The Persistence of Female Genital Cutting in West Africa

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Dedication

For the women of West Africa.

Abstract

Female genital cutting (FGC) is a practice in which a womans genitalia are partially or totally removed for nonmedical reasons. Undergoing FGC can have serious physical and psychological health consequences. Yet the practice persists in West Africa because of beliefs about beauty, cleanliness, purity, and fidelity. In my three dissertation essays, I (1) test the prevailing theory regarding why FGC persists and I reject that theory, (2) generate an new theoretical explanation for why the norm persists and test the theory with observational data, and (3) investigate the relationship between a woman's characteristics (e.g., religion, education level, age) and her likelihood of opposing FGC even if she has undergone FGC herself.

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Chapter 1

Introduction

Female genital cutting (FGC) is a practice in which a woman's genitalia are partially or totally removed for nonmedical reasons. The practice is prevalent in parts of Africa, the Middle East, and Asia as well as among immigrant communities in the United States, Canada, and Europe. Undergoing FGC can have serious health consequences: Women who have undergone FGC are more than twice as likely to experience birthing complications (Jones et al., 1999) and are 25 percent more likely to contract sexually transmitted diseases (Wagner, 2015). Moreover, undergoing FGC can cause anxiety, depression, chronic irritability, marital conflict (Dorkenoo, 1999), and even post-traumatic stress disorder (Behrendt and Moritz, 2005). Such physical and psychological health complications can have real impacts on the educational attainment and labor market outcomes. Psychiatric disorders are correlated with dropping out of school (Kessler et al., 1995) and PTSD is related to unemployment (Savoca and Rosenheck, 2000). These education and labor market consequences suggest that FGC could contribute to economic underdevelopment in communities in which FGC is practiced.

Non-governmental organizations have created campaigns to inform individuals of the risks associated with FGC and governments have even adopted official bans of FGC in order to curb the practice. Yet the practice persists for reasons such as community beliefs about beauty and cleanliness as well as purity and fidelity (Shell-Duncan and Hernlund, 2001). Because of these beliefs, families fear that their daughters will be scorned by their community or may have poor marriage prospects if they have not undergone FGC. Indeed, in the 13 West African countries that I study in my dissertation, women who

have undergone FGC are 13 percent more likely to get married (Wagner, 2015). With these social expectations in play, it is perhaps not surprising that three million girls worldwide undergo the procedure every year (World Health Organization, 2012).

The prevailing theory regarding why the norm persists is that the practice is a social coordination norm—that is, a household will deviate from the norm if and only if a sufficient portion of their community members also agree to abandon the practice (Mackie, 1996). This theory has been influential in the policy discussions surrounding FGC. Organizations that design interventions according to this theory encourage community members to participate in public declarations in which community members declare that their households will no longer practice FGC. According to the social coordination norm theory, if a sufficient proportion of households agree to abandon the practice, a tipping point is reached and the rate of FGC should rapidly decline.

In the first essay of my dissertation, I test the hypothesis generated by this theory that the the persistence of FGC can be largely attributed to the community. I reject this hypothesis. In the second essay of my dissertation, I derive a new data-supported theory regarding why FGC persists. The crux of this theory is preference heterogeneity, that is, if households have heterogenous preferences for FGC a tipping point in the rate of FGC is far from guaranteed. Because I show that households have heterogenous preferences, I dedicate my third essay to exploring which women are most likely to deviate from the norm of FGC. Specifically, which characteristics of women predict their support for the perpetuation, or abandonment, of the practice. This will better inform the targeting of interventions aimed at reducing the prevalence of FGC.

In each of the three dissertation essays, I use nationally representative datasets from USAID's Demographic and Health Survey and UNICEF's Multiple Indicator Cluster Survey that include information about women aged 15 to 49. My first essay includes information from 38 repeated cross-section country-year datasets covering 13 West African countries between the years 1995 and 2013. These datasets provide information about whether a woman has undergone FGC, her opinion of FGC, her education level, and many characteristics about the household and village in which she lives. My second and third essays use a subset of these datasets.

While much research has been conducted regarding how FGC emerged and evolved into a common practice (Mackie, 1996) as well as the effects of FGC (Wagner, 2015;

Jones et al., 1999; Dorkenoo, 1999), relatively little research has focused on identifying why households continue to practice FGC. Furthermore, no studies have yet identified which women are most likely to change their opinions and become pioneers in eliminating the practice. It is crucial to know how opinions about FGC are formed and what affects perceptions of FGC in order to generate public policy that promotes change in the practice.

My contribution to the literature is threefold. First, I test the theory that FGC is a social coordination norm (Mackie, 1996). I show that this theory is not supported by data from West Africa. In fact, 87 percent of the variation in the persistence of FGC can be attributed to individual and household characteristics rather than village or region characteristics. Furthermore, individual factors explain a larger share of the persistence in countries in which the rate of FGC is highest. Lastly, women who have undergone FGC are only 16 percentage points more likely to be in favor of the practice than women who have not undergone the procedure.

Second, I generate a new theoretical explanation for why FGC persists, and I test that theory with data from Burkina Faso. I show that households have heterogeneous *thresholds* in the rate of FGC in their community. I define the threshold to be the the rate of cutting in a community at which a household is indifferent between cutting and not cutting its daughter. I show that this heterogeneity in household thresholds has important implications for if and how the norm should subside. Specifically, a tipping point in the rate of FGC in a community is far from guaranteed. The distribution of thresholds in some communities suggest that there is a tipping point in the rate of FGC and that tipping point has already been reached. In these communities, FGC will likely be eliminated quickly. In other communities, there is a stable internal equilibrium in the rate of FGC suggesting that the rate of FGC may remain constant for the foreseeable future until an external shock changes household preferences.

Third, using data from 13 West African countries, I identify which women are most likely to oppose FGC even when they have undergone the practice themselves. I show that educated women are less likely to support FGC than uneducated women in all nine countries with a rate of FGC above 35 percent. Muslim women are more likely than Christian women to support FGC in the seven countries with rates of FGC above 42 percent. With this information, policy makers can better target interventions.

Together these essays shed light on why FGC persists and who is most likely to perpetuate the practice. Future research should prioritize testing interventions that aim to reduce the prevalence of FGC. The design of these interventions should pay special attention to who is targeted and researchers should draw careful conclusions based on the targeted populations.

Chapter 2

All in the Family: Explaining the Persistence of Female Genital Cutting in West Africa*

2.1 Introduction

Why does the practice of female genital cutting (FGC),[1] in which a woman's genitalia is partially or totally removed for nonmedical reasons, persist in certain places even though it has been generally declining elsewhere (UNICEF, 2013)? Although more than 100 million women have undergone FGC and an additional three million girls experience the procedure every year worldwide (World Health Organization, 2012), social scientists only have a limited understanding of the reasons why FGC persists (Hayford, 2005).

Yet the potential physiological impacts of FGC are widely documented. According to (Skaine, 2005), FGC can:

*This chapter was written in collaboration with Marc Bellemare, Department of Applied Economics at the University of Minnesota and Tara Steinmetz, Department of Agricultural and Resource Economics, University of California, Davis

[1]Many terms are used to describe the procedure examined in this study, including "female genital cutting," "female genital mutilation," and "female circumcision." "Female genital mutilation" is largely used by opponents of the practice, and carries with it an underlying negative judgment of the tradition, a moral judgment well outside the scope of our empirical investigation. "Female circumcision" tends to imply a tradition similar to the more familiar male circumcision, a comparison that can be misleading depending on the type of cutting referred to. Therefore, except when directly citing other sources, we favor the expression "female genital cutting".

> "cause severe scarring that causes an obstruction during delivery. If infection is present at the time of the procedure in [clitoridectomy] and [excision], possible vulval adhesions can form that narrow or obstruct the vaginal opening and make labor long. The herbal pessaries used in [other types of FGC] and the use of rock salt after early pregnancies to reduce the vagina may result in severe scarring and stenosis."

Studies in Mali and Burkina Faso have documented the negative health impacts associated with having undergone FGC: compared to the 5 percent of uncut women who experience birthing complications, 18 to 30 percent of women who have undergone FGC experience similar complications (Jones et al. 1999). Moreover, some speculate that the practice also has psychological consequences such as decreased trust in caregivers and relationship problems stemming from painful intercourse due to infibulation (Jones et al., 1999; Shell-Duncan and Hernlund, 2006). Others surmise that the psychological damage inflicted by FGC is deeply embedded in the consciousness of those who have undergone the practice and that "[i]n the longer term, women may suffer anxiety, depression, chronic irritability, frigidity, and marital conflicts" (Dorkenoo, 1999). Lastly, others assert that, regardless of health or psychological damage, FGC is a violation of human rights (Moore et al., 1997), and that "[s]uppression and control over women's sexuality are demeaning to women and deny an aspect of their humanity" (Skaine, 2005).

Our results suggest that among women aged 15 to 49 in West Africa, the bulk of support for FGC—87 percent on average for the period 1995 to 2013—is due to household- and individual-level factors. Indeed, the total contribution from those levels of variation ranges from a low of 71 percent in Nigeria in 2011 to a high of 93 percent in Burkina Faso in 2006. Put differently, only about 12 percent of the variation in support for FGC among women aged 15 to 49 can be explained by village-level factors on average (the remaining 1 percent is due to variation at levels beyond that of the village). Moreover, our results suggest that a woman who has undergone FGC is 16 percentage points more likely to support the continuance of the practice, a figure which is obtained by averaging our estimates of that increase in likelihood over the 38 country-year data sets for the most complete specification we estimate in this chapter.

The practice of FGC is of economic interest for a number of reasons. First, given the physiological and psychological consequences of FGC discussed above, FGC is likely to

have real consequences on the health, educational attainment, labor market outcomes, and productivity of women in societies where the practice is widespread, which means that FGC can contribute to underdevelopment. Second, there is a substantial line of research in economics focusing on how social norms emerge and evolve. For North (1990), a social norm like FGC is an institution, a "humanly devised constraint that shape[s] human interaction," and "structure[s] incentives in human exchange, whether political, social, or economic" (North, 1990, p.3). For Ellickson (1989, 1991), social norms emerge and evolve so as to minimize transaction costs and maximize social welfare.[2] Third, FGC is often associated with (and seemingly sustained by) marriage market prospects: in places where the practice is common, men often expect their future wife to have undergone FGC, and Wagner (2015) finds that women who report having undergone FGC are 40 percent more likely to get married in the 13 African countries we study. Lastly, understanding what drives the persistence of FGC in different countries can provide some insight about the (potentially nonlinear) dynamics of FGC persistence. Following tipping point and informational cascade models (Schelling, 1978; Bikhchandani et al., 1992, 1998), the decision to abandon FGC might follow a logistic growth path, and so in places where the practice is widespread the decision to abandon FGC might be entirely due to individual-level factors, whereas it might be increasingly driven by higher-level (e.g., village, region, country) factors as the practice becomes less common, perhaps reverting back to becoming an individual-level decision when the practice becomes very uncommon. Consequently, we conclude by using our results to speculate as to whether this is the case for FGC in West Africa, and find that it is not. Indeed, our data suggest that as FGC becomes more and more pervasive over time and space, individual-level factors increasingly appear to contribute to the practice's persistence in our data.

Our contribution is thus threefold. First, we quantify the contribution that each level of variation (i.e., individual, household, village, and beyond) has on the persistence of FGC as we define it in our analysis. Second, we study the relationship between reporting having undergone FGC and support for the practice. Third, and perhaps most importantly, this study is among one of the first contributions of economics to the study of FGC, along with De Cao and Lutz (2015), Naguib (2012), Wagner (2015).

[2]That said, a discussion of which exact transaction costs were being minimized when FGC first emerged in human societies must necessarily remain speculative due to the paucity of historical data on the practice, and is thus beyond the scope of this chapter.

The strength of our approach lies in the survey design of the data we use. The data cover over 300,000 women aged 15 to 49 across 38 repeated country-year cross-sections of households in West Africa for the period 1995 to 2013. There is more than one respondent in a substantial number of households in each country-year cross-section, and there is sufficient within-household variation in whether respondents support the practice to incorporate region, village and, ultimately, household fixed effects.[3] This allows us to quantify the contribution of each level of variation (i.e., individual, household, village, and beyond) to the persistence of FGC as we define it here.

The rest of this chapter is organized as follows. Section 2.2 provides some background on FGC for those readers who may not be familiar with the practice, and then discusses the data and provides some descriptive statistics. In section 2.3, we present our empirical framework, the strategy we use to quantify the contribution of each level of variation, and our identification strategy. Section 2.4 presents estimation results, compares the results among the countries included in our analysis, briefly speculates about the nonlinear dynamics involved in FGC persistence, and discusses the limitations of our approach. In section 2.5, we conclude with some directions for future research.

2.2 Background, Data, and Descriptive Statistics

The practice of FGC is widespread throughout Africa, Asia, and the Middle East,[4] but it is also a public health concern in the United States, the United Kingdom, and other developed countries (Black and Debelle, 1995; Jones et al., 1997; National Public Radio, 2004). Individuals from where FGC is widespread often import the practice with themselves when they migrate, and practice "back-alley" FGCs on girls born to their communities (Black and Debelle, 1995; US Department of Health and Human Services, 2009).[5]

[3] We discuss the amount of within-household variation in the dependent variable in Section 2.2.1

[4] Cases of FGC have been reported in Benin, Burkina Faso, Côte d'Ivoire, the Central African Republic, Egypt, Eritrea, Ethiopia, The Gambia, Ghana, Guinea, India, Indonesia, Kenya, Liberia, Malaysia, Mali, Mauritania, Niger, Nigeria, Oman, Senegal, Somalia, South Sudan, Sudan, Tanzania, the United Arab Emirates, and Yemen (Black and Debelle, 1995; Dorkenoo, 1999; Hayford, 2005; Hernlund and Shell-Duncan, 2007; Jackson et al., 2003; Mackie, 1996; Shell-Duncan and Hernlund, 2006).

[5] Historically, FGC has been practiced in the United States as early as the 1860s. (James, 1998, 1037) "[i]mmediately following the Civil War... [b]ecause women's 'mental disorders' were equated with their sexual organs, one 'cure' adopted in the late 1860s was clitoridectomy."

In its typology of FGC, the World Health Organization distinguishes between four types of FGC. In the first type (clitoridectomy), the clitoris is partially or totally removed. In the second type (excision), both the clitoris and the labia are partially or totally removed. In the third type (infibulation), the vaginal opening is narrowed by sewing or stitching the labia together. The fourth type of FGC is a residual category of sorts, which covers any FGC-type procedure that does not neatly fit in any of the first three categories, and which usually involves any of "pricking, piercing, incising, scraping and cauterizing the genital area" (World Health Organization, 2012). The procedure can take place at any time between birth and the age of 15, but this varies widely, both between and within countries (US Department of Health and Human Services, 2009; Yount, Kathryn, 2002). As a US Department of Health and Human Services (2009) fact-sheet on FGC notes:

> "Most often, FGC happens before a girl reaches puberty. Sometimes, however, it is done just before marriage or during a woman's first pregnancy. In Egypt, about 90 percent of girls are cut between 5 and 14 years old. However, in Yemen, more than 75 percent of girls are cut before they are 2 weeks old. The average age at which a girl undergoes FGC is decreasing in some countries (Burkina Faso, Côte d'Ivoire, Egypt, Kenya, and Mali)."

The West African context is well-suited to study the persistence of FGC. Our 38 data sets, which are all designed to be representative at the national level, show that 55 percent of the women across the 13 countries (and 38 country-years) in West Africa retained for analysis have undergone FGC. This number masks a considerable amount of heterogeneity, however, given that the prevalence of FGC at the country level ranges from 3 percent in Niger in 2012 to 99 percent in Guinea in 1999. Given the prevalence of FGC in West Africa as well as the sharp differences just discussed among West African countries, West Africa constitutes an ideal setting to study FGC.

2.2.1 Data and Descriptive Statistics

Depending on the country-year, the data come either from the Demographic and Health Surveys (DHS) collected by USAID or from the Multiple Indicator Cluster Survey (MICS) collected by UNICEF. Both USAID and UNICEF work with in-country partners; those

partners are often the country's national statistical agency or another government entity. The DHS and MICS use very similar and consistent data collection practices that make the data comparable across countries and time. The countries included in the analysis are all West African countries for which comparable data exist. For each country we include all available survey years that contain information on FGC. Those countries (survey: year) are Benin (DHS: 2001, DHS: 2006, DHS: 2011–2012), Burkina Faso (DHS: 1998, DHS: 2003, MICS: 2006, DHS: 2010), Côte d'Ivoire (DHS: 1998, MICS: 2006, DHS, 2011–2012), The Gambia (MICS: 2005, MICS: 2010), Ghana (MICS: 2006, MICS: 2011), Guinea (DHS: 1999, DHS: 2005, DHS: 2012), Guinea-Bissau (MICS: 2006), Mali (DHS: 1995, DHS: 2001, DHS: 2006, DHS: 2012), Niger (DHS: 1998, DHS: 2006, DHS: 2012), Nigeria (DHS: 1999, DHS: 2003, MICS: 2007, DHS: 2008, MICS: 2011, DHS: 2013), Senegal (DHS: 2005, DHS: 2010–2011), Sierra Leone (MICS: 2005, DHS: 2008, MICS: 2010), and Togo (MICS: 2006, MICS: 2010). Cape Verde[6] and Liberia[7] are excluded from the analysis due to a lack of data.

Selection of respondents within clusters (i.e., villages) was random, with few refusals to participate in the survey. See section A.1 of the appendix for a discussion of how many women were identified, selected for survey, and were ultimately surveyed in each country. Response rates range from 99.0 percent (Côte d'Ivoire in 2006) to 80.9 percent (Guinea-Bissau in 2006). Sampling weights based on these response rates are provided in each DHS and MICS dataset to make the sample nationally representative. We use those weights throughout our analysis.

See section A.2 of the appendix for a discussion of slight variations in data availability and quality for the various datasets. Section A.3 of the appendix includes a discussion of the systematic differences (or lack thereof) between the women included and not included in the sample. Women are dropped from the sample due to missing data (i.e.,

[6]Cape Verde (DHS, 2005) is not included because USAID decided against distributing data for Cape Verde as part of the DHS program due to serious problems which were identified in a high proportion of the questionnaires. The MICS program does not have a dataset for Cape Verde.

[7]Liberia is not included in the analysis because, due to the particularly sensitive nature of discussing FGC in Liberia, the questionnaire does not include a question that asks if the respondent has undergone FGC. Instead the enumerators ask if the respondent is a member of the Sande society, which is a bush school for young girls at which most undergo FGC. Membership in the Sande society could serve as a proxy indicator for FGC status. More damning for the inclusion of Liberia is the fact that the survey includes a question about a respondent's beliefs about the Sande society only if she is a member of it. Thus, we do not have information on our outcome variable for women who are not members of the Sande society. The DHS program does not have a dataset for Liberia that includes information on FGC.

a lack of response to key variables). The most notable and common difference between included and non-included women is age and education level. We find that, in general, older women in the 15 to 49 age range and more educated women are more likely to respond to the question regarding whether they believe the practice of FGC should continue and the question regarding their personal FGC status. This is important to keep in mind, as our results are slightly more indicative of older and more educated women.

Columns 1 and 2 of table 2.1 present the descriptive statistics for the dependent variable (i.e., a dummy for whether the respondent believes that the practice of FGC should continue) and the variable of interest (i.e., a dummy variable for whether the respondent reports having undergone FGC). Guinea in 1999 claims the highest prevalence rate of FGC, with 99 percent of respondents stating that they have undergone FGC. Sierra Leone in 2005 professes the highest level of support for the practice, with 86 percent of respondents stating that they are in favor of the practice continuing. Niger in 2012 has the lowest prevalence of FGC with only 3 percent of respondents stating that they have undergone FGC, while Benin in 2006 had the lowest level of support for FGC, with only 2 percent of women stating that the practice should continue. All means and standard errors are weighted using the sampling weights discussed above.

Tables 2a to 2al of the online appendix[8] include descriptive statistics for all variables included in the analysis for each country and year of survey. Variables included in the analysis for each country and year of survey are age of the respondent, highest level of education attained by the respondent, marital status of the respondent, household ownership of a television and/or radio, household access to electricity, area of residence (rural or urban), ethnicity (of the respondent for DHS datasets and of the household head for the MICS datasets), and religion (of the respondent for DHS datasets and of the household head for MICS datasets).

Columns 3 and 4 of table 2.1 present the proportion of households with intrahousehold variation in FGC status and support for the practice, which we exploit in order to study the persistence of FGC in this context. The majority of country-years retained for our analysis have sufficient variation—both between and within households—to estimate the relationship between a woman's report of her own FGC status and her beliefs

[8]Online supplementary material can be found at http://doi.org/10.1016/j.jdeveco.2015.06.001.

about whether the practice should continue. Some countries, however, have very little within-household variation, which means that although it is in principle possible to estimate specifications with household fixed effects, those estimates should be taken with the requisite amount of caution, as they are likely to be imprecisely estimated. The country-years with the least within-household variation are Niger in 2012 and Nigeria in 2011.

Tables 7a to 7y of the online appendix show the relationship of the respondent to the household head. Note that the MICS datasets do not include this variable, thus we can only comment on relationship to household head for countries and years for which DHS supplied the data. The majority of respondents are the wife of the household head.[9] A substantial portion of respondents are the daughter or daughter-in-law of the household head. Some respondents are the household head. A small number of respondents are the mother, mother-in-law, or co-spouse of the household head.

Lastly, table 8 of the online appendix shows the percent of women aged 15 to 49 who ascribe to a religion and report having undergone FGC or are in support of the practice. In the majority of countries, Muslim women are more likely to undergo FGC than women in the same country that ascribe to a different religion. The two exceptions to this are Niger and Nigeria, in which FGC is practiced and supported more among Christian women than Muslim women aged 15 to 49. In countries in which FGC is highly prevalent, FGC is practiced and supported by women from all religions. For example, in Sierra Leone, which has one of the highest rates of FGC, a large proportion of both Christian and Muslim women aged 15 to 49 report having undergone FGC and support the practice. We have not generated a similar table for ethnicity because many ethnic groups are only present in one or two countries, which makes cross-country comparisons more burdensome and less interesting.

2.3 Empirical Framework

As we noted in the introduction, our data allow us to do two things. First, they allow us to quantify the contribution of each level of variation (i.e., individual, household, village,

[9]Note that the MICS datasets do not include this variable, thus we can only comment on relationship to household head for countries and years for which DHS supplied the data.

and beyond) has on the persistence of FGC as we define it in our analysis, i.e., support for the continuance of FGC. Second, they allow us to look at the relationship between whether a woman reports having undergone FGC and her support for the practice. We discuss how we do both of these things in turn.

Table 2.1: Descriptive statistics and intrahousehold variation for FGC variables—West Africa (n=38 Country–Year Observations)

Country-Year	Proportion of Respondents who underwent FGC (Std. Err.)	Proportion of Respondents who Think FGC should continue (Std. Err.)	Proportion of Households with intrahousehold variation in support for FGC	Proportion of Households with intrahousehold variation in FGC status of respondents
Benin 2001	0.248	0.056	0.019	0.032
	(0.027)	(0.007)		
Benin 2006	0.229	0.017	0.006	0.031
	(0.017)	(0.002)		
Benin 2011	0.134	0.025	0.005	0.025
	(0.011)	(0.003)		
Burkina Faso 1998	0.841	0.206	0.093	0.062
	(0.012)	(0.012)		
Burkina Faso 2003	0.744	0.144	0.103	0.111
	(0.016)	(0.008)		
Burkina Faso 2006	0.745	0.137	0.083	0.112
	(0.020)	(0.010)		
Burkina Faso 2010	0.746	0.073	0.043	0.099
	(0.011)	(0.004)		
Côte d'Ivoire 1998	0.440	0.267	0.113	0.077
	(0.030)	(0.020)		
Côte d'Ivoire 2006	0.452	0.272	0.077	0.072
	(0.029)	(0.026)		
Côte d'Ivoire 2011	0.447	0.152	0.051	0.068
	(0.028)	(0.015)		
Gambia 2005	0.824	0.770	0.056	0.027
	(0.014)	(0.016)		
Gambia 2010	0.790	0.676	0.126	0.034
	(0.019)	(0.018)		

Continued on next page

Table 2.1 (continued)

Country-Year	Proportion of Respondents who underwent FGC (Std. Err.)	Proportion of Respondents who Think FGC should continue (Std. Err.)	Proportion of Households with intrahousehold variation in support for FGC	Proportion of Households with intrahousehold variation in FGC status of respondents
Ghana 2006	0.214	0.037	0.009	0.026
	(0.029)	(0.005)		
Ghana 2011	0.386	0.062	0.006	0.016
	(0.024)	(0.008)		
Guinea 1999	0.989	0.748	0.099	0.006
	(0.003)	(0.013)		
Guinea 2005	0.978	0.795	0.082	0.020
	(0.004)	(0.010)		
Guinea 2012	0.985	0.769	0.112	0.014
	(0.003)	(0.014)		
Guinea-Bissau 2006	0.508	0.312	0.070	0.027
	(0.027)	(0.019)		
Mali 1995	0.728	0.647	0.060	0.012
	(0.037)	(0.035)		
Mali 2001	0.860	0.787	0.254	0.095
	(0.022)	(0.021)		
Mali 2006	0.852	0.713	0.052	0.016
	(0.019)	(0.019)		
Mali 2012	0.934	0.801	0.052	0.016
	(0.006)	(0.009)		
Niger 1998	0.137	0.259	0.046	0.027
	(0.023)	(0.025)		
Niger 2006	0.041	0.028	0.013	0.015
	(0.007)	(0.004)		
Niger 2012	0.029	0.021	0.007	0.006
	(0.005)	(0.003)		
Nigeria 1999	0.332	0.22	0.025	0.025
	(0.024)	(0.017)		
Nigeria 2003	0.326	0.509	0.046	0.045
	(0.022)	(0.026)		
Nigeria 2007	0.389	0.176	0.028	0.043

Continued on next page

Table 2.1 (continued)

Country-Year	Proportion of Respondents who underwent FGC (Std. Err.)	Proportion of Respondents who Think FGC should continue (Std. Err.)	Proportion of Households with intrahousehold variation in support for FGC	Proportion of Households with intrahousehold variation in FGC status of respondents
	(0.016)	(0.010)		
Nigeria 2008	0.425	0.214	0.036	0.038
	(0.016)	(0.010)		
Nigeria 2011	0.439	0.204	0.009	0.010
	(0.016)	(0.010)		
Nigeria 2013	0.378	0.222	0.042	0.049
	(0.016)	(0.011)		
Senegal 2005	0.462	0.295	0.112	0.052
	(0.028)	(0.021)		
Senegal 2010	0.535	0.315	0.121	0.061
	(0.025)	(0.019)		
Sierra Leone 2005	0.954	0.863	0.040	0.023
	(0.005)	(0.011)		
Sierra Leone 2008	0.9	0.673	0.074	0.041
	(0.009)	(0.021)		
Sierra Leone 2010	0.929	0.739	0.029	0.010
	(0.008)	(0.015)		
Togo 2006	0.161	0.048	0.010	0.031
	(0.019)	(0.006)		
Togo 2010	0.139	0.026	0.005	0.026
	(0.018)	(0.004)		

2.3.1 Estimation Strategy

The first equation we estimate is:

$$y_{ihvr} = \alpha_1 + \gamma_1 D_{ihvr} + \beta_1 x_{ihvr} + \delta_{1e} d_e + \epsilon_{1ihvr} \tag{2.1}$$

where the subscripts denote individual i in household h in village v in region r, y_{ihvr} denotes our outcome of interest (i.e., whether the respondent would like the practice of

FGC to continue), D_{ihvr} is our variable of interest (i.e., whether a respondent reports having undergone FGC), x_{ihvr} is a vector of control variables, d_e is a vector of interviewer (or enumerator, hence the subscript e) fixed effects, and ϵ_{ihvr} is an error term with mean zero.

