On the Economic Origins of Constraints on Women's Sexuality

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Abstract

This paper studies the economic origins of customs aimed at constraining female sexuality, such as a particularly invasive form of female genital cutting, restrictions on women's freedom of mobility, and norms about female sexual behavior. The analysis tests the anthropological theory that a particular form of pre-industrial economic production – subsisting on pastoralism – favored the adoption of such customs. Pastoralism was characterized by heightened paternity uncertainty due to frequent and often extended periods of male absence from the settlement, implying larger payoffs to imposing constraints on women's sexuality. Using within-country variation across 500,000 women in 34 countries, the paper shows that women from historically more pastoral societies (i) are significantly more likely to have undergone infibulation, the most invasive form of female genital cutting; (ii) are more restricted in their mobility, and hold more tolerant views towards domestic violence as a sanctioning device for ignoring such constraints; and (iii) adhere to more restrictive norms about virginity and promiscuity. Instrumental variable estimations that make use of the ecological determinants of pastoralism support a causal interpretation of the results. The paper further shows that the mechanism behind these patterns is indeed male absenteeism, rather than male dominance per se.

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1 Introduction

Customs, norms, and attitudes regarding the appropriate behavior and role of women in society vary widely across societies and individuals. A large qualitative literature in anthropology[1] argues that a subset of such norms and customs aims at regulating preventing women from having extramarital sex, for example norms about female virginity or promiscuity, restrictions on women's freedom of mobility outside their homes, or infibulation, the most invasive form of female genital cutting.

Consider the case of infibulation. This procedure is performed on young girls well before the onset of puberty. In addition to the removal of the clitoris and labia, the vaginal opening gets sutured closed and only a small hole is left open to allow for the passage of urine and menstrual blood.[2] As a direct consequence, penetration becomes painful, strongly reducing the incentives of having extramarital sex. This custom is practiced in some parts of Africa and has been a recent focus of policy makers trying to eradicate the practice due to human rights concerns.[3] A perhaps particularly puzzling feature of infibulation is its strong geographical variation. For example, while in Niger about one third of women are infibulated, only about one percent are in neighboring Burkina Faso. Similarly, within Benin, the prevalence of infibulation exceeds 10% in the north-western departments, but is less than 4% in close-by central-east departments. The objective of this paper is to understand the economic origins of this contemporary variation in infibulation and related customs.

In case studies, anthropologists have argued that customs that implicitly or explicitly restrict female sexuality, appear disproportionately often in environments in which mate guarding is difficult (Mackie, 1996, 2000; Hicks, 1996). Based on this observation, they have hypothesized that these customs share the common underlying function of reducing paternity uncertainty, which is the uncertainty men face regarding their relatedness to their offspring.

The key observation underlying this paper is that paternity uncertainty was particularly pronounced in pre-industrial pastoralism, because it was characterized by frequent, and often extended periods of male absence from settlement. This paper hence tests the hypothesis that historical dependence on pastoralism favored the adoption of infibulation, constraints on women's mobility, and stronger norms about women's sexual behavior, and that these customs and norms have persisted until today. For this purpose, I link contemporary individual-level data on female genital cutting, women's mobility, and promiscuity to a historical ethnicity-level measure of dependence on pastoralism. In a broad set of within-country analyses, I find that women who descend from ethnic groups that historically relied more strongly on pastoralism (i) are more likely to be infibulated; (ii) are more restricted in their mobility; and (iii) adhere

[1] See, for example, Mackie (1996, 2000); Hicks (1996); Daly et al. (1982); Hayes (1975); Pazhoohi (2016); Pazhoohi et al. (2017) and references therein.

[2] The scar that covers the vaginal opening also covers the urethral opening. After infibulation, urine therefore passes the urethra first and then has to pass through the 'pinhole' that the procedure leaves open.

[3] https://www.unfpa.org/female-genital-mutilation

to stricter norms about women's sexual behavior.

Pastoralism is the breeding, care, and use of herd animals such as sheep, goats, camels, cattle, horses, llamas, reindeer, and yaks and involves taking the herds out to natural pasture.[4] In pastoralism, men are frequently away from camp on various occasions. During the day, they have to take the animals out to pasture grounds. If these are far away, absences from camp can amount to multiple days or even weeks. During the night, men often have to stay with the herd to protect them from predators or thieves. If a society's production relies largely on pastoralism, trade is important and represents another reason for men to leave the settlement for some time. Frequent absence implies heightened paternity uncertainty which could generate an increased incentive to control or inhibit female sexuality.

The data on historical subsistence style are based on information from the *Ethnographic Atlas* (Murdock, 1967), an anthropological database covering more than 1,200 ethnic groups worldwide. The database contains detailed ethnographic information on the ways of life of the portrayed ethnic groups prior to industrialization and colonial contact, such as on mode of subsistence and domesticated animals. Combining information on the type of domesticated animal and dependence on animal husbandry, I construct an ethnic-group level measure of historical dependence on pastoralism.

The contemporary data on infibulation and other restrictions on female sexuality stem from the *Standard Demographic and Health Surveys* (*DHS*). The *DHS* surveys are nationally representative household surveys which are run in developing countries worldwide, eliciting detailed household and respondent characteristics. Since one central topic of the *DHS* is the empowerment of women, the majority of respondents are female and detailed information on women's issues in developing countries are recorded. In particular, the data include information on female genital cutting, women's mobility, and adherence to norms about and attitudes towards women's sexuality. In addition, for a much smaller subset of households, the *DHS* also records data on men. Importantly, the *DHS* contains information on respondents' ethnicity. Thus, my empirical analysis links individuals' responses to their ethnic group's historical dependence on pastoralism from the *Ethnographic Atlas*.

This procedure generates substantial within-country variation. First, many countries are populated by multiple ethnic groups that often differ in their historical reliance on pastoralism. For example, for Uganda, my sample contains data on descendants from 21 different ethnic groups, some of which historically depended on pastoralism by 10 percent or less, and others by 30 – 40 percent. Second, even if historical ethnic diversity in a country was relatively low, contemporary ethnic diversity is often higher due to migration. For example, for Moldova, my sample contains women who are of Bulgarian, Gagauzian, Romanian, Russian, and Ukrainian descent. The hypothesis is then that within countries, individuals' attitudes, customs, and behaviors as recorded in the *DHS*, are affected by the mode of economic production of their ancestors.

My empirical strategy rests on three pillars. First, variation in historical dependence on pastoral production is largely determined by climatic and soil conditions. These environmental

[4]For more detailed descriptions, see for example (Bates, 2001; Kardulias, 2015; Salzman, 2004).

conditions are plausibly exogenous to gender norms and customs. As described in greater detail below, these ecological determinants also facilitate an instrumental variable approach. Second, throughout the analysis, I compare individuals from different ethnic groups who live in the same country today, thereby holding constant the institutional environment and other factors that vary at the country level. Third, the analysis accounts for a large set of individual-level observables and ethnic-group level characteristics.

The analysis begins by showing that, in a sample of about 80,000 women from 13 countries in Africa, historical dependence on pastoralism significantly affects the prevalence of infibulation today. This effect is quantitatively meaningful. A one standard deviation increase in historical dependence on pastoralism increases the likelihood that a woman has undergone infibulation by 6.7 percentage points, which amounts to more than 60% of the baseline probability of being infibulated. This result is robust across a wide range of regression specifications that account for (i) individual-level observables such as age, year of interview, religious denomination, urban residence, educational attainment, or marital status, and (ii) historical ethnic group level characteristics such as plow use, year of observation, settlement patterns, or jurisdictional hierarchy.

Individuals exhibit variation not only in the *incidence* of infibulation, but also in its *severity*. While every infibulated woman needs to be 'deinfibulated' when giving birth to a child, some require an incision to allow for the passage of menstrual blood or for making penetration possible when getting married, which is an indication that the initial procedure was unusually severe. For a small sample of women in 4 countries, the *DHS* contains data on the occurrence of deinfibulation at the onset of menstruation or when getting married. I show that women of pastoral descent are more likely to have undergone a particularly severe form of infibulation: they are more likely to have needed an incision in their vaginal area at the onset of menstruation or when getting married.

Next, I study the relationship between historical pastoralism and other norms and customs that restrict female sexuality.[5] To this end, I extend the analysis to a much larger *DHS* sample of about 500,000 women descending from 275 ethnic groups in 35 countries in Africa, Asia, Europe, and South America. I find that pastoralism favored the adoption of restrictions on female sexuality more generally, in particular in the domains of female mobility, promiscuity, and virginity.

Women whose ethnic group historically depended more strongly on pastoral production are more constrained in their mobility outside their homes: their husband is more likely to decide

[5]Indeed, several cultural practices have been hypothesized to have the function of increasing paternity uncertainty. In medieval Europe, knights allegedly would put chastity belts on their women to keep them chaste when they were gone on crusades (Robinson, 1984), although it is unclear how common this practice was (Classen, 2007; Smith, 2007). Throughout history in various regions of the world, the partial or complete veiling of women is common, presumably to hide female attractiveness from potential mate poachers, see Pazhoohi et al. (2017) and references therein. Similarly, eye-covering practices are potential customs that facilitate mate guarding (Pazhoohi, 2016). In China, footbinding became a nearly universal practice during the Sung Dynasty, a period that was characterized by urbanization, increasing trade, and Mongol invasions (Mackie, 1996).

about visits to relatives. Moreover, women of pastoral descent are more tolerant of domestic violence as a response to not observing their mobility constraints, suggesting that women have internalized norms regarding their mobility, at least to some extent.

