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Abstract

Female genital mutilation (FGM) is still a widespread practice in certain parts of Africa, including Egypt. This practice is closely related to the position of women in these societies/communities. The improvement of the social position of women, i.e., their empowerment is then also considered, by both researchers and international organizations, as a strategy towards the eradication of FGM. This study examines whether the mother's female autonomy affects girls likelihood of being cut. Three distinct components of female autonomy are distinguished: the resources a woman possesses, her environment, and her decision autonomy. While the latter forms to core of female autonomy, the former two are directly linked to modernization.

This paper uses data from the 2005 *Egypt Demographic and Health Survey*. Only currently married women with at least one unmarried daughter were retained in the effective sample ($N = 11,837$), as were their unmarried daughters aged 18 or less ($N = 21,057$). OLS and multilevel logistic regression techniques are used to examine how the three components of female autonomy affect the likelihood of girls being cut, with the mother's knowledge and attitudes regarding FGM as intermediate variables.

The results show that that the core component of female autonomy, decision autonomy has a weak direct effect on the intent to cut. However, in combination with the woman's knowledge and attitudes regarding FGM decision autonomy does have a clear effect on the likelihood of girls being cut. Furthermore, a mother's education level and household wealth do have significant effects on girls being cut, as does the respondent's knowledge and attitudes regarding FGM. The latter two are in turn influenced by the resource and environment components of female autonomy, i.e., by modernization processes.

Empowerment strategies therefore may be successful to combat FGM, but not because they increase female decision autonomy. Rather, they may be successful because they also improve the social status of women and change their knowledge and attitudes regarding FGM, which makes them less inclined to favor FGM.

Female Autonomy and Female Genital Mutilation in Egypt

Introduction

Female genital mutilation (FGM), also known as female genital cutting or female circumcision, is still widespread in certain parts of Africa. The *World Health Organization* (WHO) estimates that worldwide between 100 and 140 million women have been cut (World Health Organization (WHO) 2008b), of which about 91.5 million in Africa. They also estimate that annually about three million girls in Africa undergo the practice. Another study estimates the number of cut women over the age of 15 in Africa at somewhat less than 80 million (Yoder and Khan 2008).

FGM should to be seen in the context of the social status and position of women and of the gender inequality in these societies. Countries where FGM is prevalent also have high gender inequality. International organizations emphasize female empowerment as one strategy to eradicate FGM (OHCHR et al. 2008). This paper examines the effect of female autonomy of Egyptian women on whether their daughters are cut. Female autonomy is expected to affect FGM both directly and indirectly (through knowledge and attitudes).

In Egypt, FGM is nearly universal: over 95% of women between 15 and 49 years old are circumcised, and this proportion remains fairly constant across all cohorts (Ministry of Health and Population and National Population Council 2006 and own calculations). These figures suggest that the prevalence of FGM remains both high and stable. However, El-Gibaly et al. (2002) argue that the EDHS systematically overestimates the prevalence of FGM as their estimates are based on a sample of ever-married women between 15 and 49 years of age and therefore remain blind for recent changes in the younger cohorts. Their own research on a representative sample of girls aged 10-19 shows a clear decline of the practice, with as much as 10% compared to the mothers. Other studies confirm these results (Yount 2002; Hassanin, Saleh, Bedaiwy, Peterson, and Bedaiwy 2008).

WHO distinguishes 4 types of FGM (2008a). In Egypt types I (clitoridectomy) and II (clitoridectomy + (partial) removal of the labia minor) are the most frequent ones (Assaad 1980). Type III (infibulations) is fairly rare as is type IV (other forms). The practice usually takes place before puberty (Hassanin et al. 2008). The median age at circumcision is 10 years of age, and almost all girls are cut before their 13th birthday (El-Zanaty and Way 2006). Traditionally, the cutting was done by

Dayas, traditional midwives, but over the last few decades there are clear signs of the medicalization of the practice (El-Gibaly et al. 2002; Hassanin et al. 2008). The 2005EDHS estimates that currently more than 70% of the cuttings are performed by doctors and only 22% by Dayas (El-Zanaty and Way 2006).

For over half a century Egypt has been pursuing, to little effect, policies to discourage and ban FGM. Already, in 1959 Nasser banned infibulation and decreed that other types could only be performed by schooled medical personnel (Boyle and Preves 2000). In the following decades some more measures were imposed, usually as a response to some scandal and ensuing international pressures. For instance, in the mid-90s hospitals and doctors were forbidden to perform the practice, but only in 2007 it was formally banned after public outcries about the death of another girl as result of the practice (Maki and Population Reference Bureau 2008; Hassanin et al. 2008; Michael 2007; Hauslohner 2007).

An important reason for the failure of these policies is that FGM still enjoys the support of a large majority of the population (Boyle and Preves 2000). Among the ever-married women in the 2005EDHS only 23.3% favored its discontinuation (El-Zanaty and Way 2006). Religion is an important factor here: no less than 60.8% of the women in the 2005EDHS believed that FGM was required by their religion. Although some prominent Islamic leaders have recognized that Islam does not require women to be cut (Allam et al. 2001) and even though the country's supreme Islamic authorities reiterated it was prohibited (Michael 2007; Hauslohner 2007), many Islamic religious leaders still accept or even support the practice. In Egypt (as elsewhere), Islam certainly contributed the legitimization of FGM (Gruenbaum 2001; Hicks 1993; Assaad 1980). One of the reasons legislation against FGM was never enforced was not to anger the conservative religious groups that support the practice. As recent as 1994 the president of the Al-Azhar university issued a fatwa legitimizing FGM (Boyle and Preves 2000).

Theoretical background

FGM is thoroughly entrenched in the communities that practice it. It is rarely challenged and many people accept it as a normal part of growing up as a woman. Both researchers and community members name a wide range of reasons (and potential rationalizations) for the practice: religious duty, tradition, esthetic standards, femininity, purity, honor, control over female sexuality, rite de passage, etc. (Jones, Ehiri, and

Anyanwu 2004; Rajadurai and Igras 2005; Shaaban and Harbison 2005; Yoder, Camara, and Soumaoro 1999; Hassanin et al. 2008; Lee 2007; Shaaban and Harbison 2005; James and Robertson 2002b; Gruenbaum 2001; Hicks 1993). The marriagebility of daughters, in particular, is often mentioned as a reason to engage in FGM (Almroth et al. 2001; Baker, Gilson, Vill, and Curet 1993; Gruenbaum 2001; Gruenbaum 2006; James and Robertson 2002a; Jones et al. 2004; Missailidis and Gebre-Medhin 2000; Shaaban and Harbison 2005; Shell-Duncan 2001; UNFPA, United Nations Population Fund 1997; Walley 2002; World Health Organization 1986). Parents fear than non-circumcised daughters will do less well on the marriage market, have more difficulties finding a spouse, or will have to be satisfied with a lower status spouse.

All these explanations have in common that they link FGM to the social position of women, i.e., to the stratification system of these societies. Several international organizations issued a statement in which they linked FGM to gender inequality, and advocated female empowerment to eradicate the practice (OHCHR et al. 2008). A woman's control over her own sexuality and reproductive health is recognized as a human right (United Nations 1996). Structuration theory and related models (Giddens 1973; Elias 1988; Bourdieu 1977) emphasize that social inequalities are reproduced and potentially transformed through everyday practices and relations. Female circumcision is one practice, among many, that reproduces the social position of women (Toubia and Sharief 2003). This is not simply a question of patriarchate or male domination (Epstein 2007) as FGM not only reflects the social position of women with respect to men, but also with respect to other women and as members of the community. Women play an important role in maintaining the practice as their social status and position are linked to their roles as wife and mother. By safeguarding the status and marriagebility of their daughters they also secure their own status (Gruenbaum 2001; Walley 2002). From this perspective and given the circumstances having one's daughter cut is rational, and in many cases it is the women themselves who support and promote this practice and who are actively involved in perpetuating it.

In relatively closed societies the extended rather than the nuclear family or the individual is the main unit of social organization and status. The identity and status of an individual depend largely on the family he or she belongs to (Hicks 1993). Marriage in these societies is an important source of status for women as well as for their families. Hence maximizing the marriage chances of daughters is crucial, even if it requires having them cut. Parents who do not have their daughters cut can even be accused of endangering their daughter's future (Lee 2007; James and Robertson 2002b; Gruenbaum 2005; Gruenbaum 2006). Honor and virtue are

important aspects of family status that depend on the behavior of its members. For women this often implies strict rules about sexuality and about interactions with men, this to assure that women enter the marriage as a virgin and will remain faithful to their husbands (Gruenbaum 2001; Hicks 1993; Nordenstam 1968). Inappropriate sexual behavior, especially of women, can inflict substantial damage to the honor and status of their family, and therefore needs to be prevented. Assaad (1980), for instance, mentions that many in Egypt still consider the loss of virginity prior to marriage as a disgrace for the family, and that it still motivates honor killings of daughters. FGM is one of the strategies, besides dress codes, limitations on the contact between sexes, etc, used by societies to control the sexuality of women. Circumcision is often considered a guarantee that a girl will remain a virgin until marriage, which will improve her marriagebility (Almroth et al. 2001; Baker et al. 1993; Gruenbaum 2001; Hicks 1993; Missailidis and Gebre-Medhin 2000; UNFPA, United Nations Population Fund 1997; World Health Organization 1986; James and Robertson 2002b; Epstein 2007; Gruenbaum 2006; Gruenbaum 2005; Freymeyer and Johnson 2007). FGM, therefore, is a way to safeguard the virginity and honor of daughters by curtailing their sexuality, and thus assuring the status of families.