We estimate equation (2.1) by ordinary least squares (OLS), weighting each observation with the associated probability weights provided in the data and clustering the standard errors at the village level, given the sampling scheme. Given the binary nature of the dependent variable, our use of OLS means that every equation estimated in this chapter is a linear probability model (LPM). Although the LPM might be biased and inconsistent relative to nonlinear procedures like probit or logit (Horrace and Oaxaca, 2006), we favor it for two reasons. First, recall that we use district–village–household fixed effects, and there is bias associated with using fixed effects in the context of nonlinear procedures stemming from the incidental parameter problem (Greene et al., 2002). Second, although we could focus on specifications without fixed effects, this would almost surely introduce much more bias due to unobserved heterogeneity than would our use of an LPM instead of a probit or logit, something that is supported by our empirical results.

In estimating LPMs, we follow the recommendations of Angrist and Pischke (2008) for microeconomic applications. There are three clear advantages to estimating LPMs instead of popular alternatives like probit and logit. First and foremost, a linear procedure like the LPM is better-suited to handle fixed effects given the incidental parameters problem associated with the probit (Greene et al., 2002; Heckman, 1981). Second, the LPM prevents identification via the specific functional form (e.g., normal or logistic) assumed in a probit or logit. Finally, LPM coefficients are directly interpretable as marginal effects, i.e., as changes in the probability that $\Pr(y_{ihvr} = 1)$, whereas probit and logit coefficients have to be transformed before they can be interpreted as such.

There are some disadvantages to estimating LPMs, however, but we argue that those disadvantages are offset by the disadvantages associated with probit and logit in this context. The first disadvantage is that the variance of a binary variable like y_{ihvr} has a Bernoulli structure—i.e., $Var(y_{ihvr}) = p_{ihvr}(1 - p_{ihvr})$, where $p_{ihvr} = Pr(y_{ihvr} = 1)$—so the LPM is inherently heteroskedastic. Our use of robust standard errors, however, means that our standard errors are robust to heteroskedasticity in general, and not

just the heteroskedasticity that comes from a binary dependent variable. Second, many researchers avoid the LPM because it can lead to predicted values of the dependent variable that lie outside of [0,1] interval. But as Wooldridge (2002) notes, "if the main purpose is to estimate the partial effect of [a variable of interest] on the response probability, averaged across the distribution of [the variable of interest], then the fact that some predicted values are outside the unit interval may not be very important." The goal of our analysis is not to predict the probability that an individual respondent will be in favor of the practice of FGC continuing, but to find an average association between FGC status and support for FGC.

That said, equation (2.1) does a poor job of controlling for the unobserved heterogeneity between respondents. Indeed, many of the characteristics of our respondents are unobserved, which means that those characteristics are captured by the error term ϵ. But if those unobserved characteristics are correlated with whether a respondent has undergone FGC, our estimate of γ_1 (i.e., the estimate of the impact of a woman having undergone FGC on whether she wants the practice to continue) will be biased.

In order to obtain a measure of the impact of a woman's own reported FGC status on our outcome variables that is as accurate as possible, we incorporate increasingly refined levels of fixed effects—district, village, and household—in order to filter out unobserved heterogeneity at the same levels. Thus, the second equation we estimate controls for the heterogeneity between districts and is:

$$y_{ihvr} = \alpha_2 + \gamma_2 D_{ihvr} + \beta_2 x_{ivhr} \delta_{2r} d_r + \delta_{2e} d_e + \epsilon_{2ihvr} \tag{2.2}$$

where d_r is a vector of region or district fixed effects to control for the factors that are common to all the respondents in a given district.

Equation (2.3) controls for the heterogeneity between villages (and, by construction, between districts) and is:

$$y_{ihvr} = \alpha_3 + \gamma_3 D_{ihvr} + \beta_3 x_{ihvr} + \delta_{3vr} d_{vr} + \delta_{3e} d_e + \epsilon_{3ihvr} \tag{2.3}$$

where d_{vr} is a vector of village–district fixed effects to control for the factors that are common to all the respondents in a given village.

Lastly, equation (2.4) controls for the heterogeneity between households (and, by

construction, between villages and districts) and is:

$$y_{ihvr} = \alpha_4 + \gamma_4 D_{ihvr} + \beta_4 x_{ihvr} + \delta_{4hvr} + d_{hvr} + \delta_{4e} d_e + \epsilon_{4ihvr} \tag{2.4}$$

where d_{hvr} is a vector of household–village–district fixed effects to control for the factors that are common to all the respondents in a given household.

As we explain below, equations (2.1) to (2.4) allow us to (i) quantify the contribution of each level of variation—individual, household, village, and beyond—to FGC persistence as we define it here, i.e., whether respondents support the continuance of the practice; as well as (ii) control for mechanisms of FGC persistence at those levels. For example, Blaydes and Izama (2015) find that in Egypt, women in households with more sons are more likely to be in favor of FGC, and they speculate that having more sons invests women more heavily in patriarchal values.[10] Our use of household fixed effects would control for such a mechanism for FGC persistence, because it would hold constant the number of sons in a given household.

Our progressive use of increasingly refined layers of fixed effects also allows for quantification of the contribution of each level of variation to the persistence of FGC as defined here, i.e., as captured by respondents' support for the continuance of FGC. Estimating equation (2.1) allows one to recover the associated R^2 measure, or coefficient of determination. The R^2 for equation (2.1)—which we label R_1^2 for ease of exposition—tells us how much of the variation in the dependent variable (here, support for FGC) is due to the variables on the RHS of equation (2.1).

Note, however, that equation (2.1) does not include any geographic fixed effects. Estimating equation (2.2)—which incorporates regional or district fixed effects—yields a coefficient of determination R_2^2, which necessarily has the property that $R_2^2 > R_1^2$ given the nondecreasing nature of the coefficient of determination in the number of covariates included in a regression. But R_1^2 and R_2^2 can also be used to compute the contribution of district- or regional-level factors to the persistence of FGC by computing:

[10] As part of the preliminary empirical work for this chapter, we estimated specifications controlling for the number of sons and daughters each respondent had living with her, for the year she last gave birth, for the number of children she lost while giving birth, and for the number of co-wives living with her. None of those factors were found to be statistically significant determinants of support for FGC.

$$\frac{R_2^2 - R_1^2}{1 - R_1^2} \tag{2.5}$$

That is, we compute how much of the variation not explained by the factors on the RHS of equation (2.1) (i.e., the denominator) is explained by the inclusion of district or regional fixed effects (i.e., the numerator). Similarly, estimating equation (2.3)—which incorporates village fixed effects—yields a coefficient of determination R_3^2, which is such that $R_3^2 > R_2^2$, and which can be used to compute the contribution of village-level factors to the persistence of FGC by computing:

$$\frac{R_3^2 - R_2^2}{1 - R_1^2} \tag{2.6}$$

That is, we compute how much of the variation not explained by the factors on the RHS of equation (2.1) is explained by the inclusion of village fixed effects. Similarly, estimating equation (2.4)—which incorporates household fixed effects—yields a coefficient of determination R_4^2, which is such that $R_4^2 > R_3^2$, and which can be used to compute the contribution of village-level factors to the persistence of FGC by computing:

$$\frac{R_4^2 - R_3^2}{1 - R_1^2} \tag{2.7}$$

That is, by computing how much of the variation not explained by the factors on the RHS of equation (2.1) is explained by the inclusion of household fixed effects. Finally, equation (2.4) can also be used to determine how much of the variation in the persistence of FGC is due to unobserved individual-level factors by computing:

$$\frac{1 - R_4^2}{1 - R_1^2} \tag{2.8}$$

In other words, unexplained individual-level factor contribution is whatever variation is left unexplained after estimating equation (2.4) (i.e., the numerator of equation (2.7)) as a percentage of whatever variation was unexplained after estimating equation (2.1) (i.e., the denominator of equations (2.5) to (2.8)). By definition, the sum of the contributions of each level of variation—individual, household, village, and beyond—has to equal 1.

2.3.2 Identification

We noted earlier that another contribution of ours is to estimate the association between a woman reporting having undergone FGC and her support for the practice. While this is true, our estimate of that association is not as cleanly identified as one would like, which means that we cannot claim that the estimated relationships between a respondent's FGC status and our variables of interest are causal.

Indeed, there are three potential sources of statistical endogeneity to any empirical application, all of which are sources of bias: (i) reverse causality, (ii) unobserved heterogeneity, and (iii) measurement error. In this context, reverse causality is unlikely to be an issue, first because most women have little to no say in whether they undergo FGC given that the bulk of FGCs occur between the ages of four and eight (World Health Organization, 2012). Second, even if a girl were given a choice in the matter, it is unlikely that her future support for the practice would affect that early choice. This concern is also alleviated by the fact that FGC almost always takes place before the girl turns 15 and because our sample only includes women aged 15 to 49.

As is often the case in applied microeconomics, unobserved heterogeneity is perhaps the most important source of statistical endogeneity in this context, and thus the most important potential source of bias. That is, even though our use of district–village–household fixed effects allows purging the error term of a great deal of its correlation with the variables on the RHS of equation (2.4), it is not possible to control for the unobserved heterogeneity between individuals in this context. Indeed, there are many individual-level characteristics that are difficult to measure and which our data do not include, such as a respondent's bargaining power within her household, her degree of risk aversion, her level of trust, and so on. Furthermore, it is likely that at least some of those unobservable characteristics, which are in the error term in equation (2.4), are correlated with some of the variables on the right-hand side of the same equation.

With regards to measurement error, a few studies question the reliability of self-reported data on FGC, but the types of measurement error reported in those studies do not threaten the validity of the estimates presented in this chapter. First, note that throughout our analysis, we are careful to talk of the association between reporting having undergone FGC and support for the practice rather than of the association between having undergone FGC and support for the practice. To talk of the latter,

FGC status would need to be physically verified by interviewers. Moreover, Elmusharaf et al. (2006), report that there is measurement error in their Sudanese data due to their respondents being confused about which type of FGC they have undergone, but not about whether they have undergone FGC or not. Elmusharaf et al. (2006) note that in their context, "there was complete agreement between reporting undergoing FGM or not and what was found by inspection of genitals" (p. 126). Second, Jackson et al. (2003) find that between 1995 and 2000, 13 percent of the women in their Ghanaian longitudinal data went from reporting having undergone FGC in 1995 to reporting not having undergone FGC in 2000—those respondents were the same in 1995 and in 2000. In that context, however, the government began enforcing a law banning FGC sometime between 1995 and 2000, and so the respondents in Jackson et al.'s study might have been responding to a change in the legality of the practice. As such, because Ghana is one of the 13 countries we retain for analysis and other included counties have implemented similar bans, measurement error of this kind is a distinct possibility in this study.[11]

Another potential problem threatening the identification of the γ coefficients in equations (2.1) to (2.4) is a violation of the stable unit treatment value assumption (SUTVA; see Morgan and Winship, 2007), which requires that whether one unit is treated should have no impact on another unit's outcome. In our application, the SUTVA entails that whether a woman reports having undergone FGC or not has no impact on whether another woman is in support of the continuance of the practice, i.e., that there are no spillovers between respondents. This is highly unlikely to hold in this context; one can think of situations where a woman who regrets having undergone FGC discusses it with the other women in her household and changes their view of the practice. Indeed, even with household fixed effects, which control for all the factors common to women in the same household, one cannot rule out that one respondent's experience (or lack thereof) of FGC has no impact on another woman's support for the practice.[12]

[11] As per UNICEF (2013), the following countries have bans on FGC, with the year of adoption of the ban in parentheses: Benin (2003), Burkina Faso (1996), Côte d'Ivoire (1998), Ghana (1965, amended 2007), Guinea (1965, amended 2000), Guinea-Bissau (2011), Niger (2003), Nigeria (1999–2006), Senegal (1999), Togo (1998). The presence of those bans does not change the empirical results in tables 2.3 to 2.15 below, however, because all respondents in a given country-year where the practice is banned face the same ban, and those bans only vary from country-year to country-year.

[12] Note that this is distinct from confirmation bias, the phenomenon whereby a woman who reports having undergone FGC might be more likely to be in favor of it, and vice versa. Our estimate of FGC persistence includes the effect of confirmation bias. This does not threaten identification, because

How could one obtain a causal or cleanly identified estimate of γ? Because the gold standard provided by a randomized controlled trial would raise serious ethical questions, one needs to think about alternative methods aimed at teasing out causation from correlation. The next-best alternative might be a difference-in-difference design that would survey respondents before and after they undergo FGC and look at whether their views on the practice change as a result of having undergone FGC. But given that the bulk of FGCs occur before the age of 15 (indeed, many occur between the ages of 4 and 8; see World Health Organization (2012), the immaturity of respondents would likely make it difficult to get reliable answers. Similar issues would arise with longitudinal data, which would follow respondents over several years and exploit the variation in respondents' own-FGC status and in their views on the practice of FGC, with the additional problem that one might not observe enough variation in the dependent variables and in the outcome of interest.

Another alternative would be to use a quasi-experimental research design that would rely on an instrumental variable, i.e., a variable that is correlated with whether a woman has undergone FGC, but which only affects her support for the practice through her own FGC status. Such a variable, however, might be extremely difficult, if not impossible, to come by.

2.4 Results

2.4.1 Cross Tabulations

For each of the 38 country-years we retain for analysis, table 2.2 presents a cross-tabulation of the dependent variable and the variable interest, i.e., whether the respondent would like FGC to continue and whether the respondent reports having undergone FGC, for women aged 15 to 49 in West Africa. As alluded to in the tables of descriptive statistics, in all countries except The Gambia, Guinea, Mali, and Sierra Leone, the proportion of women aged 15 to 49 who say they do not support the continuance of FGC is greater than the proportion of women aged 15 to 49 who say they support the continuance of the practice. This is true for all years of data collection. Similarly, the proportion of women

confirmation bias can be one reason among many why a respondent supports FGC or not. Thus, whereas a violation of SUTVA threatens identification, confirmation bias does not.

aged 15 to 49 who report not having undergone FGC exceeds the number of women aged 15 to 49 who report having undergone FGC in all but 5 out of 13 countries. Those countries are Burkina Faso, The Gambia, Guinea, Mali, and Sierra Leone. This is true for all years of data collection. Encouragingly for the opponents of FGC, the number of women aged 15 to 49 who (i) report having undergone FGC but (ii) are against the continuance of the practice exceeds the number of women aged 15 to 49 who (i) report not having undergone FGC but (ii) are in favor of the continuance of the practice in each of the countries and years retained for analysis, except in Nigeria in 1998.

Table 2.2: Cross tabulations of the dependent variable with the variable of interest

Respondent Underwent FGC:	No	No	Yes	Yes
Respondent Would Like FGC to Continue:	No	Yes	No	Yes
Country–Year	%	%	%	%
Benin 2001	73.71	1.70	20.84	3.75
Benin 2006	78.28	0.76	20.20	0.76
Benin 2011	86.21	1.72	11.44	0.63
Burkina Faso 1998	14.46	1.18	62.82	21.54
Burkina Faso 2003	22.28	1.08	60.89	15.75
Burkina Faso 2006	23.36	1.39	63.79	11.46
Burkina Faso 2010	23.79	0.41	67.72	8.08
Côte d'Ivoire 1998	52.44	2.50	18.56	26.50
Côte d'Ivoire 2006	52.82	1.50	19.74	25.94
Côte d'Ivoire 2011	54.93	1.48	29.81	13.78
Gambia 2005	17.53	0.64	6.25	75.58
Gambia 2010	19.29	1.38	11.90	67.43
Ghana 2006	87.39	1.86	9.60	1.15
Ghana 2011	76.87	1.53	19.45	2.15
Guinea 1999	0.68	0.35	23.95	75.02
Guinea 2005	1.28	1.73	19.47	77.52
Guinea 2012	1.43	0.59	20.65	77.33
Guinea Bissau 2006	49.57	1.49	18.83	30.11
Mali 1995	7.10	0.83	10.51	81.56
Mali 2001	6.70	0.96	8.77	83.57
Mali 2006	8.45	1.71	11.67	78.17
Mali 2012	5.10	1.22	15.07	78.61
Niger 1998	62.76	21.12	4.18	11.94

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Table 2.2 (continued)

Respondent Underwent FGC:	No	No	Yes	Yes
Respondent Would Like FGC to Continue:	No	Yes	No	Yes
Country Year	%	%	%	%
Niger 2006	92.57	1.76	4.58	1.09
Niger 2012	92.80	2.82	3.20	1.18
Nigeria 1999	62.09	2.67	14.44	20.80
Nigeria 2003	50.99	5.12	21.59	22.30
Nigeria 2007	53.45	2.88	25.35	18.32
Nigeria 2008	51.56	2.69	24.51	21.24
Nigeria 2011	47.99	3.04	28.55	20.42
Nigeria 2013	52.93	7.66	22.58	16.83
Senegal 2005	59.74	1.63	15.55	23.08
Senegal 2010	58.62	1.69	16.57	23.12
Sierra Leone 2005	2.54	1.66	10.27	85.53
Sierra Leone 2008	6.40	2.31	22.54	68.75
Sierra Leone 2010	4.02	1.31	19.72	74.95
Togo 2006	85.95	1.94	10.68	1.43
Togo 2010	89.07	1.22	8.35	1.36

2.4.2 Linear Probability Models

Tables 2.3 to 2.15 present, in alphabetical order of countries for the most recent available year, estimation results for the LPMs in equations (2.1) to (2.4) in which a respondent's response to the question regarding her support for the continuance of the practice is regressed on whether she reports having undergone FGC herself, individual-level covariates, and household-level covariates. Ethnicity, religion, and interviewer fixed effects are included throughout all regressions. Our results do not show estimated coefficients for these variables. These coefficients are omitted in order to economize on space and, more importantly, because the estimated coefficients are not particularly meaningful since the coefficients only allow the reader to make comparisons to the omitted category. Interested readers should refer to table 8 of the online appendix for descriptive statistics on the prevalence of FGC and support for the practice among women aged 15 to 49 that ascribe to each religion. Tables 1a to 1y of the online appendix present the results for the LPMs in equations (2.1) to (2.4) for all earlier available years

for each country retained for the analysis.

Consistent with the methodology outlined in section 2.3.1, columns 1 to 4 of each of tables 2.3 to 2.15 (shown at the end of the text of this chapter) include increasingly refined layers of fixed effects, from no geographic fixed effects in column 1 to region, village, and household fixed effects in columns 2, 3, and 4, respectively (ethnicity, religion, and interviewer fixed effects are included in all specifications).

Given the number of countries retained for analysis, we do not discuss individual country results, focusing instead on a summary of the results for the most recent year available for each country. In what follows, we focus on our most complete specifications (i.e., column 4 of tables 2.3 to 2.15 as well as the tables of early country-years which are not shown) and on the estimated coefficient for whether a respondent reports having undergone FGC, which is our variable of interest. Looking at the first line of each table, which presents the estimated coefficient on whether a respondent reports having undergone FGC, our results suggest that women aged 15 to 49 who report having undergone FGC are on average 16 percentage points more likely to be in favor of the practice in West Africa once household fixed effects (under which fixed effects for village, region, and beyond are subsumed) are included, but this average masks a considerable amount of heterogeneity given that it is the result of averaging over our estimates of that increase in likelihood over the 38 country-year data sets we use in this chapter.

At one extreme of the distribution, there are countries where there is little to no relationship between having undergone FGC and being in favor of the practice for women aged 15 to 49. In Benin in 2011, for example, the estimated coefficient on whether a woman reports having undergone FGC in column 4 is neither economically nor statistically significant, which suggests that in this country-year for the women included in our data, a woman's own reported FGC status has no relationship with whether she supports the continuance of the practice. Similarly, in Niger in 2012, and in Togo in 2010, that coefficient is not statistically significant, and the point estimate is less than 0.05. These coefficients are also statistically insignificant in all earlier available years of data from Niger and Togo.

At the other extreme of the distribution, there are countries in which, for women aged 15 to 49, a woman's reported FGC status has a very strong association with whether she supports the practice. In The Gambia in 2010, the estimated coefficient on whether a

woman aged 15 to 49 reports having undergone FGC is equal to 0.502 and is significant at the 1 percent level. Similarly, in Mali in 2012, the estimated coefficient on whether a woman aged 15 to 49 reports having undergone FGC is equal to 0.352 and is significant at the 1 percent level. This suggests that in The Gambia in 2010 and in Mali in 2012, a woman aged 15 to 49 who reports having undergone FGC was respectively 50 and 35 percentage points more likely to support the practice. The estimated coefficients and significance levels are very similar in earlier rounds of data collection for The Gambia and Mali.[13]

In an alternative specification of our main regression results, we included all variables listed above as well as (i) gender of the household head, and (ii) age of the respondent's partner. These variables are included to coarsely proxy for bargaining power of the woman in decisions related to FGC, such as whether her daughters will be cut. Table 5a to 5al of the online appendix display the regression results for this alternative specification. The results of this alternative specification are almost identical to the regression results presented here.

Turning to the respective contribution of each level of variation (i.e., individual, household, village, and beyond), we use the method outlined in equations (2.5) to (2.8) to do so for each country-year on the basis of our core specifications. Table 3 in the online appendix presents those contributions, and figure 2.1 below summarizes those results. What is immediately striking about figure 2.1 is how, in almost all country-years, the bulk of the variation in support for FGC among women aged 15 to 49 can be ascribed to household-level factors. The lone exception to this is Mali in 2001 which, given that Mali in 1995 and Mali in 2006 look very similar, is likely the result of sampling error. In addition, in all but two cases (i.e., Niger in 2012 and Nigeria in 2011), individual- and household- level factors explain over 80 percent of the variation in support for FGC.

2.4.3 Dynamics in the Persistence of FGC

The findings in tables 2.3 to 2.15 and in figure 2.1 show the sources of variation in support for the continuance of FGC among women aged 15 to 49 across the 13 countries retained for analysis. The information contained in those tables and in that figure can

[13]Except for Mali in 2006, for which the estimated coefficient is substantially smaller (0.123) and statistically insignificant.

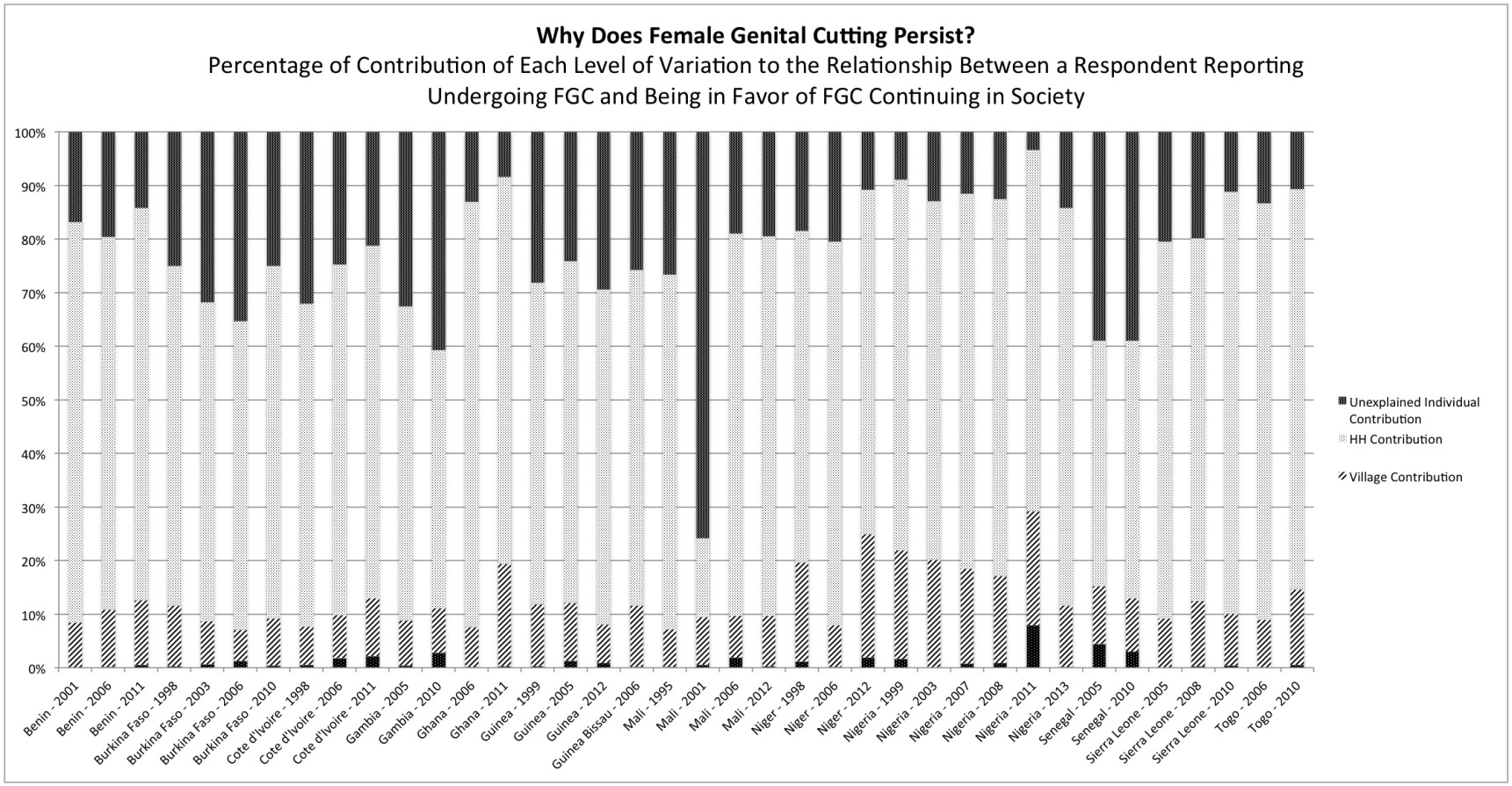

Figure 2.1: Percentage of Contribution of Each Level of Variation to the Persistence of FGC in West Africa

be used to provide a discussion, albeit a necessarily speculative one, of the potential dynamics of FGC persistence. That is, for all 38 country-years in our sample, one can plot the percentage contribution of each level of variation against the extent of reported FGC and look at whether there seems to be any relationship between the proportion of women aged 15 to 49 who report having undergone FGC and what level of variation drives support for the continuance of the practice among these same women.