Women who descend from more pastoral groups also hold more restrictive attitudes about the sexual behavior of married women. Specifically, they (i) deem it more important to be faithful; (ii) are less likely to have cheated on their husband; (iii) are more likely to state that women should not have sex before marriage and, in line with this statement, (iv) they have fewer sex partners in their lifetime. Thus, historical dependence on pastoralism is tightly linked to a broad set of restrictions on female sexuality. Again, these patterns are robust to controlling for a comprehensive set of individual and ethnic group level observables.

The causal interpretation of my results is supported by the results of an instrumental variable approach, which makes use of the fact that variation in historical dependence on pastoralism was largely determined by ecological conditions. Based on data provided by Beck and Sieber (2010), I construct a land suitability measure for pastoralism relative to agriculture and use this measure as an instrument for an ethnic group's historical dependence on pastoralism. The resulting IV estimates are consistent with their OLS counterparts in terms of coefficient sign and statistical significance, but tend to be larger in terms of effect size.

Inherent in the narrative about pastoralism put forward in this paper is the idea that the absence of men is the mechanism that generates customs or norms that aim at constraining female sexuality. However, since pastoralism is also a very male dominated form of subsistence, it is also conceivable that customs and norms that restrict female sexuality are simply manifestations of a culture of male dominance per se. To test whether male dominance alone is sufficient to generate the observed patterns, I explore whether the same results hold true for plow agriculture, another particularly male dominated form of subsistence (Boserup, 1970; Alesina et al., 2013, 2018). Since men are not absent in plow agriculture, there should be no unusually high incentive to restrict female sexuality if absenteeism is the key mechanism. I find that the relationship between restrictions of female sexuality and plow agriculture is weak at best: the OLS coefficients are either small and statistically insignificant or even have the wrong sign. This suggests that male dominance alone does not generate customs or norms aimed at inhibiting or controlling female sexual behavior. In contrast, the effect of pastoralism always holds when controlling for historical plow use.

In robustness checks, I further verify that the effects of pastoralism on concerns with female sexuality are not driven by one specific type of pastoralism. Running separate analyses for sheep and goat herding, cattle herding, horse herding, and camel herding yields very similar results throughout. Finally, as a placebo exercise, I confirm that the results are specific to pastoralism and do not generalize to other forms of animal husbandry, e.g., animal husbandry with pigs, dogs, or poultry. These species live within the confines of human settlements and are not taken out to pasture, which eliminates absence. Consistent with the hypothesis, I find that none of the outcome variables is significantly related to animal husbandry with non-herd species.

Relating this work to the literature, this paper adds to recent research on the historical

origins of heterogeneity in gender inequality, such as the effect of the historical division of labor on contemporary norms about women in the labor market (Alesina et al., 2013; Baiardi, 2016), how traditional customs can affect female education levels (Ashraf et al., 2016), the role of legal institutions in explaining female HIV rates (Anderson, forthcoming), or the importance of women in historical production and their subsequent value in society (Qian, 2008; Meng Xue, 2016; Carranza, 2014). The paper also relates to the literature on female genital cutting, e.g., studying the effects of regime stability on prevalence (Poyker, 2018), proximate determinants of persistence of female genital cutting (Bellemare et al., 2015), or the effect of interventions on attitudes towards the continuation of the practice (Vogt et al., 2016).

The paper contributes to this literature by (i) providing the first study on the origins of female genital cutting and restrictions on female sexuality more generally; (ii) introducing the novel explanatory variable of pastoralism; (iii) focusing on the reduction of paternity uncertainty as the main function underlying economically relevant phenomena.[6]

More generally, the paper also speaks to the literature on the historical origins of contemporary variation in culture (Bazzi et al., 2018; Becker et al., 2017; Chen, 2013; Enke, 2017; Falk et al., forthcoming; Galor and Özak, 2016; Galor and Savitskiy, 2018; Lowes, 2017; Michalopoulos, 2012; Schulz, 2017), to the literature on the persistence of cultural traits (Fernandez and Fogli, 2009; Galor et al., 2017; Giavazzi et al., 2018; Michalopoulos and Papaioannou, 2013; Michalopoulos et al., forthcoming; Nunn and Wantchekon, 2011; Olivetti et al., forthcoming; Lowes and Montero, 2018; Safronov and Strulovici, 2018; Voigtländer and Voth, 2012), and to the literature on female empowerment in developing countries (Anukriti et al., 2018; Ashraf et al., 2010; Beaman et al., 2009; Field et al., 2010).

The remainder of the paper is structured as follows. Section 2 discusses the measures of restrictions on women's sexuality. Section 3 provides an overview of preindustrial pastoralism, derives the hypotheses, presents the historical data, and shows that variation in pastoralism is largely determined by ecological conditions. In section 4, I present the contemporary data and the empirical strategy, and in section 5 the results on infibulation, restrictions on women's mobility, and restrictive norms about their sexual behavior. Section 6 In section 7, I delve into the mechanism of absenteeism and show that male dominance alone does not suffice to explain the results. Section 8 presents the placebo analysis with other forms of animal husbandry and further robustness checks. In section 9, I explore heterogeneity in persistence and section 10 concludes.

[6]Other papers have studied a slightly different notion of male absenteeism which has positive effects on female empowerment: when male absence is permanent, e.g., due to the slave trade (Teso, 2016) or due to casualites in the World Wars (Goldin and Olivetti, 2013; Mazumder, 2017), more gender equal norms and higher female labor force participation emerge.

2 Constraints on Women's Sexual Freedom

2.1 Infibulation

Infibulation is the most invasive form of female genital cutting, a term that comprises all procedures involving the partial or total removal of or any form of injury done to the female external genital organs for non-medical reasons (WHO, UNICEF, UNFPA, 1997).[7] Typically, infibulation involves the complete removal of the clitoris, the labia minora and most or all of the labia majora. The opposing raw sides of the vulva are then sutured together so that they heal together to form a physical barrier over the vaginal opening. A small hole is left open to allow for the passage of urin and menstrual blood. As a consequence, vaginal penetration becomes painful.[8]

Infibulation is practiced in some parts of Africa and the prevalence varies substantially both across and within countries. For example, with about 30 percent of women being infibulated, Niger has the highest prevalence. High prevalences are also found in Kenya (18 percent), Senegal (17 percent), and Ethiopia (24 percent). In contrast, in Guinea and Benin less than 7 percent of women are infibulated, and not even 1 percent of women undergo infibulation in Burkina Faso. In practicing societies, parents subject their daughters to this custom in order to secure or improve their marriage prospects. While this gives a proximate explanation for why infibulation is practiced, its origins remain unclear.

Infibulation is usually performed on young girls before the onset of puberty, typically between the ages of four and ten. Upon marriage, it can take days or weeks until full penetration during vaginal intercourse is possible (see reports in Gruenbaum (2006)). Before giving birth, infibulated women have to be de-infibulated, i.e. an incision has to be made because the scar tissue presents a physical barrier that is an obstruction to childbirth.[9] After childbirth, women typically undergo re-infibulation in order to restore the closure over the vaginal opening.[10]

[7] According to estimates of the United Nations Population Fund, 3.9 million girls underwent some form of female genital cutting in 2015. This number is projected to rise to annually 4.6 million girls by 2030. About 10 percent of them will undergo infibulation, although these estimates should be taken as a lower bound. Often, infibulation gets reported as "just a prick" or "sunna". For example, a study with 537 participants in Sudan found that about half of the women and girls who reported to have undergone pricking or sunna had actually been infibulated (Elmusharaf et al., 2006).

[8] Other forms of female genital cutting are less invasive (no narrowing of the vaginal opening) and are often performed at the onset of puberty, in a ritual involving the whole age cohort. Infibulation, on the other hand, is performed on young girls well before puberty in a private ceremony. This sets infibulation apart from other forms that are often regarded as initiation rituals or rites of passage (Kennedy, 1970; Hayes, 1975).

[9] Among the most common side effects associated with infibulation are obstructed or prolonged labor, which can cause fistulae (openings between the vagina and either the rectum or the bladder or both, so that feces or urin pass through the vagina without the woman having control over it), see for example p. 14 in Shell-Duncan and Hernlund (2000).

[10] See Lightfoot-Klein (1983, 1989); Hicks (1996); Mackie (1996); Shell-Duncan and Hernlund (2000); El Dareer (1983) and references therein for more detailed descriptions and variations of the procedure.

2.2 Restrictions on Women's Mobility

Male guardianship in Saudi Arabia and purdah – the social seclusion of women – in India, Pakistan, Bangladesh or the Arab World, are two well-known examples of customs that involve strong constraints on the freedom with which women can move freely outside their home and interact with others. More generally, restrictions on women's mobility mean any reduction in women's agency with regard to decisions about leaving the house. Such restrictions include, for example, prohibitions to leave the house alone or after a certain time, or prescriptions on staying within a certain radius or avoiding certain places.

In 2009, about one third of countries in a sample of 122 non-OECD countries had some restrictions on either women's freedom of movement or freedom of dress in public spaces encoded in their law (OECD, 2010). A typical example of the former are the need for approval by the husband or father when applying for a passport, and for the latter requirements on covering (parts of) the body when in public space. Of course, this data only captures *de jure* restrictions on women's mobility. Presumably, women's freedom to move outside their home is restricted *de facto* in many more countries around the world. In this paper, I will focus on *de facto* restrictions on women's mobility and analyze individual-level data from 33 countries on four continents.