Douglas (2004) pointed to the use of terms such as "dirty" and "purity" when defining a community's moral code and appropriate behavior, and to that the use of such terms increases when the boundaries between different statuses become more outspoken. Societies or communities where FGM is common tend to have a more strict separation between male and female roles and statuses. Being cut labels a women as clean and therefore of a high moral standing (Epstein 2007; Lee 2007; Gruenbaum 2005), a view that is further reinforced by esthetic criteria and opinions about sexual attractiveness (Gruenbaum 2006; James and Robertson 2002a).

Being cut or not, not only determines the moral standing of a woman, but also her social identity and status within the community (Gruenbaum 2001; Jones et al. 2004; Little 2003; Rajadurai and Igras 2005; Toubia and Sharief 2003; World Health Organization. 1999; Walley 2002). Being cut may stress the subservient position of women in society, but it also symbolizes her entry in the world of women and confirms her as full member of the community (Assaad 1980; Walley 2002). Non-circumcised women run the risk to be treated as outcasts, as immoral women. In such communities not being cut leads to stigmatization and loss of status, not only for the woman in question but for her entire family as well (Gruenbaum 2005; Epstein 2007; Rajadurai and Igras 2005). Mothers, therefore, are under considerable social pressure to have their daughters cut (Freymeyer and Johnson 2007; Jackson et al. 2003; Mackie 2000). The social costs

of not having one's daughter cut can be quite substantial: loss of status, lower marriage opportunities for their daughters, social exclusion, etc. Several studies have indeed observed that non-circumcised women were excluded by their community (Almroth et al. 2001; Gruenbaum 2005; Gruenbaum 2001; Gruenbaum 2006; Yoder et al. 1999; Shell-Duncan 2001). FGM is part of women's socialization into their adult roles, where they learn how to behave towards their (future) husband and family, and what their role is within the community (Yoder et al. 1999; Shaaban and Harbison 2005).

Because the family constitutes the primary unit of status, decisions pertaining to this status, such a those concerning FGM, tend to be family affairs. The extent that women weigh in on these decisions depends on their position within the family and community. This means that in many cases, mothers have little control over whether their daughters will be cut or not. For this reason, several international organizations suggest improving female status or female empowerment as a strategy to fight FGM (OHCHR et al. 2008). One assumes that when women obtain more effective decision-making power regarding their own life in general and regarding their own and their children's (reproductive) health in particular, they will become less inclined to have their daughters cut. This assumption is supported by evidence that, for instance, better educated women are more inclined to oppose FGM (Freymeyer and Johnson 2007; Population Reference Bureau 2001; Mandara 2004; Hassanin et al. 2008; El-Gibaly et al. 2002). More emancipated women with greater autonomy are not only expected to be guided less by tradition and less subjected to social control, but also to have better knowledge of the benefits and costs of FGM and to hold more modern, i.e., more western, attitudes, which makes them less inclined to support this practice. For these women and their daughters marriage no longer is the only way to obtain status as they possess of alternative routes of status attainment.

The literature distinguishes between "status", "empowerment" and "autonomy" (Sen and Batliwala 2000; England 2000). Although these three concepts overlap considerably, there are some important differences. A woman's status refers to her position within the system of stratification (Sen and Batliwala 2000; Mason 1986).The status of women is determined by two systems of stratification: 1) the socio-economic system stratification which allocates means across households, and 2) the system of gender stratification that affects the division of means and power within the household (Mason 1986). A woman, therefore, can have low status because she is a member of a poor household, or because she is a woman, or both.

Empowerment emphasizes the process by which women from a subservient position can gain power and control over their own life, and thus improve their *de facto* status (Sen and Batliwala 2000; Malhotra, Schuler, and Boender 2002; Kabeer 2000). Characteristic for empowerment is the emphasis on the process by which women obtain control, on the presence of power differences, and on the active involvement of women themselves (Sen and Batliwala 2000; England 2000; Kabeer 2001; Malhotra et al. 2002; Basu and Koolwal 2005). The latter refers to an increase in the self-confidence of women, their self-efficacy, self-image, bargaining skills, knowledge, beliefs, attitudes, etc. Williams (2005) argued that this implies that women challenge the existing gender stratification system, and go in against the dominant gender norms. Essential to this concept is that women gain power and capabilities that they did not have previously, often despite resistance from their environment (Kabeer 2001).

The female autonomy or empowerment model of behavioral change stresses the ability of women to make their own decisions and the structural factors that affect this, and this in contrast to the dominant social-cognitive models that emphasize knowledge and attitudes. Nevertheless, the latter models do provide opportunities to incorporate female autonomy. For instance, the theory of planned behavior stresses the role of (perceived) behavioral control and self-efficacy (Ajzen 1991; Ajzen 2002; Fishbein and Cappella 2006). According to this model (perceived) behavioral control not only affects the intentions of actors, but also how these intentions translate into actual behavior. These concepts refer to the internalized aspects of female autonomy, to (social-)psychological factors that affect decision autonomy, while the female autonomy model stresses the relationship between the actor and her environment.

In this study the emphasis is on autonomy which refers to the extent that women have effectively acquired such power and control, irrespective of whether this is the result of an empowerment process or not. The classic definition of female autonomy by Dyson and Moore (1983:45) is: "[…] the capacity to manipulate one's personal environment. Autonomy indicates the ability—technical, social, and psychological—to obtain information and use it as the basis for making decisions about one's private concerns and those of one's intimates." The term autonomy has a double meaning, namely: 'autonomy to', and 'autonomy from' (Basu and Koolwal 2005). The former refers to the ability of women to make decisions regarding themselves and their immediate surroundings (e.g., children, household), and the latter to the degree that they can make such decisions independently from others (Dyson and Moore 1983; Malhotra et al. 2002; Jejeebhoy 2003; Hindin 2000; Mason 1986).

At the heart of female autonomy lies the decision autonomy of women, the agency they have to make decisions (Kabeer 2001). This decision

autonomy involves a multitude of processes and skills, among which the abilities to collect information, to process and analyze it, to reflect on it, to bargain and negotiate, to manipulate one's environment, etc. Decision autonomy is domain specific and female autonomy can vary substantially over domains. This paper focuses on autonomy regarding their own life and their household, but the argument can extended to other domains, such as female autonomy regarding labor force participation or political participation. The United Nations (1996) recognizes a woman's right to control her own sexuality and reproductive health, and thus her autonomy in these domains (Sen and Batliwala 2000).

However, one has to keep in mind that the decision to cut one's daughter rarely is purely an individual decision of the mother, but usually also involves the husband and other family members. Yount (2002) remarks that although mothers tend to decide whether or not to have their daughters cut, this decision is heavily constrained by their environment. Given the subordinate status of women in Egypt society and the extent that FGM is embedded in tradition and linked to family status, mothers are subjected to considerable family and community pressure to have their daughters cut. A recent study on FGM decision making in Senegambia (Shell-Duncan, Hernlund, Wander, and Moreau 2010) confirms that multiple family members are involved in the decision and that there is considerable social pressure to conform to tradition. The extent that women can weigh in on this decision depends to a large extent on the freedom and decision autonomy they are permitted by their social environment regarding this issue.

Decision autonomy has both intrinsic (subjective) and extrinsic (objective) aspects. The former refers to internalized, personality and psychological factors, while the latter points to the social position of the woman, i.e., to structural conditions. These include both the resources possessed by the woman and her social environment. The literature not only connects female autonomy to these components on a theoretical level but also often operationalizes female autonomy using these structural conditions as proxies (Kishor 2000; Hindin 2000; Malhotra et al. 2002; Sen and Batliwala 2000). These structural conditions shape the opportunity structure for female autonomy (Dixon-Mueller and Germain 2000). The distribution of resources, material and non-material ones, over the actor and her environment shape the opportunity structure for decision making. The ability of a woman to make decisions depends on her power relations with others.