Figures 2.2 a to c plot the extent of reported FGC on the x-axis and how much of the variation in support for the continuance of FGC comes from the individual, household, and village levels, respectively, on the y-axis. A round marker indicates that there is no FGC ban in place at the time of data collection in that country while an x marker indicates that there was a ban on FGC at the time of data collection in the given country. The regressions used to obtain the fitted linear functions in each one of figures 2.2 a to c can be found in appendix table A.1.[14] Again, we wish to reiterate that given the small sample of 38 country-year observations, this discussion is meant to be speculative. With that said, the results in figures 2.2 a to c suggest that

1. The greater the prevalence of reported FGC among women aged 15 to 49 in a society, the more support for the continuance of the practice is driven by individual-level factors (figure 2.2 a).

2. Conversely, the greater the prevalence of reported FGC among women aged 15 to 49 in a society, the less support for the continuance of the practice is driven by household-level factors (figure 2.2 b).

3. Likewise, the greater the prevalence of reported FGC among women aged 15 to 49 in a society, the less support for the continuance of the practice is driven by village-level factors (figure 2.2 c).

4. Generally speaking, a 10 percent increase in the prevalence of FGC among women aged 15 to 49 is associated with about (i) a 2 percent increase in the unobserved individual-level contribution to variation in support for FGC, (ii) a 1 percent decrease in the household-level contribution to variation in support for FGC, and

[14] In preliminary empirical work, we also investigated potential nonlinear dynamics by estimating quadratic specifications of the regressions in appendix table A.1, but we found that the quadratic terms were never statistically significant.

(iii) a 0.5 percent decrease in the village-level contribution to variation in support for FGC.

5. In the aggregate, as the practice of FGC becomes less prevalent among women aged 15 to 49, support for the practice appears to increasingly become the result of factors beyond the individual (i.e., household and village).

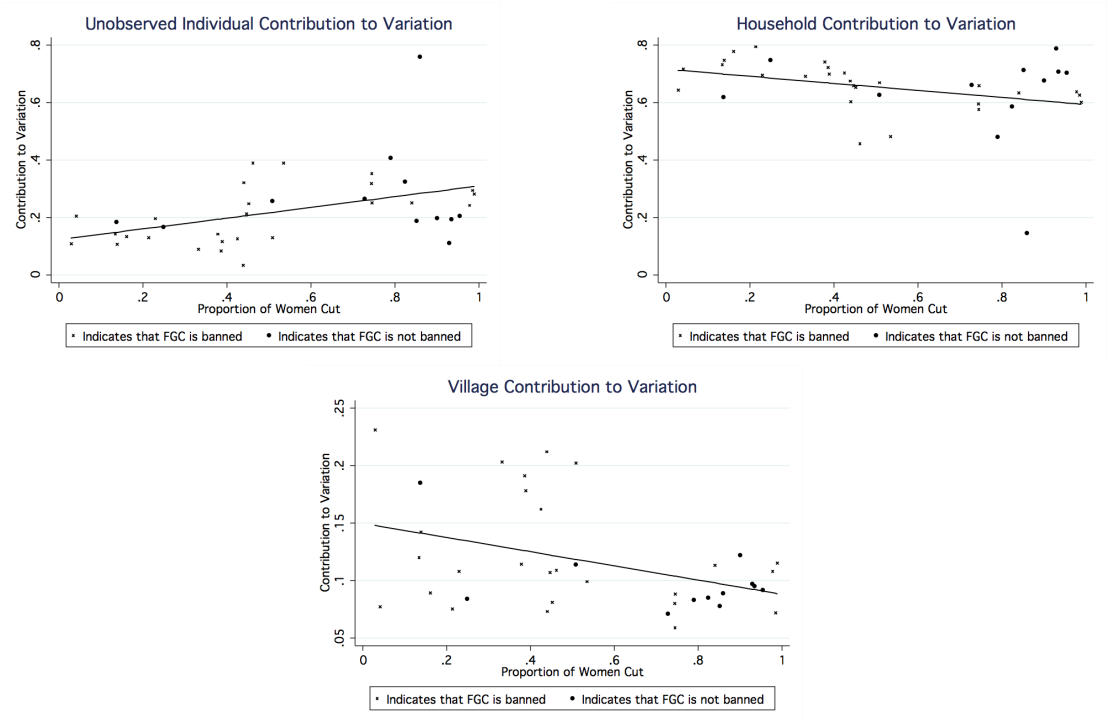

Figure 2.2: Relationship between the proportion of women who report having undergone FGC and the proportion of variation in support from FGC that is due to: individual-level factors (panel a); household-level factors (panel b); and village-level factors (panel c).

Figure 2.2 b suggests that even with a sharp decrease in FGC prevalence, the bulk of FGC persistence would still come from household-level factors. This is in contrast to the tipping point and informational cascade models (Schelling, 1978; Bikhchandani et al., 1992, 1998) discussed in the introduction, wherein the decision to abandon a social norm such as FGC should be entirely individual in places where the practice is highly pervasive.

2.4.4 Limitations

We have discussed the limitations of our identification strategy at length in section 2.3. In addition to those limitations, we note the following limitations of this study. First, we cannot distinguish between the various types of FGC the women in our sample report to have undergone or between the types of FGC they support. This matters because one can be in support of one type of FGC without necessarily being in support of another type. Second, recall that the data we use only sampled women between the ages of 15 and 49, which means that we cannot possibly capture what women younger than 15 or older than 49 think. This is important to consider because elderly women are often the ones performing FGC (Morrone et al., 2002), and so they may have an important influence in the persistence of the practice—as one of our reviewers noted, women aged 15 to 49 are an important piece of the puzzle—but they are only one piece of it. Our findings, however, indicate that generally, either age has no impact on support for FGC or that support for FGC is decreasing in the age of respondents up to age 49. Additionally, we must remain agnostic about what men think about FGC. Sampling men as well as women would allow studying intrahousehold decision processes regarding FGC (Alderman et al., 1995; Doss, 1996) as well as the marriage market value of FGC (Wagner, 2015).

Third, relative to other studies, we must remain agnostic about the three theories that have been developed to account for the persistence of FGC. The first of those theories, convention theory, states that FGC persists as a social norm (Easton et al., 2003; Hayford, 2005; Lightfoot-Klein, 1989; Mackie, 1996; Shell-Duncan and Hernlund, 2006). The second theory, feminist theory, posits that as women's rights expand, support for FGC should decrease (Easton et al., 2003; El Dawla, 1999; Finke, 2006; Yount, Kathryn, 2002). The third theory, modernization theory, states that as a society modernizes, support for FGC should wane (Easton et al., 2003; Williams and Sobieszczy, 1997). Fourth, and finally, regarding external validity, though our sample allows drawing inference about the persistence of FGC among all women aged 15 to 49 in 13 out of 15 West African countries, it is unclear whether our results apply to other countries where FGC is practiced—or even to West African women younger than 15 or older than 49.

2.5 Summary and Conclusions

We have investigated the practice of FGC, which has been declining in some countries but persists in others. Specifically, using household survey data covering over 300,000 women aged 15 to 49 in 38 country-year observations in West Africa, we have done two things. First, we have studied the relationship between a woman's own reported FGC status—whether she reports having undergone FGC—and her support for the practice, which we adopt as our definition of FGC persistence. Second, we have quantified the contribution of each level of variation—individual, household, village, and beyond—in explaining support for the continuance of FGC. We find that much of the variation in a woman's support for FGC can be attributed to individual- and household-level factors rather than to village-level factors or to factors beyond the village level.

Finally, we find that reporting having undergone FGC is associated with a 16 percentage point increase in the likelihood that a woman will be in favor of the continuance of the practice in West Africa. This figure is found by averaging over our estimates from the 38 country-year datasets we use in this chapter of the increase in the likelihood that one supports FGC if she reports that she has undergone FGC.

The main strength of this study lies in the design of the surveys used for analysis, which allows exploiting the within-household variation in respondents' support for the practice, which allows determining how much each level of variation contributes to the persistence of FGC. Additionally, our findings are nationally representative for women aged 15 to 49 in for 38 country-year observations spanning the period 1995 to 2013 in 13 out of 15 West African countries.

That said, the countries in our sample are only a fraction of the many countries where the practice of FGC remains widespread, which points to the need for studies such as this one in other regions. Cases of FGC have also been reported in the Central African Republic, Egypt, Eritrea, Ethiopia, India, Indonesia, Kenya, Liberia, Malaysia, Oman, Somalia, South Sudan, Sudan, Tanzania, the United Arab Emirates, and Yemen, and in those countries, the sources of variation in support for the practice might be different than in West Africa. In addition, to better understand the mechanisms through which FGC persists, there is a need for systematic investigations of the causal pathways behind FGC persistence. Likewise, there is a need for a better understanding of the

consequences of FGC regarding educational, health, and labor-market outcomes for the women who undergo FGC.

Table 2.3: LPM estimation results for whether respondents think FGC should continue—Benin 2011

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.056***	0.058***	0.054***	0.006
	(0.012)	(0.012)	(0.011)	(0.016)
Age	0.001	0.001	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.004)
Age squared	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.006	-0.006*	-0.006	-0.014
	(0.004)	(0.004)	(0.004)	(0.021)
Secondary education	0.000	0.000	-0.000	-0.001
	(0.005)	(0.005)	(0.005)	(0.016)
Higher education	0.010	0.007	0.010	0.010
	(0.014)	(0.013)	(0.014)	(0.031)
Married	-0.002	-0.002	-0.000	0.004
	(0.005)	(0.005)	(0.005)	(0.016)
Cohabitating	0.017*	0.016*	0.016	0.007
	(0.009)	(0.009)	(0.010)	(0.032)
Widowed	0.014	0.013	0.021	0.052
	(0.014)	(0.014)	(0.014)	(0.059)
Divorced	0.019	0.018	0.012	0.005
	(0.018)	(0.018)	(0.018)	(0.017)
Separated	-0.005	-0.006	-0.002	-0.025
	(0.006)	(0.006)	(0.007)	(0.039)
Television	-0.001	-0.001	-0.002	
	(0.004)	(0.004)	(0.004)	
Radio	-0.004	-0.004	0.001	
	(0.004)	(0.004)	(0.005)	
Electricity	0.004	0.004	0.008*	
	(0.004)	(0.004)	(0.004)	
Urban household	-0.001	-0.001		
	(0.004)	(0.004)		
Constant	-0.030	-0.026	0.011	0.094
	(0.020)	(0.030)	(0.029)	(0.142)
Observations	10,477	10,477	10,477	10,477
R-squared	0.402	0.405	0.477	0.915

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Table 2.3 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.4: LPM estimation results for whether respondents think FGC should continue—Burkina Faso 2010

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.079***	0.080***	0.076***	0.036*
	(0.007)	(0.007)	(0.007)	(0.019)
Age	-0.008***	-0.008***	-0.008***	-0.010**
	(0.002)	(0.002)	(0.002)	(0.005)
Age squared	0.000***	0.000***	0.000***	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.007	-0.008	-0.005	-0.005
	(0.006)	(0.006)	(0.006)	(0.019)
Secondary education	-0.032***	-0.033***	-0.030***	-0.021
	(0.007)	(0.007)	(0.008)	(0.021)
Higher education	-0.043***	-0.050***	-0.051***	-0.026
	(0.013)	(0.013)	(0.012)	(0.035)
Married	0.000	0.000	-0.005	0.013
	(0.008)	(0.008)	(0.008)	(0.025)
Cohabitating	0.004	0.003	-0.008	-0.015
	(0.012)	(0.012)	(0.013)	(0.035)
Widowed	-0.024*	-0.025*	-0.030**	0.013
	(0.014)	(0.014)	(0.015)	(0.037)
Divorced	0.015	0.013	0.025	-0.043
	(0.033)	(0.033)	(0.034)	(0.054)

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Table 2.4 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Separated	-0.005	-0.007	-0.009	-0.031
	(0.019)	(0.019)	(0.020)	(0.047)
Television	-0.003	-0.005	-0.001	
	(0.008)	(0.008)	(0.009)	
Radio	-0.010*	-0.009	-0.010	
	(0.006)	(0.006)	(0.006)	
Electricity	-0.008	-0.009	-0.010	
	(0.009)	(0.009)	(0.010)	
Urban household	-0.009	-0.012*		
	(0.007)	(0.007)		
Constant	0.092**	0.098*	0.501***	0.198
	(0.046)	(0.055)	(0.079)	(0.138)
Observations	16,595	16,595	16,595	16,595
R-squared	0.094	0.097	0.177	0.773
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.5: LPM estimation results for whether respondents think FGC should continue—Côte d'Ivoire 2011

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.215***	0.202***	0.175***	0.110**
	(0.016)	(0.015)	(0.015)	(0.043)
Age	-0.014***	-0.014***	-0.012***	-0.012
	(0.004)	(0.004)	(0.004)	(0.012)
Age squared	0.000***	0.000***	0.000***	0.000

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Table 2.5 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.050***	-0.051***	-0.042***	-0.004
	(0.010)	(0.010)	(0.010)	(0.027)
Secondary education	-0.065***	-0.063***	-0.067***	-0.030
	(0.013)	(0.013)	(0.012)	(0.029)
Higher education	-0.032*	-0.032*	-0.053***	-0.022
	(0.018)	(0.019)	(0.013)	(0.035)
Married	0.044***	0.042***	0.031**	0.055
	(0.013)	(0.013)	(0.014)	(0.042)
Cohabitating	0.032**	0.036**	0.030**	0.043
	(0.014)	(0.014)	(0.015)	(0.042)
Widowed	0.028	0.032	0.028	0.081
	(0.027)	(0.027)	(0.027)	(0.065)
Divorced	0.016	0.024	0.007	0.087
	(0.034)	(0.034)	(0.038)	(0.097)
Separated	0.018	0.020	0.012	0.032
	(0.020)	(0.020)	(0.020)	(0.041)
Television	-0.038***	-0.038***	-0.042***	
	(0.014)	(0.014)	(0.014)	
Radio	0.009	0.011	0.018*	
	(0.012)	(0.011)	(0.011)	
Electricity	-0.028	-0.027	-0.013	
	(0.018)	(0.017)	(0.022)	
Urban household	-0.035**	-0.028*		
	(0.016)	(0.015)		
Constant	0.330***	0.485***	0.306***	0.629*
	(0.082)	(0.095)	(0.101)	(0.364)
Observations	8,731	8,731	8,731	8,731
R-squared	0.279	0.295	0.372	0.847
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

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Table 2.5 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.6: LPM estimation results for whether respondents think FGC should continue—The Gambia 2010

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.676***	0.670***	0.677***	0.502***
	(0.011)	(0.018)	(0.018)	(0.053)
Age	-0.003	-0.001	-0.002	-0.003
	(0.003)	(0.003)	(0.003)	(0.005)
Age squared	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education		-0.069**	0.004	-0.009
		(0.034)	(0.042)	(0.036)
Secondary education		-0.134***	-0.056	-0.065*
		(0.034)	(0.041)	(0.035)
Higher education		-0.217***	-0.135**	-0.153**
		(0.049)	(0.053)	(0.070)
Non-traditional education		-0.111**	0.000	-0.055
		(0.047)	(0.000)	(0.088)
Madrassa primary education		-0.024	0.031	-0.002
		(0.036)	(0.043)	(0.037)
Madrassa secondary education		0.000	0.073	0.000
		(0.000)	(0.050)	(0.000)
Married		0.012	0.016	0.013
		(0.012)	(0.013)	(0.023)
Cohabitating		-0.322**	-0.318*	-0.004
		(0.137)	(0.168)	(0.023)
Widowed		0.022	0.018	0.007
		(0.031)	(0.030)	(0.044)
Divorced		-0.017	-0.021	-0.035
		(0.030)	(0.029)	(0.054)

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Table 2.6 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Separated		0.010	0.021	0.067
		(0.058)	(0.058)	(0.175)
Television	0.016*	0.012	0.008	
	(0.009)	(0.010)	(0.011)	
Radio	-0.019**	-0.012	-0.015	
	(0.009)	(0.013)	(0.013)	
Electricity	-0.031***	-0.016	-0.014	
	(0.010)	(0.013)	(0.014)	
Urban household	0.022***	0.087***		
	(0.009)	(0.031)		
Constant	0.319***	0.234***	0.168	-0.221
	(0.046)	(0.073)	(0.107)	(0.183)
Observations	10,919	13,101	13,101	13,101
R-squared	0.522	0.535	0.575	0.805
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.7: LPM estimation results for whether respondents think FGC should continue—Ghana 2011

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.066***	0.066***	0.060**	0.118
	(0.023)	(0.023)	(0.029)	(0.153)
Age	-0.015**	-0.015**	-0.012	-0.048
	(0.007)	(0.007)	(0.009)	(0.077)
Age squared	0.000*	0.000*	0.000	0.001

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Table 2.7 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
	(0.000)	(0.000)	(0.000)	(0.001)
Primary education	0.041***	0.041***	0.038*	0.018
	(0.014)	(0.014)	(0.022)	(0.313)
Secondary education	0.019	0.019	0.025	-0.073
	(0.012)	(0.012)	(0.020)	(0.251)
Vocational training	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Tertiary education	0.015	0.012	0.022	-0.047
	(0.022)	(0.022)	(0.028)	(0.461)
Married	0.031	0.028	0.015	0.184
	(0.026)	(0.026)	(0.028)	(0.397)
Cohabitating	0.029	0.026	0.026	0.208
	(0.028)	(0.028)	(0.031)	(0.440)
Widowed	0.024	0.023	0.028	-0.029
	(0.037)	(0.037)	(0.045)	(1.102)
Divorced	0.012	0.013	0.008	0.174
	(0.028)	(0.029)	(0.031)	(0.334)
Separated	-0.006	-0.010	-0.002	0.186
	(0.036)	(0.036)	(0.038)	(0.607)
Television	0.031	0.031	0.047	
	(0.025)	(0.025)	(0.034)	
Radio	-0.007	-0.006	-0.014	
	(0.012)	(0.012)	(0.015)	
Electricity	-0.020	-0.020	-0.013	
	(0.019)	(0.019)	(0.022)	
Urban household	-0.022	-0.020		
	(0.015)	(0.015)		
Constant	0.218*	0.248*	0.185	0.572
	(0.117)	(0.129)	(0.152)	(1.222)
Observations	4,181	4,181	4,181	4,181
R-squared	0.081	0.084	0.259	0.923
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes

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Table 2.7 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.8: LPM estimation results for whether respondents think FGC should continue—Guinea 2012

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.313***	0.312***	0.302***	0.260**
	(0.041)	(0.042)	(0.040)	(0.123)
Age	-0.002	-0.003	-0.002	0.007
	(0.004)	(0.004)	(0.004)	(0.011)
Age squared	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.023	-0.023	-0.021	-0.009
	(0.017)	(0.017)	(0.017)	(0.050)
Secondary education	-0.172***	-0.171***	-0.169***	-0.121***
	(0.021)	(0.021)	(0.021)	(0.045)
Higher education	-0.349***	-0.353***	-0.347***	-0.284***
	(0.035)	(0.035)	(0.037)	(0.102)
Married	0.079***	0.081***	0.073***	0.067
	(0.015)	(0.016)	(0.016)	(0.049)
Cohabitating	0.034	0.023	0.011	0.086
	(0.054)	(0.053)	(0.059)	(0.159)
Widowed	0.048	0.051	0.046	-0.007
	(0.048)	(0.047)	(0.048)	(0.109)
Divorced	-0.043	-0.044	-0.052	-0.016
	(0.048)	(0.047)	(0.048)	(0.115)
Separated	0.125**	0.111*	0.122**	0.072
	(0.059)	(0.058)	(0.059)	(0.185)
Television	-0.006	-0.010	0.003	
	(0.026)	(0.025)	(0.028)	

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Table 2.8 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Radio	-0.027**	-0.021*	-0.014	
	(0.012)	(0.012)	(0.012)	
Electricity	-0.042	-0.061**	-0.057	
	(0.031)	(0.030)	(0.037)	
Urban household	-0.073***	-0.086***		
	(0.021)	(0.022)		
Constant	0.764***	0.834***	0.361**	0.213
	(0.105)	(0.108)	(0.174)	(0.464)
Observations	8,607	8,607	8,607	8,607
R-squared	0.190	0.198	0.256	0.762
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.9: LPM estimation results for whether respondents think FGC should continue—Guinea Bissau 2006

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.269***	0.269***	0.242***	0.083
	(0.023)	(0.023)	(0.023)	(0.065)
Age	-0.004	-0.004	-0.003	-0.000
	(0.006)	(0.006)	(0.006)	(0.010)
Age squared	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.147**	-0.147**	0.058	-0.006
	(0.069)	(0.069)	(0.072)	(0.041)
Secondary education	-0.195***	-0.195***	0.008	-0.028

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Table 2.9 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
	(0.069)	(0.069)	(0.073)	(0.031)
Higher education	-0.195*	-0.194*	0.000	0.000
	(0.100)	(0.100)	(0.000)	(0.000)
Non-standard education	0.000	0.000	0.160	-0.040
	(0.000)	(0.000)	(0.103)	(0.083)
Married	0.055***	0.054**	0.041*	0.023
	(0.021)	(0.021)	(0.021)	(0.034)
Cohabitating	-0.014	-0.016	-0.022	-0.054
	(0.026)	(0.026)	(0.026)	(0.063)
Widowed	0.068	0.067	0.073*	0.093
	(0.041)	(0.041)	(0.042)	(0.094)
Divorced	-0.031	-0.033	-0.038	-0.086
	(0.026)	(0.026)	(0.030)	(0.091)
Television	-0.057**	-0.057**	-0.045*	
	(0.024)	(0.024)	(0.025)	
Radio	0.017	0.018	0.019	
	(0.016)	(0.016)	(0.017)	
Electricity	0.004	0.003	0.014	
	(0.022)	(0.022)	(0.021)	
Urban household	-0.127***	-0.126***		
	(0.018)	(0.018)		
Constant	0.858***	0.869***	0.859***	1.027***
	(0.124)	(0.125)	(0.158)	(0.284)
Observations	6,431	6,431	6,431	6,431
R-squared	0.484	0.485	0.544	0.867
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.10: LPM estimation results for whether respondents think FGC should continue—Mali 2012

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.551***	0.549***	0.494***	0.352***
	(0.028)	(0.028)	(0.029)	(0.121)
Age	-0.008**	-0.007**	-0.008**	-0.006
	(0.003)	(0.003)	(0.004)	(0.016)
Age squared	0.000*	0.000*	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.050***	-0.051***	-0.051***	-0.052
	(0.017)	(0.017)	(0.017)	(0.069)
Secondary education	-0.104***	-0.104***	-0.102***	-0.080
	(0.016)	(0.015)	(0.016)	(0.071)
Higher education	-0.253***	-0.259***	-0.245***	-0.272*
	(0.037)	(0.037)	(0.036)	(0.143)
Married	0.038**	0.038**	0.044**	0.025
	(0.017)	(0.017)	(0.017)	(0.071)
Cohabitating	0.018	0.018	0.029	0.065
	(0.030)	(0.030)	(0.032)	(0.123)
Widowed	0.025	0.023	0.043	0.071
	(0.045)	(0.046)	(0.048)	(0.173)
Divorced	-0.024	-0.022	0.010	0.064
	(0.058)	(0.057)	(0.059)	(0.287)
Separated	0.027	0.029	0.037	0.087
	(0.054)	(0.053)	(0.052)	(0.161)
Television	-0.038***	-0.039***	-0.025**	
	(0.011)	(0.011)	(0.011)	
Radio	0.017*	0.018*	0.020**	
	(0.010)	(0.010)	(0.010)	
Electricity	0.027*	0.022	0.027*	
	(0.016)	(0.015)	(0.014)	
Urban household	0.027	0.007		
	(0.018)	(0.019)		
Constant	-0.120	-0.130	0.148	0.397
	(0.127)	(0.184)	(0.183)	(0.462)
Observations	9,202	9,202	9,202	9,202
R-squared	0.274	0.276	0.345	0.859

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Table 2.10 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.11: LPM estimation results for whether respondents think FGC should continue—Niger 2012

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.218***	0.223***	0.198***	0.021
	(0.046)	(0.044)	(0.051)	(0.116)
Age	-0.003	-0.003	-0.003	-0.001
	(0.002)	(0.002)	(0.002)	(0.004)
Age squared	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.007	-0.007	-0.008	-0.012
	(0.006)	(0.006)	(0.006)	(0.017)
Secondary education	-0.009**	-0.013***	-0.007	-0.012
	(0.005)	(0.005)	(0.006)	(0.018)
Higher education	-0.023***	-0.023***	-0.017**	-0.016
	(0.008)	(0.007)	(0.008)	(0.020)
Married	0.010*	0.008	0.010	0.005
	(0.006)	(0.006)	(0.006)	(0.022)
Cohabitating	0.004	0.004	0.004	0.003
	(0.007)	(0.008)	(0.013)	(0.011)
Widowed	0.033	0.030	0.032	-0.004
	(0.021)	(0.020)	(0.021)	(0.030)
Divorced	0.027*	0.024	0.015	-0.000
	(0.015)	(0.015)	(0.012)	(0.026)

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Table 2.11 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Separated	0.005	0.001	-0.002	0.010
	(0.012)	(0.011)	(0.011)	(0.020)
Television	0.002	0.002	0.002	
	(0.005)	(0.005)	(0.005)	
Radio	0.000	-0.000	-0.002	
	(0.005)	(0.005)	(0.005)	
Electricity	-0.016***	-0.017***	-0.014**	
	(0.005)	(0.005)	(0.006)	
Urban household	-0.019***	-0.024***		
	(0.007)	(0.008)		
Constant	0.084***	0.086**	0.016	0.053
	(0.029)	(0.034)	(0.028)	(0.060)
Observations	4,474	4,474	4,474	4,474
R-squared	0.165	0.180	0.373	0.910
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	No	No	No	No
Religion fixed effects	No	No	No	No
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.12: LPM estimation results for whether respondents think FGC should continue—Nigeria 2013

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.292***	0.291***	0.253***	0.154***
	(0.012)	(0.012)	(0.012)	(0.049)
Age	-0.002	-0.002	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.009)
Age squared	-0.000	-0.000	-0.000	-0.000

