03)
# Observations	716	716	716	716
Prob > chi^2	0.0000	0.0000	0.0000	0.0000
Log likelihood	-168.133	-167.747	-167.295	-161.881

[a]Standard errors are in parentheses. *$p < 0.1$**$p < 0.05$, ***$p < 0.01$

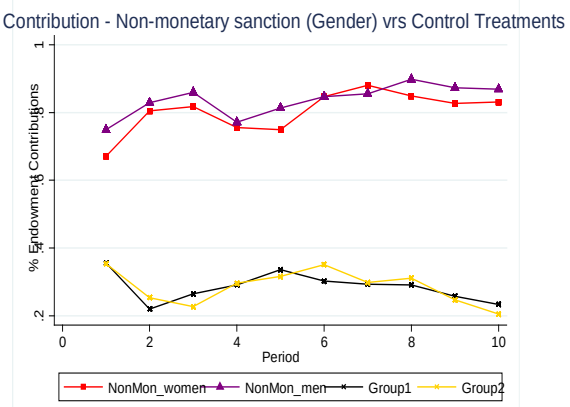
These results indicate that contrary to our expectations, female and male monitors in the patriarchal society are not different in the use of sanctions. However, in the matrilineal society, where we expected to find lower differences in the use of sanctions between genders, male monitors sanction more often than female monitors. If we are to believe that sanctioning is related to status, this would indicate that men have a higher status than women.

2.6.3 *Impact of sanctions on cooperation*

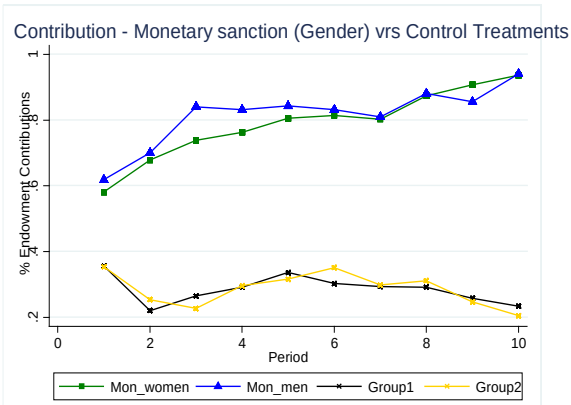
Figure 2.2 graphically presents the average contributions to the public good for different genders of the monitoring and sanctioning technologies. Panels A and B refer to the Volta

region, the patriarchal society; while Panels C and D refer to the matrilineal society. We compare contributions with the control treatment when there are no opportunities to sanction. We observe a general positive trend in contributions under both monetary as well as social sanctioning institutions. Contributions of endowment under the sanctioning institutions (both non-monetary and monetary sanctions) averages a little over 60 percent in the first period and gradually increases, approaching full cooperation in latter periods for both female monitors and male monitors. In contrast, the average contribution in the no sanction treatment starts from below 40 percent and gradually decays to about 20 percent by the last period. Thus, as can be seen in Figure 2.2, the presence of sanctioning opportunities enhances pro-social behavior considerably in both localities.

Figure 2.2 Average contributions across periods

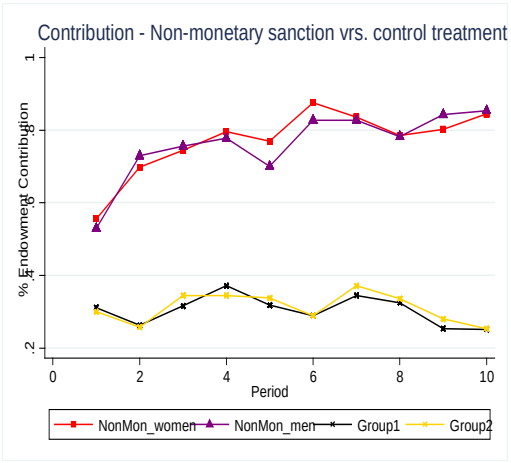


a. Non-Monetary

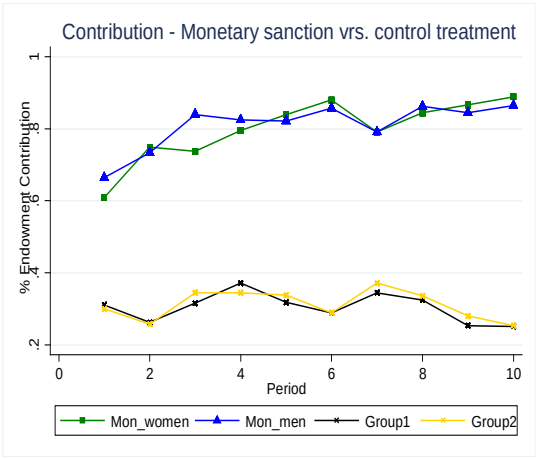


b. Monetary

Locality Volta (Patriarchal)



c. Non-Monetary



d. Monetary

Locality Ashanti (Matrilineal)

2.6.4 *Social influence of the monitor*

The social influence of the monitor can be captured by the degree of cooperation in the public good game. Table 2.5 presents the average contributions to the group account for groups with male and female monitors under the different sanction technologies. We find that in the patriarchal location, Volta, when sanctioning is costly, there are no significant differences between contributions to the group account in the presence of female or male monitors (Wilcoxon rank sum test, $Z = 1.030$, $p = 0.152$, one-tailed test). However, we do observe significant differences in contributions to the group account under non-monetary (social) sanctioning. Participants contributed significantly more when they have male monitors than when they had female monitors (Wilcoxon rank sum test, $Z = 1.434$, $p = 0.076$, one-tailed test). As discuss previously, male and female monitors are equally likely to use sanctioning mechanisms. Hence, this difference is not due to a disciplining effect of the sanction. When contributions are pooled across sanctioning types, a much stronger difference in contribution is observed. Thus, in the patriarchal region, locality average contributions to the group account with female monitors are significantly lower than with male monitors (Wilcoxon rank sum test, $Z = 1.735$, $p = 0.041$, one-tailed test).

In the matrilineal location, Ashanti, we observe no significant differences in the contributions to the group account under either female or male monitors. This result holds for both monetary and non-monetary (social) sanctioning (Wilcoxon rank sum test, $Z = 0.485$, $p = 0.314$ and $Z = 0.492$, $p = 0.3114$, respectably). Also, we observe no significant differences when the data is pooled across sanctioning mechanisms (Wilcoxon rank sum test, $Z = 0.070$, $p = 0.472$). As discussed previously, male monitors are more likely to sanction in the matrilineal society than monitors, hence, further analysis should control for this difference.