Among the resources that affect a woman's decision autonomy are the various forms of capital she can possess: economic, human, social and cultural. This capital enhances the capacity of women to make decisions and may help to overcome environmental constraints. In the literature much attention has been paid to education and labor force participation as forms of capital that enhance female autonomy (Hindin 2000; Malhotra and Mather 1997). Several studies indeed show that a mother's education level negatively effects the probability of their daughters to be cut (Freymeyer and Johnson 2007; Population Reference Bureau 2001; Mandara 2004; Hassanin et al. 2008; El-Gibaly et al. 2002). However, the possession of such capital is not a sufficient (nor a necessary) condition for female autonomy. One's social environment must enable or at least allow women to make such decisions. In the societies practicing FGM, however, severe social constraints are placed on women's rights to make these decisions. The social environment affects a woman's decision autonomy at various levels (Sen and Batliwala 2000; Kabeer 2001).

For instance, at the national level female autonomy may be limited because of discriminating legislation that limits the rights of women (to work, to vote, to receive education, to inherit, etc.) and that maintain gender inequality, or because of inadequate provisions for women (such as education or health services), the lack of political representation, the presence or absence of women's organizations, etc. At the community level factors concerning the diversity within and the closure of the community may affect female autonomy. More heterogeneous or less closed communities not only provide access to a wider range of information, but also exert less consistent social control over their members, and thus provide more opportunities for autonomy. The integration of a woman in the community, for instance, because of the presence of strong family(-in-law) network may also influence her autonomy, and so can the presence or absence of certain services or organizations (e.g., health services, NGOs, …). The most immediate environment affecting a woman's autonomy is her household and family. For instance, the socio-economic background of one's husband, his education and how traditional he is, and the SES of the household may affect a woman's autonomy. The presence of other family members, such as parents or parents-in-law, may undermine a woman's decision autonomy.

The empowerment of women and the accompanying increase in female autonomy can only occur because of an overall improvement in the status of women (OHCHR et al. 2008), often linked to processes of modernization: urbanization, increased education, industrialization, rationalization, individualization, emotional nuclearization, etc. (Freymeyer and Johnson 2007; Yoder et al. 1999; Shell-Duncan and Hernlund 2000; Leonard 1996). Education is often seen as the key factor here, spreading modernity across society. Improving women's education is of considered the core strategy to improve female status. In combination with employment in modern sectors of the economy, education provides women with alternative routes of status attainment. Marriage no

longer is to only way for women to obtain status, and thus the social 'need' to have one's daughters cut is lessened. Modernization not only affects women's social position and thus female autonomy directly, but also will affect their knowledge and attitudes as well, which indirectly will impact on their status and autonomy (Hindin 2000). With regard to FGM it not only affects women's ability to make decisions regarding whether their daughters will be cut, but also women's knowledge about FGM and their attitudes toward it. Better educated women, for instance, will have more accurate knowledge about the dangers associated with FGM, will be more individualistic in their outlook and less committed to tradition or family-obligations, and be less committed to FGM for status attainment, and thus be more inclined to reject FGM. For instance, Allam et al. (2001) found that among the most modernized group in Egypt, i.e., university students, the support for FGM was substantially lower than in the rest of society. Only 28% of the students supported it. Those favoring its abolishment also had better knowledge of the dangers of the practice and tended to deny its advantages. Giddens (1990) points out that modernization brings a fundamental change in the reflexivity of actions. While in traditional cultures reflexivity is integrated with the existing social organization, modern reflexivity (re-)evaluates social practices in the light of new information and is therefore more transformative than reproductive.

Modernization therefore not only affects women's autonomy but also their knowledge and attitudes regarding this practice. Decision autonomy is a double edged sword, it can be used both to change behavior and to uphold traditions. Decision autonomy is a tool that actors can use for various goals. Thus, decision autonomy will only contribute to stopping FGM if the woman no longer wants her daughters to be cut. For women who still support the practice decision autonomy will contribute to the cutting of the daughters. This argument is similar to Coale's classic argument about the first demographic transition, namely that to change behavior one needs to be ready, willing and able to change one's behavior (Coale 1973; Lesthaeghe and Vanderhoeft 2001). Female autonomy here is an aspect of the ability component of this model, but to be successful in the fight against FGM, women also need to be ready and willing to stop the practice. It also is only a single component of ability, as a woman's ability to weigh in on the decision to have her daughter cut also depends on the social and cultural organization of this decision, i.e., to what extent this decision is made at the household, family or community level.

This study examines how female autonomy of the mother affects whether daughters are cut. According to the model, women who have more autonomy will be less inclined to have their daughters cut. This expected relationship holds for all three components of female autonomy: the

resources of a woman, her environment, and her decision autonomy. The former two components, however, are structural aspects related to modernization that will, among others, also affect the knowledge and attitudes of women which in turn may influence the cutting of girls. The structural effects of female autonomy therefore will have both direct effects on the cutting of girls and indirect ones through both decision autonomy and through women's knowledge and attitudes.

Data and methods

SAMPLE

This study makes use of the data from the 2005 Egypt Demographic and Health Survey (Ministry of Health and Population and National Population Council 2006). For more details on the study design, see the official report (El-Zanaty and Way 2006). The target population of this survey was ever married women between 15 and 49 years of age. The total sample consists of 19,474 women. For this study only currently married women with at least one unmarried daughter still living at home were retained, which resulted in an effective sample of 11,837 respondents. We also selected information on their daughters with a maximum of seven daughters who were still living at home and whose FGM status was known. This resulted in a daughter sample of 21,057 observations.

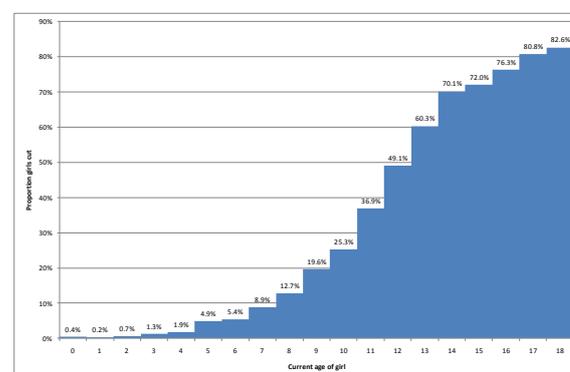### VARIABLES

DAUGHTER-LEVEL VARIABLES

Figure 1: Proportion of girls who experienced FGM, by age

The outcome variable is whether or not a girl has been cut. Of the girls in the sample only 28.8% were cut, but this varies strongly by age (see Figure 1). While less than 1% of girls under age one were

cut, about 20% of the nine-year-olds were cut, and over 80% of those aged 17 or 18. The current age of the girl is included in the analysis as a control variable as the chance of being cut varies by age. Of those who were cut, the median age at which cutting occurred was 9 years.

Female autonomy

Female autonomy, as used in the literature, consists of various components: a woman's decision autonomy, the resources she possesses, and her environment. The decision autonomy is at the core of the concept of female autonomy while the two other components shape the conditions for decision autonomy. Kishor (2000) makes a similar distinction when she identifies both indicators that "give evidence of empowerment" and indicators that capture the sources and settings for empowerment.

Decision autonomy. Decision autonomy refers to how decisions are made in the household and the family and the role of woman in these decision-making processes, and thus to the power relations in the household. In the literature decision autonomy has been operationalized in various ways. Four indicators for decision autonomy were created, each providing in their own way evidence of empowerment (Kishor 2000), and capturing a different aspect of it.

The first indicator captures the extent to which women can decide to obtain medical care for themselves: whether getting permission to go or getting the money needed for treatment would pose a big problem or not. When the respondents indicated these items were not a big problem a score of +1 was given. Only 6.6% of the respondents scored the minimum value (0), while 64.2% scored the maximum (2), indicating that most Egyptian women encountered few obstacles to obtain medical care for themselves. The second index measures the participation of the respondent in household decisions regarding health care for oneself, major purchases, daily purchases and visits to family or relatives. For each of the domains that the respondent reported that she could decide alone she obtained a score of +2 and for each domain for which she had could make a decision jointly with her husband she obtained a score of +1. This index has a range from 0 to 8 with a mean of 3.9 (SD = 1.8). Only 9.4% score 0 or 1 and 6.2% obtained a score of 7 or 8.

The third indicator measured the extent to which respondents could decide how the household income was spent. Separate questions were asked about the income of the respondent and that of her husband. The scoring was analogous to the second indicator, with a range from 0 to 4. The mean score here is 0.9 (SD = 0.7), and 53.7% of the respondents score 1 on this indicator and only 0.4% the maximum score of 4. Egyptian women overall have little to say in how household income is spent. As being beaten is one indicator of a woman's subordination (Kishor 2000), the respondent's attitude regarding domestic violence captures the respondent's acceptance of gender inequality within the household, and thus pertains to the self-efficacy component of decision autonomy. The respondents had to indicate in which of five situations it is ok for a man to beat his wife. For each situation that one indicated it was not ok to beat one's wife a score of +1 was given. The variable has a range of 0 through 5 with a mean of 3.1 (SD = 2.0). 45.9% of the respondents obtained the maximum score on this variable, but still 30.7% score 0 or 1. This indicates that the respondents are quite divided about whether wife beating is acceptable or not.