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Table 2.12 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.015	-0.017	-0.010	-0.038
	(0.012)	(0.012)	(0.010)	(0.048)
Secondary education	-0.030**	-0.031**	-0.022*	-0.031
	(0.013)	(0.013)	(0.011)	(0.054)
Higher education	-0.083***	-0.084***	-0.064***	-0.107
	(0.015)	(0.015)	(0.013)	(0.067)
Married	-0.011	-0.011	-0.011	0.022
	(0.009)	(0.009)	(0.009)	(0.045)
Cohabitating	-0.003	-0.005	-0.003	-0.029
	(0.016)	(0.016)	(0.016)	(0.097)
Widowed	0.005	0.006	0.003	-0.009
	(0.016)	(0.016)	(0.017)	(0.083)
Divorced	0.002	0.003	-0.004	-0.035
	(0.024)	(0.024)	(0.023)	(0.099)
Separated	-0.004	-0.004	-0.021	0.029
	(0.021)	(0.021)	(0.021)	(0.115)
Television	-0.021***	-0.022***	-0.014**	
	(0.007)	(0.007)	(0.007)	
Radio	-0.013*	-0.012*	-0.013	
	(0.007)	(0.007)	(0.008)	
Electricity	-0.009	-0.007	0.010	
	(0.010)	(0.010)	(0.013)	
Urban household	-0.005	-0.004		
	(0.011)	(0.011)		
Constant	0.283***	0.351***	0.398**	-0.133
	(0.064)	(0.076)	(0.180)	(0.229)
Observations	21,336	21,336	21,336	21,336
R-squared	0.339	0.339	0.415	0.906
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	No	No	No	No
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

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Table 2.12 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.13: LPM estimation results for whether respondents think FGC should continue—Senegal 2010

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.411***	0.392***	0.326***	0.228***
	(0.022)	(0.021)	(0.020)	(0.048)
Age	-0.009**	-0.010**	-0.009**	-0.009
	(0.004)	(0.004)	(0.004)	(0.007)
Age squared	0.000	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.054***	-0.054***	-0.043***	-0.050**
	(0.014)	(0.014)	(0.013)	(0.021)
Secondary education	-0.134***	-0.131***	-0.122***	-0.115***
	(0.014)	(0.014)	(0.013)	(0.031)
Higher education	-0.068	-0.061	-0.069	-0.064
	(0.051)	(0.049)	(0.049)	(0.067)
Married	0.023	0.031**	0.031**	0.036**
	(0.015)	(0.015)	(0.014)	(0.017)
Cohabitating	-0.116**	-0.111**	-0.088**	-0.005
	(0.051)	(0.052)	(0.042)	(0.090)
Widowed	-0.032	-0.039	-0.033	0.047
	(0.045)	(0.043)	(0.045)	(0.065)
Divorced	-0.002	0.005	0.009	0.027
	(0.027)	(0.027)	(0.027)	(0.046)
Separated	-0.032	-0.024	-0.016	0.050
	(0.056)	(0.056)	(0.054)	(0.101)
Television	-0.006	-0.012	0.004	
	(0.016)	(0.015)	(0.015)	
Radio	0.019	0.021	0.012	
	(0.013)	(0.013)	(0.013)	

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Table 2.13 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Electricity	-0.004	-0.015	-0.009	
	(0.018)	(0.018)	(0.017)	
Urban household	-0.047***	-0.039**		
	(0.018)	(0.018)		
Constant	0.237***	0.634***	0.589***	0.254
	(0.082)	(0.183)	(0.210)	(0.177)
Observations	13,160	13,160	13,160	13,160
R-squared	0.404	0.422	0.481	0.768
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.14: LPM estimation results for whether respondents think FGC should continue—Sierra Leone 2010

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.349***	0.350***	0.347***	0.402
	(0.026)	(0.026)	(0.029)	(0.464)
Age	-0.004	-0.004	-0.006	-0.006
	(0.006)	(0.006)	(0.007)	(0.033)
Age squared	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.001)
Primary education	-0.039	-0.040	-0.020	-0.077
	(0.025)	(0.025)	(0.029)	(0.133)
Secondary education	-0.173***	-0.172***	-0.162***	-0.172
	(0.031)	(0.031)	(0.034)	(0.279)
Higher education	-0.294***	-0.291***	-0.287***	-0.180

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Table 2.14 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
	(0.068)	(0.067)	(0.078)	(0.405)
Married	-0.001	-0.001	-0.015	-0.064
	(0.027)	(0.027)	(0.030)	(0.261)
Cohabitating	0.006	0.005	0.003	-0.196
	(0.046)	(0.045)	(0.054)	(0.441)
Widowed	-0.004	-0.002	0.008	-0.093
	(0.043)	(0.043)	(0.047)	(0.360)
Divorced	0.087	0.074	-0.022	0.159
	(0.094)	(0.090)	(0.073)	(0.499)
Separated	-0.001	-0.004	-0.017	-0.020
	(0.037)	(0.037)	(0.039)	(0.266)
Television	-0.016	-0.014	-0.005	
	(0.034)	(0.034)	(0.035)	
Radio	-0.053***	-0.053***	-0.036***	
	(0.012)	(0.012)	(0.013)	
Electricity	-0.018	-0.021	-0.010	
	(0.032)	(0.032)	(0.037)	
Urban household	-0.024	-0.020		
	(0.020)	(0.021)		
Constant	0.620***	0.400***	0.585***	0.358
	(0.156)	(0.131)	(0.159)	(0.695)
Observations	7,232	7,232	7,232	7,232
R-squared	0.325	0.328	0.393	0.925
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.15: LPM estimation results for whether respondents think FGC should continue—Togo 2010

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Underwent FGC	0.110***	0.109***	0.087***	0.032
	(0.023)	(0.023)	(0.024)	(0.041)
Age	-0.005	-0.005	-0.003	-0.005
	(0.003)	(0.003)	(0.003)	(0.008)
Age squared	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	-0.003	-0.003	0.003	0.002
	(0.008)	(0.008)	(0.009)	(0.023)
Secondary education (Collége)	-0.008	-0.009	-0.003	0.012
	(0.007)	(0.007)	(0.008)	(0.013)
Higher education (Lycée)	-0.018	-0.020*	-0.010	0.006
	(0.011)	(0.011)	(0.012)	(0.037)
Married	0.017	0.018	0.010	-0.001
	(0.012)	(0.012)	(0.013)	(0.039)
Cohabitating	0.015	0.014	0.007	0.017
	(0.012)	(0.012)	(0.015)	(0.055)
Widowed	0.018	0.017	0.016	-0.018
	(0.018)	(0.018)	(0.021)	(0.041)
Divorced	0.012	0.011	-0.016	-0.014
	(0.015)	(0.015)	(0.018)	(0.037)
Separated	0.015	0.017	0.009	0.000
	(0.012)	(0.012)	(0.013)	(0.028)
Television	0.004	0.003	0.009	
	(0.009)	(0.009)	(0.009)	
Radio	-0.007	-0.007	-0.004	
	(0.008)	(0.008)	(0.009)	
Electricity	0.007	0.008	-0.001	
	(0.008)	(0.007)	(0.009)	
Urban household	-0.011	-0.011		
	(0.007)	(0.007)		
Constant	0.092*	0.102**	0.079	0.131
	(0.048)	(0.050)	(0.083)	(0.144)
Observations	3,843	3,843	3,843	3,843
R-squared	0.139	0.143	0.265	0.908

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Table 2.15 (continued)

	(1)	(2)	(3)	(4)
Dependent variable: = 1 if respondent thinks FGC should continue, = 0 otherwise.				
Interviewer fixed effects	Yes	Yes	Yes	Yes
Ethnicity fixed effects	Yes	Yes	Yes	Yes
Religion fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes
Village fixed effects	No	No	Yes	Yes
Household fixed effects	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Chapter 3

Persistent Norms and Tipping Points: Female Genital Cutting in Burkina Faso

3.1 Introduction

Each year more than three million girls undergo female genital cutting (World Health Organization, 2012). Female genital cutting (FGC)[1]—a practice wherein a woman's genitalia are partially or totally removed for nonmedical reasons—has no documented health benefits, and this procedure can have profound negative health effects on the women subjected to the practice. Women who have undergone FGC are more than twice as likely to experience birthing complications (Jones et al., 1999; Banks et al., 2006) and 25 percent more likely to contract sexually transmitted diseases (Wagner, 2015). They are also more likely to experience anxiety, depression, and marital conflict (Dorkenoo, 1999). These complications can create barriers to women working effectively both inside and outside of the household, which can contribute to economic underdevelopment in communities that practice FGC. Yet the practice persists because of beliefs that FGC

[1]Female genital cutting (FGC) is also referred to as "female circumcision" and "female genital mutilation." I use the terminology FGC because it makes a larger distinction between FGC and male circumcision than does the term female circumcision, and it is more value-neutral than the term "mutilation." Throughout this manuscript I use the terminology FGC, "cut," and "cutting" interchangeably.

will discourage infidelity among women subjected to the practice (Shell-Duncan and Hernlund, 2001), as well as beliefs that women who have undergone FGC attain higher standards of beauty, cleanliness, and femininity (Toubia and Sharief, 2003).

Why does FGC persists as a norm when there are no medical benefits and there are many potential physical and psychological costs? I propose a new theoretical explanation for this phenomenon, and I test this explanation using observational data from Burkina Faso's Demographic and Health Survey. Additionally, I investigate whether there is a tipping point in the proportion of community members abandoning FGC.

Gender-biased harmful practices, including FGC, child marriage, and sex-selective abortion, have become a significant topic of public and political discourse. Many gender-biased harmful practices are a result of entrenched social norms which, once in place, are very difficult to alter without external stimuli such as public policy interventions. Whether those interventions can change individual behavior or whether they must be targeted toward changing community-wide beliefs and behavior is the subject of an important debate (Powell, 2017). If FGC is a social coordination norm—that is, communities will abandon FGC if and only if a sufficient proportion of households within the community agree to abandon the practice—as posited by Mackie (1996), deviating from the social norm is so socially costly that individuals or households will not do so on their own. Many development organizations and governments working to reduce the prevalence of FGC design interventions with the belief that FGC is a social coordination norm. Agencies and governments operating under this assumption advocate for public declarations by community members that they will abandon FGC if a sufficient number of community members also agree to abandon the practice.

Recent empirical findings show that FGC is not a social coordination problem in Sudan (Efferson et al., 2015) and that individual- and household-level factors contribute to a larger share of the practice's persistence than do community-level factors in West Africa (Bellemare et al., 2015). This suggests that development agencies could broaden the set of policy interventions in order to address the support for and the perpetuation of FGC. Specifically, agencies could design policies aimed to change individual- or household-level preferences.

This chapter's contribution is threefold. First, recent empirical findings that FGC is not a social coordination norm suggest the need for a new theoretical explanation for why

FGC persists as a practice in many communities. I posit a new theory that highlights preference heterogeneity. I hypothesize that while households may wait to abandon FGC until a certain proportion of community members have already abandoned the practice, each household may have a different threshold, i.e. it may require a different proportion of community members to abandon FGC before it also abandons the practice.

Second, I test this theory with observational data from Burkina Faso, and I show that households do have heterogeneous thresholds. This heterogeneity provides important insights into why FGC persists; in a community with heterogeneous preferences there may not be a tipping point in the rate of FGC, and there may in fact be stable internal equilibrium. The distribution of household preferences has a large influence on the effectiveness of policies aimed at reducing the incidence of FGC (Platteau et al., 2017).

Third, I explore whether there is a tipping point in the proportion of community members practicing FGC beyond which the prevalence of the practice should shrink to zero or if there are stable internal equilibria in the rates of FGC. I show that some communities in my data have a stable equilibrium at low levels of FGC, suggesting that achieving at a low rate of FGC may be feasible; completely eliminating FGC, however, may be more difficult.

The strength of my approach comes from the long time period I analyze using three cross-sectional datasets from 1998, 2003, and 2010 from Burkina Faso that include women born between 1949 and 1995 and their daughters. The use of this six-decade timeframe is important when considering an intergenerational problem and long-term dynamics of FGC as well as the external validity of my estimates.

The remainder of this chapter is organized as follows. In section 3.2 I provide background information on FGC. Section 3.3 provides a conceptual framework for analysis, and section 3.4 introduces the data and descriptive statistics. Section 3.5 discusses the empirical framework and estimation strategy, and section 3.6 present the results of the analysis. In section 3.7 I interpret the results and conclude.

3.2 Background

The practice of FGC is concentrated in 29 countries across parts of Africa, Asia, and the Middle East (UNICEF, 2013), as well as among immigrant communities from those

parts of the world now living in other countries. The World Health Organization (2012) classifies FGC into four types. Clitoridectomy (Type I) includes any partial or total removal of the clitoris, excision (Type II) includes partial or total removal of the clitoris and the labia minora, and infibulation (Type III) consists of narrowing the vaginal opening by sewing or stitching the labia together. Type IV includes all other procedures including pricking, piercing, incising, scraping or cauterizing the female genitalia for non-medical reasons.

In Burkina Faso, the vast majority of girls who undergo FGC, experience either clitoridectomy or excision. In the data, less than four percent of girls who undergo FGC experience infibulation. This figure is comparable to Jones et al. (1999), who show, using gynecological exams, that five percent of women in their Burkina Faso sample had undergone infibulation. The majority of procedures occur at very young ages in Burkina Faso. In the data, more than 94 percent of girls who undergo the procedure are cut before the age of 11, and approximately 42 percent of procedures occur during infancy.

The cultural norms surrounding FGC vary widely. Most scholars speculate that the practice originated as a way to reduce premarital and extramarital sex and thus ensure the paternity of children (Mackie, 1996; Boyle, 2005; Dorkenoo, 1999). Though FGC arose and may persist in part in response to male preferences, today women are primarily responsible for the decision to cut their daughters (Mackie, 1996; Toubia and Sharief, 2003). Undergoing FGC is seen as a rite of passage, or a way to join the society of women in the community (Toubia and Sharief, 2003). Some societies view the clitoris as a masculine part of a woman's body that must be removed in order for the girl to be fully female (Gruenbaum, 2000; Shell-Duncan and Hernlund, 2001). Other societies believe that girls who have not undergone FGC are "unclean," and these girls are not allowed to wash dishes or touch certain items.

Burkina Faso is well suited to studying how and why the norm of FGC persists or wanes. The rate of FGC in Burkina Faso, while still high, fell substantially during the 60-year period for which I have data. This heterogeneity in rates of FGC by year of birth allows me to explore how household decisions change when faced with different rates of FGC. Further, it is possible to speculate about the future trends in countries where the rate of FGC remains high. Guinea, Mali, and Sierre Leone are three such countries, where rates of FGC are respectively 96 percent, 89 percent, and 88 percent of

adult women (UNICEF, 2013).

3.3 Theoretical Model

In order to analyze a household's decision about whether its daughter should undergo FGC, I present an adapted version of the social coordination norm model proposed by Mackie (1996) and add to it Schelling (1978)'s model of critical mass.

3.3.1 Social Coordination Norm

Consider a household's decision of whether its daughter will undergo FGC. I refer to the household as a single unit and remain agnostic about the decision-making process within the household because I am able to observe only the final decision made by the household (i.e., the girl's FGC status) and the constraints faced by the household, but not the intrahousehold bargaining process. Assume that the household knows the extent to which community members practice FGC. This is not an unreasonable assumption, because the FGC procedure is often performed in conjunction with a ceremony and community members often know who participated in such a ceremony (Cloward, 2016).

Let $r \in [0, 1]$ represent the rate of FGC at the community level, and let $g \in \{0, 1\}$ represent the daughter's FGC status where $g = 1$ denotes a girl who has undergone FGC. A household takes r as given and chooses between two strategies; (i) to cut its daughter ($g = 1$) and (ii) not to cut its daughter ($g = 0$). Let $s_{gi}(r)$ represent the social cost associated with strategy g for household i when faced with FGC rate r. This social cost is a function of r because social sanctions delivered by the community are related to the proportion of community members practicing FGC.

I first normalize to zero the payoff accruing to a household that does not cut its daughter in a community in which the cutting rate equals zero, that is $s_{0i}(0) = 0$. Then, let $s_{0i}(r) \geq 0$ and $s_{1i}(r) \geq 0$. These social costs include reduced marriage prospects of the girl (Wagner, 2015) and reduced acceptance into the community (Toubia and Sharief, 2003). Additionally, $s_{0i}(r)$ may include perceived disregard for religious edicts (Cloward, 2016) and inferior perceived beauty and femininity (Shell-Duncan and Hernlund, 2001). Finally, let $c_i \geq 0$ be the perceived non-social costs—monetary, psychological, and physical—associated with cutting the girl.

Assume that the payoff accruing to a household that abstains from FGC is monotonically decreasing in the proportion of community members that practice FGC, and that the payoff accruing to a household that practices FGC is monotonically increasing in the proportion of community members that practice FGC.

Assumption 1. $\frac{\partial s_{0i}(r)}{\partial r} < 0$, *i.e. the social cost accruing to a household that abstains from practicing FGC is monotonically decreasing in the proportion of community members that practices FGC.*

Assumption 2. $\frac{\partial s_{1i}(r)}{\partial r} > 0$, *i.e. the social cost accruing to a household that practices FGC is monotonically increasing in the proportion of community members that practices FGC.*

It is not necessary to assume a functional form for the payoff functions. It is, however, important to consider the number of times the payoff functions for the two strategies could cross. Assumptions 1 and 2 allow us to conclude that the payoff functions can cross at most once in the space of FGC rates.

Lemma 1. *Under assumptions 1 and 2, the potential payoffs accruing to households under each strategy cross at most once in the space of community FGC rates.*

Figure 3.1 shows this graphically by displaying the potential payoff accruing to a household if it practices FGC or abstains from FGC, dependent on the proportion of community members practicing FGC. Let $s_{0i}(1) = \hat{s}_{0i}$ and $s_{1i}(0) = \hat{s}_{1i}$. Assume that $s_{1i}(1) = 0$ because there is no social cost of practicing FGC in a community in which all members practice FGC. Most households receive a higher payoff if they adhere to local norms. That is, in most cases, a household in a community in which all members practice FGC will achieve a higher payoff if the daughter undergoes FGC (i.e., $-c_i > -\hat{s}_{0i}$). Conversely, a household in a community in which no members practice FGC will achieve a higher payoff if the daughter does not undergo FGC (i.e., $0 > -\hat{s}_{1i} - c_i$).

For ease of exposition, and without loss of generality, I use a payoff structure that is a linear function of the rate of FGC in the community. Figure 3.1 shows that when the proportion of community members practicing FGC is above r_i^*, the household derives a higher payoff from practicing FGC than from abstaining. This situation flips if the proportion of practicing households is below r_i^*.

Proposition 1. *If $r < r_i^*$, household i will abstain from FGC for its daughter, and if $r > r_i^*$, household i will choose to have its daughter undergo FGC.*

Proof. Normalize $s_{0i}(0)$ to zero, and assume that $s_{1i}(1) = 0$. Let $s_{0i}(1) = \hat{s}_{0i}$ and $s_{1i}(0) = \hat{s}_{1i}$. If Lemma 1 is satisfied, then the household has a single indifference point at r_i^*.

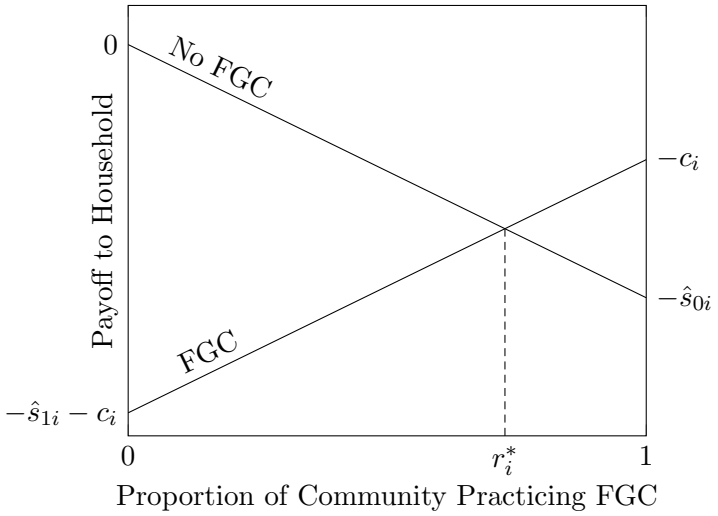


Figure 3.1: Household $i's$ Payoff Structure

□

3.3.2 The Threshold Model of Collective Behavior

Mackie (1996) assumes homogeneous households within a community such that each household is facing the same costs and benefits of cutting. This implies that $r_i^* = r^* \; \forall \, i \in \mathcal{H}$, where $\mathcal{H}$ is the set of households in the community. According to this model, if a community can gather at least $1 - r^*$ community members to declare that they will abandon FGC, all community members will abandon FGC. That is, r^* is the *tipping point* for this community. This is the crux of the policies that arrange public declarations for the abandonment of FGC. Bellemare, Novak, & Steinmetz (2015) and Efferson et al. (2015) show that highly heterogeneous cutting rates—between zero and one—exist across communities. These findings are inconsistent with the hypotheses generated by Mackie's theory because if social sanctions prevent households from deviating from the

norm and if a single tipping point is guaranteed in every community, one would expect to see rates of FGC that are either very close to zero or very close to one.

Hypothesis 1. *Households within a community have heterogeneous thresholds* r_i^*.

If instead each individual values the benefits and costs to cutting differently, there are as many variations to figure 3.1 as there are community members. This implies that each individual will require a different proportion of community members to abandon FGC before deciding to switch from practicing to abandoning FGC. This indifference point—referred to in this chapter as a threshold—is the proportion of community members that must abandon FGC in order for the household to abandon the practice. In figure 3.1, r_i^* is this household's threshold. In this chapter I test whether households in a given community have heterogenous thresholds.

3.3.3 Tipping Point or Stable Internal Equilibria

A key insight from Efferson et al. (2015) is that if thresholds are heterogeneous within a community, a tipping point as proposed in Mackie (1996) may not exist. (Schelling, 1978, p.105) makes the point that in the face of heterogeneous thresholds (what he refers to as "cross-over points"), multiple stable equilibria may exist, some of which are interior solutions. Drawing on Schelling's model of critical mass, I investigate whether there is a tipping point for the practice of FGC in communities in Burkina Faso. To do this, I analyze the cumulative distribution function (CDF) of community member thresholds.

Continue to assume that a household observes the rate of FGC in the community before making the decision for their daughter. Let $f(r_i^*)$ be the probability density function (PDF) and $F(r)$ be the CDF of the thresholds of the community members. Then, $F(r) = \int_0^r f(r_i^*)dr_i^*$ represents the proportion of community members with a threshold that is lower than or equal to r.

If all households have the same threshold, the PDF of community thresholds would be a vertical line at the level r^*, and the CDF of the proportion of households favoring FGC would resemble curve 1 in figure 3.2. In this curve, no household favors FGC if the rate of FGC is below r^*, and all households favor FGC for their daughter if the rate is above r^*. Alternatively, if thresholds are heterogeneous, the CDF of the proportion of households favoring FGC could resemble curve 2 (or a myriad of other curves). In this

particular rendering of a CDF in a community with heterogeneous household thresholds, a small proportion of household will practice FGC even if they believe that no one else will. The proportion of community members favoring FGC is higher if the proportion of community members practicing FGC is larger. In this hypothetical community there are some households that will abstain from practicing FGC even if they expect every other household in the community will practice FGC.

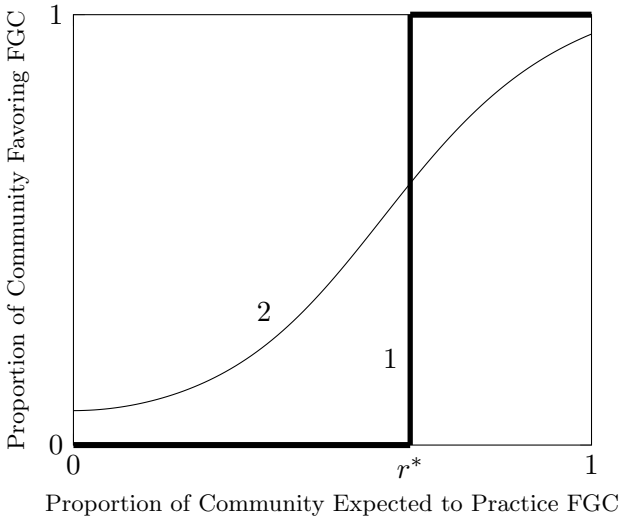


Figure 3.2: Hypothetical Community CDFs

Figure 3.3 shows hypothetical CDFs of the proportion of community household favoring FGC as a function of the proportion of community household that are expected to practice FGC. The dashed line is the 45-degree line.

Any point at which the CDF crosses the 45-degree line, or $F(r) = r$, is an equilibrium—either stable or unstable. Curve 1 of figure 3.3 shows a community in which a small portion of households value FGC sufficiently that they will practice FGC even if no other household practices. Because these households practice FGC, they will draw a few more community households with a low threshold into practicing FGC until the community reaches point A. If instead the rate of FGC is higher than the rate at point A, there are fewer households favoring FGC (as a function of practicing households) than there are practicing households. This would lead these households to abandon FGC, pushing the equilibrium to point A. Thus, point A is a stable equilibrium, and it

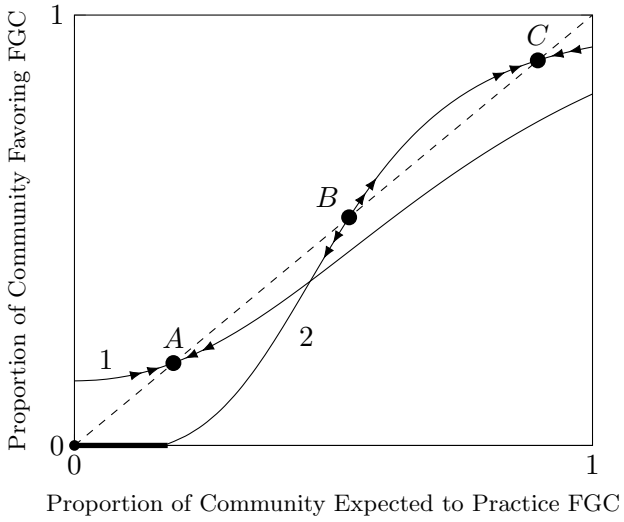


Figure 3.3: Hypothetical Community CDFs

is the only equilibrium on curve 1.

If instead the community's distribution of thresholds resembles curve 2, there are three equilibria, two of which are stable. If the proportion of households practicing FGC is below point B, fewer households favor FGC than there are households expected to practice, so the proportion of households practicing FGC will fall to zero. If instead, the proportion of household practicing FGC is above point B, more households will be drawn to practicing FGC until point C is reached. If the proportion of households practicing FGC is higher than at point C, some will decide to stop practicing, and the proportion of practicing households will return to point C. A community with thresholds, r_i^* of community members distributed as shown in curve 2 has two stable equilibria—one at a high rate of FGC and one at zero, and one unstable equilibrium at point B.

Thus, if households have heterogeneous thresholds it is possible that there is a tipping point, as is illustrated with curve 2 at point B. It is also possible that a tipping point does not exist, as is illustrated with curve 1. Thus, if community members have heterogeneous thresholds, the existence of a tipping point is not guaranteed and it is possible that there is a stable equilibrium at an interior rate of cutting (i.e., $r \in (0, 1)$). Below, I use data from Burkina Faso to determine which phenomenon is most prevalent in communities across the country.