Table 2.5 Mean Subjects Contributions (Gender)

	Volta (Patriarchal) Mean (Std. Err.)			Ashanti (Matrilineal) Mean (Std. Err.)		
Gender	Pooled	No_Mon	Mon	Pooled	No_Mon	Mon
Female	1.991	2.008	1.973	1.963	1.926	2.001
	(0.028)	(0.042)	(0.038)	(0.031)	(0.045)	(0.041)
Male	2.064	2.091	2.037	1.966	1.906	2.026
	(0.026)	(0.037)	(0.036)	(0.031)	(0.045)	(0.041)
z-value	z =1.735**	z = 1.434*	z = 1.030	z = 0.070	z = 0.492	z = 0.485
N	720	360	360	720	360	360

[a] Standard errors are in parentheses. NMP denotes non-monetary sanctions and MP denotes monetary sanctions

In order to test the effect of demographic characteristics of the monitor on contributions to the public good, we use panel data analysis. Given the right-censoring in the data, we use a panel Tobit model. Ordinary least squares in this case will yield biased estimates, as the individual contributions are bounded from below by 0 and from above by 250. The empirical strategy adopted here is to first estimate and present the unconditional results based on the main treatment variables (dummy variable for gender, dummy for the type of sanctioning mechanism and the period). Because our experimental design in principle is a 2x2 design, we also present conditional regression results accounting for the interaction of the monitor's gender and the type of sanctioning. This interaction may account for the possibility that the social influence of male or female monitors is different depending on the sanctioning mechanism in place.

Aside from the use of the panel regression to capture the underlying panel nature of the data, we also acknowledge the presence of dynamic incentives in the experiment. Therefore, we also include various forms of lagged variables (i.e. lagged sanctions, lagged contributions of others) in other specifications. As part of this effort, we account for both dynamics as well

as censoring in our data. We also carried out other specification checks by controlling for differences in all observable demographic variables defined in Table 2.2. The specifications serve as a robustness check for our main result.

Tobit Regression estimate

$$(2)\ Contributions\ by\ group\ member_{g,t} = \alpha_0 + \beta FemaleMonitor_{g,t} + \gamma' X_{g,t} + \varepsilon_{g,t}$$

where the dependent variable is the contribution of a group member g and period is t. The indicator dummy variable $FemaleMonitor$ equals 1 if monitored by a female; the $X_{g,t}$ depending on the model includes controls for lagged sanctions, lagged contribution, demographic characteristics of the group member.

Our estimation result as presented in Table 2.6 parallels the conclusions derived from the non-parametric statistics discussed earlier. Model 1 presents the unconditional effect of the monitor's gender on individuals contributions (female =1 and male =0, monetary sanction = 1, non-monetary (social) sanction = 0). Results from Model 1 replicate the results from the parametric test. In Volta, subjects contribute significantly less to female monitors than to male monitors ($p < 0.05$) whereas in Ashanti, the contribution levels are not significantly different for groups with female and male monitors.

Model 2 provides the conditional effect by including an interaction term of monitor's gender and sanctioning type. Controlling for female-sanctioning-type interaction, we find that the gender effect persists in the patriarchal society ($p < 0.05$) so contributions to the public good are lower when the monitor is female. Model 3 further includes lagged sanctions and lagged contributions of others variables to attempt to capture some of the dynamic incentives inherent in the data over the periods of the experiment. As expected, we find that reciprocity explains cooperation. Hence, contributions depend positively on lagged contributions of

others in the group. Yet, the gender effect still persists in the Volta Region ($p < 0.10$). Model 4 further controls for the differences in observable demographic characteristics of the participants, i.e., gender of contributor, age, education, marital status, and religion. After controlling for observable differences in the demographic characteristics of group members, the effect of gender of the monitor becomes much stronger ($p < 0.05$). It is interesting to note that in Volta, male participants contribute less when the monitor is female and when sanctions are monetary than when they are non-monetary. As we control for the leverage of the sanction, this indicates that male contributors disregard female monitors when sanctions are costly as opposed to when they are not. The Ashanti region seems to favor a meritocracy rule, so male contributors are less likely to contribute to the public good when they have lower education.

Irrespective of which model specification is chosen, subjects in Volta contribute significantly less to the public good when confronting a female monitor than a male monitor. Yet as male and female monitors use sanctioning equally, the higher contributions that male monitors can achieve cannot be attributed to different levels of enforcement. Our results indicate that differences in the effectiveness of female monitors can be attributed to cultural differences. In the matrilineal society where women are more empowered, we find no significant differences in the level of contributions to the public good in groups with male and female monitors.

Table 2.6 Tobit Regressions of Participant's Contributions

	Loc. Volta- Patriarchal				Loc. Ashanti- Matrilineal			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Monetary	-0.142	-0.132	-0.063	-0.167	0.200	0.202	0.274	0.237
	(0.139)	(0.142)	(0.236)	(0.236)	(0.193)	(0.207)	(0.304)	(0.197)
Female Monitor	-0.099**	-0.102*	-0.188**	-0.125**	0.004	0.036	0.123	0.040
	(0.042)	(0.059)	(0.096)	(0.060)	(0.038)	(0.054)	(0.102)	(0.053)
Monetary		0.037	0.183	0.050		-0.059	-0.109	-0.076
× Female Monitor		(0.081)	(0.120)	(0.083)		(0.077)	(0.129)	(0.077)
Lagged sanction		-0.160**	-0.155**			0.006	0.005	
		(0.067)	(0.067)			(0.061)	(0.061)	
Lagged contri. Others		0.133**	0.139**			-0.011	-0.001	
		(0.061)	(0.061)			(0.060)	(0.061)	
Male Monitor			0.077				0.370	
× Male Contributor			(0.219)				(0.283)	
Female Monitor			0.138				-0.120	
× Male Contributor			(0.122)				(0.120)	
Monetary× Female Monitor			-0.291*				0.053	
× Male Contributor.			(0.166)				(0.163)	
Period	0.069***	0.049***	0.048***	0.069***	0.076***	0.051***	0.051***	0.076***
	(0.007)	(0.009)	(0.009)	(0.007)	(0.007)	(0.009)	(0.009)	(0.007)
Constant	1.895***	1.765***	1.760***	1.909***	1.597***	1.791***	2.486***	1.579***
	(0.108)	(0.154)	(0.506)	(0.111)	(0.142)	(0.177)	(0.598)	(0.143)
Other controls	No	No	Yes	No	No	No	Yes	No
# Observations	720	648	648	720	720	648	648	720
Prob > chi^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Log likelihood	-584.864	-486.324	-486.324	-483.919	-522.928	-440.491	-433.139	-522.436

[e] Standard errors are in parentheses: $*p < 0.1$**$p < 0.05$, ***$p < 0.01$

Notes: Contributions are bound from below by 0 and above by 2.5. Other controls refer to controlling for all other demographic variables defined in Table 2

Note that despite similar contributions to male monitors and female monitors in the matrilineal Ashanti society as observed from both non-parametric statistics and the model specifications, evidence from Table 2.3 and 2.4 indicates that male monitors in the matrilineal Ashanti region sanction significantly more than the female monitors. Thus, female monitors in Ashanti do not have to sanction as often as male monitors to induce similar levels of cooperation. Empirical results from the above specification support the hypothesis of the impact of culture on gender differences in social influence.