2.3 Social Norms about Women's Sexual Behavior

Another way through which societies regulate behavior of women is social norms. Individuals adhere to social norms either because they have internalized them or because they fear social ostracism. One manifestation of strong social norms about women's fidelity are so-called "honor cultures", in which the family's honor depends on women's chastity and women's infidelity is sanctioned with violence or even death (Vandello and Cohen, 2003; Kulzcycki and Windle, 2011). More generally, prescriptions about female virginity or societal disapproval of promiscuity of women are particularly common norms about women's sexual behavior. In this paper, I measure women's adherence to such norms by examining their attitudes towards virginity and promiscuity and their sexual behavior.

3 Pastoralism

3.1 Pastoralism in Preindustrial Societies

Pastoralism as a form of preindustrial subsistence was found in almost all regions of the world. Diverse ecologies such as the most northern regions of Scandinavia and Russia, the steppes of Eurasia, the deserts of the Arabian Peninsula and Northern Africa, or the Andes in South America were (and still are) homes to pastoral people. Herd animals cover a broad spectrum of species, from smaller ones like goats and sheep to larger ones like horses, reindeer, donkeys,

camels and camelids, and a large variety of cattle.[11] While some pastoral societies were (almost) fully sedentary, some practiced a more localized transhumance lifestyle, and others were semi-nomadic or permanently mobile people (Hall, 2015). Typically, pastoral societies were not entirely dependent on animal resources, but most of them additionally subsisted on horticulture or some other form of agriculture.

Unlike other forms of preindustrial subsistence, pastoralism is characterized by frequent and often extended periods of male absenteeism. Men not only spend the day out with the animals, but they often have to stay with the herd at night to protect them from predators or thieves. When pasture grounds or water sources are far away, they are away from camp for multiple days, and in some cases even weeks. In nomadic groups which highly depend on pastoralism, trade is important, another reason for men to spend time away from their settlement. In describing the economic status of women among the Bororo, a pastoral society in Niger, Dupire (1963) notes that "[to] look after the cattle, which are only semi-domesticated, demands activities of which a woman is physically incapable. It would be beyond a woman's strength to draw water for the herd in the dry season, to go on long marches to reconnoitre for grazing lands, to protect the herd against wild animals and thieves, to hold her own with a buyer at the market, to castrate bulls, or to train the pack oxen. This hard, dangerous life, full of uncertainty and of prolonged absences from the camp, would be incompatible with the duties of motherhood, which require a more sedentary and more regular life".

As already indicated in the quoted paragraph, pastoralism is also a particularly male dominated form of subsistence, meaning that most of the work related to the animals is done by men. The disadvantage that women have due to child bearing seems especially pronounced in this form of subsistence. For example, going on long marches or handling large animals is hardly compatible with being pregnant or carrying an infant that is nursed. Thus, in pastoralism men are of particular importance to economic production.

3.2 Hypotheses

While women know with certainty that they are related to their children, men face varying degrees of uncertainty about whether they are the biological father of their wive's children. Male absenteeism is the prime example for heightened paternity uncertainty as mate guarding is difficult during absence. As long as fathers have to invest into their children, it is relevant to them whether they are genetically related to the children. Men who make sure to invest only

[11] According to Barfield (1993), the Old World can be divided into five herding zones: (1) the cattle raising zone south of the Sahara, in the Sahel across the African continent, and in and around the Great Rift Valley in East Africa; (2) the camel herding zone in the Saharan and Arabian Desert; (3) a sheep and goat herding zone along the Mediterranean littoral through the Anatolian and Iranian Plateaus into mountaineous central Asia; (4) a horse herding zone in the Eurasian steppe running from the Black Sea to Mongolia; (5) the Tibetan Plateau with herding of yaks, sheep, goats, and horses at high altitude. For the New World, Kardulias (2015) identifies three to four zones. Here, the Andes are the only place where people tended herds in prehistoric times (camelids like llamas and alpacas). Horses were brought to Mexico and the Southwest of North Americas by the Spanish, from where they eventually spread to the Great Plains. Finally, next to horses, the Spanish also brought sheep to the North American Southwest.

into genetically related offspring have a higher chance of passing on their genes, and will hence prevail in the population (Trivers, 1972).

In pastoralism, men are not only frequently absent from camp, but they are also the ones providing the economic basis for their families. Hence, being absent – increased paternity uncertainty – is particularly costly for them. Consequently, they have a particularly pronounced incentive to control or inhibit female sexuality in order to increase the likelihood that they are genetically related to their children (Trivers, 1972; Xia, 1992).

In analogy, women have a strong incentive to credibly signal their willingness to be faithful to their husbands. They depend on their husbands' investment into them and their children as women's outside options are limited in pastoral production. They therefore have incentives to ensure that their husband remains willing to provide for their children by making sure that he knows that he is their father.[12]

Anthropologists have argued that certain customs have the function of reducing paternity uncertainty (Hicks, 1996; Mackie, 1996, 2000; Shell-Duncan and Hernlund, 2000; Pazhoohi, 2016; Pazhoohi et al., 2017). One such custom is infibulation. Infibulation reduces the benefits of having an extramarital affair by making penetration painful.[13]

Instead of imposing physical pain during intercourse, other customs restrict women's sexual freedom by preventing them from meeting or being alone with potential extramarital partners, i.e., by restricting their freedom to be mobile outside their homes. Such restrictions can come as rules about whether and when a woman can leave the house, how far she can be away from her house, which places she is allowed to visit, or whether she needs to be accompanied by a family member. Male guardianship in Saudia Arabia or female seclusion, e.g., in India, Bangladesh, or some countries in the Middle East, are particularly extreme manifestations.

Finally, social norms about women's sexual behavior is another common way in which their sexuality is regulated. Prime examples for such norms are the social desirability of female virginity when entering marriage or societal disapproval of female promiscuity. These norms are either internalized, or lead to stronger social surveillance and social sanctions.

Consequently, in this paper I test the following hypothesis:

Hypothesis. *Subsisting on pastoralism favored the adoption of customs and norms that contrain women's sexual behavior, such as infibulation, restrictions on women's freedom of mobility outside their homes, and norms regarding women's promiscuity. These customs and norms have persisted until today.*

[12] Henrich (2009) provides a theory for the cultural emergence of such costly 'credibility-enhancing displays'.

[13] In line with the idea that women use this as a signal of faithfulness, there are anecdotal reports of women undergoing 're-infibulation', i.e., the renewal of the narrowing of the vaginal opening, when their husbands leave their village to work in the city (Kennedy, 1970).

3.3 Data on Pastoralism in Preindustrial Societies

The *Ethnographic Atlas* – an old anthropogical database – is a collection of information from ethnographic work on cultural aspects such as historical subsistence, kinship organization, religious beliefs, settlement patterns, political organization, or institutional complexity for approximately 1,300 ethnic groups worldwide, compiled by George Peter Murdock (Murdock, 1967). The *Ethnographic Atlas* is intended to reflect ancestral ways of living before colonization and industrialization, even when the exact timing of observation differs across ethnic groups.

I construct my main explanatory variable – an ethnic group's historical dependence on pastoralism – by combining two variables from the *Ethnographic Atlas*: (i) the degree to which a society depended on animal husbandry (0-100%) and (ii) which animal was the predominant type in that society. I create an indicator that takes value 1 if the predominant animal in a society classifies as a herding animal (i.e., sheep, cattle, horses, reindeer, alpacas, or camels), and 0 otherwise, i.e., if the predominant type of animal is a 'non-herding' species such as pigs, dogs, or poultry, or if there are no animals at all. Multiplying this indicator with a society's dependence on animal husbandry produces the main explanatory variable: a society's historical dependence on pastoralism. Formally,

$$\text{pastoralism}_j = \text{animalhusbandry}_j \times \mathbb{1}_j^{herd_animal}$$

where animalhusbandry_j denotes a society's dependence on animal husbandry and $\mathbb{1}_j^{herd_animal}$ indicates whether the predominant animal in a society was a herd species.

Figure 1 shows the variation in historical dependence on pastoralism for 1,202 societies in the *Ethnographic Atlas*.[14] About one third of societies have no pastoral production, or only very little ($< 5\%$).[15] Similarly, few societies depend on pastoralism to more than 50% (about 5%). Most societies have intermediate shares of pastoral production. On average, societies depend on pastoralism by about 15% ($\pm 19\%$).

Historical dependence on pastoralism varies within relatively narrowly defined regions. For example, in what is present day Kenya, the Teso and Turkana depended to about 30 percent on pastoralism compared to the Borana with 50 percent pastoralism or the Somali and Samburu with about 90 percent pastoral production. Similarly, in what is present day Guinea, the Toma had about 10 percent pastoral production, the Susu 20, and the Pulaar 40. This fine-grained variation is important for my empirical analysis, which relies on comparing individuals who live in the same country.

Moreover, since historical populations moved and dispersed to different countries, in my analysis I can leverage more variation than is depicted in the map. For example, present day

[14] Figure A1 in section A in the appendix shows a histogram of the variation in dependence on pastoralism for 1,202 societies in the *Ethnographic Atlas*.

[15] Many of these societies are in North and South America. Here, the lack of pastoralism might be due to the fact that many domesticated species did not arrive in the New World until relatively recently. The lack of pastoralism in the Pacific, however, is rather due to ecological conditions, as the following section shows.