3.3.4 Estimating the Cumulative Distribution Function

A household's threshold is unobservable. It is a function of individual preferences and intrahousehold bargaining power. Additionally, each individual may have difficulty articulating their threshold if asked via survey. Fortunately, for the purpose of estimating a community's CDF, it is not necessary to identify a household's threshold. Instead, by revealed preference, it is possible to recover the community CDF from the behavior of the community members. In fact, the CDF at rate r is exactly equal to the proportion of households that opt to practice FGC when faced with rate of FGC r in the previous cohort.

Let $\pi(r)$ be the proportion of households that opt to practice FGC when faced with rate of FGC r, and let $g_i = 1$ if the girl undergoes FGC. Then, $\pi(r) = F(r)$.

Proposition 2. $F(r) = \pi(r)$.

Proof. The probability that girl i undergoes FGC when her parents are faced with rate r is equal to the proportion of households that opt to practice FGC when faced with rate r, or $\pi(r) = \mathbb{P}(g_i = 1|r)$. Furthermore, the probability that a girl undergoes FGC when faced with rate r is equal to the probability that her household's threshold is less than r, or $\mathbb{P}(g_i = 1|r) = \mathbb{P}(r_i^* < r)$. And, $\mathbb{P}(r_i^* < r) = \int_0^r f(r_i^*)dr_i^* = F(r)$.

$$\pi(r) = \mathbb{P}(g_i = 1|r) = \mathbb{P}(r_i^* < r) = \int_0^r f(r_i^*)dr_i^* = F(r)$$

□

Thus, it is possible to recover the CDF of household thresholds by estimating the rate of FGC in a cohort given the rate of FGC of the previous cohort, because $\pi(r) = F(r)$.

In the next section I discuss the data used in this analysis.

3.4 Data and Descriptive Statistics

I use publicly available data from the Demographic and Health Survey (DHS) for Burkina Faso. I use three cross-sectional datasets collected in 1998, 2003, and 2010. The DHS includes female respondents aged 15 to 49 at the time of survey, thus I have data for women born between 1949 and 1995. A respondent provides information on her health

and her children's health, along with many characteristics of her partner, if relevant, and the household in which she lives. I identify in which department and province a household resides by using the geographic coordinate information provided by the DHS. There are 45 provinces in Burkina Faso[2] and 351 departments. Provinces are the second administrative level in Burkina Faso, one level below region, one level above departments, and two levels above villages. Combining three cross-sectional datasets facilitates the investigation of a much longer timeframe than any one dataset provides, which is important when considering long-term dynamics in FGC.

Women report their own FGC status and the FGC status of their daughters. These reports are susceptible to reporting bias. In order to determine the likelihood and extent of misreporting, I compare my data to data from Burkina Faso collected in 1998 in which gynecological exams are used to estimate the prevalence of FGC (Jones et al., 1999). This study includes women attending rural clinics in two provinces of Burkina Faso (Bazèga and Zoundwéog) who are between 15 and 55 at the time of data collection. They find that 93 percent of women in their sample have undergone FGC. Restricting my sample to the rural areas in the two specified provinces and weighting rates of FGC by cohort according to the proportion of their sample in each cohort, I find a rate of FGC of 89 percent. This four percentage point difference in the rate of FGC may be even smaller given that the sample used by Jones et al. (1999) includes women up to the age of 55 in 1998 while my data include women up to the age of 49, and this cohort has the highest observed rate of FGC. Further, their data were collected in clinics, and it is possible that the women attending the clinics have more health complications than the average woman in these areas, and some of these health complications may have been the result of FGC. While this does not rule out the possibility of reporting bias, I argue that it is not a large concern in this setting.

Table 3.1 shows descriptive statistics for the three samples used in my analyses. These three cross-sections provide information from 24,474 women born between 1949 and 1995 who report their FGC status (shown in column 1). In many specifications, I use data only from the 6,873 women who have a daughter who is old enough to have undergone FGC and who report their daughter's FGC status (column 2). This sample

[2]The provinces were redrawn between 1998 and 2003. I use the geographic coordinates of the villages sampled in 1998 to determine in which modern province the village lies.

is restricted to women with a daughter who is 11 years or older because 94 percent of women who underwent FGC were cut before the age of 11. Including daughters younger than 11 would risk counting girls as uncut when in fact they will undergo FGC at a later date. In a small number of analyses I include only the 5,934 women who report their daughter's FGC status and who themselves underwent FGC (column 3).

Table 3.1: Descriptive Statistics

	(1) Full Sample	(2) Respondents with Daughters	(3) Cut Respondents with Daughters
Respondent Underwent FGC	0.749	0.863	1.000
	(0.003)	(0.004)	(0.000)
Daughter Underwent FGC		0.383	0.437
		(0.006)	(0.006)
Respondent Ever Attended School	0.280	0.104	0.103
	(0.003)	(0.004)	(0.004)
Respondent Ever Married	0.755	1.000	1.000
	(0.003)	(0.000)	(0.000)
Respondent's Partner Educated		0.125	0.126
		(0.004)	(0.004)
Average Rate of FGC in Province	0.745	0.633	0.654
Cohort	(0.001)	(0.002)	(0.002)
Average Rate of FGC in	0.744	0.637	0.663
Province-Ethnic Cohort	(0.001)	(0.003)	(0.003)
Respondent in Polygamous		0.568	0.567
Marriage		(0.006)	(0.006)
Respondent Year of Birth	1981	1967	1967
	(0.045)	(0.086)	(0.092)
Respondent's Partner's Year of		1955	1956
Birth		(0.137)	(0.145)
Daughter's Year of Birth		1988	1989
		(0.080)	(0.087)
Religion: Catholic	0.246	0.240	0.226
	(0.003)	(0.005)	(0.005)
Protestant	0.062	0.054	0.046
	(0.002)	(0.003)	(0.003)

Continued on next page

Table 3.1 (continued)

	(1) Full Sample	(2) Respondents with Daughters	(3) Cut Respondents with Daughters
Muslim	0.592	0.580	0.610
	(0.003)	(0.006)	(0.006)
Other	0.100	0.126	0.118
	(0.002)	(0.004)	(0.004)
Household Owns TV	0.189	0.117	0.119
	(0.003)	(0.004)	(0.004)
Household Owns Radio	0.733	0.702	0.708
	(0.003)	(0.006)	(0.006)
Ethnic Group: Bobo	0.037	0.032	0.032
	(0.001)	(0.002)	(0.002)
Dioula	0.026	0.028	0.030
	(0.001)	(0.002)	(0.002)
FulFulde/Peul	0.067	0.057	0.061
	(0.002)	(0.003)	(0.003)
Gourmatche	0.062	0.062	0.055
	(0.002)	(0.003)	(0.003)
Gourounsi	0.047	0.042	0.031
	(0.001)	(0.002)	(0.002)
Lobi	0.045	0.029	0.031
	(0.001)	(0.002)	(0.002)
Mossi	0.542	0.588	0.598
	(0.003)	(0.006)	(0.006)
Senoufo	0.049	0.049	0.053
	(0.001)	(0.003)	(0.003)
Touareg/Bella	0.012	0.011	0.005
	(0.001)	(0.001)	(0.001)
Bissa	0.040	0.041	0.044
	(0.001)	(0.002)	(0.003)
Other	0.073	0.059	0.061
	(0.002)	(0.003)	(0.003)
Household is in Urban Area	0.307	0.206	0.209
	(0.003)	(0.005)	(0.005)
Observations	24,474	6,873	5,934

Standard deviations in parentheses

Approximately 75 percent of women surveyed have undergone FGC. Only 28 percent of surveyed women are educated—bluntly defined here as having attended at least some formal primary school. Almost 76 percent have been or are currently married, the average year of birth of respondents is 1981, 25 percent of respondents are Catholic and 59 percent are Muslim, 19 percent of respondents own a television and 73 percent own a radio. Fifty-four percent of respondents are from the Mossi ethnic group, the remaining 46 percent belong to 10 other ethnic groups. Thirty-one percent of respondents live in an urban area.

Thirty-eight percent of women who have a daughter 11 years of age or older state that their daughter has undergone FGC, while 44 percent of women who have undergone FGC themselves have a daughter who has undergone FGC. Due to data limitations, I use the information on the woman's oldest daughter's FGC status only. The data collected in 1998 and 2003 include information on the oldest daughter only, data collected in 2010 include data on all daughters and show that there is little variation in FGC status of a woman's daughters. Thus, using the woman's oldest daughter only should yield very similar results to using information on multiple daughters. The women included in the daughter analyses (columns 2 and 3) are, on average, older, less educated, and have a higher rate of FGC than the full sample of women. This is unsurprising since these are women with relatively old daughters, and the rate of FGC has been decreasing over time in Burkina Faso while the rate of education has been rising.

Figure 3.4 displays the rate of FGC by year of birth. The substantial amount of heterogeneity in rates of FGC over time in Burkina Faso which makes Burkina Faso an ideal place to analyze changes in the practice of FGC.

3.4.1 Identifying the Community & Cohort

In order to estimate the rate of FGC at the community level, I first identify the year of birth of the respondent and the year of birth of the respondent's oldest daughter. Year of birth of respondents and daughters (of different women) do overlap, given that my data provide such a long timeframe. I combine information on self-reported FGC status of the respondents (using the full sample of 24,474 women) with the reported FGC status of daughters (6,873 daughters). I then estimate the rate of FGC in the daughter's cohort within her community.

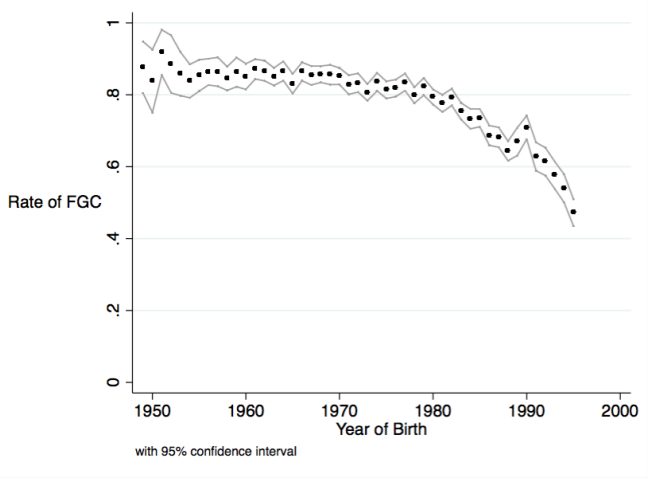


Figure 3.4: Rate of FGC in Burkina Faso by Year of Birth

I define cohort as the girls born five years or less prior to the birth of the daughter in question. I use the information on girls born five years prior because I assume that the household is able to observe the rate of FGC for girls in preceding years of birth before making the decision for its own daughter. This definition of cohort has the added benefit of minimizing the reflection problem (Manski, 1993).[3]

Correctly identifying the community is especially important in this type of analysis. Ideally, I would have information on the social network of observed households. In the absence of this data, I use multiple definitions of the community and analyze the consistency, or lack thereof, of my results between definitions. I use the marriage market as a proxy for the community because people are more likely to interact with individuals in their marriage pool as well as see them as the relevant reference group for norms. In Burkina Faso, inter-ethnic marriage is uncommon (Breusers et al., 1998), thus I use ethnic group in every definition of community. It is common for Burkinabe women to move out of their natal village for marriage (Henry et al., 2004), thus I do not use village as the definition of community.

For robustness I define the community in four ways. First, all girls in the same province within the same ethnic group. In order to determine if province is too large to accurately capture the community, I narrow the definition of community by looking

[3]The reflection problem arises when attempting to identify the effect of a group's behavior on an individual when that individual's behavior simultaneously affects the group's behavior.

at only those girls in the same department. Recall that there are 45 provinces and 351 departments in Burkina Faso, so each province includes 7.8 departments, on average. Thus, the second definition of community is all girls in the same department within the same ethnic group. While households in rural communities are aware of the FGC status of other girls in the community, this assumption may be less reasonable in urban areas. Thus, the third definition of community is all girls in the same province within the same ethnic group who live in the rural area. Lastly, religion plays a key role in the marriage market. I focus on Catholics and Muslims because they are the most common religions in Burkina Faso. Thus, the fourth definition of community is all girls in the same province within the same ethnic group and same religious group.

3.5 Empirical Framework

In this section I explain my estimation strategy, relate it to the ideal experiment for comparison, and I discuss threats to validity of my estimates. I begin by testing Hypothesis 1, that is, whether thresholds are heterogeneous among households in Burkina Faso. Second, I test whether there is a tipping point or stable internal equilibrium in the rate of FGC in communities in Burkina Faso.

3.5.1 Tipping Point or Stable Internal Equilibrium

I begin by analyzing whether thresholds are heterogenous among households in Burkina Faso by plotting the CDF of the proportion of households that decide to cut their daughter as a function of the proportion of community members practicing FGC (where community is defined in the four ways specified above). As stated in Proposition 2 it is not possible to observe each household's threshold r_i^*. Instead, I am able to directly observe the community CDF by estimating the proportion of households opting to practice FGC as a function of the previous cohort's rate of FGC, r.

I perform a kernel-weighted local polynomial smoothing regression of the rate of FGC in community k for girls born in year t on the rate of FGC in community k among girls in the cohort c born between $t-1$ and $t-6$. I use an an Epanechnikov kernel with a polynomial smooth of degree two because higher order polynomials perform better at the boundary points than lower order polynomials (Fan and Gijbels, 1996).

$$r_{tk} = f(r_{c\in[t-6,t-1],k}) + \eta_{tk} \tag{3.1}$$

If the CDFs resembles curve 1 in figure 3.2, households have homogenous thresholds. Otherwise, we can conclude that thresholds are heterogeneous among households.

I then turn to analyzing whether there is a tipping point in communities or if there are stable internal equilibria in the rate of FGC. I do this by determining how the CDFs estimated using equation 3.1 interact with the 45-degree line, and I compare this to figure 3.3.

3.5.2 Estimation Strategy

I estimate the likelihood that a girl will undergo FGC based on the rate of FGC in her community within her cohort and her household characteristics. I estimate equation 3.2 for girls who have a mother who has undergone FGC. I restrict the sample to girls with mothers who have undergone FGC because it is rare for a woman who has not undergone FGC to have a daughter who has undergone FGC.

$$y_{itk} = \beta_0 + \beta_1 r_{ck} + \beta_2 m_{itk} + \beta_3 f_{itk} + \beta_4 \mathbf{x}_{itk} + \beta_5 \mathbf{d}_t + \beta_6 \mathbf{d}_m + \beta_7 \mathbf{d}_f + \beta_8 \mathbf{s} + \epsilon_{itk} \tag{3.2}$$

The subscripts denote girl i born in year t, whose relevant cohort is cohort $c \in [t-6, t-1]$ whose mother is in cohort m, whose father is in cohort f, and who lives in community k. Let y_{itk} equal one if the respondent's daughter has undergone FGC and zero if her daughter has not undergone FGC. Let r_{ck} denote the rate of FGC in the girl's community-cohort, let m_{itk} denote the level of education of the girl's mother, and f_{itk} denote the level of education of the girl's father. Let $\mathbf{x}_{itk}$ be a vector of other control variables, $\mathbf{d}_t$ is a vector of the girl's year of birth fixed effects, $\mathbf{d}_m$ is a vector of mother's year of birth fixed effects, $\mathbf{d}_f$ is a vector of father's year of birth fixed effects, and $\mathbf{s}$ is a vector of survey wave fixed effects. Finally, ϵ_{itk} is an error term with mean zero.

I estimate equation 3.2 using ordinary least squares (OLS) regression. Because y_{itk} is binary, my use of OLS implies that each equation I estimate is a linear probability model (LPM). In estimating an LPM rather than a logit or a probit model, I follow the recommendations of Angrist and Pischke (2009). The primary benefits of using LPMs are (i) LPMs do not rely on distributional assumptions for the error term that are required

by logit and probit estimators, and (ii) LPMs do a much better job than probit models of handling a large number of fixed effects (Angrist & Pischke, 2009 page 98). The primary drawback to using LPMs is that LPMs produce errors that are heteroskedastic. I use robust standard errors in all estimations in order to address this concern. An additional drawback of LPMs is that LPMs can predict a likelihood of FGC that is outside of the $[0, 1]$ interval. This is not a large concern in this case, as I am not attempting to forecast the likelihood that a girl will undergo FGC. In a series of robustness checks, I estimate equation 3.2 using logit regression (see table B.2 in the appendix).

3.5.3 Ideal Dataset and Threats to Validity

In order to appreciate the threats to validity of my approach, it is useful to imagine the ideal dataset for addressing this question. Assume first that in each community there is a set time when all girls in a given community undergo FGC, if their household decides to practice FGC.

Now, imagine that a researcher can go to each household within a community to ascertain the household's exact threshold. The researcher should then determine which households have girls who are near the age of undergoing FGC, let's call them group 1. Assume the researcher knows the rate of FGC among the previous cohort, then given the distribution of household thresholds among group 1, the researcher could determine what the rate of FGC will be in group 1. Based on the distribution of thresholds among the households of girls born in the subsequent year, call them group 2, the researcher could determine what the rate of FGC will be in the subsequent period. The household threshold is a complicated function of individual preferences for FGC and intrahousehold bargaining power. Moreover, it is likely difficult for individuals to articulate their preference for FGC.

A much more reliable approach involves observing a households revealed preference. Consider instead a dataset in which there are 100 communities. Each community has an identical distribution of thresholds. Each community, however, has a different rate of FGC (imagine that this is, for example, a result of interventions in some communities). One could then observe the rate of FGC among group 1 in all 100 communities. From this information, a researcher could infer the distribution of thresholds within the 100 communities. Unfortunately, it is not possible for the observer to guarantee that the

distribution of thresholds is identical in each of these communities.

Instead, imagine a world in which each household in a community has 10 daughters, each born one year apart. In year one, a researcher could give false information to each household regarding the rate of FGC in the community. The researcher could then observe the choice of the household made to cut or refrain from cutting their daughter in group 1. In the second year, the researcher could return to the household and give new false information regarding the rate of FGC and observe whether the household cuts its daughter in group 2. Assuming that all households believe the researcher each year, and if the falsely reported rate of FGC is in increments of 10 percentage points, the researcher could create bounds on each household's threshold within 10 percentage points. Finding such a community is unlikely, moreover this strategy relies on the assumption that the household's threshold does not change within that 10 year timeframe.

These research designs are not feasible. The data that I use are as close to ideal as is possible because I use data on revealed preference, and I observe heterogeneity in the rate of FGC within a given community. It is, however, important to highlight key limitations of the data. First, all of the research designs above assume that the researcher has correctly identified the relevant community. In the ideal dataset, one would ask respondents who they view as the relevant community or who they interact with on a regular basis in order to identify the social network. In lieu of that information, I have identified the most likely definition of community according the literature, and in order to alleviate some of this concern, I vary the definition of community to determine if my results are consistent across definition.

Second, I assume that the distribution of thresholds within a community do not change over the period in which I observe them. This is a strong assumption since households observed at a later date may, for example, have more information about the health complications associated with FGC or may have experienced a religious leader publicly denounce FGC. More fundamentally, each year the households that make the decision to cut their daughters are different households than the year before or the year after. If thresholds are randomly allocated among households with daughters of different ages, the fact that I observe different households does not bias my measurement of the threshold distribution. If instead thresholds are correlated with age of the daughter, this could have some effect on the observed distribution of thresholds. If for example, people

with high thresholds had daughters born in 1990, while people with low thresholds had daughters born in 1995, this could make the CDF appear volatile. The use of the local polynomial smoothing regression addresses this issue.

Third, I assume that households have a clear picture of the proportion of households that practice FGC. This is reasonable for rural communities as the FGC procedure is typically celebrated and households, and particularly women in those households, are aware of who has undergone FGC. This, however, may be a strong assumption for urban communities. Thus, I conduct robustness checks in which I analyze only rural communities.

3.6 Results

I begin by examining whether households have heterogeneous thresholds. I then analyze whether there is a tipping point or stable internal equilibria in the rate of FGC in communities in Burkina Faso. Finally, I examine the various definitions of community to determine which are statistically equivalent and which different.

3.6.1 Thresholds and Tipping Point

Figure 3.5 displays the CDF of household thresholds for all of Burkina Faso using the ethnic group within the province as the definition of community. One can see that within Burkina Faso thresholds are heterogeneous because the CDF does not resemble curve 1 in figure 3.2, and in fact looks very similar to curve 2 in figure 3.2.

Because the CDF crosses the 45-degree line from above, figure 3.5 indicates that there is stable interior equilibrium in the rate of FGC in Burkina Faso. This suggests that the rate of FGC may remain close to 10% in Burkina Faso for some time. It is, however, a bit misleading to analyze the CDF for Burkina Faso as a whole. Instead, we should draw conclusions from community-level figures.

I now turn to analyzing whether there is a tipping point or stable internal equilibrium in the proportion of community members practicing FGC in communities in Burkina Faso. Figures 3.6, 3.7, and 3.8 show the CDFs for a select sample of three province-ethnic groups. Panel a in each figure is the CDF for the entire province-ethnic group, panel b is

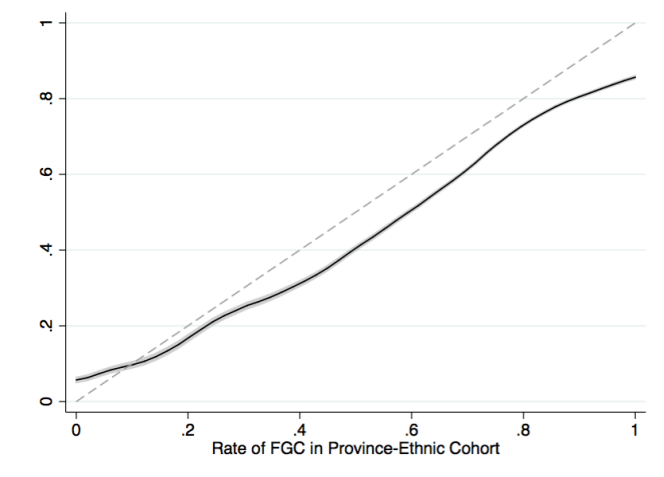


Figure 3.5: CDF for Burkina Faso

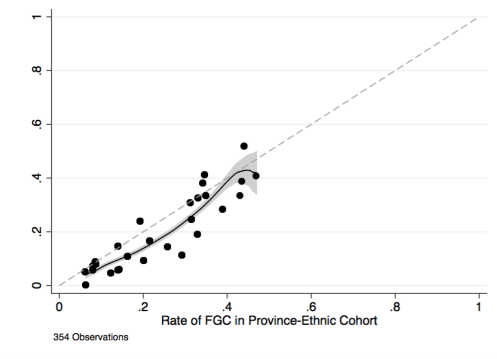
Community defined as Province-Ethnic Cohort, with 95% confidence interval

the CDF for the province-ethnic group in the rural area only, panels c and, if applicable,[4] d include data from the department-ethnic groups from departments within the given province. Panel e shows the CDF for Catholics in the province-ethnic group, and panel f shows the CDF for Muslims in the province-ethnic group.

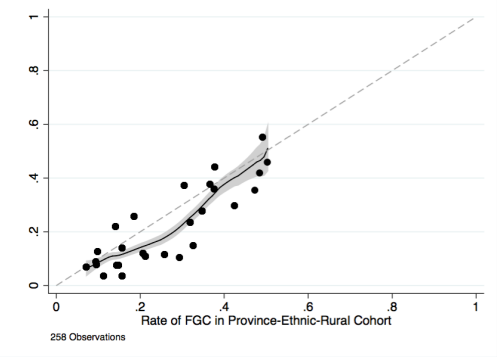
The CDFs for the Mossi in Mouhoun (figure 3.6) suggest that a stable low-rate of FGC is possible among this community. The rural communities appear to behave similarly to the province as a whole. The observed department includes only low rates of FGC, suggesting that this department may be different from the 12 other departments in Mouhoun. Catholics have a lower rate of FGC than Muslims in Mohoun.

The CDFs for the Senoufo in Ganzourgo (figure 3.7) show that the observed rates of FGC are higher among this province-ethnic group than among the Mossi in Mouhoun. Panel a suggest that this group may have had a tipping point at a rate of FGC of approximately 95 percent. The rural community behaves similarly to the province as a whole, though the very low rates of FGC observed in panel a appear to occur in the urban areas. The observed department (of which is 78 percent of surveyed households lie in an urban area) behaves similarly to the province as a whole, but more similarly to

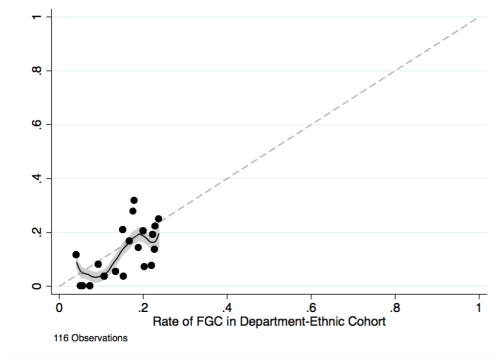
[4]I include only communities with 50 or more girls for whom the decision to practice FGC is observed. This excludes a large number of department-ethnic groups as well as some province-ethnic groups.



(a) All Province-Ethnic Group

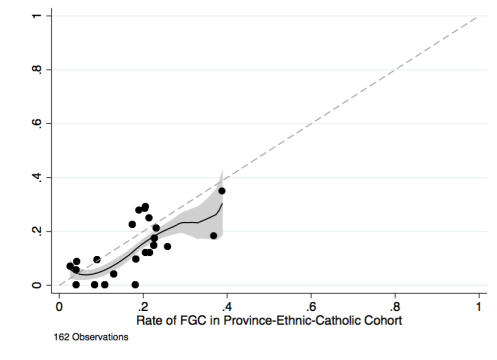


(b) Rural Province-Ethnic Group

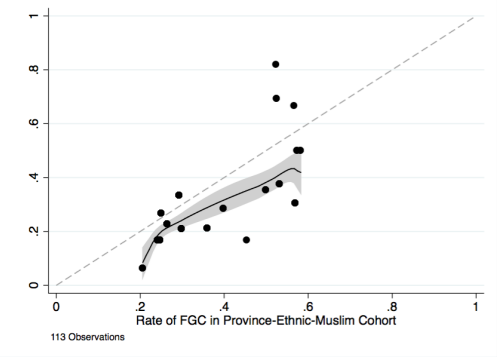


(c) Department 1-Ethnic Group

(d)



(e) Catholic-Province-Ethnic Group

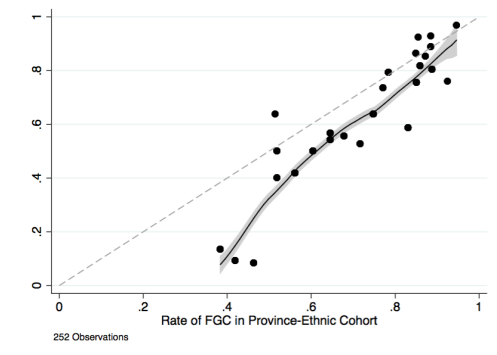


(f) Muslim-Province-Ethnic Group

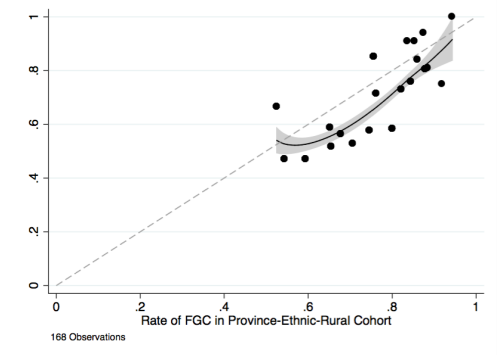
Figure 3.6: CDFs from the Mossi in Mouhoun
with 95% confidence interval

the rural area. Lastly, Catholics and Muslims behave similarly to one another among the Senoufou in Ganzourgo.