2.6.5 *Summary of the results and hypothesis test*

The results of the study confirm our hypothesis regarding the effectiveness of sanctioning mechanisms on cooperation (*Hypothesis 1*). Yet, contrary to our expectations we find that the relative social status of men and women is not reflected in different use of sanctions (*Hypothesis 2*). In the patriarchal society, male and female monitors are equally likely to use sanctions, while in the matrilineal society, male monitors sanction more often. Identity threat could explain this behavior. As it is socially expected that women are more powerful than men, male monitors might need to contest this expectation exerting power. This is however a question that requires further research.

One of our hypotheses was that status would affect social influence (*Hypothesis 3*). Consistent with our hypothesis, we see that in our patriarchal societies, contributions were lower in groups with female monitors compared with groups with male monitors. Also, consistently with our expectations, we find no significant differences in cooperation in groups with male and female monitors in our matrilineal societies.

We find some support to the hypothesis that participant's status matter in the degree of social influence *(Hypothesis 4*). In particular, we find that in patriarchal societies, male contributors discriminate against female monitors and cooperate less in groups led by a

female monitor compared with groups led by male monitors. Also, male participants contribute less than female participants when monetary sanctions are in place. Interestingly, we find that in the patriarchal society, female contributors also discriminate against female monitors particularly when non-monetary sanctions are in place. Our results do not support any such difference in the matrilineal society.

Our results partly support *Hypothesis 5.* We find that gender differences in the use of sanctions and social influence are not constant across these two societies. This result suggests that culture, and in particular, inheritance systems are important in shaping social status and determining the gender roles in society. Yet, differences in social status are not manifested across all dimensions. Status differences are not necessarily reflected in the use of sanctions but on social influence.

Our results support *Hypothesis 5.* In the patriarchal society, we find gender differences in the degree of social influence depending on the type of sanctions being used. Women discriminate against other women cooperating less when sanctions are non-monetary. Male contributors discriminate against female monitors when sanctions are monetary. We do not find such effect in matrilineal societies.

2.7 Conclusion

Chipping-away the glass ceiling for women especially those in developing countries has strong policy implication for the overall goal of gender empowerment and economic development around the world. The goal of this paper was to use a controlled experiment in the field to examine the impact of gender on norm enforcement and collective action outcomes in two distinct societies; one matrilineal, and the other patriarchal. The two inheritance systems in these societies provide a unique platform to examine the use of sanctions and social influence of women in society.

We find that in the matrilineal society where women have control and power in inheritance and as such have high status within the society, subjects tend to contribute the same to groups monitored and sanctioned by females and males alike. On the other hand, subjects in the patriarchal society tend to contribute significantly less to groups monitored and sanctioned by women. However, we find that the differences in monitoring outcomes is not attributed to gender differences in sanctioning, as female and male monitors in the patriarchal society show similar sanctioning behavior. These results therefore refute the general hypothesis that women or lower status individuals exhibit a much lower willingness to sanction norm violation (see Hoff et al, 2011; Balafoutas and Nikiforakas, 2012). The evidence squares well with the notion that cultural factors are responsible for a low representation of women in positions of authority. Thus, the negative impact of women's monitors on collective action may be driven more by factors that are external to the woman.

These findings provide strong implication for public policy. Overall, we argue strongly in favor of "breaking the glass ceiling". However, we also argue that policy makers should bear in mind that placing women in positions of authority alone, i.e. "chipping-away at the glass ceiling" does not automatically lead to superior outcomes but more policy and institutional commitment would be needed to support this change. Our results, together with other papers that compare behavior in matrilineal and patriarchal societies point to a robust relationship between gender, culture and economic outcomes. Our results are also a testament to the presence of a strong gender-inequality-differential within countries. We argue that policies that promote the welfare of women and the aged (e.g., economic participation and decision-making power) especially in developing countries should take inequality differences within the countries into account for effective policy intervention.

Appendix to Chapter 2

Instructions

Hello and welcome to the workshop. Thank you all very much for making time to come to this workshop. We really do appreciate. In this workshop you will have the option to earn some money. How much money you earn will depend on your decision and the decision of others in the group. Money earned in the workshop will be paid to you in cash at the end of the workshop. During this workshop you will be asked to perform a task. We will explain to you the task at its due time. In total the workshop will last about 2 hours.

Before we start the different tasks, we please ask that you all come to the front of the room so we can reorganize the seats.

Please do not open the envelops on the table.

In order to maintain comparability across different participants in the workshop we have prepared some instructions that we will read to you.

For the task, you will have different roles in the workshop. Some of you will be called ‘workers’ and others will be called ‘inspectors’.

What do workers need to do?

For the next task, you will have different roles in the workshop. Some of you will be called ‘workers’ and others will be called ‘inspectors’.

Each worker will be assigned to two independent groups ‘Group Pink’ and ‘Group Blue’. Each group consists of three participants; you and two others participants. You will not know who is in each of the groups you belong.

Each worker will receive ₵2.5 for each group they belong. So in total you will receive ₵5. In each group there is a group account. Your task is to decide how much you want to invest in the group account and how much to put in your pocket. Whatever money you put in your pocket will multiply by one. The money that you invest in the group account will be multiplied by two and will be equally shared by the three group members. Similarly, the money that other group members invest in the group account will be multiply by two and will be equally shared among the three group members.

You have to make this decision for your ‘Pink Group’and as well as for your ‘Blue Group’. You will receive two decision cards like these ones (show example). The pink card refers to group Pink, while the light blue card refers to the group Blue. The cards have boxes with the numbers, ranging from 10 pesewa to ₵ 2.5.Your task is to ‘circle’ the amount of money that you want to invest into the group account. For instance if you want to invest all your ₵ 2.5, then you need to circle ₵ 2.5. If you want to invest only 10 pesewas , then you circle 10p. The money that is not invested in the group account will be automatically transferred to your private pocket. Let’s demonstrate with the following example (use posters)::

Example1:

Assume that you invested 60pesewas into the Group Pink and kept ₵ 1.90 in your pocket. Hence in the decision card for Group Pink, pink, you ‘circle’ 60p. For ‘Group Blue’, let’s assume that you invested 80pesewas into the group account and kept ₵ 1.70 in your pocket. Now in the decision card for group blue, light blue card, you ‘circle’ 80p. How much do you receive? Well, what you earn will depend on how much money you and the other two

subjects in each group invested in the group account and how much money each person kept in their own pockets. If the others did exactly the same as you, and invested 60p each to Group Pink's account and 80p to Group Blue's account, the total investment in the Group Pink's account will be: 60p*3=₵1.8 and in Group Blue is 80p*3= ₵ 2.4. Your earning from Group Pink would be ₵ 1.90 + ₵ 1.8*2/3 = ₵ 3.10. And how much would you earn from Group Blue? ₵ 1.70+ ₵ 2.4*2/3 = ₵ 3.30.