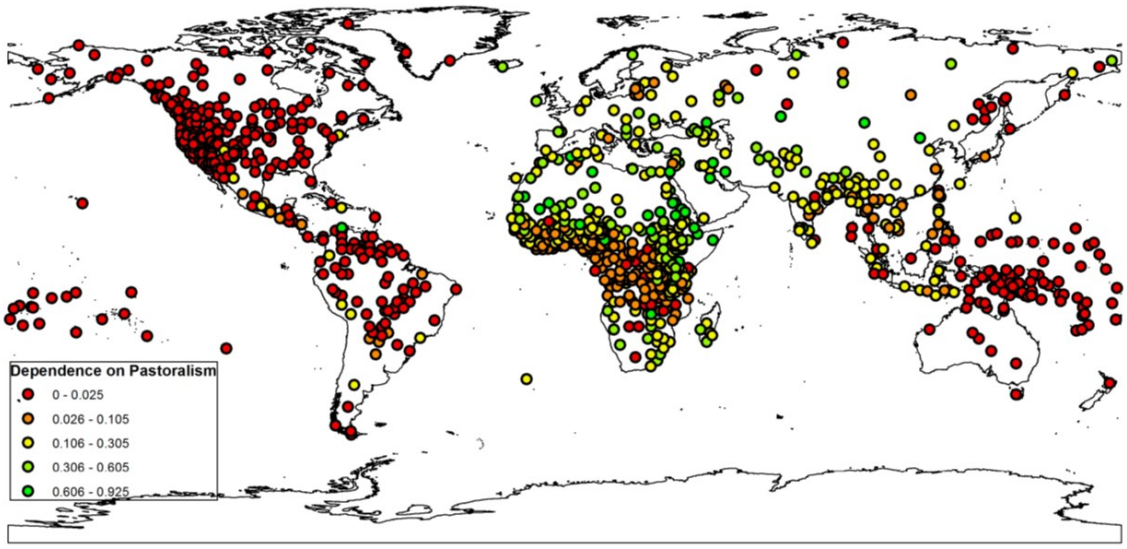


Figure 1: Location of 1,202 societies in the *Ethnographic Atlas* and their dependence on pastoralism.

Uzbekistan has residents who are of Turkmen, Kazakh, Iranian, Russian, or Ukrainian descent. These populations historically depended on pastoralism to 40, 55, 80, 30, and 35 percent, respectively.

3.4 Ecological Determinants of Pastoralism

The empirical analysis will relate contemporary outcomes to historical pastoralism. To rule out reverse causality, dependence on pastoralism must not be a function of gender attitudes itself. This would be the case if variation in subsistence mode was largely determined by ecological factors. Intuitively, certain ecological conditions are highly favorable for pastoralism whereas others make pastoralism impossible to practice. A good example of the latter is regions in Africa where the TseTse fly is endemic as it transmits trypanosome disease that is lethal to livestock such as cattle (Alsan, 2015; Diamond, 1997). More generally, herding animals need access to pasture grasses which grow on different soils, such as gleyosols (wetland soils) or leptosols, soils that are typically shallow over calcareous material making them unattractive for agriculture because of their inability to hold water but that have potential for extensive grazing.

In a recent study, Beck and Sieber (2010) explore the extent to which climate and soil conditions determine the spatial distribution of basic landuse types (hunting-gathering, agriculture, sedentary animal husbandry, and nomadic pastoralism). The environmental data they employ includes detailed information about climate (e.g.,temperature, precipitation, or altitude) between 1961 and 1991 (Hijmans et al., 2005), and soil classification data from the United Nations Food and Agriculture Organization. Using these variables in maximum entropy modelling

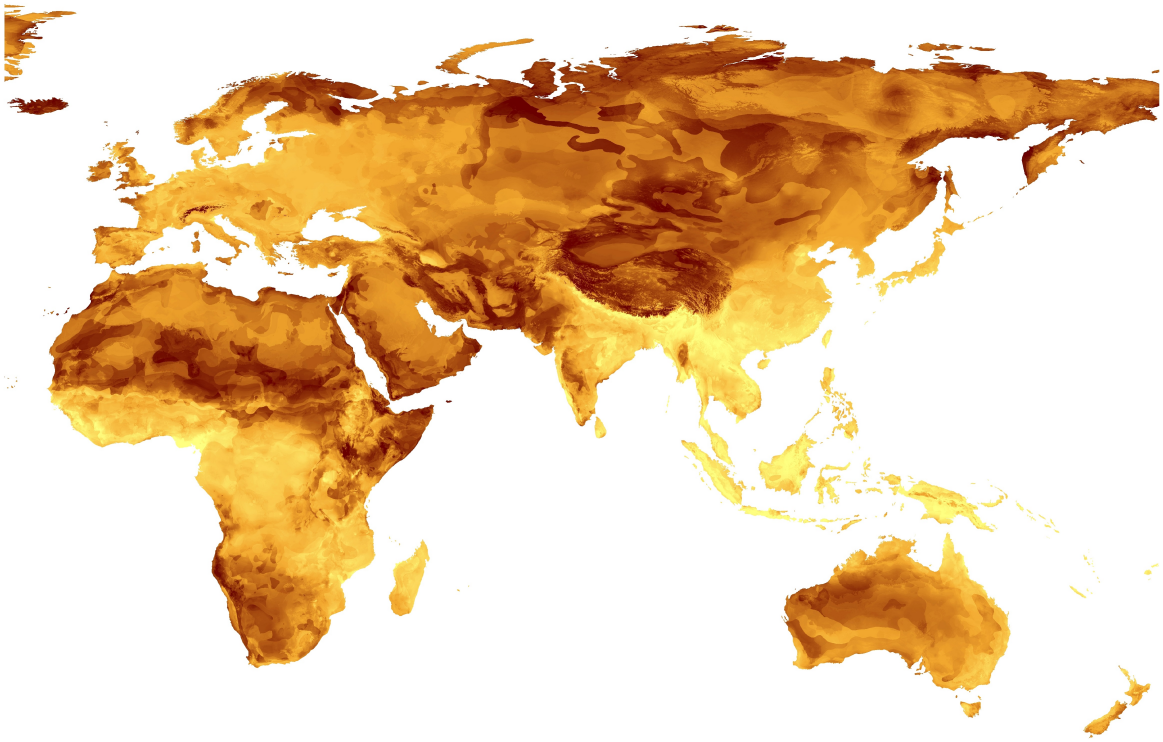


Figure 2: Land suitability for pastoralism based on data from Beck and Sieber (2010). Darker areas indicate higher suitability. Data is available only for Africa, Europe, Asia, and Australia.

(Phillips et al., 2006; Phillips and Dudik, 2008), they estimate the probability with which each type of landuse occurs on 5x5 km grid cells for the Old World and Australia.

To calculate for each grid cell how suitable the area in it is for pastoralism relative to agriculture, I simply take the difference between a grid cell's suitability for pastoralism and its suitability for agriculture.[16] Figure 2 shows the resulting heat map of land suitability for pastoralism relative to agriculture. Darker areas indicate higher probability of occurrence of pastoralism as compared to agriculture, and lighter areas indicate lower probability of occurrence.

Using this data, I assign a measure of suitability for pastoralism relative to agriculture to 750 societies in the *Ethnographic Atlas*. Based on information on their location in latitude and longitude, I calculate the average suitability for pastoralism of the land relative to agriculture in a 25 kilometer radius around their historical centroid. Actual dependence on pastoralism is strongly positively correlated with this suitability measure ($\rho = 0.59$, $p < 0.01$). Figure A2 in section A in the appendix depicts the relationship conditional on continent fixed effects.[17]

[16]As general suitability for pastoralism, I take the maximum value of a grid cell's suitability for sedentary animal husbandry and its suitability for nomadic pastoralism, since my measure for pastoralism encompasses both nomadic and sedentary types.

[17]Note that this analysis likely underestimates the size of the true association between actual historical pastoralism intensity and land suitability for pastoralism. For example, the suitability measure is based on contemporary conditions. Moreover, we can also expect the data on dependence on pastoralism to have some measurement error.

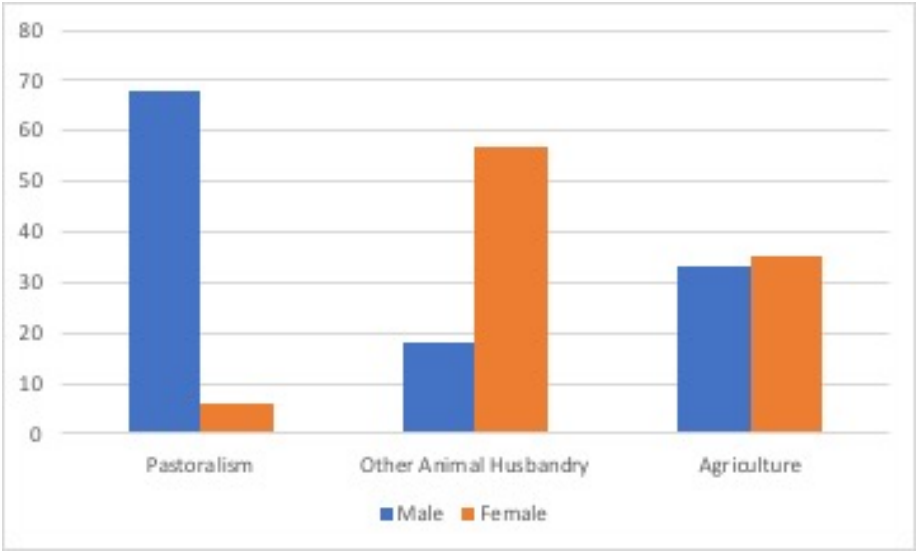


Figure 3: Share of societies in which a form of subsistence (indicated on the x-axis) is done mostly or exclusively by men (blue bars), versus share of societies in which a subsistence form is practiced mostly or exclusively by women (orange bars). Based on data from the *Ethnographic Atlas*.

Moreover, the association between pastoralism and suitability for pastoralism remains strong and statistically highly significant when adding historical controls or fixed effects for 24 world regions. Thus, the evidence presented here strongly suggests that variation in historical dependence on pastoralism is largely determined by ecology.