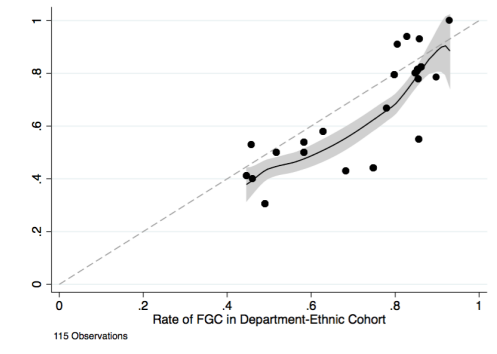
The CDFs for the Mossi in Ioba (figure 3.8) suggest that there is a tipping point in



(a) All Province-Ethnic Group

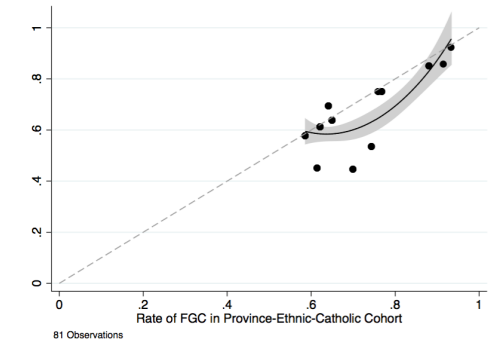


(b) Rural Province-Ethnic Group

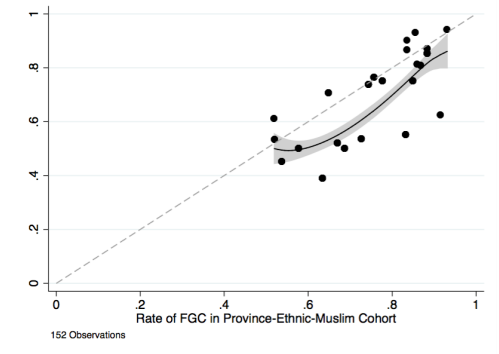


(c) Department 1-Ethnic Group

(d)



(e) Catholic-Province-Ethnic Group

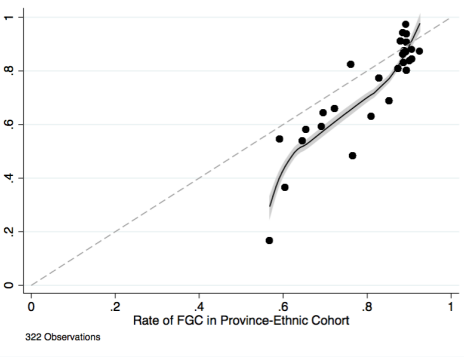


(f) Muslim-Province-Ethnic Group

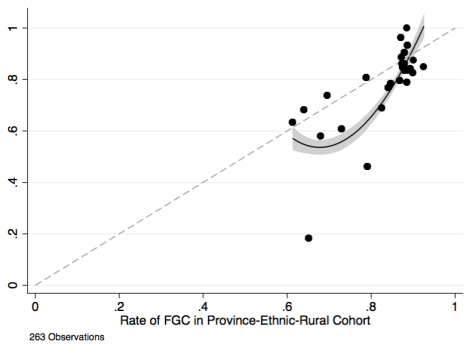
Figure 3.7: CDFs from the Senoufo in Ganzourgo
with 95% confidence interval

the rate of FGC among this province-ethnic group. The rural area behaves similarly to the full province-ethnic group. The two departments have little data for drawing conclusions, but the first department (panel c) appears to behave very similarly to the

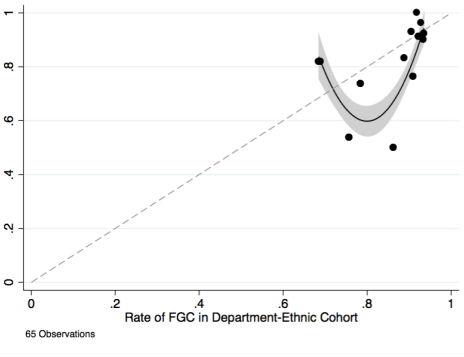
rural community (though 79 percent of surveyed households in this department lie in an urban area). The Catholic and Muslim households behave similarly to each other and to the broader province-ethnic group.



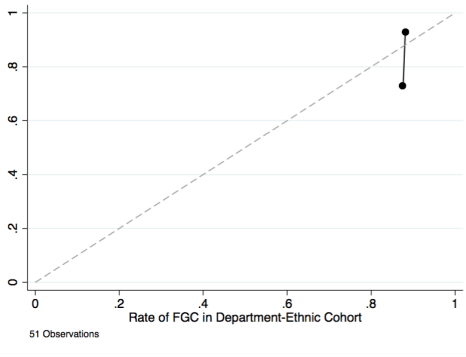
(a) All Province-Ethnic Group



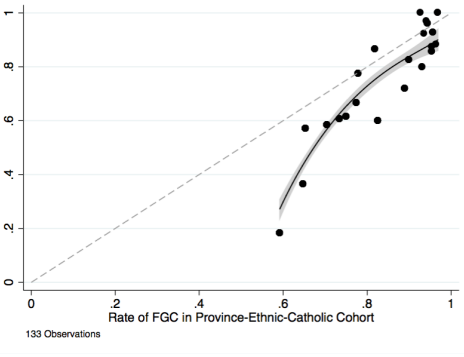
(b) Rural Province-Ethnic Group



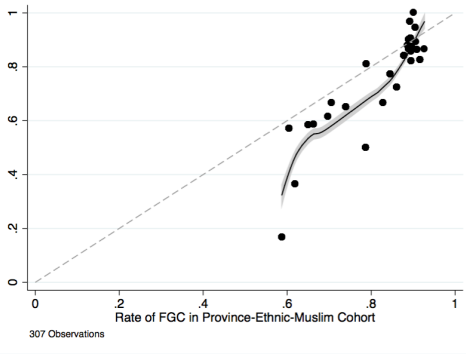
(c) Department 1-Ethnic Group



(d) Department 2-Ethnic Group



(e) Catholic-Province-Ethnic Group



(f) Muslim-Province-Ethnic Group

Figure 3.8: CDFs from the Mossi in Ioba
with 95% confidence interval

3.6.2 Likelihood That a Girl Undergoes FGC

Table 3.2 presents the results of estimating equation 3.2 using five definitions of the girl's community-cohort. Cohort is defined as all girls born in the five years prior to the year of birth of the girl in question. Column 1 defines the girl's community-cohort as all girls who live in the same province and are part of the same ethnic group, column 2 defines the girl's community-cohort as all girls who live in the same department and are part of the same ethnic group. Column 3 estimates equation 3.2 defines the girl's community-cohort as all girls who live in the province, are part of the same ethnic group, and is restricted to those living in a rural area. Columns 4 and 5 defines the girl's community-cohort as all girls who live in the same province, are part of the same ethnic group, are part of the same religious group.

Table 3.2: LPM Estimation Results for Whether Girl Undergoes FGC

	(1) Province-Ethnic Cohort	(2) Department-Ethnic Cohort	(3) Province-Ethnic Rural Cohort	(4) Province-Ethnic Catholic Cohort	(5) Province-Ethnic Muslim Cohort
Rate of FGC in Community	0.580***	0.568***	0.588***	0.436***	0.548***
	(0.048)	(0.034)	(0.044)	(0.070)	(0.066)
Urban Household	-0.037*	-0.037*		0.030	-0.056**
	(0.020)	(0.021)		(0.039)	(0.026)
Religion [Omitted: Catholic]					
Protestant	-0.034	-0.049	-0.020		
	(0.030)	(0.041)	(0.045)		
Muslim	0.076***	0.076***	0.096***		
	(0.015)	(0.017)	(0.021)		
Other	0.064**	0.048	0.061		
	(0.029)	(0.035)	(0.038)		
Constant	0.511***	0.583***	0.615***	0.692*	1.347***
	(0.161)	(0.187)	(0.193)	(0.356)	(0.191)
Observations	5,934	4,523	3,493	1,079	2,818
R-squared	0.215	0.237	0.228	0.297	0.213

Controls included: Ethnicity, religion, education level of the mother, education level of the father, proxies for wealth, rural indicator, polygamy indicator, mother's year of birth FE, father's year of birth FE daughter's year of birth FE.
Standard Errors Clustered at the Province Level.
***p<0.01 **p<0.05 *p<0.1

Table 3.2 shows that the rate of FGC in the girl's community cohort plays an important role in determining the girl's likelihood of undergoing FGC, however the likelihood that a girl undergoes FGC is not fully determined by the rate of FGC in her community-cohort. Coefficients range between 0.436 and 0.588 suggesting that a girl living in a community in which $r = 1$ is between 43.6 and 58.8 percentage points more likely to undergo FGC than a girl living in a community in which no one practices FGC. These two extremes ($r = 0$ and $r = 1$) are uncommon in my data. A more useful conceptualization of the results is that for each 10 percentage point increase in the rate of FGC, a girl is between 4.4 and 5.9 percentage points more likely to undergo FGC.

The coefficients on the rate of FGC within the community (variably defined) are similar but not identical across definitions of the community. Following Pei et al. (2016) I perform a Hausman (1978) specification test to determine whether these coefficients are statistically similar. Table 3.3 reports the Hausman test statistics. The null hypothesis of the Hausman test is that the difference between two coefficients is statistically zero. In six of the reported cases, the null is rejected at the 5 percent level, and the null is rejected in seven of cases at the 10 percent level. The coefficients on the rate of FGC in the province-ethnic cohort, the rate of FGC on the province-ethnic-rural cohort, and the rate of FGC in the province-ethnic cohort among Muslims are statistically similar to each other.

Table 3.3: Hausman Specification Test Results Between Coefficient on Rate of FGC in the Girl's Community

	(1) Province-Ethnic Cohort	(2) Department-Ethnic Cohort	(3) Province-Ethnic Rural Cohort	(4) Province-Ethnic Catholic Cohort
Department-Ethnic Cohort	5.46			
	(0.020)			
Province-Ethnic Rural Cohort	0.07	4.16		
	(0.786)	(0.041)		
Province-Ethnic Catholic Cohort	17.54	4.08	13.18	
	(0.000)	(0.043)	(0.000)	
Province-Ethnic Muslim Cohort	0.02	3.19	0.00	8.54
	(0.883)	(0.074)	(0.973)	(0.004)

χ^2 value reported with p-value in parentheses

3.6.3 Discussion

According to the regression results and Hausman tests, religion appears to be an important component of the definition of community. This is shown to be true in the CDFs for the Mossi in Mouhoun, though it is less apparent among the other two featured province-ethnic groups. The rural communities appear to behave similarly to the province as a whole. Further delineating the definition of community into the department rather than the province seems to be important according to the regression results, though the data limitations make drawing conclusions from the CDFs difficult.

Overall, it is clear that communities do behave differently from each other. In particular, some communities appear to have a tipping point in the rate of FGC (this is most clearly shown among the Mossi in Ioba), while other communities have a stable interior equilibrium in the rate of FGC (as is suggested by the CDFs for the Mossi in Mouhoun).

3.6.4 Limitations

I discussed the limitations of the research design in subsection 3.5.3. In addition to those limitations, there are some limitations of the data. First, my analyses rely on direct reporting of the respondent's FGC status and daughter's FGC status. Obtaining physician records would lead to more precise estimates. I discussed the possible extent of measurement error in section 3.4. Second, it is important to be aware of the differences between the context of Burkina Faso between 1949 and 2010 and other settings. The rate of FGC has declined substantially in Burkina Faso during the observation period, while other countries have not seen a similar decline.

3.7 Discussion and Conclusions

I contribute to the current debate in the literature regarding whether FGC is a social coordination norm (Powell, 2017). If FGC is a social coordination norm, as was posited by Mackie (1996), then the presence of a tipping point in the rate of FGC in a community is guaranteed. Recent empirical evidence question this assertion by showing that individual and household factors explain a substantially larger share of

the persistence of FGC than do community-level factors (Bellemare et al., 2015) and that rates of FGC within a community are often between zero and one (Efferson et al., 2015). I propose a new theoretical explanation for why FGC persists. I show that heterogenous thresholds—where threshold is defined as the proportion of community members practicing FGC that makes a household indifferent between cutting and not cutting its daughter—among households make the presence of a tipping point far from guaranteed.

Using data from Burkina Faso that include women born between 1949 and 1995, I show that households have heterogeneous thresholds. Some communities in Burkina Faso do have a tipping point, and that tipping point has likely been reached in those communities. There are communities, however, that have a stable equilibrium in the rate of FGC in their community. This suggests that eliminating FGC from these communities may be extremely difficult.

The strength of my research design comes from the six-decade long timeframe provided by the three cross-sections of the Demographic and Health Survey data. These data allow me to observe the same community over an extended period of time, observe a household's revealed preference for FGC (the decision to cut its daughter), and observe variation in the constraints faced by households over time (changes in the rate of FGC). Additionally, I am able to define the community in multiple ways in order to determine whether my results are sensitive to the definition of community and further narrow my definition of community based on those results.

That said, community is imperfectly defined in my analysis. Ideally, I would have complete social network data from these communities. Additionally, I rely on reported FGC status of the mother and daughter. Data from gynecological exams or other more objective measures of FGC would be preferable. Finally, Burkina Faso is only 1 of 29 countries in which FGC is practiced. The social norms surrounding FGC are heterogeneous between communities and certainly between countries. More research is needed to determine how these findings hold in other settings.

My findings show that households are able to deviate from the social norm and are willing to do so at different rates of FGC. This suggests that interventions that target village-level behavior may be inefficient compared to interventions that target households and individuals. Platteau et al. (2017) demonstrate that the distribution of household

preferences (what they refer to as an aversion coefficient) greatly influences the way in which a community will respond to laws or interventions aimed at decreasing the prevalence of FGC or other harmful norms. If a community has a tipping point at a high rate of FGC, the most efficient strategy is to target those most willing to deviate from the norm. Alternatively, if a community has a stable equilibrium, targeting those who are the least willing to abandon FGC could be the most efficient strategy because once those with a low threshold abandon FGC others are likely to follow.

More research is needed to identify the distribution of thresholds in communities in which FGC is practiced. Additionally, little research has been done that rigorously identifies the impact of policies aimed at reducing FGC. Camilotti (2015a,b) shows that one NGO's programs have had a small effect in the reduction of FGC and that laws that ban FGC have had an adverse effect—namely households are cutting their daughters at an earlier age. More studies are needed to show the impacts of interventions aimed at curbing FGC and how these interventions interact with the distribution of household thresholds.

Chapter 4

Change of Heart: Explaining Shifting Opinions of Female Genital Cutting in West Africa*

4.1 Introduction

Female Genital Gutting (FGC),[1] is a practice in which a woman's genitalia are partially or totally removed for non-medical reasons. Undergoing FGC can have serious physical and psychological health consequences including increased risk for birthing complications (Jones et al., 1999), sexually transmitted diseases (Wagner, 2015), as well as anxiety, post-traumatic stress disorder (PTSD), and memory loss (Behrendt and Moritz, 2005). Women who have undergone FGC are also more likely to experience depression, chronic irritability, frigidity, and marital conflict (Dorkenoo, 1999). Such physical and psychological health complications have been shown to have real impacts on educational attainment and labor market outcomes. Psychiatric disorders are correlated with dropping out of school (Kessler et al., 1995) and PTSD is related to unemployment (Savoca and Rosenheck, 2000). Severe PTSD symptoms are associated with worse labor market outcomes (Smith

*This chapter was written in collaboration with Marie Baguet, Department of Economics, University of Cergy-Pontoise.

[1]Female genital cutting (FGC) is also referred to as "female circumcision" and "female genital mutilation". Throughout this article we use the terminology FGC, "cut," and "cutting" interchangeably.

et al., 2005). These potential education and labor market consequences suggest that FGC can contribute to economic underdevelopment in communities in which the practice is prevalent.

Even when faced with the health complications associated with FGC, many families choose to cut their daughters. This decision is often a response to the social expectations placed on families and girls. Indeed, in the 13 West African countries that we study, FGC is correlated with an increased likelihood of marriage (Wagner, 2015), and FGC is often viewed as a rite of passage for girls (Toubia and Sharief, 2003) and a way for them to join the society of women. There are, however, some families that choose to abandon FGC even when constrained by these social expectations. In this chapter, we examine which families are most likely to perpetuate the practice of FGC—proxied for here by a woman's stated support for the continuation of the practice of FGC—and which families are most likely to abandon it.

Bellemare et al. (2015) show that despite the social importance of FGC, 87% of the variation in a woman's support for FGC is explained by individual- and household-level characteristics rather than village or region characteristics. In countries in which the rate of FGC is high, individual factors explain a larger share of the support for FGC than in countries in which the rate of FGC is lower (Bellemare et al., 2015). Further, Novak (2017) shows that households have heterogeneous preferences for FGC. She shows that when faced with the same rate of FGC within their community, some households will choose to cut their daughter and others will not.

Non-governmental organizations (NGOs) and governments have created campaigns to inform individuals of the risks associated with FGC in order to reduce the prevalence of the practice. For these organizations, it is important to know which individuals and households should be targeted by their interventions. If an organization wishes to achieve the greatest decrease in the rate of FGC in the shortest amount of time, these organizations may wish to target individuals who are the most likely to abandon the practice. Organizations may instead wish to target the hardest to reach in order to promote equity. Depending on the distribution of preferences within the community, targeting the hardest to reach could induce a cascade effect if a tipping point in the rate of FGC exists in the community (Novak, 2017; Efferson et al., 2015; Platteau et al., 2017).

While much research has been conducted regarding how FGC emerged and evolved into a common practice (Mackie, 1996; Shell-Duncan and Hernlund, 2006) as well as its immediate and long term effects (Wagner, 2015; Jones et al., 1999; Dorkenoo, 1999), insufficient research has focused on the social and economic characteristics of women who are less likely to support the perpetuation of FGC, despite being born and raised in an environment that valued this practice. It is crucial to understand who is likely to be a leader in the abandonment of the practice and who is likely to hold on to the tradition. We focus on the opinions of women because women are often the primary decision makers regarding whether their daughters or granddaughters will undergo FGC (Toubia and Sharief, 2003; Shell-Duncan and Hernlund, 2001). We use data from 13 West African countries that include women aged 15 to 49 at the time of survey to explore this question.

The contribution of this chapter is twofold. First, Wagner (2015) shows that higher educational attainment is associated with a reduced likelihood that the woman herself has undergone FGC. It was unclear, however, if cut women who are also educated are less likely to support the continuation of the practice. We find that educated women are less likely to support the practice of cutting only in countries where the prevalence of FGC is moderate or high (more than 35 percent of adult women).

Second, we systematically study the role of religion. There is no religion that mandates or even directly encourages FGC (Mackie, 1996). In Senegal and The Gambia, many respondents perceive FGC as a matter of tradition, rather than religion (Shell-Duncan and Hernlund, 2006). Nevertheless, Islamic rituals and priorities—washing and cleanliness—may indirectly legitimize FGC since uncut women are considered "unclean" in many communities. Additionally FGC is a way for women to signal their piety and thus gain respect in many religious cultures. Shell-Duncan and Hernlund (2006) conclude that women who view FGC as a part of their religious practice are less likely to be willing to abandon FGC. We investigate the relationship between religious affiliation and support for FGC. We find that Muslim women are more likely than Christian women to support FGC in 7 out of our 13 included countries. Atheist, animists, and other religiously affiliated women are more likely than Christian women to support FGC in 5 of our 13 included countries.

The strength of our approach comes from our use of data from 13 West African

countries from multiple survey waves for each country. These countries and time periods provide substantial heterogeneity in the prevalence and support for FGC, which allows us to make broader conclusions than any one dataset would provide.

The remainder of the chapter is organized as follows. Section 4.2 presents the data and descriptive statistics. Section 4.3 explains the empirical framework we use to address our question of interest. In section 4.4 we present the results, and in section 4.5 we interpret the results and conclude.

4.2 Data and Descriptive Statistics

Female genital cutting is practiced in parts of Africa, the Middle East, and Asia as well as among some immigrant communities in the United States, Canada, and Europe. We study West Africa because the variation in prevalence rates of FGC across and within countries as well as the heterogeneity in the rate of decline of FGC makes it an ideal place to study the persistence of the practice. Figure 4.1 shows the heterogeneity in the rates of FGC among adult women in African and Middle Eastern countries.

We use publicly available, nationally representative data sets from USAID's Demographic and Health Survey (DHS) program and UNICEF's Multiple Indicator Cluster Survey (MICS) program. These datasets include information about women aged 15 to 49 at the time of survey. Data are collected with similar methodologies for the DHS and the MICS, making the datasets comparable across countries and time. We use 23 cross-sectional datasets from 13 West African countries.[2] The data were collected between the years 2005 and 2013. Table 4.1 shows the countries and the dates of the surveys included in our analysis.

Some governments have enacted bans in order to curb the prevalence of FGC. Column 2 of table 4.1 shows the year a ban was enacted or expanded in each country. A larger discussion about the effect of a ban on misreporting can be found in subsection 4.3.2.

[2]Cape Verde (DHS, 2005) and Liberia (MICS, 2007) are not included in our analysis because the data do not include questions regarding whether the respondent has undergone FGC

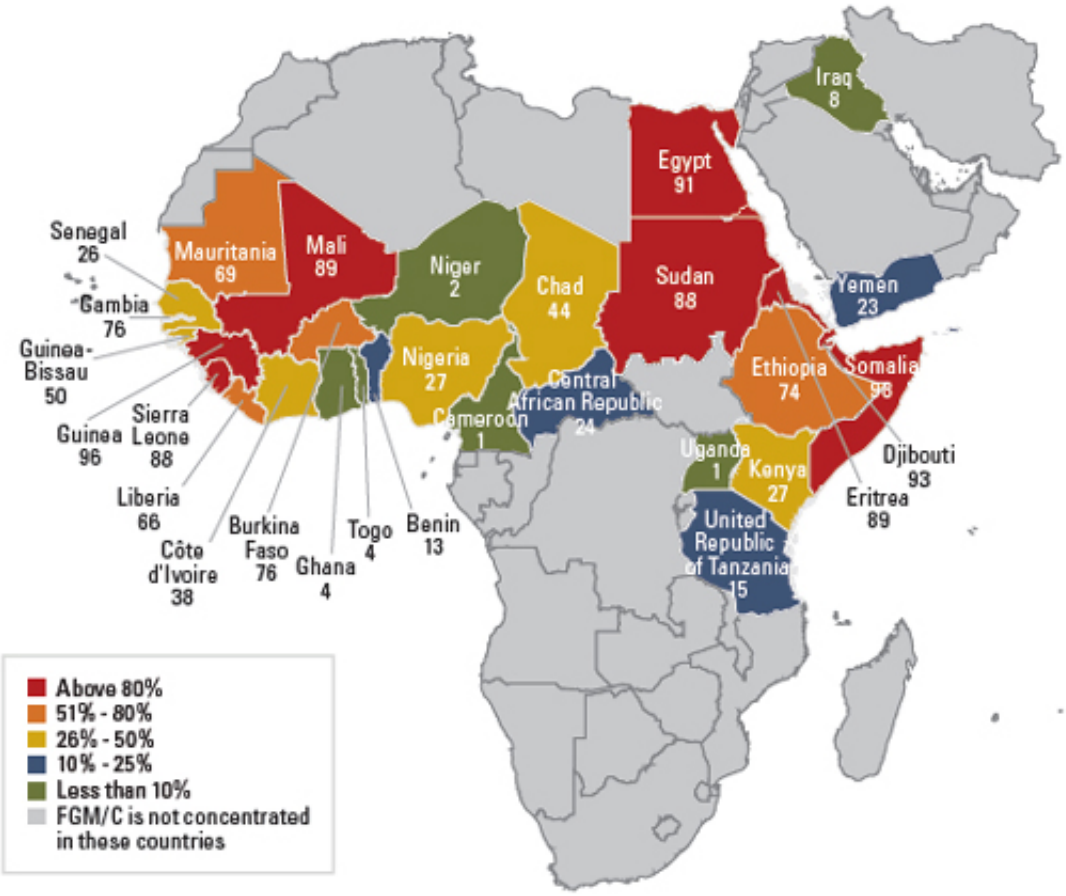


Figure 4.1: Percentage of girls and women aged 15 to 49 years who have undergone FGC

Source: UNICEF 2013

Table 4.1: Datasets

Country	Datasets	Year of Ban
Benin	DHS: 2006, 2011-2012	2003
Burkina Faso	DHS: 2003, 2010	1996
Côte d'Ivoire	DHS, 2011-2012	1998
Gambia	MICS: 2005, 2010	2015
Ghana	MICS: 2006, 2011	2007*
Guinea	DHS: 2005, 2012	2000*
Guinea-Bissau	MICS: 2006	2011
Mali	DHS: 2006, 2012	-
Niger	DHS: 2006	2003
Nigeria	DHS: 2008, 2013	2015
Senegal	DHS: 2005, 2010-2011	1999
Sierra Leone	DHS: 2008, MICS: 2010	-
Togo	MICS: 2006, 2010	1998

*The existing law was expanded

4.2.1 Attitudes Toward FGC

We study the intergenerational persistence of FGC—proxied for here by women who have undergone FGC and who support the continuation of the practice. We restrict our sample to women who have undergone FGC because these women are more likely to have been raised in an environment in which individuals value FGC. Unfortunately, our data do not systematically include information about whether a respondent's daughters have undergone FGC. Further, in some communities the practice is performed when a girl is ready for marriage and may occur at a date that is too late for us to observe in our data. Additionally, the father's opinion of FGC is infrequently reported in our data. Women are more likely than men to support FGC (Gage and Van Rossem, 2006), and women are more often the decision makers regarding whether their daughter will undergo FGC (Mackie, 1996; Toubia and Sharief, 2003). In fact Shell-Duncan and Hernlund (2001) explain in their book that, "generally, women more actively perpetuate FGC than do men. It is women's business. It may be possible to concentrate initially on women because if they are won over, they will persuade husbands, grandparents, and religious and political figures." Thus, while we would ideally have information on a father's attitudes toward FGC as well as on daughters' FGC status, we argue that the woman's opinion is a good proxy for the household's decision to cut it's girls.