Table 1: Polychoric correlations among decision autonomy indicators

		1	2	3	4
1	Getting medical help for self	1.00			
2	Household decision making	0.10	1.00		
3	Decision spending earnings	0.23	0.37	1.00	
4	Acceptance of wife beating	0.24	0.15	0.24	1.00

note: all coefficients significant at p < 0.001.

Table 1 shows that although all four indicators of decision autonomy are significantly correlated, the correlations are quite weak. They all capture different aspects of decision autonomy as they either measure decision autonomy in different domains of everyday life or the power relation between husband and wife. It worth noticing that the ideas of decision and female autonomy remain conceptually underdeveloped and that no established measures exist for this concept.

Resources. A second component of female autonomy are the resources a woman possesses, her capital, and which she can use to improve her position and power versus others in the household and family. These resources create the conditions under which women can acquire decision autonomy. In the literature they are often used as proxies for female autonomy, i.e., for decision autonomy. The most commonly used resource indicators are the woman's education and her labor force participation (Dyson and Moore 1983; Kishor 2000; Kabeer 2001; Kishor and Neitzel 1996). In this study we include the level of education of the respondent and her occupation as indicators of the resources she possesses. A large minority (37.0% or 4.374/11,837) stated to have no formal education, while another 11.5% (1,362/11.837) did not complete primary education. Only 37.5% (4,442/11,837) of the respondents had completed high school. The overwhelming majority of the respondents (77.4% or

9,159/11,837) did not formally participate in the labor force. Those who did work, were found mainly in professional, technical or management occupation or in agriculture.

Environment. As a woman's autonomy is also dependent on her environment, on the extent it supports or opposes her taking decisions, several indicators for environmental support of female autonomy are included in the analysis. A first variable is the spousal age difference. A husband considerably older than the wife tends to point to a large power inequality between the partners (Casterline, Williams, and McDonald 1986; Casterline et al. 1986; Kishor 2000; Mason 1986). In this sample the husband is on the average 7.0 years older (SD = 5.4 years) than his wife and the modal age difference was 5 years. In 20% of the cases the husband was 10 or more years older than the wife, while iIn only 3% of the cases was the wife older than the husband.

The education level of the husband is a proxy for his attitudes toward gender equality and household roles. The assumption is that better educated husbands will be more tolerant regarding gender equality in the household. The husbands tend to be better educated than their wives, 22.8% (2,697/11,837) had no formal education while 45.3% had completed high school and 13.7% had even higher education. The DHS wealth index captures the economic status of the household (Rutstein and Johnston 2004). This variable is factor score based on the presence of assets in the households. Wealthier households should provide more room for female autonomy.

The presence of parents-in-law in the household also limits the power of the woman in her household (Jejeebhoy and Sathar 2001; Kishor 1995; Kishor 2000; Hatem 1992; Eft and Russ-Eft 2005). This is measured using a binary variable with a value of 1 when parents-in-law live in the household, and 0 otherwise. 18.8% (2,230/11,837) of the respondents report that they live together with their parents-in-law.

Urbanization is a major component of modernization which tends to diffuse from urban centers to rural areas, type of place of residence was also included as a measure for the environment component of female autonomy. Almost three fifths (59,8% or 7,074/11,837) of the respondents lived in rural areas, 14.0% lived in the capital and 21.0% in smaller towns.

Knowledge and attitudes regarding FGM. Indicators about the respondent's knowledge and attitudes regarding FGM are also included in the model. The social-cognitive models of behavioral change do stress their importance. The index about the respondent's knowledge regarding FGM measures the extent to which the respondent recognizes the dangers of this practice, and denies the 'benefits' of it. Benefits included the beliefs that men prefer brides who are cut and that cutting prevents adultery. Dangers of FGM included beliefs that childbirth is more difficult for a cut woman and that the practice can lead to the death of a girl. This resulted in an index with a score of 0 through 4, where a higher score indicated that the respondent was quite aware of the dangers of FGM and denied its 'benefits'. The mean score on the variable was only 1.0 (SD = 1.1). Almost half of the respondents (48.7% or 5,759/11,831) scored the minimum of this variable, meaning that they did not recognize the dangers and still saw the benefits, while only 3.0% (360/11,831) scored the maximum. 19% of the respondents disagreed that men preferred a cut wife, and 30% disagreed that FGM prevents adultery. 15% recognized that FGM may make childbirth more difficult and 32% that it may cause the death of girls.

The respondent's attitude regarding FGM was measured using two items: whether one believes that FGM is a religious tradition, and whether one beliefs that the practice should be continued. If one answered that FGM is not a religious tradition or that the practice should be discontinued one scored +1 on this measure. The range of the attitudes variable therefore is 0 through 2. A higher score indicated a more negative attitude towards FGM. The overwhelming majority of the respondents (72.9% or 8,617/11,825) scores the minimum and thus is still quite committed to the practice. Only 15.5% (1,827/11,825) scored the maximum and opposed FGM.

Background characteristics. As background variables we included the age of the respondent (in years), the region where she lives, her religion (Christian vs. Muslim) and whether the respondent is cut herself. The latter two indicators capture the tradition factor. The mean age of the respondents is 33.5 years (SD = 7.7 years). Because we only retained married women with at least one daughter we skewed the age distribution upwards. Only 3.2% of the respondents are 20 years of age or younger while 20.8% is older than 40 years.

The overwhelming majority of the respondents are Muslim (94.8%), the others are Christians. In the effective sample 95.9% (11,348/11,828) of the women reported to be cut. However, there may be overreporting here. Studies have found that women may give socially preferable answers (Jackson et al. 2003; Huntington, Nawar, Abdel Tawab, and Hegazi 1996). For instance, a study in Egypt in which a self-report of FGM status was followed by a gynecological examination gave only an accuracy of 92% for the self-report (Huntington et al. 1996), and it were the non-cut women that were more likely to provide an inaccurate answer.

Results

KNOWLEDGE AND ATTITUDES

Modernization not only affects the position of women and thus their autonomy, but also their knowledge and attitudes. These are core aspects of individual modernization. Table 2 shows the results of regression analyses on the knowledge and attitudes regarding FMG variables. As predictor variables are included the control variables, the resources and the environment variables. The control variables are the strongest predictors of both attitudes and knowledge regarding FGM. There are clear regional differences on both variables where respondents living in the urban governorates tend to have both a better knowledge about the danger of FGM and a more anti-FGM attitudes than those of the other regions. Upper Egypt respondents tend to score worst on both indicators. The tradition variables also prove to be important predictors of both outcomes. Christians and uncut women tend to be more aware of the dangers of FGM and have more negative attitudes toward it than Muslim and cut women.

Of the resource component of female autonomy only the education level is an important predictor of knowledge and attitudes, while labor market participation has little or no effect. Better educated women are more aware of the dangers of FGM and less favorable to the practice. This finding confirms that education is indeed a major carrier of modernization. On the other hand, one cannot argue that women who are active on the labor market differ substantially from non-working women with regard to knowledge about and attitudes toward FGM. Only women working in clerical jobs tend to be more aware of the risks of FGM and less favorable towards FGM than non-working women. Of the environmental factors only two variables had an effect on knowledge and attitudes: the wealth index, and urbanization. As expected, women who live in wealthier households tend to score significantly higher on both the knowledge and the attitudes variables than those living in poorer ones, and thus tend to be more critical towards FGM. A remarkable finding is that respondents living in the capital (Cairo) tend to have significantly less knowledge about the disadvantages of FGM than respondents who live elsewhere. This may be due to the larger degree of medicalization of the practice there.