3.5 Evidence for Historical Validity of the Hypothesis

The data in the *Ethnographic Atlas* allow me to tentatively evaluate the historical validity of the narrative about pastoralism that is put forward here. First, I verify whether pastoralism is indeed a particularly male dominated form of subsistence, e.g., relative to agriculture. Figure 3 illustrates this. For pastoralism, other animal husbandry, and agriculture it illustrates whether it is done mostly or exclusively by men, or whether it is mostly or exclusively women who contribute to the particular form of subsistence. For example, in almost 70% of the societies that practice pastoralism, it is a mostly or exclusively male activity, and in only 5% it is practiced by women. For other forms of animal husbandry, this ratio is almost reversed. Importantly, for societies that practice agriculture, the share in which agriculture is done by men is almost identical to the number of societies in which agriculture is practiced by women.[18] Thus, pastoralism is male dominated and this distinguishes it from other forms of subsistence.

Second, even though the *Ethnograpic Atlas* does not contain information about whether infibulation – or any other form of female genital cutting – was practiced, it does have information on whether a society insisted on female virginity before marriage. Whether this restriction on

[18]Societies, in which agriculture is a female dominated subsistence tend to practice horticulture, whereas societies in which agriculture is male dominated tend to use the plow.

female sexuality was enforced by a custom like infibulation is unclear. Nevertheless, it reflects a general desire to control female sexuality. Indeed, historically, dependence on pastoralism is positively associated with the likelihood that a society insists on female virginity ($\rho = 0.15$, $p < 0.01$).[19]

Thus, the historical data provide evidence that the narrative about pastoral groups holds true in pre-industrial times at the ethnic group level.

4 Contemporary Data and Empirical Strategy

The contemporary individual-level data stem from the *Standard Demographic and Health Surveys (DHS)*. The *DHS* surveys are nationally representative household surveys covering more than 90 countries worldwide. Until today, seven waves have been conducted, starting in 1984. The country samples are quite large, with typically between 5,000 and 30,000 households being surveyed. The *DHS* elicits very detailed household and respondent characteristics. It records not only standard sociodemographic variables, but also, for example, information on housing quality, availability of electricity, school attendance of children, literacy, access to clean water, sanitation, or use of cooking fuel. Since empowerment of women is one central topic of the *DHS* surveys, respondents are women, and the surveys provide ideal measures for the research question at hand.

To study the relationship between contemporary outcomes and historical dependence on pastoralism, I match respondents in the *DHS* to their ancestors' ethnic group in the *Ethnographic Atlas*. The matching procedure follows the methodology outlined in Bahrami-Rad et al. (2018): based on the language an ethnic group speaks today – as given by Glottolog[20], a comprehensive language database – I identify the ethnic group in the *Ethnographic Atlas* that spoke the same language and match them accordingly. In cases where more than one historical ethnic group spoke that language, all ethnic groups who spoke the same language get assigned to the current population, and values (e.g., dependence on pastoralism) get averaged. In total, I match about 700,000 women representing more than 300 ethnic groups in 44 countries to their ethnic group's historical dependence on pastoralism. For about 500,000 women descending from 275 ethnic groups in 35 countries, there is some measure of constraints on women's sexuality, such as infibulation, restrictions on women's mobility, or social norms about their sexual behavior.

4.1 Baseline Specification

Using this sample, I regress an outcome, e.g., an indicator for whether a woman has undergone infibulation, on her ethnic group's historical dependence on pastoralism. The baseline regression specification will be

[19] Figure A3 in section A in the appendix depicts this relationship with continent fixed effect partialled out.

[20] glottolog.org

$$y_{i,j} = \alpha + \beta \times \text{pastoralism}_j + \sum_c \delta_c \times \text{Country}_i^c + \epsilon_{i,j}$$

with $y_{i,j}$ denoting an individual-level outcome for individual i from ethnic group j, for example an indicator for whether this individual has undergone infibulation, pastoralism_j the ethnic group's historical dependence on pastoralism, Country_i a dummy for the country of residence c of individual i, and $\epsilon_{i,j}$ the error term.[21] Since variation in the main explanatory variable occurs at the ethnic group level, observations of outcomes of individuals of the same ethnic group are not independent. Throughout, standard errors are therefore clustered at the ethnic group level.

4.2 Covariates

Throughout the analyis in this paper, in addition to the baseline specification, I will present three additional specifications: (i) adding plausibly exogenous individual-level controls; (ii) adding plausibly exogenous ethnic group level controls from the *Ethnographic Atlas*; (iii) adding a broad set additional endogenous controls, some of which are potentially a function of pastoralism themselves and hence "bad controls". The additional specification described in (i) and (ii) will be used to assess the potential role of unobservables along the lines of Altonji et al. (2005) and Oster (forthcoming).

I will begin by including exogenous individual-level observables, such as an individual's age at the time of interview, year of interview fixed effects and fixed effects for respondents' religion. The latter are of particular importance as infibulation is sometimes regarded to be a predominantly Muslim tradition, even though the majority of Muslim communities around the world do not practice infibulation and the Quran does not mention or recommend it.[22]

In a second step, I add controls for ethnicity-level characteristics that are similarly exogenous to pastoralism. First, I include an ethnic group's year of observation to alleviate the concern that some groups were portrayed later than others and might therefore have been more developed and hence potentially more gender equal, for example. I also include an indicator for whether an ethnic group used the plow in agriculture since the use of the plow as opposed to the digging stick or hoe has been shown to affect norms about women in the labor market today (Alesina et al., 2013) and the induce a preference for sons (Alesina et al., 2018).[23] The augmented specification is therefore given by

[21] Throughout, I will always only compare individuals who live in the same country since institutional differences are an important aspect, for example, in explaining differences in female empowerment. For example, Doepke and Tertilt (2009) and Anderson (forthcoming) illustrate the role of legal rights in female empowerment, and Goldin (1995) looks at the relationship between economic development and female labor force participation. Similarly, it is conceivable that countries differ in whether infibulation is legal and how well potential laws against infibulation get enforced.

[22] Of the women in my sample who have been infibulated, almost 80% are Muslim and about 20% are Christian. Of those who have *not* been infibulated, 70% are Muslim and 26% are Christian.

[23] For the analysis of infibulation, the plow is empirically almost irrelevant. Only 6 of the 113 ethnic groups represented in the sample did historically use the plow in agriculture. All of them are in East Africa (Kenya and Ethiopia). The plow can therefore not explain the variation in infibulation in other parts of Africa.

$$y_{i,j} = \alpha + \beta \times \text{pastoralism}_j + \sum_c \delta_c \times \text{Country}_i^c + \sum_m \gamma_m \times I_i^m + \sum_n \zeta_n \times H_j^n + \epsilon_{i,j}$$

where I_i^m denotes the set of individual-level observables and H_j^n the set of historical ethnicity-level controls.

In a final step, I include a broad set of variables which might be outcomes of pastoralism themselves. Therefore, this specification is only intended to be a sensitivity check. At the individual level, I add fixed effects for educational attainment, marital status, and a dummy for living in an urban area. At the historical ethnic group level, I include a measure for settlement patterns to alleviate the concern that the effect of pastoralism is not merely the result of a more nomadic as opposed to a more sedentary life. Similarly, I include a measure for how hierarchical a society was in terms of their political organization to ensure that pastoral groups are not simply less egalitarian and hence also less equal, e.g., in terms of their relations between men and women. Finally, I include measures for polygyny – mate guarding is potentially more difficult the more wives a husband has – and for kinship tightness (Enke, 2017) – a woman's sexual freedom might be more limited in societies that place emphasis on the interest of the extended versus the nuclear family.

All variable definitions and sources are discussed in section F in the appendix.

5 Main Results

5.1 Infibulation

Of the total sample of 77,074 women, about 10 % (N=7,534) have undergone infibulation. In line with Hypothesis 1, I find that an ethnic group's historical dependence on pastoralism significantly increases the likelihood that a women is infibulated today. Column 1 in Table 1 documents that a one standard deviation increase in dependence on pastoralism in pre-industrial times leads to a 6.7 percentage points increase in the likelihood for a woman to have undergone infibulation. In light of the fact that the unconditional likelihood of a woman to undergo infibulation in my sample is only 10 percent, this effect is large.

Controlling for the woman's age and adding fixed effects for her religion and the year of interview leaves the coefficient largely unchanged. Adding controls for historical plow use and year of observation decreases the coefficient substantially but it remains large and statistically significant. Finally, adding the large set of additional controls – an indicator for whether the respondent lives in an urban area, fixed effects for educational attainment and marital status, and an ethnic group's historical jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure – neither affects the size nor the statistical significance of the coefficient in a substantial way.

Next, I explore the effect of pastoralism on the *severity* of the practice. Women who undergo a particularly severe initial infibulation have a higher likelihood of needing to be de-infibulated, i.e., that someone has to make an incision to extend the remaining vaginal opening, at the onset

Table 1: Historical Pastoralism and Contemporary Infibulation

	Dependent variable: Respondent is Infibulated [0/1]			
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	0.067**	0.067**	0.048**	0.037**
	(0.028)	(0.027)	(0.022)	(0.018)
Country FE	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	Yes
Historical Controls	No	No	Yes	Yes
Endogenous Controls	No	No	No	Yes
Observations	77074	77074	77074	65701
# of Clusters	114	114	114	96
Mean of Dep. Var.	0.098	0.098	0.098	0.094
R^2	0.074	0.082	0.101	0.144

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls are age and year of interview fixed effects. Historical controls are traditional plow use and year of observation. Endogenous controls include (at the individual level) religion fixed effects, a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

of menstruation or when getting married. Data on the incidence of de-infibulation for reasons other than childbirth stems from the IPUMS database (Heger Boyle et al., 2018), which is based on data collected within the *DHS* framework.[24]

In 1998 and 1999 in 4 countries – Guinea, Cote d'Ivoire, Niger, and Burkina Faso – the *DHS* asked participants "*With your first period or when you got married, did someone have to make an incision to open the vaginal area?*". Of the total sample of 8,579 women – descendants from 24 ethnicities – 93 reported to have undergone de-infibulation (21 cases in Burkina Faso, 67 in Guinea, and 5 in Niger). Clearly, given the small number of countries, ethnicities, the low incidence rate, and the fact that we observe variation only in three of the four countries, the analysis of this data is only tentative. Nevertheless, the results are in line with what we expected: a stronger dependence on pastoralism of a woman's ancestral ethnicity leads to a higher likelihood of having needed to undergo deinfibulation with the onset of menstruation or upon marriage. The positive coefficient remains stable across the first three specifications shown in Table 2, and decreases only slightly in the specification in column 4 that includes an extensive set of controls.