Table 4.2 shows the rate of FGC in each country in our analysis, as well as the rate of support for FGC among cut women. The rate of FGC is highest in Guinea where over 97 percent of adult women have undergone FGC, and the rate is lowest in Niger where less than 6 percent of women have undergone FGC. The highest rate of support for FGC among cut women is in the Gambia followed by closely by Mali. The lowest rate of support among cut women is in Togo and Burkina Faso. Burkina Faso has seen a rapid decline in the rate of FGC which is consistent with the fact that the rate of FGC is high but support for the practice is low among respondents.

Table 4.2: Rate of FGC and Rate of Support Among Cut Respondents

Country	Rate of FGC	Rate of Support Among Cut Women
Benin	0.165	0.046
Burkina Faso	0.762	0.146
Côte d'Ivoire	0.446	0.452
The Gambia	0.777	0.880
Ghana	0.141	0.102
Guinea	0.974	0.792
Guinea-Bissau	0.483	0.616
Mali	0.886	0.870
Niger	0.055	0.188
Nigeria	0.420	0.437
Senegal	0.392	0.588
Sierra Leone	0.889	0.774
Togo	0.104	0.127

Sample: Married women aged 15 to 49.

Sources: Sources: Benin 2006, 2011; Burkina Faso 2003, 2010; Côte d'Ivoire 2006, 2011; The Gambia 2005, 2011; Ghana 2006, 2011; Guinea 2005, 2012; Guinea-Bissau 2006; Mali 2006, 2012; Niger 2006; Nigeria 2008, 2013; Senegal 2005, 2010; Sierra Leone 2008, 2010; Togo 2006, 2010

We exclude from our analyses women who have not undergone FGC. If a woman did not undergo FGC it is unlikely that she will choose to have her daughter undergo the procedure, and it is uncommon that she will support the practice. Further, including only women who have undergone FGC allows us to narrow the sample to women who are comparable in terms of their cultural upbringing and who are more likely to perpetuate the practice.

We exclude never married women from our sample since married or previously married women are more likely to already have children or be thinking about about having children. These women are more likely to have given some thought to whether their daughter(s) will undergo FGC. Additionally, never married women are 27 percentage points more likely to underreport their support for FGC than are ever married women (De Cao and Lutz, 2015).

4.2.2 Determinants of FGC Support

The previous subsection described our outcome of interest and our sample of women. In this section we describe the main socioeconomic characteristics that are hypothesized to be correlated with FGC in the literature, as well as why we include them in our analysis. Table 4.3 show the descriptive statistics for these variables.

Education

We investigate the relationship between education and support for FGC. The literature has not established a causal relationship between education and FGC, though Wagner (2015) found that educated women are significantly less likely to have undergone FGC themselves in the 13 West African countries that we study. We are interested in whether education is correlated with a reduced likelihood of supporting the practice and thus a reduced likelihood that an educated woman's daughter will undergo FGC. In Egypt an increase in mothers' education is associated with a reduction in the likelihood that her daughter will undergo FGC (Modrek and Liu, 2013). Education may be associated with a reduction in support for FGC if, for example, educated women are more aware of the harmful health effects of FGC and are thus less likely to support the continuation of the practice. Additionally, Mackie (1996) suggests that FGC is a premarital investment that increases and improves marriage opportunities. If FGC and education are substitutes on the marriage market, an educated woman's child (who is then also more likely to be educated) may rely less heavily on FGC to guarantee marriage.

We break education into four categories: (i) no formal education, (ii) at least some primary education, (iii) at least some secondary education, (iv) more than secondary education ("higher education"). We use level of education rather than years of education as we expect this categorization to be less sensitive to misreporting. A woman is more

Table 4.3: Descriptive statistics

	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Guinea	Guinea Bissau	Mali	Niger	Nigeria	Senegal	Sierra Leone	Togo
Education: None	0.908	0.816	0.818	0.809	0.824	0.819	0.785	0.779	0.817	0.240	0.723	0.750	0.816
	(0.005)	(0.004)	(0.009)	(0.004)	(0.015)	(0.004)	(0.010)	(0.006)	(0.039)	(0.004)	(0.006)	(0.008)	(0.014)
Primary	0.066	0.121	0.131	0.076	0.107	0.095	0.162	0.107	0.119	0.284	0.210	0.109	0.142
	(0.005)	(0.003)	(0.008)	(0.003)	(0.012)	(0.003)	(0.009)	(0.004)	(0.033)	(0.005)	(0.006)	(0.005)	(0.013)
Secondary	0.026	0.062	0.047	0.108	0.068	0.074	0.052	0.108	0.064	0.363	0.066	0.125	0.040
	(0.003)	(0.003)	(0.005)	(0.003)	(0.009)	(0.003)	(0.006)	(0.005)	(0.025)	(0.005)	(0.004)	(0.007)	(0.007)
Higher	0.000	0.002	0.003	0.008	0.001	0.012	0.001	0.007	0.000	0.113	0.001	0.017	0.002
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.004)	(0.000)	(0.003)	(0.002)
Religion: Christian	0.162	0.262	0.146	0.006	0.319	0.061	0.032	0.035	0.069	0.668	0.018	0.179	0.080
	(0.007)	(0.004)	(0.009)	(0.001)	(0.019)	(0.002)	(0.005)	(0.003)	(0.017)	(0.005)	(0.002)	(0.007)	(0.009)
Muslim	0.748	0.620	0.678	0.993	0.632	0.920	0.928	0.935	0.906	0.308	0.978	0.821	0.721
	(0.008)	(0.004)	(0.011)	(0.001)	(0.020)	(0.003)	(0.007)	(0.003)	(0.020)	(0.005)	(0.002)	(0.007)	(0.017)
Other	0.091	0.118	0.175	0.001	0.048	0.019	0.041	0.030	0.025	0.024	0.005	0.000	0.199
	(0.005)	(0.003)	(0.009)	(0.000)	(0.009)	(0.001)	(0.005)	(0.002)	(0.009)	(0.002)	(0.001)	(0.000)	(0.015)
Age	32.672	32.094	31.945	30.118	36.169	31.749	30.714	30.147	32.160	34.729	30.302	32.692	34.813
	(0.149)	(0.081)	(0.198)	(0.090)	(0.314)	(0.098)	(0.208)	(0.105)	(0.786)	(0.091)	(0.117)	(0.130)	(0.298)
Polygamous: No	0.475	0.531	0.527	0.359	0.498	0.468	0.479	0.607	0.578	0.656	0.563	0.567	0.406
	(0.009)	(0.005)	(0.012)	(0.005)	(0.020)	(0.005)	(0.012)	(0.006)	(0.048)	(0.005)	(0.007)	(0.009)	(0.019)
Yes	0.478	0.418	0.410	0.315	0.429	0.480	0.442	0.350	0.353	0.257	0.361	0.327	0.536
	(0.009)	(0.005)	(0.012)	(0.005)	(0.019)	(0.005)	(0.012)	(0.006)	(0.047)	(0.005)	(0.006)	(0.008)	(0.019)
Unspecified	0.048	0.051	0.063	0.327	0.073	0.052	0.079	0.043	0.070	0.087	0.076	0.106	0.058
	(0.004)	(0.002)	(0.005)	(0.004)	(0.010)	(0.002)	(0.007)	(0.003)	(0.022)	(0.003)	(0.004)	(0.006)	(0.009)
Wealth Index	-3.270	0.357	-0.020	0.233	-0.635	-0.539	0.018	4.820	4.490	2.596	-2.235	-0.015	-0.120
	(0.124)	(0.101)	(0.197)	(0.009)	(0.025)	(0.102)	(0.019)	(0.524)	(1.425)	(0.094)	(0.112)	(0.020)	(0.017)
Survey Year 1	0.616	0.426	1.000	0.295	0.164	0.416	1.000	0.614	1.000	0.363	0.431	0.439	0.551
	(0.009)	(0.005)	(0.000)	(0.004)	(0.012)	(0.005)	(0.000)	(0.005)	(0.000)	(0.005)	(0.006)	(0.005)	(0.020)
Survey Year 2	0.384	0.574		0.705	0.836	0.584		0.386		0.637	0.569	0.561	0.449
	(0.009)	(0.005)		(0.004)	(0.012)	(0.005)		(0.005)		(0.005)	(0.006)	(0.005)	(0.020)
Observations	3,274	17,818	3,110	13,703	929	12,164	2,332	16,985	173	12,036	8,147	11,519	835

Standard deviations in parentheses. Sample: Married women aged 15 to 49 at the time of survey who underwent FGC.

Sources: Benin 2006, 2011; Burkina Faso 2003, 2010; Côte d'Ivoire 2011; The Gambia 2005, 2011; Ghana 2006, 2011; Guinea 2005, 2012; Guinea-Bissau 2006; Mali 2006, 2012; Niger 2006; Nigeria 2008, 2013; Senegal 2005, 2010; Sierra Leone 2008, 2010; Togo 2006, 2010.

likely to remember at what level she ceased her education than in which year she completed her schooling. Table 4.3 shows that rates of education are very low among our respondents. In Nigeria, 24 percent of respondents never attended school, while the other 12 included countries 72 percent or more of respondents never attended school.

Religion

We are interested in the role of religion in the persistence of FGC. The practice of FGC predates both Islam and Christianity, and there are no overt prescriptions to practice FGC in either religion's sacred texts (Mackie, 1996). Nevertheless some religious observers believe that Islam mandates FGC. In Egypt there has been a sharper decline in the prevalence FGC among Coptic Christian women than among Muslim women despite comparable average levels of both education and wealth among Christians and Muslims in the study area (Blaydes and Izama, 2015). As mentioned in section 4.1 Islamic rituals may indirectly legitimize FGC, as uncircumcised women are considered "unclean," and FGC is a way for women to demonstrate their piety (Shell-Duncan and Hernlund, 2006). In Senegal and the Gambia, many respondents feel that FGC is a matter of tradition more so than a matter of religion, but Shell-Duncan and Hernlund (2006) conclude that women who view FGC as part of their religious practice are less likely to abandon it.

We break religion into three possible categories: Christianity, which includes all Protestant and Catholic sects; Islam; and other religions, which includes animists, atheists, and "spiritual" beliefs. Muslims comprise the majority of our respondents in all countries except Nigeria, where Christianity is the predominate religion.

Age

We include the age of the respondent at the time of survey in our analysis. Older women who have undergone FGC often play the role of "gatekeepers" in its perpetuation (Coyne and Coyne, 2014). In the Gambia female elders perpetuate FGC to assert their influence and social position in the community (Ahmadu, 2005). FGC works as a signal that a woman who underwent FGC respects the authority of the older cut women in her community. The practice facilitates the accumulation of social capital for younger women and increases influence and prestige for elder women. Further, FGC procedures are often performed by a traditional circumciser, who is typically an older women in the

community (Shell-Duncan and Hernlund, 2001). For these older women the end of FGC would represent both a financial and social loss.

Additionally, Shell-Duncan and Hernlund (2006) find that in Senegal and the Gambia the persistence of FGC is not driven by marriageability concerns and instead find strong evidence that FGC is a peer convention. Thus, a woman's peer group may be an important determinant of her beliefs about FGC.

Polygamy

Mackie (1996) suggests that FGC first emerged in polygamous unions, since men in a polygamous union have less control over their wives' behavior and thus a higher incentive to control their wives sexuality because they want to ensure the paternity of their children. Thus, a polygamous man may be more likely than a monogamous man to require that his wives have undergone FGC. It is also possible that women in a polygamous union are from more traditional households and may thus to be more likely to support FGC. A woman in a polygamous union may also experience more pressure from her cowives to adhere to social norms and traditions.

We include a categorial variable specifying if the respondent (i) is in a monogamous union, (ii) is in a polygamous union, or (iii) did not specify the type of her marital union.

Wealth

The relationship between support for FGC and wealth is unclear. The practice of FGC started among elite families (Mackie, 1996), so one could expect wealthier households to have an attachment to the practice. In Sierra Leone, for example, FGC is practiced in an all-female secret society called the Bondo society (also known as the Sande society), and the cost of initiation, including FGC, is expensive (approximately 100 USD). Members of the Bondo society have higher social standing than other women, and undergoing FGC thus allow girls to signal the wealth of their family (Mgbako et al., 2010).

Alternatively, if family wealth and FGC are substitutes on the marriage market or substitutes for gaining respect among community members, then girls from wealthy families may not need to signal additional quality on the marriage market or in the community whereas girls from poor families need to compensate for their lack of family wealth.

We include a wealth index in our regressions. This wealth index is provided in the DHS and MICS datasets. It is computed using principal component analysis of household possessions including a radio, television, mobile telephone, and bicycle. The wealth index provides a ranking of households' wealth within a country-year.

Ethnicity

The rate of FGC within a woman's community explains an important amount of her preference for FGC, and communities are often delineated by ethnic group (Novak, 2017). The rate of FGC varies substantially between ethnic groups across Sub-Saharan Africa (Yoder et al., 2004). Including ethnicity fixed effects allows us to control for shared norms which affect the value placed on FGC by the respondent. The number of ethnic groups reported in a country ranges between 7 and 19. In the interest of brevity, we do not report the estimated coefficients for each ethnic group, but they are available from the authors upon request. Additionally, since many ethnic groups are represented in only a few countries, cross-country comparisons of ethnic groups are not feasible or particularly interesting.

Village

We include village fixed effects in our regressions in order to account for a large amount of the time-invariant characteristics of a woman's surroundings that might influence her opinion of FGC. For example, individuals living in rural communities often have more limited interactions with individuals from other cultural groups in comparison to individuals living in urban areas. This relative isolation can foster more traditional views which could include support for FGC. Village fixed effects account for the average level of social costs of deviating from the norm of FGC perceived within a village. Village fixed effects also control for time-invariant access to labor market and educational opportunities available to women, which could influence their support for FGC.

Survey Year

There has been much international and domestic attention paid to the practice of FGC in recent years. These campaigns could have instigated some change the perceptions of

FGC. Additionally, as shown in table 4.1, some countries in our dataset instituted a ban on FGC in or between the years for which we have data. We included survey year fixed effects in order to account for country-level changes in the perception of FGC between survey waves.

Interviewer

Lastly, the interviewer and the way in which she conducts the interview could influence the responses of the respondent, particularly on a subject as personal as FGC. We include interviewer fixed effects in our regressions.

4.3 Estimation

4.3.1 Estimation Strategy

We investigate which characteristics of cut women predict their likelihood to support the continuation of FGC. For each of the 13 countries in our dataset we estimate the following regression for ever married women who report having undergone FGC:

$$y_{ivt} = \beta_0 + \mathbf{x_{ivt}}\beta_\mathbf{1} + \mathbf{d_v}\beta_\mathbf{2} + \mathbf{d_t}\beta_\mathbf{3} + \mathbf{d_e}\beta_\mathbf{4} + \epsilon_{ivt} \tag{4.1}$$

where subscripts denote individual i in village v surveyed at a time t. Let y_{ivt} equal 1 if the respondent supports the continuation of FGC and 0 otherwise. Let $\mathbf{x_{ivt}}$ denote the vector of control variables,[3] which are: level of education of the respondent, her religion, her at the time of survey, age squared, her type of marital union, wealth index for the household in which she lives, and her ethnic group. Let $\mathbf{d_v}$ be a vector of village fixed-effects, $\mathbf{d_t}$ is a vector of survey year fixed-effects, $\mathbf{d_e}$ is a vector of interviewer fixed-effects, and ϵ_{ivt} is an error term with mean zero.

We estimate equation 4.1 using ordinary least squares (OLS). Because our outcome variable is binary, the use of OLS means that we are estimating linear probability models (LPM). Our use of LPM, instead of logit or probit models, follows the recommendations of Angrist and Pischke (2008). LPMs handle a large number of fixed effects much better

[3]Boldface is used to indicated vectors.

than logit and probit models due to the incidental parameter problem (Greene et al., 2002).

4.3.2 Misreporting

Our goal is to show which women are likely to have positive opinions of FGC in order to help policy makers better target their interventions. It is important to consider the possibility that a respondent will misreport her FGC status or her support for FGC—that is, report that she does not support the continuation of FGC when in fact she does support it. Misreporting may occur since FGC can be a sensitive topic and FGC is banned in some included countries (see table 4.1). There is much heterogeneity in the extent and enforcement of national laws against FGC, and the effects of these laws are unclear. Nevertheless, misreporting in response to these law is possible.

First, consider the possibility that a woman misreports her own FGC status. It is possible that a woman would falsely report that she has undergone FGC when in fact she has not. This side of misreporting is less likely due to the current international and domestic climate toward FGC in the majority of our included countries. It is more likely that there are false negatives, that is women who state that they have not undergone FGC when in fact they have. Because these women report that they have not undergone FGC, they are dropped from our regressions entirely. If these women, on average, have the same level of support as women who correctly report that they have undergone FGC our estimates will not be effected. If instead women who falsely state that they have not been cut have a different level of support for FGC than true positives and if their propensity to support is correlated with their observable characteristics, our estimates on included characteristics will be biased. The direction of that bias depends both on the characteristics of the false negatives and the difference in propensity to support FGC. Ideally, we would have information from gynecological exams of the respondents. In lieu of this information, we use reported FGC status and discuss the extent of possible misreporting.

Huntington et al. (1996) show that in their study conducted in Egypt, 94 percent of gynecological examinations revealed the same information as self-reports. It is important to note that no ban was enacted in Egypt at the time of the study. According to Novak (2017), DHS data from Burkina Faso have an average rate of FGC that is similar to the

rate of FGC calculated using gynecological exams in Jones et al. (1999). Klouman et al. (2005) find that in Tanzania 66 percent of women self-report that they underwent FGC, while medical exams revealed that 73 percent of these women had undergone FGC. The authors argue that women who were "minimally" cut at an early age might be unaware of their FGC status. Elmusharaf et al. (2006) find misreporting regarding type FGC the respondent had undergone (excision versus infibulation) but no misreporting for overall FGC status in Sudan. In this chapter we will not differentiate between the various types of FGC, we will only use the fact that a woman reports her FGC status. This eliminates some of the potential misreporting errors.

It is also possible that women misreport their support for FGC. If, for example, Christian women are more likely to falsely report that they do not support FGC, the coefficient on Muslims (as compared to Christians) might be biased upward in absolute value. Additionally, if educated women are more likely to know about the laws and media campaigns discouraging FGC, these women might be more likely to believe that their interviewer is against the practice and falsely report that they do not support FGC in order to please the interviewer. This would bias upward (in absolute value) the association between support for FGC and education. In fact, in Ethiopia a decade after the enactment of a ban against FGC, uneducated women were 16 percentage points more likely to *falsely* report that they did not support the continuation of FGC than were educated women (De Cao and Lutz, 2015).[4] If this finding holds in all countries that we study, our estimates on education would be an underestimate of the association with support for FGC.

4.4 Results

We pool cross-sections from multiple survey rounds within a country, where available, and report the pooled results. Our sample includes ever married women who report having undergone FGC. Table 4.4 presents the results from our estimation of equation 4.1.

Table 4.4 shows that in the majority of countries, education is negatively and

[4]De Cao and Lutz (2015) use a list experiment in addition to direct questioning about support for FGC in order to measure the potential bias that arises when women are directly asked about their support for FGC.

Table 4.4: LPM estimation results for whether respondent thinks FGC should continue

Dependent variable = 1 if respondent reports supporting FGC, 0 otherwise

	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Guinea	Guinea Bissau	Mali	Niger	Nigeria	Senegal	Sierra Leone	Togo
Level of Support	0.046	0.146	0.452	0.880	0.102	0.792	0.616	0.870	0.188	0.437	0.588	0.774	0.127
Education [Omitted: No Formal School]													
Primary	0.011	-0.017**	-0.081***	-0.038***	0.050	-0.044***	-0.210***	-0.035*	-0.077	-0.013	-0.074***	-0.030	0.043
	(0.016)	(0.009)	(0.027)	(0.013)	(0.068)	(0.015)	(0.031)	(0.020)	(0.134)	(0.016)	(0.019)	(0.030)	(0.044)
Secondary	-0.019	-0.046***	-0.128***	-0.114***	-0.004	-0.184***	-0.311***	-0.153***	-0.089	-0.046***	-0.243***	-0.166***	-0.020
	(0.015)	(0.013)	(0.034)	(0.017)	(0.056)	(0.023)	(0.060)	(0.022)	(0.240)	(0.017)	(0.030)	(0.036)	(0.034)
Higher		-0.051*	-0.244***	-0.318***	-0.063	-0.382***	-0.251	-0.289***		-0.104***	-0.444***	-0.318***	-0.029
		(0.028)	(0.060)	(0.057)	(0.081)	(0.043)	(0.364)	(0.055)		(0.024)	(0.106)	(0.098)	(0.083)
Religion [Omitted: Christian]													
Muslim	-0.008	0.017*	0.073*	0.054	-0.074	0.113**	0.195**	0.223***	0.036	0.109***	0.021	0.092***	-0.016
	(0.010)	(0.009)	(0.038)	(0.065)	(0.065)	(0.045)	(0.093)	(0.044)	(0.224)	(0.025)	(0.067)	(0.026)	(0.117)
Other	0.017	0.075***	0.126***	0.068	0.084	0.111***	0.104	0.202***	0.282	0.279***	-0.062	0.036	-0.032
	(0.018)	(0.016)	(0.040)	(0.084)	(0.093)	(0.030)	(0.087)	(0.049)	(0.256)	(0.033)	(0.139)	(0.079)	(0.089)
Age	0.003	-0.014***	-0.024***	-0.000	-0.028	-0.003	0.010	-0.009**	0.020	-0.012**	-0.015***	-0.005	-0.043***
	(0.004)	(0.003)	(0.009)	(0.003)	(0.023)	(0.003)	(0.011)	(0.003)	(0.037)	(0.005)	(0.005)	(0.007)	(0.016)
Age Squared	-0.000	0.000***	0.000**	-0.000	0.000	0.000	-0.000	0.000**	-0.000	0.000**	0.000**	0.000	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Polygamous	-0.005	-0.004	0.007	-0.007	-0.019	0.017*	-0.050*	0.004	0.007	0.034**	0.025*	0.031**	0.021
	(0.009)	(0.007)	(0.027)	(0.012)	(0.038)	(0.009)	(0.029)	(0.012)	(0.114)	(0.014)	(0.014)	(0.013)	(0.033)
Wealth Index	-0.001	-0.001**	-0.005**	0.012	0.010	-0.003**	-0.092***	-0.000	-0.002	-0.003***	-0.002*	-0.042***	-0.005
	(0.001)	(0.001)	(0.002)	(0.009)	(0.062)	(0.001)	(0.028)	(0.000)	(0.018)	(0.001)	(0.001)	(0.015)	(0.058)
Constant	-0.065	0.408***	0.403	1.095***	0.595	0.870***	0.398	0.763***	-0.359	0.727***	0.694***	0.817***	0.943***
	(0.072)	(0.066)	(0.341)	(0.108)	(0.467)	(0.085)	(0.284)	(0.091)	(0.550)	(0.228)	(0.140)	(0.129)	(0.325)
Observations	3,274	17,818	3,110	13,703	929	12,164	2,332	16,985	173	12,036	8,147	11,519	835
R-squared	0.437	0.229	0.362	0.261	0.357	0.241	0.433	0.274	0.640	0.349	0.307	0.329	0.564

Standard errors clustered at the village level shown in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sample: Married women aged 15 to 49 at the time of survey who underwent FGC. Controls included: Ethnicity, village, interviewer, and survey year fixed effects.

Sources: Benin 2006, 2011; Burkina Faso 2003, 2010; Côte d'Ivoire 2011; The Gambia 2005, 2011; Ghana 2006, 2011; Guinea 2005, 2012; Guinea-Bissau 2006; Mali 2006, 2012; Niger 2006; Nigeria 2008, 2013; Senegal 2005, 2010; Sierra Leone 2008, 2010; Togo 2006, 2010.

significantly associated with support for FGC. Further, the likelihood of supporting FGC is decreasing in the level of education. In Côte d'Ivoire, for example, a woman who attended primary school is 8.1 percentage points less likely to support FGC than a similar woman who attended no formal school. A women who attended secondary school or higher education is 12.8 and 24.2 percentage points, respectively, less likely to support FGC than a woman who attended no formal schooling. There are four countries—Benin, Ghana, Niger, and Togo—in which there is no statistically significant relationship between education and support for FGC. These countries have four of the five lowest rates of support for FGC among cut women, which could contribute the lack of a relationship between a woman's characteristics and her support for FGC.

Muslims are more likely than Christians to support the continuation of FGC. The magnitude of this difference ranges between (a statistical) 0 and a 22.3 percentage points increased likelihood of support. In three countries—Burkina Faso, Côte d'Ivoire, and Nigeria—the "other" religious groups have a higher likelihood of support than both Christians or Muslims. This category varies in composition between countries but typically includes animists and non-religious groups. There is no statistical relationship between religion and support for FGC in Benin, the Gambia, Ghana, Niger, Senegal, and Togo. In four of those countries, this lack of statistical relationship is likely due to the lack of variation in reported support for FGC. In the Gambia and Senegal this lack of relationship likely comes from the fact that respondents in these countries are overwhelmingly Muslim (96 percent in both cases).

A woman in a polygamous union is more likely to support FGC than a woman in a monogamous union in 4 of the 13 countries that we study. In Guinea-Bissau a woman in a polygamous union is five percentage points *less* likely to support FGC than a woman in a monogamous union. This suggests that in some cases women in polygamous unions are more traditional and are more likely to favor traditional practices.

Wealthy women are statistically less likely to support FGC in 7 of the 13 countries we study. This suggests that there has been a shift in the demographics of those who practice FGC since the practice first began among wealthy women, and this lends credence to the substitution hypothesis. That is, it is possible that household wealth compensates for the need to undergo FGC in order to ensure acceptance into the community and marriage for a daughter.

4.4.1 Limitations

We discussed the limitations of using direct reports of a woman's FGC status and her support for FGC in section 4.3.2. Ideally we would have data from gynecological exams in order to verify FGC status and we would elicit opinions of FGC via less direct questioning. Our true outcome of interest is whether a woman's daughter undergoes FGC. Unfortunately a woman's daughter's FGC status is infrequently reported in our datasets.

Our sample is restricted to women aged 15 for 49 at the time of survey. Older women are often important players in a family's decision of whether to cut its daughter. Men's opinions about FGC may also be influential. While we have information about a very important subgroup of the population regarding the decisions surrounding FGC, we have an incomplete picture of the decision makers.

Our estimates provide evidence of associations between a woman's characteristics and her support for FGC, but do not provide causal estimates. These results should guide policy makers wishing to most efficiently target their interventions, but our results do not provide evidence regarding the causal effect of such interventions. Future research should be conducted to address these limitations.

4.5 Discussion and Conclusions

Using data from 13 West African countries, we investigated which characteristics of women best predict their support for FGC. In particular, we are interested in whether education, religion, age, polygamy status, wealth, and ethnicity are correlated with a woman's stated support for the continuation of the practice of FGC. We find that in 9 of the 13 countries, a more educated woman is statistically and economically significantly less likely to support FGC. The rate of FGC is moderate or high (above 35 percent) in each of these 9 countries. Muslim women are more likely to support FGC than Christian women in 7 of the 13 included countries. In each of these seven countries, 42 percent or more of adult women have undergone FGC. Animists, atheists, and women ascribing to other religions are more likely than Christian women to support FGC in 5 of the 13 included countries. A polygamous woman is more likely to support FGC in four of our included countries, though the estimated relationships are relatively small. The

likelihood of support is decreasing in wealth in 7 of the 13 included countries.