Example2:

Assume that for 'Group Pink' you invested 0pesewa into the group account and kept all ₵2.50 in your pocket. Hence in the decision card for Group Pink, pink, you 'circle' 0p. If the other two participants in Group Pink invested on average ₵2.0 into the Group Pink Account, then the total amount of money in Group Pink account is 0p+ ₵ 2*2= ₵ 4. And your earnings from Group Pink is ₵ 2.5 + 4*2/3 = ₵ 5.17.

For 'Group Blue', let's assume that you invested ₵ 2.5 into the group account in 'Group Blue' and kept nothing in your pocket. Now in the decision card for group blue, light blue card, you 'circle' ₵2.5. If the other participants in Group Blue invested on an average invested 0p each into the group account, the total amount of money in the group account would be ₵2.5+0p*2= ₵2.5. How much would your earnings be? 0p + 2.5* 2/3 = ₵ 1.67

After making your decision as a worker on the Decision Cards, the assistant will pass by to collect the decision cards and send them to the inspectors.

What do inspectors need to do?

The job of the inspectors is to observe workers group investment and to fill a report. For carrying out this task the inspectors will receive ₵5.0. After observing each worker's investment to the group account, the inspector has the opportunity to show dissatisfaction or disapproval of any worker's investment level to the group account. If the inspector is

dissatisfied, the inspector can send one sadface to one worker. Each inspector will observe decisions for ONLY one group.

After the inspectors have made their decision workers will receive two REPORTS. One from the inspector for group pink and one from the inspector for group blue. The REPORT is at the back of the DECISION CARDS. The inspectors will also put the sadface if any, in the middle of the report card and fold it (Demonstrate) to be sent to the workers. The report card looks like this one (show with example on poster). In the report workers will see how much money in total is investment in the group account and how much money each person receives back from the group account.

Let's consider our last example. Two of the 'workers' invested 0p in the group account and the other invested all ₵ 2.5 into the group account. Hence the inspector needs to write:

Total investment in the group account: ₵2.5.

We double the total investment in the group account, so the group account now has ₵5. This value is divided equally among all the three participants in the group. In this case, everyone will get ₵1.67.

REPORT (Example)

Total investment in group account	Double	Payback from group account
₡2.5	₡5	₡1.67

The inspectors also have to complete an 'Inspector History Form'. The inspectors have to complete the 'Inspector History Form' first which looks like this one (show example and explain on poster) before completing the report cards for each of the three participants.

Let's demonstrate how the 'Inspector History Form' should be completed by the inspectors:

Let's consider our last example. Let's assume 'worker1' and 'worker 2' are those who invested 0p in the group account and 'worker 3 invested all ₡ 2.5 into the group account. Let's assume the inspector sent a sadface picture to ´worker 2'. Hence the inspector needs to write and tick as follows:

Round 1

	Worker			
	1	2	3	Total Investment
Investment group account	0	0	₡ 2.5	₡2.5
Sad Face		1		

Total investment in the group account: ₡2.5. When the inspectors' finishes completing the 'Inspector History Form' and the report cards, our assistants will come round and collect them.

This process will be repeated a total of 10 rounds. At the end of the 10 rounds, one round will be selected at random for payment in cash. The money you receive will be yours to take home and use as you please.

<CONTROL QUESTIONS>

Before starting the third task, we would like to verify that we had been clear in explaining the task.

Please open envelope 1 and solve the questions.

Imagine that you are a worker and want to invest ₡1.2 in the group account. 1. Please represent this case using the following decision card.

DECISION CARD
CONTROL QUESTION
PARTICIPANT ___

0p				
10p	20p	30p	40p	50p
60p	70p	80p	90p	₡1.0
₡1.10	₡1.20	₡1.30	₡1.40	₡1.50
₡1.60	₡1.70	₡1.80	₡1.90	₡2.0
₡2.10	₡2.20	₡2.30	₡2.40	₡2.50

Assume the other two group members together contributed 60p each into the group account.

1. How much money is left in your pocket after investing?

2. How much money (payback) will you receive from the group account?

3. How much money will you receive in total?

4. How much money will you receive if the inspector sends you a sadface?

Please open envelope 2 and solve the second question.

Imagine that you are an inspector for a group and observed that two people invested ₡1.50 each in the group account and the other invested 0p in the group account. Please represent this case using the following REPORT CARD.

REPORT CARD

Total investment in group account	Double	Payback from group account

<Random selection into roles>

Now we will continue by separating some of you to be 'workers' and others to be 'inspectors'. As I told you before, some of you will serve as inspectors. Please all the women should kindly come forward (*select 3 randomly* if there are more than 3 participants). Please bring all your belongings along. Now I would like to please ask all the men to kindly come to the front *(select 3 randomly if there are more than 3 participants).* We would like to ask the women among you to sit on the front row and the men to sit on the chairs on the second row.

Actual Task

Now we will start the third task. Please, participants who are sitting behind the second row 'workers' should open envelop 3 and take out decision card pink and light blue for round 1. The pink card will be observed by one of the women participants in the first row and the blue card will be observed by one of the men participants sitting in the second row. Please when finish making your decisions; turn the decisions sheets upside down on the table so our assistants can collect them. Please begin by making your first investment decisions into group pink and group blue.

Exit Questionnaire

Please open envelop 4. Envelop 4 contains a questionnaire. We will please ask that you complete the questionnaire. Raise your hand if you need any help to complete the questionnaire.

DECISION CARD
GROUP PINK

PARTICIPANT ___ ROUND _____

0p				
10p	20p	30p	40p	50p
60p	70p	80p	90p	₡1.0
₡1.10	₡1.20	₡1.30	₡1.40	₡1.50
₡1.60	₡1.70	₡1.80	₡1.90	₡2.0
₡2.10	₡2.20	₡2.30	₡2.40	₡2.50

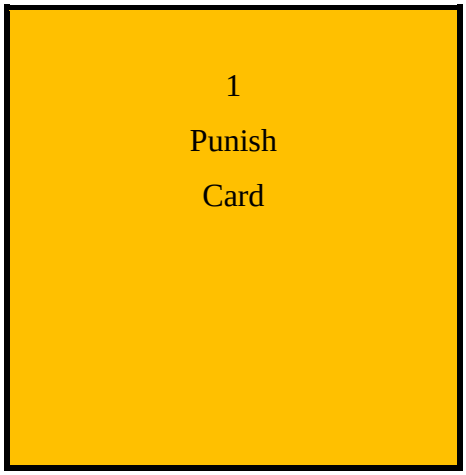
DECISION CARD
GROUP BLUE

PARTICIPANT ___ ROUND _____

0p				
10p	20p	30p	40p	50p
60p	70p	80p	90p	₡1.0

₡1.10	₡1.20	₡1.30	₡1.40	₡1.50
₡1.60	₡1.70	₡1.80	₡1.90	₡2.0
₡2.10	₡2.20	₡2.30	₡2.40	₡2.50

COSTLY SANCTIONS



Exit Survey (Workers)

Participant No: _____

Name of Respondent: _____

1. How interesting did you find this workshop?

Not Very Interesting				Very Interesting
□ 1.	□ 2.	□ 3.	□ 4.	□ 5.