[24]It can be downloaded from https://www.idhsdata.org/idhs/

Table 2: Hist. Pastoralism and De-Infibulation at Onset of Menstruation or Upon Marriage

	Dependent variable: Had to be Deinfibulated [0/1]			
	(1)	(2)	(3)	(4)
Historical Dependence on Pastoralism [Std.]	0.011**	0.010**	0.010**	0.013**
	(0.005)	(0.004)	(0.004)	(0.006)
Country FE	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	Yes
Historical Controls	No	No	Yes	Yes
Add. Controls	No	No	No	Yes
Observations	8579	8579	8579	8579
# of Clusters	24	24	24	24
R^2	0.005	0.006	0.006	0.008

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls is year of observation only because there is no variation in the historical use of the plow in this sample. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.2 Constraining Female Mobility Outside the Home

To assess whether a woman is restricted in her freedom to move outside her house, I make use of (i) information about who decides about visits to relatives; (ii) a respondent's tolerance towards domestic violence as a sanctioning device for not complying with constraints on her mobility. This information is available for a sample of more than 350,000 women across 34 countries in Africa ($N = 23$), Europe ($N = 2$), South and Central America ($N = 4$), and Asia ($N = 5$).

My first proxy for whether a woman is restricted in her mobility outside her home is an indicator for whether it is the husband alone that decides about visits to relatives. For 40% of the women in my sample this is the case. Regressing this indicator on the respondent's ethnic group's historical dependence on pastoralism yields a statistically positive coefficient. Table 3 shows the results. With country fixed effects partialled out, a one standard deviation increase in historical dependence on pastoral production implies a 5 percentage point increase in the likelihood that the husband decides about visits to relatives. This coefficient decreases only slightly in size but not in statistical significance when adding exogenous individual level and ethnicity level controls. In the most extensive specification, the coefficient slightly increases again. Overall, the estimates appear very stable, suggesting that unobservables are unlikely to drive the results (Altonji et al., 2005).

As a second proxy for constraints on women's mobility I make use of information on a woman's tolerance towards domestic violence as a sanctioning device for ignoring constraints on her mobility. More specifically, women were asked whether they thought that beating was

Table 3: Hist. Pastoralism and Female Mobility: Husband Decides About Visits

	Dependent variable: Husband Decides on Visits to Relatives [0/1]			
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	0.053***	0.052***	0.051***	0.047**
	(0.012)	(0.012)	(0.012)	(0.018)
Country FE	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	Yes
Historical Controls	No	No	Yes	Yes
Endogenous Controls	No	No	No	Yes
Observations	353333	353333	353333	278200
Mean of Dep. Var.	0.381	0.381	0.381	0.379
# of Clusters	262	262	262	204
R^2	0.144	0.153	0.154	0.186

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls are age and year of interview fixed effects. Historical controls include traditional plow use and year of observation. Endogenous controls include (at the individual level) religion fixed effects, a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

justified if a wife goes out without telling her husband. I generate an indicator that takes value 1 if they agreed with this statement, and 0 if they did not agree with it. About 37% of women in the sample agree with the statement. Moreover, in line with the hypothesis, agreement with this statement is systematically associated with an individual's ancestral dependence on pastoralism. Table 4 illustrates the results. The more an ethnic group historically relied on herding animals, the more likely its descendants are to think that domestic violence is justified if a women goes out without telling her husband.

Importantly, pastoralism has a *specific* effect on tolerance of domestic violence for leaving the house without permission. In particular, pastoralism affects the tolerance of domestic violence for leaving the house without permission more than the tolerance of domestic violence for reasons unrelated to women's mobility outside the home, such as for burning the food or for neglecting the children (Table A4 in section B.2 in the appendix). Similarly, I do not observe that women who descend from more pastoral groups are generally more likely to have experienced violence, such as sexual violence (Table A5 in section B.3 in the appendix). Thus, the results presented in this section are not just simply reflecting a more general pattern of violence towards women among formerly pastoral ethnic groups.

Table 4: Hist. Pastoralism and Female Mobility: Attitudes Towards Domestic Violence

	Dependent variable: Beating Justified For Going Out Without Asking [0/1]			
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	0.033***	0.034***	0.031***	0.0056
	(0.006)	(0.007)	(0.006)	(0.010)
Country FE	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	Yes
Historical Controls	No	No	Yes	Yes
Endogenous Controls	No	No	No	Yes
Observations	481604	481604	481604	409367
Mean of Dep. Var.	0.374	0.374	0.374	0.341
# of Clusters	267	267	267	209
R^2	0.171	0.194	0.195	0.207

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls include traditional plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.3 Social Norms About Female Sexual Behavior

Finally, I examine two norms about women's sexual behavior: (i) norms about women's faithfulness in marriage; (ii) norms about female virginity. I proxy both norms by examining both individuals' attitudes and behavior.

5.3.1 Norms About Sexual Behavior of Married Women

Relating to norms about women's faithfulness in marriage, respondents in the *DHS* were asked to indicate whether or not they agreed with the following statement: "*Married women should be faithful*". This measure of respondents' attitude is available for about 60,000 women from 6 countries in Africa.[25] In a separate section of the survey they were also asked how often they had had sex with a partner other than their own spouse during the 12 months before the interview. This information is available for a sample of more than 470,000 women who descend from 259 ethnic groups in 32 countries.

To measure norms about women's faithfulness in marriage, I generate (i) an indicator for agreement with the statement and (ii) an indicator for whether a respondent cheated on their partner. While there is little variation in attitudes towards faithfulness of married women – 94% agree with the statement above – there is more variation in whether a respondent cheated on her partner: almost 10% did.

[25]The overlap with the infibulation sample is relatively small (about 25%), hence, despite the small sample for this measure the analysis provides a test of the generalizability of the results.

Table 5: Historical Pastoralism and Norms About Faithfulness of Married Women

	Dependent variable:					
	Married Women Should Be Faithful [0/1]			Cheated on Spouse Past 12 Months [0/1]		
	(1)	(2)	(3)	(4)	(5)	(6)
Hist. Dep. on Pastoralism [Std.]	0.0086*	0.0086*	0.028***	-0.023***	-0.024***	-0.015***
	(0.005)	(0.005)	(0.006)	(0.003)	(0.003)	(0.005)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Hist. Controls	No	Yes	Yes	No	Yes	Yes
Endog. Controls	No	No	Yes	No	No	Yes
Observations	59348	59348	51531	476667	476667	397684
Mean of Dep. Var.	0.940	0.940	0.939	0.097	0.097	0.100
# of Clusters	50	50	43	259	259	210
R^2	0.024	0.024	0.028	0.062	0.082	0.217

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual and historical controls include respondent's age, religion fixed effects, year of interview fixed effects, and the ethnic group's year of observation. There is no variation in historical plow use in this sample. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5 illustrates the results. Both attitudes towards faithfulness in marriage and actual fidelity in marriage are predicted by historical pastoralism, although the association with the former measure tends to be small and is sometimes only marginally significant. This is not surprising given the low level of variation in this measure. A one standard deviation increase in historical dependence on pastoralism increases the likelihood of agreeing that married women should be faithful by almost 1 percentage point and decreases the likelihood that a respondent cheated on their partner by about 2 percentage points.

5.3.2 Norms About Female Sexual Behavior Before Marriage

Relating to norms about women's sexual behavior *before* marriage, respondents in the *DHS* were asked to indicate whether or not they agreed with the following statement: "*Women should wait with sex until marriage*". Again, this measure of respondents' attitude is available for about 60,000 women from 6 countries in Africa. 92% of respondents agree with the statement. In addition, the *DHS* elicits information about the number of sex partners a woman has had in her lifetime. This information is available for a sample of about 280,000 women from 27 countries, representing 224 ethnic groups. While the median woman has one sex partner in her lifetime, on average women have 1.8 (±1.9).

Table 6 shows the results. In line with what we hypothesized, variation in both attitudes towards female sexual activity before marriage and actual behavior are significantly affected

Table 6: Historical Pastoralism and Norms About Female Premarital Sex

	Dependent variable:					
	Women Should Wait Until Marriage [0/1]			# Sex Partners In Lifetime [Std.]		
	(1)	(2)	(3)	(4)	(5)	(6)
Hist. Dep. on Pastoralism [Std.]	0.013**	0.013**	0.026**	-0.066***	-0.061***	-0.070***
	(0.005)	(0.005)	(0.012)	(0.014)	(0.015)	(0.018)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Hist. Controls	No	Yes	Yes	No	Yes	Yes
Endog. Controls	No	No	Yes	No	No	Yes
Observations	60051	60051	52086	284777	284777	254716
Mean of Dep. Var.	0.922	0.922	0.921	0	0	0
# of Clusters	50	50	43	224	224	186
R^2	0.043	0.044	0.035	0.130	0.136	0.145

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual and historical controls include respondent's age, religion fixed effects, year of interview fixed effects, and the ethnic group's year of observation. There is no variation in historical plow use in this sample. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

by ancestral dependence on pastoralism. A one standard deviation in historical dependence on pastoralism increases the likelihood of agreeing with the statement that women should not have sex before marriage by about 1.3 percentage points (column 1). Similarly, it increases the number of sex partners in a woman's lifetime by about 6% of a standard deviation.