Table 2: OLS regression results for knowledge and attitudes regarding FGM

b (β)	Knowledge	Attitudes
Constant	1.965***	1.316***
Control variables		
Region (ref: Urban governorates)	***	***
Urban Lower Egypt	-0.533***	-0.085**
	(-0.125)	(-0.030)
Rural Lower Egypt	-0.565***	-0.227***
	(-0.208)	(-0.127)
Urban Upper Egypt	-0.935***	-0.269***
	(-0.277)	(-0.121)
Rural Upper Egypt	-0.882***	-0.252***
	(-0.374)	(-0.162)
Frontier governorates	-0.424***	-0.019
	(-0.079)	(-0.005)
Religion: Christian vs. Muslim	0.305***	0.570***
	(0.060)	(0.170)
Age of respondent	0.003	0.001
	(0.018)	(0.012)
Respondent circumcised (vs. non-circumcised)	-0.925***	-0.954***
	(-0.161)	(-0.253)
Resources		
Occupation (ref: not working)	**	
Professional, Technical, Managerial	0.097*	0.018
	(0.023)	(0.007)
Clerical	0.185**	0.105**
	(0.027)	(0.024)
Sales	-0.003	-0.005
	(0.000)	(-0.001)
Agriculture - self employed	-0.112*	-0.026
	(-0.019)	(-0.007)
Agriculture – employee	0.047	-0.029
	(0.007)	(-0.006)
Services	0.096	0.056
	(0.011)	(0.010)
Skilled manual labor	0.012	-0.039
	(0.001)	(-0.005)
Unskilled manual labor	-0.212	-0.067
	(-0.015)	(-0.007)
Education (ref: no formal education)	***	***
Incomplete primary	-0.010	0.001
	(-0.003)	(0.001)
Complete primary	-0.030	0.045
	(-0.005)	(0.012)
Incomplete secondary	0.149***	0.102***
	(0.039)	(0.041)
Complete secondary	0.187***	0.190***
	(0.075)	(0.116)
Higher	0.287***	0.335***
	(0.071)	(0.126)
Environment		
Spousal age difference (partner - respondent)	-0.001	-0.001
	(-0.003)	(-0.005)
Education of husband (ref: no formal education)	*	
Incomplete primary	0.049	0.022
	(0.015)	(0.011)
Complete primary	-0.002	0.070*
	(-0.001)	(0.023)
Incomplete secondary	0.032	0.011
	(0.009)	(0.005)
Complete secondary	0.035	0.027
	(0.014)	(0.017)
Higher	0.132**	0.039
	(0.040)	(0.018)
Wealth index factor score	0.091***	0.079***
	(0.078)	(0.103)
Parent-in-law respondent in HH	-0.021	-0.005
	(-0.006)	(-0.002)
Urbanization (ref: capital)	***	*
Small city	0.411***	0.056*
	(0.148)	(0.030)
Town	0.384***	-0.014
	(0.076)	(-0.004)
Countryside	0.289**	0.035
	(0.126)	(0.023)
R^2 (controls)[a]	0.161***	0.198***
R^2 (controls + resources)[a]	0.187***	0.237***
R^2 (controls + resources + environment)[a]	0.198***	0.243***

Significance: * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$
[a]: significance levels refer to ANOVA tests.

Table 3: OLS regression results for indicators of female decision autonomy

b (β)	Decision autonomy			
	Getting medical help for self	Household decision making	Decision spending earnings	Acceptance of wife beating
Constant	1.166***	3.496***	0.601***	2.813***
Control variables				
Region (ref: Urban governorates)	***	***	***	***
Urban Lower Egypt	-0.037	-0.346***	-0.001	0.311***
	(-0.016)	(-0.050)	(0.000)	(0.040)
Rural Lower Egypt	-0.024	0.062	0.283***	0.059
	(-0.016)	(0.014)	(0.158)	(0.012)
Urban Upper Egypt	-0.015	-0.368***	-0.026	0.095
	(-0.008)	(-0.068)	(-0.012)	(0.016)
Rural Upper Egypt	0.082	-0.025	0.176**	-0.133
	(0.064)	(-0.007)	(0.113)	(-0.031)
Frontier governorates	-0.089*	-0.776***	0.039	0.536***
	(-0.031)	(-0.090)	(0.011)	(0.055)
Religion: Christian (vs. Muslim)	0.089***	-0.119	0.032	0.174*
	(0.032)	(-0.015)	(0.010)	(0.019)
Age of respondent	0.001	0.021***	0.003***	-0.003
	(0.016)	(0.088)	(0.030)	(-0.010)
Respondent circumcised (vs. non-circumcised)	0.037	0.208*	0.116***	0.137
	(0.012)	(0.023)	(0.031)	(0.013)
Resources				
Occupation (ref: no work)	***	***	***	***
Professional, Technical, Managerial	0.042	0.294***	1.211***	0.204**
	(0.019)	(0.044)	(0.443)	(0.027)
Clerical	0.032	0.279**	1.182***	0.082
	(0.009)	(0.026)	(0.265)	(0.007)
Sales	-0.072	0.520***	0.857***	-0.175
	(-0.014)	(0.035)	(0.139)	(-0.010)
Agriculture - self employed	0.088**	0.118	0.132***	-0.677***
	(0.028)	(0.013)	(0.035)	(-0.065)
Agriculture – employee	0.077*	0.359***	0.447***	-0.458***
	(0.021)	(0.032)	(0.099)	(-0.037)
Services	-0.032	0.531***	1.160***	0.071
	(-0.007)	(0.039)	(0.211)	(0.005)
Skilled manual labor	0.083	0.296	1.187***	0.156
	(0.014)	(0.016)	(0.160)	(0.008)
Unskilled manual labor	-0.099	0.837***	1.027***	-0.117
	(-0.013)	(0.036)	(0.109)	(-0.005)
Education (ref: no formal education)	***	***	***	***
Incomplete primary	-0.042*	0.211***	0.028	0.248***
	(-0.022)	(0.037)	(0.012)	(0.039)
Complete primary	0.013	0.222**	0.034	0.403***
	(0.004)	(0.025)	(0.009)	(0.040)
Incomplete secondary	0.057**	0.161*	0.064**	0.582***
	(0.028)	(0.026)	(0.026)	(0.085)
Complete secondary	0.126***	0.364***	0.090***	0.991***
	(0.093)	(0.091)	(0.055)	(0.220)
Higher	0.166***	0.277**	0.142***	0.998***
	(0.076)	(0.043)	(0.054)	(0.138)
Environment				
Spousal age difference (partner - respondent)	0.000	-0.002	-0.002	-0.001
	(0.000)	(-0.005)	(-0.013)	(-0.001)
Education husband (ref: no formal education)	***	*		***
Incomplete primary	0.025	0.001	-0.010	-0.044
	(0.014)	(0.000)	(-0.005)	(-0.008)
Complete primary	-0.004	-0.108	-0.013	-0.021
	(-0.002)	(-0.015)	(-0.004)	(-0.003)
Incomplete secondary	0.059**	-0.075	-0.007	0.072
	(0.030)	(-0.013)	(-0.003)	(0.011)
Complete secondary	0.103***	-0.171**	-0.026	0.154**
	(0.078)	(-0.044)	(-0.016)	(0.035)
Higher	0.120***	-0.180*	-0.019	0.283***
	(0.067)	(-0.034)	(-0.009)	(0.048)
Wealth index factor score (5 decimals)	0.163***	0.149***	0.046***	0.419***
	(0.256)	(0.079)	(0.060)	(0.199)
Parent-in-law respondent in HH	0.014	-0.132*	-0.060***	0.024
	(0.007)	(-0.021)	(-0.024)	(0.003)
Urbanization (ref: capital)	***	***	***	***
Small city	0.224***	-0.232***	-0.098***	-0.370***
	(0.149)	(-0.052)	(-0.054)	(-0.074)
Town	0.323***	-0.393***	-0.138***	-0.299**

	(0.118)	(-0.048)	(-0.042)	(-0.033)
Countryside	0.248***	-0.700***	-0.357***	-0.329
	(0.198)	(-0.189)	(-0.235)	(-0.079)
R^2 (controls)[a]	0.010***	0.057***	0.066***	0.098***
R^2 (controls + resources) [a]	0.080***	0.072***	0.414***	0.215***
R^2 (controls + resources + environment)[a]	0.123***	0.078***	0.419***	0.237***

Significance: * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$
[a]: significance levels refer to ANOVA tests.

DECISION AUTONOMY

At the heart of female autonomy lies decision autonomy. Table 3 contains the result of a series of linear regression analyses with the various indicators for decision autonomy as dependent variables, and the control variables, the resource and environment component indicators as predictor variables. The independent variables were added in blocks as indicated by the different determination coefficients provided at the bottom of the table. All blocks added significantly (at $p < 1\%$) to the explained variance for all outcomes. Only the final full regression model is shown for each of the decision autonomy indicators.

The control variables explain between 1% (getting medical help) and 10% (acceptance of wife beating) of the variance in the decision autonomy indicators. The results for the various control variables are certainly not consistent. For instance, inhabitants of urban lower Egypt score, on the average and after controlling for the other variables in the model, significantly lower on the 'household decision making' indicator than respondents from the urban governorates, but also tend to score significantly higher on the 'acceptance of wife beating' indicator than the latter. Christian respondents tended to score significantly higher on the 'getting medical help for self' indicator but lower on the 'household decision making' indicator than Muslim respondents. Worth noticing is that women who reported to be cut themselves on the average reported higher decision autonomy (all indicators) than women who were not cut.