2. What do you think was the objective of the workshop?

_____

_____

3. As a worker in the workshop, how fair do you think the inspectors were in the workshop?

Very fair				Very Unfair
□ 1.	□ 2.	□ 3.	□ 4.	□ 5.

4. How would you characterize your behavior in the workshop?

Very fair				Very Unfair
□ 1.	□ 2.	□ 3.	□ 4.	□ 5.

Instructions: Use the scale below to indicate the extent to which you agree with each statement as it applies to you.

1 = Strongly Disagree
2 = Disagree
3 = Agree
4 = Strongly Agree

5. I am more affected when someone criticizes me in public than when someone criticizes me in private.

Strongly disagree Disagree Agree Strongly Agree

1	2	3	4
☐	☐	☐	☐

6. During a discussion, I try not to ask questions because I may appear ignorant to others.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

7. I maintain a low profile because I do not want to make mistakes in front of other people.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

8. Before I make comments in the presence of other people, I qualify my remarks.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

9. I downplay my abilities and achievements so that others do not have unrealistically high expectations of me.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

10. I carefully plan what I am going to say or do to minimize mistakes.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

11. I say I may be in error before commenting on something.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

12. When I meet other people, I am concerned about their expectations of me.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

13. I hesitate asking for help because I think my request will be an inconvenience to others.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

14. I try not to do things that call attention to myself.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

15. I do not criticize others because this may embarrass them.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

16. I carefully watch others' actions before I do anything.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

17. I will not complain publicly even when I have been treated unfairly.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

18. I try to act like others to be consistent with social norms.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

19. Before I do anything in public, I prepare myself for any possible consequence.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

20. I prefer to use a third party to help resolve our differences between another person and me.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

21. When discussing a problem, I make an effort to let the person know that I am not blaming him or her.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

22. When someone criticizes me, I try to avoid that person.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
☐	☐	☐	☐

23. When I make a mistake in front of others, I try to prevent them from noticing it.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
□	□	□	□

24. Even when I know another person is at fault, I am careful not to criticize that person.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
□	□	□	□

25. When someone embarrasses me, I try to forget it.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4
□	□	□	□

On a scale of 1 -5, please answer the following questions. When deciding what to do in the workshop how important was the following:

26. Investment of others

Very import.	Quite import.	Fairly import.	Slightly import.	Not at all import.
□	□	□	□	□

27. Shame before the inspector

Very import.	Quite import.	Fairly import.	Slightly import.	Not at all import.
□	□	□	□	□

28. Potential sanction

Very import.	Quite import.	Fairly import.	Slightly import.	Not at all import.
□	□	□	□	□

29. Identity of the inspector

Very import.	Quite import.	Fairly import.	Slightly import.	Not at all import.
□	□	□	□	□

30. I wanted to make as much money as I could for myself.

Very import.	Quite import.	Fairly import.	Slightly import.	Not at all import.
□	□	□	□	□

31. I wanted the group to make as much money as possible.

Very import.	Quite import.	Fairly import.	Slightly import.	Not at all import.
□	□	□	□	□

34. I am going to tell you the names of some occupations. Which of these occupations are generally considered to require a high level of education? For each occupation, please indicate one of the following levels: highest, quite high, average, quite low, and lowest.

	(a) Highest	(b) Quite high	(c) Average	(d) Quite low	(e) Lowest
(01) Trader	5	4	3	2	1
(02) Doctor	5	4	3	2	1
(03) Carpenter	5	4	3	2	1
(04) Farmer	5	4	3	2	1
(05) Mechanic	5	4	3	2	1

35. Now I am going to mention the names of some occupations. People often differentiate between high status occupations and low status occupations. If you were to rank these occupations on five levels from highest to lowest, how would you classify them? For each occupation, choose one of the following levels: highest, quite high, average, quite low, and lowest.

	(a) Highest	(b) Quite high	(c) Average	(d) Quite low	(e) Lowest
(01) Trader	5	4	3	2	1
(02) Doctor	5	4	3	2	1
(03) Carpenter	5	4	3	2	1
(04) Farmer	5	4	3	2	1
(05) Mechanic	5	4	3	2	1

36. Would you prefer to have a higher status occupation but not rich[a] or to have a lower status occupation but rich[b].

□ 1. a □ 2. b

General Information

37. Were you born in this city? □ 1. No □ 2. Yes

38. If no, please where were you born (Town/region)? _____

39. How long have you lived in this city? Years___ Months____

40. Does your community carry out community project like clean up, etc.?
□ 1. No □ 2. Yes

41. In the last year, how many time did your community carried out a community project? _____

Out of those, in how many did you take part? _____

42. Are you an active member of a local church or mosque and how active are you?
No, not at all Yes, very active
□ 1. □ 2. □ 3. □ 4. □ 5.

43. How many hours a week do you spend on church/mosque activities? _____

44. What is your occupation? _____

45. Do you think your occupation is considered high or low status in the society?

□ 1. High □ 2. Low □ 3. It depends □ 4. Not sure

46. If you were starting life all over again, what occupation would you have dreamt to be in? *(one response ONLY*) _____

Trust and Risk Taking Behaviors (Behavioral measures)

General trust questions

47. Do you think most people in general would try to take advantage of you if they got a chance, or would they try to be fair?"
□ 1. Would take advantage of you
□ 2. Would try to be fair
□ 3. Depends
□ 4. Don't know
□ 99. No Answer

Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?
□ 1. Try to be helpful
□ 2. Just look out for themselves

□ 3. Depends
□ 4. Don't know
□ 99. No Answer

48. Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?"
□ 1. Most people can be trusted
□ 2. Can't be too careful
□ 3. Depends
□ 4. Don't know
□ 99. No Answer

49. Rate your willingness to trust others on a scale of 1-6 where 1 is always trusting and 6 is never trusting.

Always trusting never trusting
□ 1. □ 2. □ 3. □ 4. □ 5. □ 6.