Novak (2017) showed that households have heterogenous preferences for FGC and are willing to deviate from the norm at different observed rates of cutting in their community. The results derived in this chapter provide clearer direction for policy makers as they are targeting their interventions. Specifically, if a policy maker wishes to target the women who are most willing to deviate from practicing FGC, they should, on average, target educated, wealthy, Christian women. Alternatively, policy makers wishing to change the opinions of the hardest to reach should consider directing their interventions toward women who are Muslim, animist, or atheist and who have no formal education.

The strength of our approach comes from the vast amount of data from these 13 countries over multiple time periods. This allows us to draw more substantive conclusions than any one dataset, or multiple datasets from just one country, would allow. This is particularly important when discussing a practice like FGC which varies widely between communities, and results from one country may not apply to another.

Future research should investigate the causal effect of these variables on support and perpetuation of FGC. Researchers should also explore creative ways to avoid relying on direct reporting of own FGC status, daughter's FGC status, and support for FGC.

Chapter 5

Conclusions

Female genital cutting (FGC) is practiced in parts of Africa, the Middle East, and Asia. The practice has existed for at least 3,000 years (Mackie, 1996) and persists despite the numerous health complications associated with the procedure. In this dissertation, I have investigated why the practice is perpetuated across generations. Using data from 13 West African countries that were collected between 1995 and 2013 I test the prevailing theory regarding why FGC persists—that is, that FGC is a social coordination norm (Mackie, 1996). My coauthors and I show that this theory is not consistent with empirical evidence from West Africa. Specifically, the social coordination norm theory predicts that a substantial proportion of the variation in the persistence of FGC should be explained at the community level. We find that, on average, 87 percent of the variation in the persistence of FGC is explained by individual and household level factors. Further, individual factors explain a larger share of the persistence of FGC in countries in which the practice is more widespread.

Based on these findings, and similar findings by Efferson et al. (2015) in Sudan, there was a need for a new theory regarding why FGC persists. In my second essay, I generate a new theoretical explanation for the persistence of the practice. I show that if households have heterogeneous thresholds for FGC, such that each household requires a different proportion of their community to abandon FGC before they will also agree to abandon the practice, then a tipping point in the rate of FGC is not guaranteed and a community may have a stable interior equilibrium in the rate of FGC. Using data from Burkina Faso, I show that the distribution of household thresholds vary widely

between communities. Some communities have a tipping point in the rate of FGC, and that tipping point has already been reached. In these communities, FGC should be eliminated. Other communities have stable internal equilibrium in the rate of FGC. The rate of FGC is likely to remain constant until an external stimulus (such as an effective anti-FGC campaign) alters household behavior and thus the rate of FGC.

In order for public policy interventions to be most effectively targeted, my coauthor and I investigate which characteristics of women best predict their likelihood to support or oppose FGC. I find that in countries in which 35 percent or more of adult women have undergone FGC, educated women are less likely than uneducated women to support FGC and Christian women are less likely than Muslim or animist women to support the continuation of FGC. These findings will aid policy makers in finding the most relevant group at which to aim their interventions.

A major strength of the approach in these chapters comes from the breadth of the data used in the analyses. Using data from 13 West African countries spanning almost two decades allows me to draw much broader and far reaching conclusions than any one dataset would allow. The data provide sufficient variation in respondent's FGC status, daughter's FGC status, and reported support for the practice to identify meaningful relationships with their characteristics.

Nevertheless, the countries used in these analyses are only a subset of the countries in which FGC is practiced. Norms surrounding FGC vary widely and it is important to be prudent in applying findings from West Africa to other parts of the world. Additionally, the use of direct reports of a woman's FGC status, her daughter's FGC status, and her support for FGC leaves room for misreporting. Future research should aim to include data from gynecological exams in order to verify FGC status and elicit opinions of FGC via less direct questioning.

Additionally, the samples are restricted to women aged 15 for 49 at the time of survey. Older women and men may play an important role in the decision to perpetuate FGC. Unfortunately we do not have information regarding the opinions of the full roster of those involved in the decision to cut a girl nor do we have information about the intrahousehold bargaining process. In the future, researchers should prioritize collecting data about other decision makers.

The findings in this dissertation suggest that the community plays an important

role in an individual's (or household's) decision regarding whether to cut her daughter. Nevertheless, their actions are not fully determined by their community. This suggests that policy makers should design interventions that increase a household's perceived costs of FGC (e.g., by explaining the adverse health effects) or decrease the perceived benefits. Policy makers should pay special attention to the targeting of these interventions. If a community has a distribution of household thresholds such that a tipping point exists, it may be most efficient to target those with the highest thresholds—i.e., those most willing to abandon FGC. Alternatively, if a stable equilibrium exists in the rate of FGC, targeting those with the lowest thresholds and changing their perceived cost-benefit ratio of practicing FGC may be necessary. Future research should prioritize evaluating such interventions, while keeping both the design of the intervention and the targeting of that intervention prominently in mind.

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Appendix A

Appendix—All in the Family

A.1 Sampling Scheme

Benin 2001: Of the 6,206 households selected for the survey, 5,945 were occupied, and 5,769 were successfully interviewed. In the interviewed households, 6,448 women aged 15 to 49 were identified, and 6,219 were successfully interviewed for a response rate of 96.4%.

Benin 2006: Of the 17,982 households selected for the survey, 17,675 were occupied, and 17,511 were successfully interviewed. In the interviewed households, 18,851 women aged 15 to 49 were identified, and 17,794 were successfully interviewed for a response rate of 94.4%.

Benin 2011: Of the 17,999 households selected for the survey, 17,672 were occupied, and 17,422 were successfully interviewed. In the interviewed households, 17,329 women aged 15 to 49 were identified, and 16,599 were successfully interviewed for a response rate of 95.8%.

Burkina Faso 1998: Of the 4,910 households selected for the survey, 4,812 were successfully interviewed. In the interviewed households, 6,742 women aged 15 to 49 were identified, and 6,445 were successfully interviewed for a response rate of 95.6%.

Burkina Faso 2003: Of the 9,470 households selected for the survey, 9,149 were occupied, and 9,097 were successfully interviewed. In the interviewed households, 12,952 women aged 15 to 49 were identified, and 2,477 were successfully interviewed for a response rate of 96.3%.

Burkina Faso 2006: Of the 6,034 households selected for the survey, 5,954 were occupied, and 5,523 were successfully interviewed. In the interviewed households, 8,159 women aged 15 to 49 were identified, and 7,316 were successfully interviewed for a response rate of 89.7%.

Burkina Faso 2010: Of the 14,947 households selected for the survey, 14,536 were occupied, and 14,424 were successfully interviewed. In the interviewed households, 17,363 women aged 15 to 49 were identified, and 17,087 were successfully interviewed for a 98.4% response rate.

Côte d'Ivoire 1998: Of the 2,302 households selected for the survey, 2,168 were occupied, and 2,122 were successfully interviewed. In the interviewed households, 3,155 women aged 15 to 49 were identified, and 3,040 were successfully interviewed for a 96.4% response rate.

Côte d'Ivoire 2006: Of the 7,600 households selected for the survey, 7,600 were occupied, and 7,600 were successfully interviewed. In the interviewed households, 13,020 women aged 15 to 49 were identified, and 12,888 were successfully interviewed for a 99.0% response rate.

Côte d'Ivoire 2011: Of the 10,413 households selected for the survey, 9,873 were occupied, and 9,686 were successfully interviewed. In the interviewed households, 10,848 women aged 15 to 49 were identified, and 10,060 were successfully interviewed for a 92.7% response rate.

Gambia 2005: Of the 6,175 households selected for the survey, 6,171 were occupied, and 6,071 were successfully interviewed. In the interviewed households, 10,252 women aged 15 to 49 were identified, and 9,982 were successfully interviewed for a 97.4% response rate.

Gambia 2010: Of the 7,800 households selected for the sample, 7,799 households were occupied, and 7,791 were successfully interviewed. In the interviewed households, 15,138 women aged 15-49 were identified, and 14,685 were successfully interviewed for a response rate of 97.0%.

Ghana 2006: Of the 6,302 households selected for the sample, 6,264 were occupied, and 5,939 were successfully interviewed. In the interviewed households, 6,240 women aged 15 to 49 were identified, and 5,891 were successfully interviewed for a response rate of 94.4%.

Ghana 2011: Of the 12,150 households selected for the sample, 11,970 were occupied, and 11,925 were successfully interviewed. In the households interviewed, 10,963 women aged 15 to 49 years were identified, and 10,627 were successfully interviewed for a response rate of 96.9%.

Guinea 1999: Of the 5,465 households selected for the sample, 5,216 were occupied, and 5,090 were successfully interviewed. In the households interviewed, 7,117 women aged 15 to 49 years were identified, and 6,753 were successfully interviewed for a response rate of 94.9%.

Guinea 2005: Of the 6,480 households selected for the sample, 6,333 were occupied, and 6,282 were successfully interviewed. In the households interviewed, 8,183 women aged 15 to 49 years were identified, and 7,954 were successfully interviewed for a response rate of 97.2%.

Guinea 2012: Of the 7,200 households selected for the sample, 7,148 were occupied, and 7,109 were successfully interviewed. In the households interviewed, 9,331 women aged 15 to 49 years were identified, and 9,142 were successfully interviewed for a response rate of 98.0%.

Guinea-Bissau 2006: Of the 5,452 households selected for the sample, 5,448 were occupied, and 5,305 were successfully interviewed. In the households interviewed, 9,904 women aged 15 to 49 years were identified, and 8,012 were successfully interviewed for a response rate of 80.9%.

Mali 1995: Of the 9,512 households selected for the sample, 8,833 were occupied, and 8,716 were successfully interviewed. In the households interviewed, 10,096 women aged 15 to 49 years were identified, and 9,704 were successfully interviewed for a response rate of 96.1%.

Mali 2001: Of the 13,717 households selected for the sample, 12,617 were occupied, and 12,331 were successfully interviewed. In the households interviewed, 13,543 women aged 15 to 49 years were identified, and 12,849 were successfully interviewed for a response rate of 94.9%.

Mali 2006: Of the 13,695 households selected for the sample, 13,160 were occupied, and 12,998 were successfully interviewed. In the households interviewed, 15,102 women aged 15 to 49 years were identified, and 14,583 were successfully interviewed for a response rate of 96.6%.

Mali 2006: Of the 13,695 households selected for the sample, 13,160 were occupied, and 12,998 were successfully interviewed. In the households interviewed, 15,102 women aged 15 to 49 years were identified, and 14,583 were successfully interviewed for a response rate of 96.6%.

Mali 2012: Of the 10,743 households selected for the sample, 10,265 were occupied, and 10,105 were successfully interviewed. In the households interviewed, 10,875 women aged 15 to 49 years were identified, and 10,424 were successfully interviewed for a response rate of 95.9%.

Niger 1998: Of the 6,377 households selected for the sample, 6,007 were occupied, and 5,928 were successfully interviewed. In the households interviewed, 7,863 women aged 15 to 49 years were identified, and 7,577 were successfully interviewed for a response rate of 96.4%.

Niger 2006: Of the 8,418 households selected for the sample, 7,824 were occupied, and 7,660 were successfully interviewed. In the households interviewed, 9,646 women aged 15 to 49 years were identified, and 9,223 were successfully interviewed for a response rate of 95.6%.

Niger 2012: Of the 11,900 households selected for the sample, 10,969 were occupied, and 10,750 were successfully interviewed. In the households interviewed, 11,698 women aged 15 to 49 years were identified, and 11,160 were successfully interviewed for a response rate of 95.4%.

Nigeria 1999: Of the 7,919 households selected for the sample, 7,736 were occupied, and 7,647 were successfully interviewed. In the households interviewed, 8,918 women aged 15 to 49 years were identified, and 8,199 were successfully interviewed for a response rate of 91.9%.

Nigeria 2003: Of the 7,864 households selected for the sample, 7,327 were occupied, and 7,225 were successfully interviewed. In the households interviewed, 7,985 women aged 15 to 49 years were identified, and 7,620 were successfully interviewed for a response rate of 95.4%.

Nigeria 2007: Of the 28,603 households selected for the sample, 28,431 were occupied, and 26,735 were successfully interviewed. In the households interviewed, 27,093 women aged 15 to 49 years were identified, and 24,565 were successfully interviewed for a response rate of 90.7%.

Nigeria 2008: Of the 36,298 households selected for the sample, 34,644 were occupied, and 34,070 were successfully interviewed. In the households interviewed, 34,596 women aged 15 to 49 years were identified, and 33,385 were successfully interviewed for a response rate of 96.5%.

Nigeria 2011: Of the 29,343 households selected for the sample, 29,151 were occupied, and 29,077 were successfully interviewed. In the households interviewed, 33,699 women aged 15 to 49 years were identified, and 30,772 were successfully interviewed for a response rate of 91.3%.

Nigeria 2013: Of the 40,320 households selected for the sample, 38,904 were occupied, and 38,522 were successfully interviewed. In the households interviewed, 39,902 women aged 15 to 49 years were identified, and 38,948 were successfully interviewed for a response rate of 97.6%.

Senegal 2005: Of the 7,859 households selected for the sample, 7,528 were occupied, and 7,412 were successfully interviewed. In the households interviewed, 15,587 women aged 15 to 49 years were identified, and 14,602 were successfully interviewed for a response rate of 93.7%.

Senegal 2010: Of the 8,212 households selected for the sample, 8,029 were occupied, and 7,902 were successfully interviewed. In the households interviewed, 16,931 women aged 15 to 49 years were identified, and 15,688 were successfully interviewed for a response rate of 92.7%.

Sierra Leone 2005: Of the 8,000 households selected for the sample, 7,125 were occupied, and 7,078 were successfully interviewed. In the households interviewed, 9,257 women aged 15 to 49 years were identified, and 7,654 were successfully interviewed for a response rate of 82.1%.

Sierra Leone 2008: Of the 7,758 households selected for the sample, 7,461 were occupied, and 7,284 were successfully interviewed. In the households interviewed, 7,845 women aged 15 to 49 years were identified, and 7,374 were successfully interviewed for a response rate of 94.0%.

Sierra Leone 2010: Of the 11,923 households selected for the sample, 11,578 were occupied, and 11,394 were successfully interviewed. In the households interviewed, 14,068 women aged 15 to 49 years were identified, and 13,359 were successfully interviewed for a response rate of 95.0%.

Togo 2006: Of the 6,600 households selected for the sample, 6,562 were occupied, and 6,492 were successfully interviewed. In the households interviewed, 6,713 women aged 15 to 49 years were identified, and 6,213 were successfully interviewed for a response rate of 92.6%.

Togo 2010: Of the 6,975 households selected for the sample, 6,172 were occupied, and 6,039 were successfully interviewed. In the households interviewed, 7,016 women aged 15 to 49 years were identified, and 6,376 were successfully interviewed for a response rate of 90.9%.

A.2 Irregularities in Included Datasets

Some country-years are missing variables used in the standard analysis. Namely, the data set for Nigeria- 2012 does not include information on the religion of the respondent nor the household head. Datasets for Niger-2012, Nigeria-1999 and -2003, and Sierra Leone-2005 do not include information on ethnicity of the respondent nor the household head. The dataset for Benin-2006 does not include information on whether or not a household has access to electricity. Lastly, the datasets for Côte d'Ivoire-1998 and -2006 do not include information on the respondents partners age. This variable is used in the alternative specification of our standard analysis. Additionally, the datasets for Côte dIvoire-2006 and Nigeria-2011 do not include the names of some ethnic groups; these groups are identified by a number. In these cases, ethnicity is included in the regressions, but the descriptive tables identify these ethnicities as "Undisclosed Ethnicity."

A.3 Differences in Included and Excluded Observations

Some observations are missing from the final sample due to missing data for one or more variables included in the analysis. We explore whether there are systematic differences between the observations included in and the observations that are missing from each sample. For each estimation sample we run two regressions. First, we regress a dummy equal to one if the outcome variable (i.e., the respondents support for the continuation of FGC) is missing, and equal to zero otherwise, on age of the respondent, ethnicity, and marital status, and we control for district-village-household fixed effects

and interviewer fixed effects (because our most complete specification controls for those levels of heterogeneity). We then run a similar regression in which the left hand side variable is a dummy variable that is equal to one if the observation is missing data on our variable of interest (i.e., the respondents FGC status), and equal to zero otherwise. We then determine if the likelihood of response to the questions used for our dependent variable and our variable of interest is different between the estimation sample and the missing observations at any conventional level of significance.

For ease of exposition, let question 1 refer to the dependent variable, i.e., the question regarding whether or not the respondent thinks the practice of FGC should continue. Let "question 2" refer to the variable of interest, i.e., the question regarding the personal FGC status of the respondent.

Benin 2001: There are 6,219 total observations and 3,709 are used. We find that older and more educated women are more likely to question 1. Currently married women are more likely than never married women to respond to question 1. There are no differences in response rates to the question 2.

Benin 2006: There are 17,794 total observations and 10,390 are used. We find that older and more educated women are more likely to respond to both questions.

Benin 2011: There are 16,599 total observations and 10,477 are used. We find that older and more educated women are more likely to respond to both questions.

Burkina Faso 1998: There are 6,445 total observations and 4,736 are used. We find that older and more educated women are more likely to respond to both questions. Women who are currently separated from their partner are more likely than never married women to respond to question 1.

Burkina Faso 2003: There are 12,477 total observations and 10,756 are used in the analysis. We find that older and more educated women are more likely to respond both questions. Women who are currently separated from their partner are more likely than never married women to respond to question 1.

Burkina Faso 2006: There are 9,583 total observations and 6,264 are used in the analysis. We find that more educated women are more likely to respond to both questions. Women who are currently separated from their partner are more likely than never married women to respond to question 1.

Burkina Faso 2010: There are 17,087 total observations and 16,595 are used. Older

women are more likely to respond to the question 2. Divorced women are less likely than never married women to respond question 2. There are no differences in response rates to question 1.

Côte d'Ivoire 1998: There are 3,040 total observations and 2,517 are used in the analysis. We find that older and more educated women are more likely to respond to both questions.

Côte d'Ivoire 2006: There are 13,702 total observations and 9,971 are used in the analysis. We find that older and more educated women are more likely to respond to both questions. Women who are cohabitating with their partner are more likely to respond to question 2.

Côte d'Ivoire 2011: There are 10,060 total observations and 8,731 are used. We find that older and more educated women are more likely to respond to both questions. Women who are currently cohabitating with their partner and divorced women are more likely than never married women to respond to question 2.

The Gambia 2005: There are 11,340 total observations and 9,238 are used in the analysis. We find that older women are more likely to respond to question 1. There is no difference in response rates to question 2.

The Gambia 2010: There are 16,363 total observation and 13,101 are used. Women with secondary education are more likely to respond question 1 than women with no formal education. More educated women are more likely to respond to question 2.

Ghana 2006: There are 8,206 total observations and 4,084 are used in the analysis. We find that older and more educated women are more likely to respond to both questions. Women who are currently cohabitating with their partner are less likely than never married women to respond to question 1.

Ghana 2011: There are 14,887 total observations and 4,181 observations are used. Note that in Ghana many observations are dropped due to missing responses to the question regarding whether or not FGC should continue. We find that older women are more likely to respond to questions. Women that are cohabitating and never married women are less likely than currently married women to respond question 1. Cohabitating and divorced women are less likely than currently married women to respond to question 2.

Guinea 1999: There are 6,753 total observations and 5,905 are used in the analysis.

There are no differences in response rates for either question.

Guinea 2005: There are 7,954 total observations and 6,707 are used in the analysis. Older and more educated women are more likely to respond to question 1. Women who are currently separated are more likely than never married women to respond to question 1. There are no differences in response rates to question 2.

Guinea 2012: There are 9,142 total observations and 8,607 are used in the analysis. Women with secondary education are more likely to respond to question 1 than women with no formal education. Women who are widowed or separated are less likely than never married women to respond to question 1. There are no systematic differences between those who do and do not respond to question 2.

Guinea-Bissau 2006: There are 10,253 total observations and 6,431 are used. Older women are more likely to respond to question 2. There are no systematic differences response rates to question 1.

Mali 1995: There are 9,704 total observations and 8,085 are used in the analysis. We find that older and more educated women are more likely to respond to question 1. There are no systematic differences in response rates to question 2.

Mali 2001: There are 12,849 total observations and 10,922 are used in the analysis. More educated women are more likely to respond to question 1. Women who are cohabitating with their partner are more likely than never married women to respond to question 2.

Mali 2006: There are 14,583 total observations and 11,920 are used in the analysis. Older women are more likely to respond to question 1. There are no systematic differences in response rates to question 2.

Mali 2012: There are 10,424 total observations and 9,202 are used in the analysis. Older women are more likely to respond to question 1. There are no systematic differences in response rates to question 2.

Niger 1998: There are 7,577 total observations and 1,960 are used in the analysis. Note that the majority of observations are dropped due to missing information for question 1 and question 2. Older and more educated women are more likely to respond to both questions. Currently married women are more likely and cohabitating women are less likely than never married women to respond to both questions.

Niger 2006: There are 9,223 total observations and 3,471 are used in the analysis.

Older and more educated women are more likely to respond to both questions. Currently married women are more likely than never married women to respond to both questions.

Niger 2012: There are 11,160 total observations and 4,474 are used in the analysis. Older and more educated women are more likely to respond to both questions.

Nigeria 1999: There are 9,810 total observations and 5,096 are included in the analysis. We find that older women are more likely to respond to both questions. Never married women are least likely to respond to both questions.

Nigeria 2003: There are 7,620 total observations and 3,242 are used in the analysis. Older and more educated women are more likely to respond to question 1. Currently married and divorced women are more likely than never married women to respond to question 1. There are no systematic differences in response rates to question 2.

Nigeria 2007: There are 36,131 total observations and 10,276 are used in the analysis. Older and more educated women are more likely to respond to both questions. Never married and widowed women are less likely than currently married women to respond to both questions.

Nigeria 2008: There are 33,385 total observations and 15,369 are used in the analysis. Older and more educated women are more likely to respond to both questions. Currently married women are more likely than never married women to respond to both questions.

Nigeria 2011: There are 39,932 total observations and 8,268 observations are used in the analysis. More educated women are more likely to respond to both questions. Older women are more likely to respond to question 2. Never married women are less likely than currently married women to respond to both questions. Cohabitating women are more likely than currently married women to respond to question 1.

Nigeria 2013: There are 38,948 total observations and 21,336 are used in the analysis. Older and more educated women are more likely to respond to both questions. Never married women are least likely to respond to both questions.

Senegal 2005: There are 14,602 total observations and 12,244 are used in the analysis. Older and more educated women are more likely to respond to both questions. Currently married and cohabitating women are more likely than never married women to respond to both questions.

Senegal 2010: There are 15,688 total observations and 13,160 are used in the analysis. We find that older women and those who have attended secondary school are more likely

to respond to both questions.

Sierra Leone 2005: There are 11,213 total observations and 7,354 are used in the analysis. Older women are more likely to respond to both questions. Never married women are less likely than currently married women to respond to both questions.

Sierra Leone 2008: There are 7,374 total observations and 6,579 are used in the analysis. Older women are more likely to respond to both questions.

Sierra Leone 2010: There are 16,616 total observations and 7,232 are used. Older and less educated women are more likely to respond to both questions. Never married and separated women are less likely than currently married women to respond to question 1.

Togo 2006: There are 8,176 total observations and 4,178 are used in the analysis. Older and more educated women are more likely to respond to both questions. Never married women are less likely than currently married women to respond to both questions. Separated women are more likely than currently married women to respond to question 1.

Togo 2010: There are 8,914 total observation and 3,843 are used. Older and more educated women are more likely to respond to both questions.

A.4 Tables

Table A.1: Cross-Country Regression Results for the Contribution of Various Levels of Variation to the Variation in Support for FGC

	Village Contribution	Household Contribution	Unobserved Individual Contribution
Proportion of Women Who Have Undergone FGC	-0.062**	-0.122**	0.187***
	(0.023)	(0.060)	(0.064)
Constant	0.150***	0.716***	0.123***
	(0.014)	(0.037)	(0.040)
Observations	38	38	38
R-squared	0.166	0.104	0.193

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix B

Appendix—Persistent Norms and Tipping Points

Table B.1: LPM Estimation Results for Whether Girl Underwent FGC—Squared Term for Rate of FGC in Community Included

	(1) Province-Ethnic Cohort	(2) Department-Ethnic Cohort	(3) Province-Ethnic Rural Cohort	(4) Province-Ethnic Catholic Cohort	(5) Province-Ethnic Muslim Cohort
Rate of FGC in Community	0.286*	0.311**	0.281	0.395*	0.083
	(0.147)	(0.140)	(0.184)	(0.200)	(0.250)
Rate of FGC in Community^2	0.264*	0.229*	0.274	0.039	0.388*
	(0.145)	(0.124)	(0.182)	(0.200)	(0.210)
Urban Household	-0.036*	-0.034		0.030	-0.055**
	(0.020)	(0.021)		(0.039)	(0.026)
Religion [Omitted: Catholic]					
Protestant	-0.035	-0.048	-0.019		
	(0.030)	(0.041)	(0.045)		
Muslim	0.075***	0.076***	0.096***		
	(0.015)	(0.017)	(0.021)		
Other	0.062**	0.045	0.060		
	(0.029)	(0.035)	(0.038)		
Constant	0.567***	0.640***	0.681***	0.699*	1.478***
	(0.164)	(0.183)	(0.203)	(0.362)	(0.211)
Observations	5,934	4,523	3,493	1,079	2,818
R-squared	0.215	0.238	0.229	0.297	0.214

Controls included: Ethnicity, religion, proxies for wealth, rural indicator, polygamy indicator, mother's year of birth FE, father's year of birth FE daughter's year of birth FE.
Standard Errors Clustered at the Province Level. ***p<0.01 **p<0.05 *p<0.1

Table B.2: Logit Estimation Results for Whether Girl Undergoes FGC—Marginal Effects Evaluated at the Mean

	(1) Province-Ethnic Cohort	(2) Department-Ethnic Cohort	(3) Province-Ethnic Rural Cohort	(4) Province-Ethnic Catholic Cohort	(5) Province-Ethnic Muslim Cohort
Rate of FGC in Community	0.767***	0.758***	0.782***	0.550***	0.699***
	(0.062)	(0.042)	(0.066)	(0.099)	(0.133)
Observations	5908	4501	3459	1035	2790
Pseudo R-squared	0.170	0.192	0.177	0.135	0.191

Controls included: Ethnicity, religion, proxies for wealth, rural indicator, polygamy indicator, mother's year of birth FE, father's year of birth FE daughter's year of birth FE.
Standard Errors Clustered at the Province Level.
***p<0.01 **p<0.05 *p<0.1