The resource variables significantly contribute to all decision autonomy indicators after controlling for the control variables, and are especially important for 'decision spending earnings' and 'acceptance of wife beating' indicators. Overall, working women had higher decision autonomy than non-working ones, although the effects are relatively weak for 'getting medical help for self' and 'household decision making'. Education tends to have a stronger effect, except for 'household decision making'. It is mainly the respondents with secondary or higher education that have more decision autonomy than those with no or only primary education. For 'household decision making' however the threshold is whether one has some formal education, while the level of education makes little difference.

Although the indicators for the environmental component of female autonomy had a significant net contribution (at $p < .001$) to the explained variance for all decision autonomy variables, only with regard the 'getting medical help for one self' indicator the contribution can be called substantial ($\Delta R^2 = 4.3\%$). The wealth index most consistently affected all four decision autonomy variables: a woman's decision autonomy increases with the wealth of the household. The effect of household wealth however is substantially stronger for the 'getting medical help for self' and 'decision spending earnings' indicators than for the other two. The husband's education level also only affects the former two decision autonomy indicators, and in both case it is the women whose husbands had at least had some secondary education who tend to score better on the decision autonomy indicators. For most decision autonomy indicators respondents residing in the capital tend to score significantly higher than the others, only for 'getting medical help for self' we find the opposite. The spousal age difference, often seen as indicator of power differences between spouses, did not seem to affect a women's decision autonomy, but the presence of parents-in-law in the household do reduce a woman's autonomy to make household decisions or to decide how earnings are spent.

CUTTING OF GIRLS

Table 4 shows the results of a series of multilevel logistic regression models with whether a girl was cut or not as the dependent variable. This analysis is based on the 21,057 girls born to the women in the DHS sample (girls over age 19 and/or who have married are excluded). Only the current age of the girl is included as a covariate. Model 1 test a random intercept model including the main effects of all variables. Models 2 through 5 test successively the two- and three-way interaction effects of each of the decision autonomy indicators with the respondent's knowledge and attitudes regarding FGM.

This analysis confirms that a girl's age is an important determinant of whether she is cut. The adjusted probability of being cut, i.e., the estimated probability with all other variables set to their mean, for a five-year-old is only about 2%, while for a ten-year-old it has already increased to about 20%, and for an eighteen-year-old to 93%.

Table 4: Multilevel logistic regression results for the likelihood that a girl has been cut

e^b (95% C.I.)	(1)	(2)	(3)	(4)	(5)
Daughter level effects					
Constant	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000 - 0.000)	(0.000 - 0.000)	(0.000 - 0.000)	(0.000 - 0.000)	(0.000 - 0.000)
Daughter's age	1.632***	1.624***	1.632***	1.625***	1.624***
	(1.604 - 1.660)	(1.597 - 1.652)	(1.604 - 1.660)	(1.598 - 1.653)	(1.597 - 1.652)
Mother level effects					
Control variables					
Region (ref: Urban governorates)	***	***	***	***	***
Urban Lower Egypt	0.825	0.787	0.767	0.785	0.811
	(0.598 - 1.136)	(0.570 - 1.088)	(0.554 - 1.060)	(0.569 - 1.085)	(0.587 - 1.120)
Rural Lower Egypt	1.244	1.129	1.147	1.177	1.147
	(0.660 - 2.346)	(0.597 - 2.136)	(0.607 - 2.168)	(0.624 - 2.222)	(0.607 - 2.167)
Urban Upper Egypt	4.351***	4.275***	4.120***	4.252***	4.343***
	(3.378 - 5.604)	(3.312 - 5.517)	(3.189 - 5.322)	(3.297 - 5.485)	(3.368 - 5.601)
Rural Upper Egypt	2.335**	2.207*	2.214*	2.276*	2.245*
	(1.244 - 4.381)	(1.172 - 4.154)	(1.177 - 4.164)	(1.212 - 4.275)	(1.194 - 4.222)
Frontier governorates	2.667***	2.621***	2.469***	2.622***	2.696***
	(1.668 - 4.266)	(1.634 - 4.202)	(1.538 - 3.964)	(1.637 - 4.198)	(1.683 - 4.320)
Religion: Christian (vs. Muslim)	0.727*	0.708*	0.710*	0.721*	0.723*
	(0.546 - 0.967)	(0.530 - 0.945)	(0.532 - 0.948)	(0.541 - 0.962)	(0.542 - 0.964)
Age of respondent	1.021***	1.020***	1.021***	1.020***	1.020***
	(1.010 - 1.031)	(1.009 - 1.030)	(1.010 - 1.031)	(1.010 - 1.031)	(1.010 - 1.031)
Respondent circumcised (vs. non-circumcised)	12.383***	11.862***	12.610***	13.096***	12.670***
	(6.693 - 22.909)	(6.319 - 22.266)	(6.743 - 23.583)	(7.025 - 24.415)	(6.765 - 23.727)
Resources					
Occupation (ref: no work)	**	***	**	*	***
Professional, Technical, Managerial	0.887	0.828	0.867	0.970	0.832
	(0.660 - 1.192)	(0.628 - 1.091)	(0.658 - 1.142)	(0.719 - 1.309)	(0.631 - 1.096)
Clerical	0.697	0.666*	0.693*	0.767	0.668*
	(0.482 - 1.008)	(0.466 - 0.951)	(0.485 - 0.990)	(0.526 - 1.117)	(0.468 - 0.954)
Sales	0.637*	0.591*	0.633*	0.668	0.586*
	(0.419 - 0.970)	(0.392 - 0.891)	(0.419 - 0.955)	(0.361 - 1.237)	(0.389 - 0.882)
Agriculture - self employed	0.696**	0.701**	0.723*	0.713**	0.694**
	(0.541 - 0.895)	(0.546 - 0.902)	(0.562 - 0.929)	(0.554 - 0.916)	(0.540 - 0.894)
Agriculture – employee	0.619**	0.609***	0.627**	0.642**	0.604***
	(0.460 - 0.831)	(0.454 - 0.816)	(0.467 - 0.840)	(0.478 - 0.863)	(0.450 - 0.810)
Services	0.828	0.759	0.801	0.854	0.759
	(0.541 - 1.267)	(0.501 - 1.149)	(0.528 - 1.216)	(0.555 - 1.315)	(0.496 - 1.160)
Skilled manual labor	0.720	0.672	0.687	0.773	0.690
	(0.428 - 1.211)	(0.404 - 1.121)	(0.413 - 1.141)	(0.458 - 1.305)	(0.414 - 1.149)
Unskilled manual labor	0.638	0.543	0.613	0.598	0.534*
	(0.342 - 1.190)	(0.293 - 1.005)	(0.331 - 1.134)	(0.320 - 1.118)	(0.289 - 0.988)
Education (ref: no formal education)	***	***	***	***	***
Incomplete primary	0.719***	0.705***	0.712***	0.703***	0.708***
	(0.606 - 0.853)	(0.595 - 0.837)	(0.600 - 0.844)	(0.572 - 0.863)	(0.597 - 0.840)
Complete primary	1.139	1.087	1.112	1.110	1.124
	(0.858 - 1.512)	(0.819 - 1.443)	(0.837 - 1.476)	(0.838 - 1.471)	(0.847 - 1.492)
Incomplete secondary	1.357**	1.306*	1.330**	1.321*	1.343**
	(1.095 - 1.681)	(1.054 - 1.619)	(2.687 - 0.659)	(1.067 - 1.635)	(1.084 - 1.665)
Complete secondary	1.385**	0.677***	0.699***	0.695***	0.720**
	(1.120 - 1.711)	(0.549 - 0.836)	(0.566 - 0.862)	(0.564 - 0.857)	(0.582 - 0.889)
Higher	0.418***	0.409***	0.411***	0.428***	0.440***
	(0.283 - 0.615)	(0.277 - 0.604)	(0.279 - 0.605)	(0.291 - 0.631)	(0.298 - 0.649)
Environment					
Spousal age difference (partner - respondent)	1.000	1.000	0.999	0.999	1.000
	(0.990 - 1.011)	(0.989 - 1.010)	(0.989 - 1.010)	(0.989 - 1.010)	(0.989 - 1.010)
Husband's education (ref: no formal education)	**	**	**	**	**
Incomplete primary	0.865	0.857	0.860	0.857	0.860
	(0.728 - 1.027)	(0.721 - 1.017)	(0.724 - 1.021)	(0.721 - 1.017)	(0.724 - 1.021)
Complete primary	1.056	1.058	1.046	1.050	1.049
	(0.832 - 1.340)	(0.833 - 1.343)	(0.823 - 1.327)	(0.828 - 1.332)	(0.826 - 1.331)
Incomplete secondary	1.072	1.053	1.063	1.067	1.065
	(0.869 - 1.321)	(0.854 - 1.299)	(0.862 - 1.311)	(0.866 - 1.315)	(0.863 - 1.313)
Complete secondary	1.166	1.159	1.161	1.162	1.175
	(0.969 - 1.403)	(0.964 - 1.395)	(0.965 - 1.397)	(0.966 - 1.397)	(0.977 - 1.413)
Higher	0.805	0.809	0.801	0.803	0.822
	(0.619 - 1.046)	(0.622 - 1.052)	(0.616 - 1.041)	(0.618 - 1.044)	(0.633 - 1.069)