50. How often do you leave your door unlocked?
□ 1. Very Often
□ 2. Often
□ 3. Sometimes
□ 4. Rarely
□ 5. Never

51. How willing are you to take risks, in general?
Very much willing Not at all willing

□ 1. □ 2. □ 3. □ 4. □ 5.

Demographics

52. What is the highest level of education you have completed?
□ 1. No education
□ 2. Primary school
□ 3. Some secondary school
□ 4. Completed high school
□ 5. Undergraduate university
□ 6. Postgraduate university

53. What is your marital Status?
□ 1. Married
□ 2. Single
□ 3. Divorced
□ 4. Widow
□ 5. Not together for any reason
□ 6. Married with more than one spouse

54. Whom do you live with?

- □ 1. alone
- □ 2. just partner
- □ 3. just children
- □ 4. partner and children
- □ 5. extended
- □ 6. Friends
- □ 7. Other

55. Gender of respondent:

- □ 1. Female
- □ 2. Male

56. How old are you? (in years) _____

Chapter 3

3 Are the elder more effective implementing punishment? Experimental evidence from urban Ghana

Edward Asiedu, Marcela Ibanez

Abstract: To study the persistence of cultural norms that mandate respect towards the elder, we conducted an artefactual field experiment in two cities in Ghana. Using a public good game with third-party punishment, we find that punisher's age is an important determinant of cooperation. Our results indicate the elder are more efficient using punishment than youngsters.

Keywords: Field experiment, status, age, punishment, public goods

JEL classification: H41; C92; C93

Joint paper with Marcela Ibanez.

3.1 Introduction

In some regions in the world, including Asia and Africa, there is a deep respect for the elder (Sung, 2001, Van der Geest, 1997; Löckenhoff et al., 2009). The elder are regarded as repository of communal wisdom and hence are considered the teachers and directors of the young (Diamond, 2012). They are regarded aS natural authorities and their opinions are requested in important decisions as well as in every day matters (Karlberg, 2003). However, as population migrate from rural to urban areas and as the younger get more educated the respect towards the elder seems to be decaying. The objective of this paper is to investigate if elders are more respected than juniors and hence are more effective when acting as authorities. We ask: if an authority is required to impose law and order who should it be?

Our experimental design is based on a public good game with third party punishment. We vary exogenously the age of the third-party punisher and compare elder versus junior punishers. We also vary the technology available to punish and compare non-monetary and monetary sanctions. To investigate how the urbanization process affects respect towards the elder we conducted an artefactual field experiment in two urban cities in Ghana. Ho, a relatively small city with about 100 thousand inhabitants, and Kumasi, the second biggest city in the country with a population of a little more than 2 million inhabitants.

There has been large empirical evidence supporting the effect of exogenous sanctioning mechanisms in inducing cooperation or overcoming social dilemmas (e.g. Andreoni and Gee, 2012; Baldassarri and Grossman, 2011; Fehr and Fischbacher, 2004, Kube and Traxler, 2011; Yamagishi, 1986). Nonetheless, one topic that has received little attention is how socioeconomic characteristics of the punisher affect the effectiveness of sanctions. We contribute to this research considering how the age of the punisher affects cooperation. Previous evidence supports that age matters for social preferences (Cardenas and Carpenter,

2009). It has also been shown that age affects individuals willingness to use punishment (Egas and Riedl; 2008 and Gächter and Herrmann, 2009). Unlike previous work we focus on third party punishment. Moreover, we trace the origins of this difference and consider how the urbanization process changes traditional cultural values that subscribe respect towards the elder.

3.2 Experimental design and procedures

Our experimental design is based on a repeated public good game with third-party punishment (see Fehr and Fischbacher, 2004). Upon arrival to the experiment, participants are assigned the roles of contributors or third party punishers. The oldest and youngest participants in a given session are assigned the role of third party punishers. The other participants are assigned the role of contributors. Yet, in order to avoid priming participants on age, we select punishers only based on visual inspection only so we do not ask age or make any reference towards age as selection criteria. To signal that the punishers are not exactly the same, punishers who look older sat in the first row, while punishers who look younger sat in the second row.

Participants assigned the role of contributors are assigned simultaneously to two random and anonymous groups. Each group consists of three contributors and one punisher. Subjects do not know the exact identities of the other members of their group. Yet, they know that contributions to Group 1 will be observed by one of the three punishers sitting in the first row (older punishers) while contributions to Group 2 will be observed by one of the three punishers sitting in the second row (younger punishers).

Contributor, *i*, receives an endowment of 250 pesewas (2.5 Ghana cedis) for each of the two groups he belongs to, *j*, and has to decide how to distribute the endowment between a

public (c_{ij}) and a private account in each of the two groups. Each pesewa invested in the public account yields a payoff of *b=2/3* pesewas to each group member while each pesewa not contributed are deposited in the subject's private account where it yields a return of one to the contributor.

The third party punisher receives 500 pesewas. His task is to observe contribution levels for the three contributors in one group and decide whether or not to show disapproval sending sanctioning points, *S*. Under the non-monetary or social sanctioning treatment, the punisher can send a sad face to disapprove group members' contributions. Social sanctions are costless for both sender and recipient (*v=p=0*). In the monetary punishment treatment, the punisher spends 8.33 pesewas to reduce the monetary payments of recipients by 25 pesewas (1:3). Punishers can send a maximum of only one punishment point. The punisher neither contributes to the public good, nor receives any payment from contributions in the public account. The payoff for contributors is:

$$\pi_i = \sum_{j=1}^{2} \left(250 - c_{ij} + \frac{2}{3}\sum_{i=1}^{3} c_{ij} - vS_{ij}\right) \quad (1)$$

where $S \in \{0,1\}$ indicates whether player i was sanctioned or not. The pay-off for punishers is:

$$\pi_i = 500 - \sum_{i=1}^{n=3} p_i \, S_i \quad (2)$$

Since monetary sanctioning is costly for the monitor, his optimal response is not to sanction. Since $0 < b < 1 < nb$, the optimal investment into the public good in each group is zero ($\partial \pi_i / \partial c_{ij} = -1 + b < 0$). However, the social optimal is to contributing all endowments into the group account ($\partial \pi_i / \partial c_{ij} = -1 + nb > 0$).

This game is repeated over 10 rounds. Subjects received feedback between rounds on the contributions of other group members, sanctioning decisions from the punisher and their

payoffs. One round is randomly selected to determine the actual payoffs. The experimental design is presented in Table 3.1.

Table 3.1 Experimental Design

Between Subject Treatment	Within Subject Treatment Type of Monitor	
	Group 1	Group 2
Social Sanction	Old	Young
Monetary Sanction	Old	Young

We implemented the experiment in urban areas where there is high degree of anonymity across participants. We conducted the experiments in two cities that had different degrees of urbanization measured by population size: The small city of Ho with 100 thousand inhabitants and the medium sized city of Kumasi with over 2 million inhabitants. The recruitment process was done with collaboration from Assemblymen and women. The experimental sessions were conducted in the local school or the community center with participants from different neighborhoods. On an average a session lasted approximately three hours with an average earning of 700 pesewas (3 EUR) compared with a minimum daily wage of 448 pesewas.