5.3.3 Behavioral Validity: HIV Status of Respondents

Since both proxies for women's sexual behavior are self-reported measures, it is possible that they merely reflect social desirability bias but not actual behavior. Put differently, it is conceivable that in societies with norms or customs restricting female sexual behavior women simply report being less promiscuous while actual behavior does not differ from that of women in less restrictive societies. In fact, social desirability of non-promiscuity of women is exactly what I want to measure, but for a more precise interpretation it is desirable to understand whether social desirability is reflected only in *reporting* or, instead or in addition, also in *behavior*.[26]

To explore this, I make use of data on respondent's HIV status as a proxy for frequency of sexual contact. In 19 countries in Africa, respondents could volunteer to participate in a blood test to determine their HIV status. The respondents were not informed of their HIV status in

[26]If social desirability bias in reporting alone would drive the results, we might expect that this is also reflected in non-responses because some people might prefer not to answer at all instead of adjusting their answer to what they believe to be socially desirable. However, there is no association between not answering the questions on sexual behavior and historical dependence on pastoralism.

order to ensure their anonymity.[27]

I find that respondents from ethnic groups with higher dependence on pastoralism are indeed less likely to be HIV positive as measured by a blood test.[28] This shows that more restrictive sexual behavior is also reflected in actual health outcomes. This in line with the interpretation that pastoralism generates norms that reduce female promiscuity. Table A7 in section B.2 in the appendix shows these results.

In sum, we find strong evidence that pastoralism induces norms aimed at restricting female sexuality. These norms are reflected in more restrictive attitudes towards female sexuality and more constrained female sexual behavior.

6 Instrumental Variable Approach

So far, the analysis has relied on simple OLS regressions based on the idea that variation in the main independent variable – historical reliance on pastoralism – is determined by ecological conditions. To lend further empirical support the causal interpretation of the results, I now instrument historical reliance on pastoralism with land suitability for pastoralism relative to agriculture, as described in section 3.4. The assumption underlying the exclusion restriction is that land suitability does not affect the gender customs through channels other than pastoralism. Table A8 in section C in the appendix shows the first stage. The F—statistic of the first stage is 12.

For each main outcome presented in section 5, Table 7 presents both the OLS and the IV estimates. The IV estimates confirm the results from the OLS regressions in terms of coefficient sign and statistical significance. Historical dependence on pastoralism is associated with contemporary constraints on women's sexuality as measured by the occurrence of infibulation, restrictions on mobility, and adherence to more restrictive norms about female sexual behavior. In terms of magnitude, the IV coefficients are consistently larger than their OLS counterparts.

One potential explanation for this difference in coefficient size is downward bias (bias towards zero) among the OLS coefficients reflecting that in a non-negligible share of societies pastoralism was not a male-dominated form of subsistence, but was either practiced by both men and women equally, or mostly by women. In the latter case, it is women who are absent, but being out on pasture with the animals does not raise any concerns about paternity uncertainty. In the former case, even if it is men who take the animals out to pasture, concerns about paternity uncertainty might be less consequential since women contribute to subsistence, too, and are hence less dependent on their husbands investment. Similarly, the more women provide for their offspring, the less costly it is for men to invest into children they are not related to.

[27] In order to guarantee anonymity, the *DHS* does not record participants' names in connection with their survey ID. Similarly, the blood sample was not connected to a participant's name and results of testing could therefore not be traced back to any individual.

[28] This provides evidence that variation in sexual behavior induced by environmental conditions is reflected in health outcomes (Oster, 2012).

Another plausible explanation that could induce downward bias in the OLS coefficients is measurement error in dependence on pastoralism. First, the measure of dependence on pastoralism for each society was given by a different ethnographer who estimated the amount of calories that was provided by this type of subsistence. Second, dependence on pastoralism is measured in 10 steps between 0 and 1. Thus, even if ethnographers could perfectly observe how strongly a society depended on pastoralism, the discrete nature of the variable alone induces measurement error.

Overall, the IV estimates support the causal interpretation of the results.

7 Mechanism: Male Absence versus Male Dominance

Pastoralism is not only characterized by male absence, but also by being a form of subsistence that is predominantly done by men. While the narrative put forward in this paper posits that male absence is a necessary condition to generate incentives to regulate female sexuality, it could in principle also be that the customs and norms aimed at controlling female sexual behavior are just a manifestation of male dominance *per se*. In this section, I show that male dominance alone does not suffice to generate the results.

If male dominance alone was sufficient to generate the observed patterns, we should expect to see similar associations between the outcomes – infibulation, norms about female sexual behavior, and promiscuity – and other male dominant cultures, such as plow agriculture. Like in pastoralism, in plow agriculture men have a pronounced advantage in production over women (Boserup, 1970; Alesina et al., 2013). Consequently, in 92% percent of societies in the *Ethnographic Atlas* that have plow agriculture, it is mostly or exclusively done by men. Recent research has shown that the historical use of the plow in agriculture induces gender unequal norms and lower female participation in the labor market (Alesina et al., 2013) and a preference for sons over daughters (Alesina et al., 2018).

To test whether plow agriculture has a similar effect on the regulation of female sexuality, I regress the outcomes on an indicator for whether the ancestral ethnic group of an individual traditionally used the plow in agriculture. Table 8 illustrates the results. The effect of plow use on the outcome variables is either insignificant or the coefficient has the wrong sign. The association between historical plow agriculture and the likelihood of being infibulated today is significantly *negative* in all specifications (Table 8, columns 1 to 3). If anything, using the plow in agriculture leads to a lower incidence of infibulation today, although one should keep in mind that there is very little variation in historical plow use in this sample (and in most parts of Africa more generally). Similarly, the coefficient for historical plow use is negative when an indicator for whether the husband decides on visits is the outcome variable, but the association is not statistically significant once covariates are accounted for. Columns 4 to 6 in Table 8 documents this. Finally, for promiscuous behavior we also find, if anything, that the effect of the plow is opposite to what we would expect if male dominance *per se* generated a culture of suppression of female sexuality: the association between the number of sexpartners in a woman's lifetime

Table 7: Historical Pastoralism and Constraints on Women's Sexuality: IV Estimates

	Dependent variable:									
	Is Infibulated [0/1]		Husb. Decides On Visits [0/1]		Beating Justified [0/1]		# Sexpartners in Life [Std.]		Cheated [0/1]	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hist. Dep. on Past. [Std.]	0.067**	0.098***	0.052***	0.13**	0.033***	0.075***	-0.065***	-0.18***	-0.023***	-0.046***
	(0.03)	(0.03)	(0.01)	(0.06)	(0.01)	(0.02)	(0.01)	(0.06)	(0.00)	(0.02)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76198	76198	324634	324634	441498	441498	261131	261131	435083	435083
Mean of Dep. Var.	0.098	0.098	0.393	0.393	0.390	0.390	0	0	0.099	0.099
# of Clusters	99	99	220	220	224	224	188	188	217	217
R^2	0.076	0.068	0.143	0.127	0.163	0.159	0.129	0.118	0.063	0.059

Notes. Standard errors are clustered at the ethnicity level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

and historical plow use is positive and statistically significant when only accounting for country fixed effects and it becomes indistinguishable from zero once other observables are included (columns 7 to 9 in Table 8). Columns 10 to 12 in Table 8 show that the same holds true for the relationship between historical plow use and the likelihood that a woman cheated on her husband. On the other hand, the coefficient of pastoralism is always significant when controlling for historical plow use.

In conclusion, the evidence shows that the effect of pastoralism on contemporary restrictions on female sexuality is not merely a manifestation of a male dominant culture *per se*. We do not find the same effect – if anything, opposite effects – of plow agriculture, another male dominant form of pre-industrial subsistence. This is in line with the narrative put forward in this paper, that increased paternity uncertainty induced by male absence, is a key aspect in generating incentives to inhibit or control female sexuality.

8 Additional Analyses

8.1 Other Forms of Female Genital Cutting and Male Circumcision

The hypothesis put forward by anthropologists and tested in this paper explicitly refers to one specific form of female genital cutting: infibulation. Infibulation differs from other, less invasive forms of female genital cutting in aspects that are central to its hypothesized function. For example, while removing or multilating the clitoris might also lead to a reduction of sexual pleasure it does not make penetration painful, at least not to the degree to which infibulation does. Moreover, while infibulation is performed on very young girls well before the onset of puberty and typically within the more nuclear family, other forms are usually performed at the onset of puberty as a rite of passage or initiation during a more communal ritual in which the whole age group participates. Presumably, these other forms of female genital cutting serve a different purpose.

Similarly, male circumcision – usually referring to the incision or removal of the foreskin – differs from infibulation in being less invasive and usually being performed at the onset of puberty as a rite of passage, Jewish circumcision being an exception to this rule. Male circumcision is usually just one part of an initiation ritual that entail seclusion, being tested, wearing costumes, or being subjected to dietary or sexual taboos. Different potential functions of male circumcision have been put forward, such as improving hygiene, representing willingness to sacrifice, preparing for sexual life, discouraging masturbation, or testing a boy's ability to endure pain (Daly, 1950; Silverman, 2004; Darby, 757).