	(1)	(2)	(3)	(4)	(5)
Wealth index factor score	1.203***	1.196***	1.218***	1.206***	1.219***
	(1.097 - 1.320)	(1.091 - 1.311)	(1.112 - 1.335)	(1.102 - 1.321)	(1.112 - 1.336)
Parent-in-law respondent in HH	0.948	0.955	0.956	0.954	0.961
	(0.785 - 1.144)	(0.791 - 1.153)	(0.792 - 1.154)	(0.791 - 1.151)	(0.796 - 1.160)
Urbanization (ref: capital)		**	**	**	**
Small city	1.341*	1.518**	1.476**	1.524**	1.477**
	(1.043 - 1.724)	(1.177 - 1.956)	(1.183 - 1.842)	(1.185 - 1.961)	(1.148 - 1.899)
Town	1.377	1.557*	1.510*	1.585*	1.569*
	(0.944 - 2.011)	(1.066 - 2.276)	(1.034 - 2.205)	(1.087 - 2.313)	(1.076 - 2.289)
Countryside	2.090*	2.483**	2.311*	2.406**	2.432**
	(1.101 - 3.964)	(1.306 - 4.723)	(1.217 - 4.390)	(1.269 - 4.564)	(1.281 - 4.619)
Knowledge and attitudes regarding FGM					
Knowledge	0.853***	0.883	0.867	0.915	0.921
	(0.802 - 0.906)	(0.745 - 1.046)	(0.741 - 1.014)	(0.829 - 1.011)	(0.824 - 1.030)
Attitudes	0.332***	0.475***	0.358***	0.348***	0.271***
	(0.297 - 0.371)	(0.346 - 0.652)	(0.276 - 0.463)	(0.292 - 0.414)	(0.222 - 0.332)
Decision autonomy					
Getting medical help for self	1.101*	1.090			
	(1.003 - 1.210)	(0.971 - 1.225)			
Household decision making	0.901***		0.891***		
	(0.872 - 0.930)		(0.858 - 0.926)		
Decision spending earnings	0.978			0.887*	
	(0.888 - 1.079)			(0.797 - 0.988)	
Acceptance of wife beating	0.973				0.966
	(0.945 - 1.003)				(0.932 - 1.002)
Interaction effects		***	***	***	**
Knowledge & Decision autonomy		1.041	1.020	1.017	1.003
		(0.941 - 1.151)	(0.982 - 1.060)	(0.935 - 1.106)	(0.973 - 1.035)
Attitudes & Decision autonomy		1.039	1.089**	1.364***	1.088**
		(0.851 - 1.269)	(1.021 - 1.163)	(1.125 - 1.653)	(1.022 - 1.158)
Knowledge & Attitudes & Decision autonomy		0.847***	0.936***	0.801***	0.503***
		(0.805 - 0.893)	(0.917 - 0.955)	(0.743 - 0.863)	(0.491 - 0.515)

Significance: * p < 0.050, ** p < 0.010, *** p < 0.001
models:
(1) Model with main effects of all decision autonomy indicators
(2) Model with main and interaction effects for "Getting medical help for self"
(3) Model with main and interaction effects for "Household decision making"
(4) Model with main and interaction effects for "Decision spending earnings"
(5) Model with main and interaction effects for "Wife beating"

Model 1 examines the main effects of all variables on whether a girl has been cut. Several mother-level control variables do significantly affect the probability that a girl has been cut. Some of these indicators, such as place of residence or religion, also pertain to the girls themselves. Clear regional differences are observed: girls living in the Urban Governorates are significantly less likely to have been cut than those living in Upper Egypt or the Frontier Governorates. Furthermore, as expected, Christian girls are less likely to have been cut than Muslim girls, but the effect is fairly small. Where the adjusted probability, with the age of the girl set at 18, i.e., by the age most girls are cut, and all other variables at their mean value, of a girl being cut is 92.9% for Muslim girls and 90.4% for Christian girls. Girls whose mother was circumcised are more likely to have been cut than girls whose mother had not been circumcised. Among girls whose mother is circumcised the adjusted probability of being cut is 93.5%. For girls whose mother is not circumcised, it is only 53.6%. The probability that a girl has been cut also varies according to the age of her mother. Girls whose mother is older are more like to have been cut than girls with younger mothers, but the effect is quite small. For instance, among girls

whose mother is aged 40, 93.7% have been cut, while among girls whose mother is aged 25, 91.6% have been cut.

The resources component of female autonomy also significantly affects the probability of being cut. Specifically, the probability that a girl has been cut varies according to her mother's occupation and educational level. However, the effect of education is not linear. The adjusted probability that a girl has been cut varies from 92.7% for girl whose mother has no formal education to 94.6% for girls whose mother has completed secondary education, only to fall substantially to 84.1% among girls whose mother has higher education. This may point to the importance of having one's daughters cut as status symbol, which may be more important for middle level groups than for lower and higher level groups. Girls whose mothers are employed are less likely than girls born to non-working women to have been subjected to FGM.

The environmental component of female autonomy also significantly affects whether girls have been cut. Household wealth here is the most important predictor of the likelihood that a girl has been cut, but again the effects are relatively small. If one compares the adjusted probabilities of

respondents at 1 standard deviation above and below the mean, the former have an adjusted probability of being cut of 94.0%, while the latter have one of 91.5%. Again, girls whose mothers have a higher SES mothers are more likely to have been cut than girls who mothers have a lower SES. Urbanization also has a clear effect on the likelihood that a girl has been cut. The adjusted probability of being cut for girls residing in the capital is 88.5%, for countryside dwellers it is 94.1%. The likelihood that a girl is cut declines with the education level of her mother's spouse, who, in the overwhelming majority of cases, is also the girl's biological father. The likelihood that a girl has been cut does not depend on the age difference between her parents.

The likelihood that a girl has been cut varies significantly with her mother's knowledge and attitudes regarding FGM (χ^2 (2) = 532.9, $p < 0.001$). These are clearly the best predictors of whether a girl is cut. Women's attitudes regarding FGM have a strong effect on the likelihood that a girl has been cut. Girls whose mother has strong anti-FGM attitudes are substantially less likely than other girls to have been cut. Girls whose mother has the strongest pro-FGM attitudes (score 0) have an adjusted probability of 95.4% of being cut, while girls whose mother has a strong anti-FGM attitude (score 2) have an adjusted probability of only 69.7%. The effect of knowledge is less extreme. Girls whose mother has little knowledge (score 0) have an adjusted probability of 93.7% of being cut while girls whose mother has good knowledge have a probability of 88.8%.

Compared to the previous set, women's decision autonomy only has weak main effects on whether their daughters have been cut (χ^2 (4) = 54.3, $p < 0.001$). Only the effect of household decision making is strongly significant, with girls born to women who are more involved in household decision-making being less inclined to have been cut. The adjusted probability of girls having been cut for women with the minimum score on household decision making (0) was 95.0%, for those with the maximum score (8) it was 89.2% (OR max vs. min = 0.43). The getting medical help for self indicator was also marginally significant (at $p < 0.050$), but remarkably went in against expectations. Rather than lowering the probability of girls having been cut, girls whose mother has a higher score are more likely to have been cut than girls whose mother has a lower score. The effect however is fairly small, with an adjusted probability of 91.6% for women with the lowest score (0) and one of 93.0% for those with the maximum score (2) (OR max vs. min = 1.21)

In models 2 through 5 the interaction effects between the knowledge and attitudes regarding FGM and each of the decision autonomy indicators are tested. We opted for testing the interaction effects involving each of the decision autonomy indicators separately to avoid multicollinearity problems. The results in Table 4 confirm that the sets of interaction effects do have significant effects on the outcome, and thus that the effect of women's decision autonomy on the likelihood that their daughters have been cut depends on the mother's knowledge and attitudes one has regarding FGM.

Because the various coefficients for the interaction effects cannot be interpreted separately but should be interpreted jointly with the main and other interaction effects involving these variables, Table 5 summarizes the effects of each of the decision autonomy variables on the likelihood that a girl has been cut for each combination of knowledge and attitudes regarding FGM. The figures in this table are the estimated OR-s comparing the maximum score on the decision autonomy with the minimum score. The table confirms that for all decision autonomy indicators, the effect on likelihood that a girl has been cut becomes more negative as the girl's mother is more knowledgeable about the disadvantages of FGM and less in favor of the practice. Among girls whose mother has a pro-FGM attitude, the likelihood that of being cut even increases if their mother has higher decision autonomy with respect to getting medical help. When women both hold strong anti-FGM attitudes and are aware of the disadvantages of the practice, decision autonomy decreases the likelihood that a their daughters have been cut.