3.3 Empirical results

In total 120 subjects participated in 7 experimental sessions. As each participant took more than one decision, we can account for unobserved correlation across decisions using random effects models. Table 3.2 presents the estimated coefficients for sanctioning behavior and cooperation in each city separately. The first model is a linear probability model in which the dependent variable takes value equal to one for sanctioning and zero otherwise. The second model considers a random effects Tobit model to account for the left and right-censoring of the contribution levels.

As expected, we find that the likelihood to sanction decreases with contribution levels. Whereas in the small city of Ho, older and younger punishers are equally likely to use sanctioning (both social and monetary), in the larger city of Kumasi, the elder are less likely to use sanctions than the junior punisher. This behavior could indicate that in larger cities, the young are more severe judges as a strategy to compensate for their lower status.

In Kumasi the elder are less likely to impose sanctions than the junior punishers, hence one would expect that cooperation would also be lower in groups with elder punishers compared with junior ones. However, our results indicate that there are no significant differences in contributions between groups with elder and junior punishers under the non-monetary and monetary sanctioning treatments. This result indicates that the severity of sanctioning by the junior punishers in Kumasi does not translate into higher contribution levels. The respect to the elderly compensate for their lower use of punishment compared with junior punishers. More evidence in support of higher respect towards the elder is found in Ho. Even though the elder and the junior punishers sanction as much, cooperation is significantly higher towards elder punishers in the monetary sanctions treatment.

Table 3.2 Sanctioning and cooperation by treatment

	Random Effects GLS Sanctions		Random Effects Tobit Contributions	
	Ho	Kumasi	Ho	Kumasi
	(1)	(2)	(3)	(4)
Total Contribution	-0.0526**	-0.106***		
	(0.0229)	(0.032)		
Senior Punisher	-0.107	-0.367**	-0.0788	-0.0692
	(0.115)	(0.145)	(0.061)	(0.047)
Monetary Sanction	0.0299	-0.111	-0.199	0.288**
	(0.108)	(0.143)	(0.159)	(0.129)
Senior X Monetary	-0.0436	0.176	0.159*	0.0402
	(0.151)	(0.195)	(0.087)	(0.067)
Period	-0.0255***	-0.0479***	0.0300***	0.0330***
	(0.009)	(0.0116)	(0.009)	(0.008)
L.Others Contrib.			0.0772	0.193***
			(0.058)	(0.055)
L.Sanction			-0.0628	-0.0885*
			(0.090)	(0.054)
Constant	0.642***	1.371***	1.822***	1.314***
	(0.155)	(0.162)	(0.159)	(0.115)
Observations	216	204	648	648

Standard Errors in parenthesis. *** Significant at the 1 percent level,
** Significant at the 5 percent level, * Significant at the 10 percent level.

3.4 Concluding discussion

Our results indicate that cultural norms that dictate respect for the elder persist in urban areas in Ghana. Older third-party monitors tend to induce higher levels of cooperation. While the elder is less or equally likely to impose sanctions than junior third party punishers, cooperation is equal or higher in groups with an elder third party punisher. This result indicates that the age of the judge is an important determinant of cooperative behavior. To induce cooperation in the field, policy makers must understand the social norm that permeates the society in question.

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Appendix to Chapter 3

Instructions

Hello and welcome to the workshop. Thank you all very much for making time to come to this workshop. We really do appreciate. In this workshop you will have the option to earn some money. How much money you earn will depend on your decision and the decision of others in the group. Money earned in the workshop will be paid to you in cash at the end of the workshop. During this workshop you will be asked to perform a task. We will explain to you the task at its due time. In total the workshop will last about 2 hours.

Before we start the different tasks, we please ask that you all come to the front of the room so we can reorganize the seats.

Please do not open the envelops on the table.

In order to maintain comparability across different participants in the workshop we have prepared some instructions that we will read to you.

For the task, you will have different roles in the workshop. Some of you will be called 'workers' and others will be called 'inspectors'.

What do workers need to do?

For the next task, you will have different roles in the workshop. Some of you will be called 'workers' and others will be called 'inspectors'.

Each worker will be assigned to two independent groups ‘Group Pink’ and ‘Group Blue’. Each group consists of three participants; you and two others participants. You will not know who is in each of the groups you belong.

Each worker will receive ₵2.5 for each group they belong. So in total you will receive ₵5. In each group there is a group account. Your task is to decide how much you want to invest in the group account and how much to put in your pocket. Whatever money you put in your pocket will multiply by one. The money that you invest in the group account will be multiplied by two and will be equally shared by the three group members. Similarly, the money that other group members invest in the group account will be multiply by two and will be equally shared among the three group members.

You have to make this decision for your ‘Pink Group’and as well as for your ‘Blue Group’. You will receive two decision cards like these ones (show example). The pink card refers to group Pink, while the light blue card refers to the group Blue. The cards have boxes with the numbers, ranging from 10 pesewa to ₵ 2.5.Your task is to ‘circle’ the amount of money that you want to invest into the group account. For instance if you want to invest all your ₵ 2.5, then you need to circle ₵ 2.5. If you want to invest only 10 pesewas , then you circle 10p. The money that is not invested in the group account will be automatically transferred to your private pocket. Let’s demonstrate with the following example (use posters)::

Example1:

Assume that you invested 60pesewas into the Group Pink and kept ₵ 1.90 in your pocket. Hence in the decision card for Group Pink, pink, you ‘circle’ 60p. For ‘Group Blue’, let’s assume that you invested 80pesewas into the group account and kept ₵ 1.70 in your pocket. Now in the decision card for group blue, light blue card, you ‘circle’ 80p. How much do you receive? Well, what you earn will depend on how much money you and the other two

subjects in each group invested in the group account and how much money each person kept in their own pockets. If the others did exactly the same as you, and invested 60p each to Group Pink's account and 80p to Group Blue's account, the total investment in the Group Pink's account will be: 60p*3=₵1.8 and in Group Blue is 80p*3= ₵ 2.4. Your earning from Group Pink would be ₵ 1.90 + ₵ 1.8*2/3 = ₵ 3.10. And how much would you earn from Group Blue? ₵ 1.70+ ₵ 2.4*2/3 = ₵ 3.30.

Example2:

Assume that for 'Group Pink' you invested 0pesewa into the group account and kept all ₵2.50 in your pocket. Hence in the decision card for Group Pink, pink, you 'circle' 0p. If the other two participants in Group Pink invested on average ₵2.0 into the Group Pink Account, then the total amount of money in Group Pink account is 0p+ ₵ 2*2= ₵ 4. And your earnings from Group Pink is ₵ 2.5 + 4*2/3 = ₵ 5.17.

For 'Group Blue', let's assume that you invested ₵ 2.5 into the group account in 'Group Blue' and kept nothing in your pocket. Now in the decision card for group blue, light blue card, you 'circle' ₵2.5. If the other participants in Group Blue invested on an average invested 0p each into the group account, the total amount of money in the group account would be ₵2.5+0p*2= ₵2.5. How much would your earnings be? 0p + 2.5* 2/3 = ₵ 1.67

After making your decision as a worker on the Decision Cards, the assistant will pass by to collect the decision cards and send them to the inspectors.

What do inspectors need to do?

The job of the inspectors is to observe workers group investment and to fill a report. For carrying out this task the inspectors will receive ₵5.0. After observing each worker's investment to the group account, the inspector has the opportunity to show dissatisfaction or disapproval of any worker's investment level to the group account. If the inspector is

dissatisfied, the inspector can send one sadface to one worker. Each inspector will observe decisions for ONLY one group.

After the inspectors have made their decision workers will receive two REPORTS. One from the inspector for group pink and one from the inspector for group blue. The REPORT is at the back of the DECISION CARDS. The inspectors will also put the sadface if any, in the middle of the report card and fold it (Demonstrate) to be sent to the workers. The report card looks like this one (show with example on poster). In the report workers will see how much money in total is investment in the group account and how much money each person receives back from the group account.

Let's consider our last example. Two of the 'workers' invested 0p in the group account and the other invested all ₵ 2.5 into the group account. Hence the inspector needs to write:

Total investment in the group account: ₵2.5.

We double the total investment in the group account, so the group account now has ₵5. This value is divided equally among all the three participants in the group. In this case, everyone will get ₵1.67.

REPORT (Example)

Total investment in group account	Double	Payback from group account
₡2.5	₡5	₡1.67

The inspectors also have to complete an 'Inspector History Form'. The inspectors have to complete the 'Inspector History Form' first which looks like this one (show example and explain on poster) before completing the report cards for each of the three participants.

Let's demonstrate how the 'Inspector History Form' should be completed by the inspectors:

Let's consider our last example. Let's assume 'worker1' and 'worker 2' are those who invested 0p in the group account and 'worker 3 invested all ₡ 2.5 into the group account. Let's assume the inspector sent a sadface picture to ´worker 2'. Hence the inspector needs to write and tick as follows:

Round 1

	Worker			
	1	2	3	Total Investment
Investment group account	0	0	₡ 2.5	₡2.5
Sad Face		1		

Total investment in the group account: ₡2.5. When the inspectors' finishes completing the 'Inspector History Form' and the report cards, our assistants will come round and collect them.

This process will be repeated a total of 10 rounds. At the end of the 10 rounds, one round will be selected at random for payment in cash. The money you receive will be yours to take home and use as you please.

<CONTROL QUESTIONS>

Before starting the third task, we would like to verify that we had been clear in explaining the task.

Please open envelope 1 and solve the questions.

Imagine that you are a worker and want to invest ₡1.2 in the group account. 1. Please represent this case using the following decision card.

DECISION CARD
CONTROL QUESTION
PARTICIPANT ___

0p				
10p	20p	30p	40p	50p
60p	70p	80p	90p	₡1.0
₡1.10	₡1.20	₡1.30	₡1.40	₡1.50

₡1.60	₡1.70	₡1.80	₡1.90	₡2.0
₡2.10	₡2.20	₡2.30	₡2.40	₡2.50

Assume the other two group members together contributed 60p each into the group account.

5. How much money is left in your pocket after investing?

6. How much money (payback) will you receive from the group account?

7. How much money will you receive in total?

8. How much money will you receive if the inspector sends you a sadface?

Please open envelope 2 and solve the second question.

Imagine that you are an inspector for a group and observed that two people invested ₡1.50 each in the group account and the other invested 0p in the group account. Please represent this case using the following REPORT CARD.

REPORT CARD

Total investment in group account	Double	Payback from group account

<Random selection into roles>

Now we will continue by separating some of you to be 'workers' and others to be 'inspectors'. As I told you before, some of you will serve as inspectors. These people will

serve as inspectors. The others will be ‘workers'. I would like to ask participants with the following numbers at the back of their big white envelope to come to the front *(mention the numbers of the 6 selected inspectors).* Please bring all your belongings along. We would like to ask the participants standing in front with the following numbers *(mention the numbers of the 3 older inspectors)* to sit on the front row and those with the following numbers *(mention the numbers of the 3 younger inspectors)* to sit on the chairs on the second row.

Actual Task

Now we will start the third task. Please, participants who are sitting behind from third row ‘workers’ should open envelop 3 and take out decision card pink and light blue for round 1. The pink card will be observed by one of the participants sitting in the first row and the blue by one of the participants sitting in the second row. Please when finish making your decisions; turn the decisions sheets upside down on the table so our assistants can collect them. Please begin by making your first investment decisions into group pink and group blue.

Exit Questionnaire

Please open envelop 4. Envelop 4 contains a questionnaire. We will please ask that you complete the questionnaire. Raise your hand if you need any help to complete the questionnaire.

DECISION CARD
GROUP PINK

PARTICIPANT ___ ROUND _____

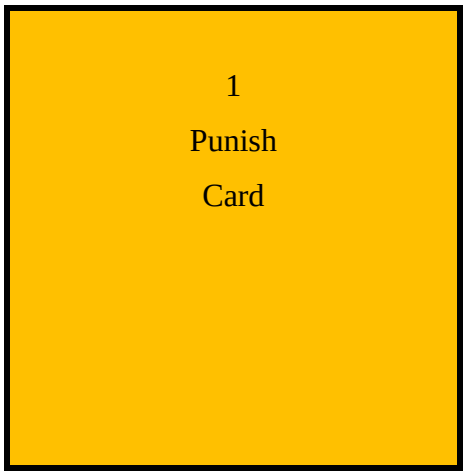
0p				
10p	20p	30p	40p	50p
60p	70p	80p	90p	₡1.0
₡1.10	₡1.20	₡1.30	₡1.40	₡1.50
₡1.60	₡1.70	₡1.80	₡1.90	₡2.0
₡2.10	₡2.20	₡2.30	₡2.40	₡2.50

DECISION CARD
GROUP BLUE

PARTICIPANT ___ ROUND _____

0p				
10p	20p	30p	40p	50p
60p	70p	80p	90p	₡1.0
₡1.10	₡1.20	₡1.30	₡1.40	₡1.50
₡1.60	₡1.70	₡1.80	₡1.90	₡2.0
₡2.10	₡2.20	₡2.30	₡2.40	₡2.50

COSTLY SANCTIONS



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