Table 5: Estimated ORs for maximum score vs. minimum score on decision autonomy indicators, by scores on attitudes and knowledge indicators

Getting medical help for self FGM Attitudes				Household decision making FGM Attitudes		
FGM Know-ledge	0	1	2	FGM Know-ledge	0	1	2
0	1.189	1.284	1.387	0	0.398	0.789	1.566
1	1.289	1.000	0.776	1	0.466	0.544	0.636
2	1.397	0.778	0.434	2	0.547	0.376	0.258
3	1.514	0.606	0.242	3	0.641	0.259	0.105
4	1.641	0.472	0.136	4	0.752	0.179	0.043
Decision spending earnings FGM Attitudes				Acceptance of wife beating FGM Attitudes		
FGM Know-ledge	0	1	2	FGM Know-ledge	0	1	2
0	0.620	2.144	7.419	0	0.842	1.284	1.958
1	0.662	0.942	1.340	1	0.856	0.042	0.002
2	0.708	0.414	0.242	2	0.871	0.001	0.000
3	0.756	0.182	0.044	3	0.886	0.000	0.000
4	0.808	0.080	0.008	4	0.901	0.000	0.000

ORs calculated using estimates from equations in Table 4, models 2 through 5.
A high score on the FGM knowledge variable indicates the respondent is aware of the dangers of FGM; a high score that she is unaware; a high score on the attitudes variable indicates more negative attitudes toward FGM.

Conclusion

FGM remains a very common practice, and although some studies suggest that the incidence of

the practice and the support for it start to decline (El-Gibaly et al. 2002) an overwhelming majority of the population still practice this tradition. By the time they are 18 the overwhelming majority of Egyptian women have been cut. The main argument of this paper is that FGM reflects the subordinate position of women in Egyptian society. Improving the position of women should therefore help eradicate FGM. Various international organizations favor empowerment of women as a strategy against FGM (OHCHR et al. 2008).

Female empowerment or autonomy remains a fairly vague concept. At the heart of it lies the ability of women to take decisions on issues that affect their own lives and those of those close to them (e.g., their children). The strategies envisioned, however, rarely affect this decision autonomy directly, but rather prefer to affect them indirectly by shaping the resources women possess or altering the environment of women. In this study we distinguish three components to female autonomy: decision autonomy, resources, and environment. The latter two enable decision autonomy, i.e., shape the possibilities for women to make decisions.

A limitation of this study is the weak conceptualization and operationalization of the concepts female autonomy (empowerment) and decision autonomy. For instance, it remains unclear whether these terms are general or domain specific abilities. In the latter case most indicators are problematic as they capture either the resources or the environment of women. In this study we made use of indicators that point more directly to decision autonomy, but none of them captured the decision autonomy with regard to FGM. In the case that autonomy is domain specific and autonomy in one domain remains relatively independent of that in others, our indicators may fail to capture the necessary decision autonomy.

Women's decision autonomy overall had only a mild effect on whether their daughters have been cut. One can argue that one should not expect a main effect of decision autonomy as it is a tool that can be used for various purposes, to support FGM as well as to oppose it. Indeed, when we tested interaction effects with the respondent's knowledge and attitudes regarding FGM, both indicators of the respondent's willingness to stop with the practice, significant effects were found. When the mother opposed FGM or saw the disadvantages of it, her decision autonomy was associated with a lower likelihood that her daughter was cut. This supports the notion of decision autonomy as a tool that people can use for a variety of purposes. To stop FGM one not only has to be able to stop it, but also ready and willing to do so. The findings presented here support Coale's RWA model (Coale 1973; Lesthaeghe and Vanderhoeft 2001).

In the theoretical background section we mentioned that a mother's freedom to make the decision to have her daughter cut is heavily constrained by her social environment and that others (spouse, family and community members) also weigh in on this decision. This limits a woman's ability to affect the decision, but our findings do show that female empowerment (decision autonomy) does contribute substantially to the stopping of the practice, and that she does weigh in on the decision. A remaining question here, however, is whether the relationship with decision autonomy is real or spurious, as it could be the case that families that are opposed to FGM and are less sensitive to social pressures are also the ones where women have greater decision autonomy.

The finding that the resource and environmental components of female autonomy (occupation, respondent's education, husband's education, household wealth an urbanization) have effects on whether one had one's daughters cut or not, support the above assertion that increased female decision autonomy is part of larger complex of changes. The findings suggest that these variables affect the decision to cut not as much through decision autonomy, but rather through the respondent's knowledge and attitudes regarding FGM. But even then, a significant residual effect of the various components of female autonomy remains.

Education is often considered the main carrier of modernity. A woman's education is not only a proxy for her exposure to the forces of modernity but also of her status within a modern status hierarchy. The development of modern institutions, attitudes and beliefs challenges existing traditions, partly because it weakens the existing stratification system and provides alternative ways for status attainment, and partly because it changes the outlook of women. More modern women therefore should be less sensitive to tradition and be more inclined no longer to support having their daughters cut. The results confirm that daughters of women belonging to groups that are more exposed to the forces of modernization, such as the better educated ones, the ones with a higher socio-economic status, employed women, urban residents, etc., are indeed less likely to been cut. Modernization, however, does not just affect individual women, but their entire social environment, and they may therefore find themselves in environments that are less supportive of FGM. Many authors and organizations then also rely on modernization and development processes to suppress FGM in the communities where it is still practiced (see: El-Gibaly et al. 2002). From this perspective one expects the rejection of FGM to spread from the (urban) modern elites to the rest of society (Shell-Duncan, Obiero, and Muruli 2000). To the extent that other groups also become modernized they are expected to stop practicing FGM.

The findings, however, also suggest that the relationship between modernization and FGM is more complex than initially thought. One should not

forget that elites often have an interest in maintaining traditions as they tend to confirm their social position. Modernization not necessarily implies the rejection of traditions (Mackie 2000; Carr 1997; Freymeyer and Johnson 2007). Even well educated women can still support FGM as part of their cultural and social identity, or because they fear that uncut their daughters will not find a suitable husband (Hicks 1993; Yoder et al. 1999; Gruenbaum 2001). And indeed, our findings show that girls whose mothers have some education and those from wealthier households are less likely to have been cut, after controlling for their mother's awareness of the disadvantages of FGM, their anti-FGM attitudes and their greater decision autonomy.

The results also confirm that modernization also affects the power relations within households. More modern women, i.e., women with more education, or employed in more modern occupations, or living in wealthier households, tend to have higher decision autonomy than less modern ones. This might be related to changes in the family structures where the extended family loses salience in favor of the nuclear family and thus to a shift in the locus of decision making, but also to cultural changes among the more modernized groups. In these groups decision making regarding FGM may have shifted more towards the nuclear family, which in turn may give the individual mother more influence.

These cultural effects of modernization are the most difficult to grasp. Modernity is not only a set of new social, economic and political institutions, but also a way of thinking, a cultural force. Modernity entails rationalization, and reflexivity, the idea that society is makeable, and that people can take their fate in their own hands (Giddens 1990; Inkeles 1983). This modern reflexivity allows people to challenge the self-evidence of traditional views and practices and look beyond what they are accustomed to. The strong effects of mother's knowledge and attitudes regarding FGM on the likelihood that their daughters have been cut suggests that these cultural aspects of modernization are the main mechanism through which modernization strategies will impact FGM. The changes in knowledge and attitudes about FGM should be seen not as isolated elements but as manifestations of wider cultural changes affecting more domains of life.

A consequence of these findings is that empowerment strategies to combat FGM may prove to be effective not because they empower women, but because essential aspects of such strategies, such as improving female education, generate cultural changes that undermine the legitimacy of the practice and also provide alternative status hierarchies. Empowerment strategies tend to be geared not towards a single issue but attempt to improve the overall position of women in society. There is little evidence that campaigns focusing exclusively on FGM are equally effective.

Interventions based on the positive deviance model have had some successes in several fields, including the fight against FGM (McCloud, Aly, and Goltz 2003). This model posits when certain individuals or groups adopt a new behavior, i.e., display positive deviance they may act as role models for others and form the nucleus from where the new behavior spreads. Elites may play such a role, and the findings of this paper suggest that the modernizing elites indeed may play this role regarding FGM. The success of positive deviance depends entirely on the extent that the deviants are considered role models and their deviance is considered positive.

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There is nothing more practical than a good theory
(K. Lewin, 1952)