To show empirically that male circumcision and other forms of female genital cutting are indeed conceptually different from infibulation, I test whether (i) having undergone some female genital cutting that does *not* involve infibulation or (ii) being circumcised as a man is predicted by historical dependence on pastoralism. For women, I generate an indicator for whether they have undergone some form of female genital cutting other than infibulation. In analogy, for

Table 8: Historical Plow Use and Contemporary Customs Controlling Female Sexuality

	Dependent variable:											
	Respondent Is Infibulated [0/1]			Husband Decides On Visits [0/1]			# Sexpartners in Lifetime [Std.]			Cheated on Partner Last Year [0/1]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Hist. Plow Use	-0.43***	-0.48***	-0.43***	-0.080***	-0.10***	-0.062	0.13***	0.096	0.040	0.018	-0.016	-0.024
	(0.15)	(0.09)	(0.10)	(0.02)	(0.03)	(0.04)	(0.04)	(0.06)	(0.08)	(0.01)	(0.02)	(0.02)
Hist. Dep. on Pastoralism [Std.]			0.037**			0.047**			-0.062***			-0.015***
			(0.02)			(0.02)			(0.02)			(0.00)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Historical Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Add. Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	77074	65701	65701	353333	278200	278200	284777	254716	254716	476667	397684	397684
R^2	0.072	0.141	0.144	0.137	0.184	0.186	0.127	0.144	0.145	0.058	0.216	0.217

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls is year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Historical Pastoralism and Contemporary Circumcision

	Dependent variable:					
	Woman Has Undergone FGC w/o Infibulation [0/1]			Man Is Circumcised [0/1]		
	(1)	(2)	(3)	(4)	(5)	(6)
Hist. Dep. on Pastoralism [Std.]	0.026	0.019	0.017	0.0029	-0.0075	0.0012
	(0.032)	(0.032)	(0.032)	(0.007)	(0.010)	(0.025)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Hist. Controls	No	Yes	Yes	No	Yes	Yes
Add. Controls	No	No	Yes	No	No	Yes
Observations	140200	139917	123581	81167	74739	68918
R^2	0.375	0.392	0.446	0.617	0.633	0.639

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls include traditional plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

men, I create a variable indicating whether they are circumcised or not.

As Table 9 illustrates, an ethnic group's historical dependence on pastoralism does not predict the incidence of female genital cutting *in general* nor male circumcision. The results for male circumcision do not change when restricting the sample to husbands of women in the infibulation sample. Table A9 in section D in the appendix presents these results.

8.2 Placebo: Animal Husbandry Without Herding

Pastoralism is not the only form of subsistence that involves caring for and using domesticated animals. Some societies practice animal husbandry with species that are not herded, such as pigs, dogs, or poultry. While these species also sometimes live in packs, they usually live within the confines of the human settlements and are not taken out to pasture. In comparison to pastoralism, this type of animal husbandry is less common, in particular in Africa, and it is most prevalent in the Pacific. Since animal husbandry with non-herd species lacks the crucial aspect of pastoralism – taking animals out to pasture – we should not expect it to affect the outcome variables in the same way.

To conduct a placebo test using animal husbandry with non-herding species, such as pigs or poultry, as a placebo treatment, I generate an ethnicity-level index for dependence on animal husbandry with non-herding species in analogy to my measure for dependence on pastoralism.[29]

[29]First, I generate an ethnicity-level indicator that takes value 1 if the predominant animal in a society was a non-herding species, such as pigs, dogs, fowls, bees, guinea pigs, or other smaller species, and that takes value 0 if it is a herding species, such as cattle, sheep, goats, horses, donkeys, reindeers, or camels. Then, I multiply this indicator with a society's dependence on animal husbandry, which gives me my measure of a society's dependence on animal husbandry with non-herding species.

By running the same analyses as before, but using dependence on animal husbandry as my main independent variable, I test whether this indeed does not generate the same patterns. Table A10 illustrates the results. The coefficient on animal husbandry with non-herding species is either statistically indistinguishable from zero, or has the opposite sign of the coefficient on pastoralism.[30] In sum, the results confirm the idea that the relationship we identified is about pastoral life specifically, and not more generally about animal husbandry.

8.3 Robustness

8.3.1 Within-Region Evidence

So far, the analyses compared individuals who live in the same country in order to hold factors constant that vary between countries, such as institutions. However, it is conceivable that important aspects of an individual's environment vary within countries, i.e., between subnational regions. It might therefore be desirable to run the same analyses while holding constant the region individuals live in, i.e., including subnational region fixed effects. On the other hand, region fixed effects explain 63% of the variation in pastoralism, substantially more than country fixed effects (45%).

Replicating the above analyses and replacing country fixed effects with subnational region fixed effects nevertheless yields very similar results.[31] Table A11 in section D in the appendix illustrates them. For all outcome variables and all regression specifications, the coefficient on historical pastoralism has the same sign as in the analyses above. In almost all cases, the coefficient estimate is significantly different from zero.

8.3.2 Robustness Across Different Types of Pastoralism

The hypothesis about the effect of pastoralism on concern with female sexuality is about pastoral way of living in general. Throughout, I have therefore not distinguished between different types of pastoralism, e.g., between whether an ethnic groups traditionally herded goats or whether they traditionally herded camels or cattle. Since all types of pastoralism share the features of being a predominantly male form of subsistence and involving frequent absences of men from camp, there is no need to distinguish between them from a conceptual perspective. Nevertheless, pastoral life might vary to some degree between the different species. Consequently, the effect on the restrictions on female sexuality might vary between species.

The data in the *Ethnographic Atlas* allows me to explore the generalizability of the results across the different types of pastoralism as it contains information on which type of animal was the predominant one in a society. In analogy to how I generated my measure for dependence on

[30]This is not surprising in light of the fact that animal husbandry with pigs, dogs, or poultry actually tends to be a female dominated activity, as also documented in section 3.

[31]More precisely, since the definition of subnational regions often changed between survey waves, I generated fixed effects for subnational regions and year of interview. Thus, the analysis presented here is even more conservative.

Table 10: Comparison Between Different Types of Pastoralism

	Dependent Variable			
Type of Pastoralism	Is Infibulated	Husband Decides About Visits	# Lifetime Sex Partners	Frequency of Cheating on Partner
Sheep, Goats	(✓)	(✓)	✓	✓
Cattle	(✓)	✓	✓	✓
Horses, Donkeys	NA	✓	✓	✓
Camels, Camelids	✓	✓	✓	✓

A "✓" indicates that the coefficient of a regression of the outcome in row on the type of pastoralism in column has the same sign and is statistically different from zero at least at the 5-percent level.
A "(✓)" indicates that the coefficient has the same sign but is not statistically different from zero at the 5-percent level.
NA means no observations for this combination of dependent variable and type of pastoralism.

pastoralism, I now create measures for dependence on goat and sheep herding, cattle herding, horse herding, and camel herding, separately.[32] For each outcome variable, I compare groups that depended on, say, cattle herding to agricultural groups or hunter-gatherers.

Clearly, this analysis should be taken with a grain of salt because the resulting sample sizes are considerably smaller.[33] Also, the categories are not completely mutually exclusive. For example, groups that are classified as camel or cattle herders will often also have secondary sheep or goat herding.[34].

Table 10 illustrates the results. Despite the data limitations, there are four insights that we can take away from this table. First, the overall picture strongly suggests that the results are not driven by one specific type of pastoralism. In fact, for each regression the sign of the coefficient is the same as the one found in the main analysis, and in most cases the effect is statistically significant. Second, sheep and goat herding does not seem to be much different from cattle, horse, or camel herding. This is reassuring in that the size of the species does not seem to matter much. Third, the results for infibulation seem to be strongest for dependence on camel herding. This is not surprising given that infibulation is a custom that is mostly practiced among ethnic groups in Saharan and Sub-Saharan Africa. Fourth, while it seems that overall the effect for camel herding is a bit stronger than for the other types, it should be noted that camel herders on average depend much more on pastoralism than the average cattle, sheep or goat herding group.

[32] I also create a measure for deer herding but there is no variation in deer herding in the *DHS*.

[33] In many cases, in particular for horse and camel herding, the number of clusters becomes very small. In these cases, standard errors were bootstrapped (and clustered them at the ethnic group level).

[34] Sheep and goats are easy to have as a secondary type of species because their eating and living habits are less specific and demanding (they are so-called non-selective grazers) than those of larger species)

8.3.3 Excluding Descendants of Ethnic Groups With High Dependence on Pastoralism.

A further potential concern with the above analyses is that the effects are driven by ethnic groups that very strongly depend on pastoralism. To address this concern, I exclude descendants of groups with dependence on pastoralism in the highest decile of the distribution. Table A12 in section D presents the results. For infibulation, the coefficient is smaller than the one found for the full sample, but remains statistically significant when including exogenous individual-level and ethnicity-level controls. For the other three outcome variables, the effect sizes are very similar to and sometimes even a bit larger than the ones found above and remain statistically significant throughout. In sum, the effect of pastoralism on customs inhibiting female sexuality does not seem to be driven only by groups that almost exclusively practice herding.

9 Heterogeneity in Persistence

Immediate questions that arise from the results presented in this paper is whether persistence gets weaker over time, why customs such as infibulation and norms persist, and whether some customs persist more than others. In this section I first compare persistence across cohorts to test whether persistence gets weaker over time. Second, I explore whether the persistence of norms and customs reflects the persistence of pastoralism. Third, I explore the possibility that contemporary absence of men for reasons potentially unrelated to pastoralism makes customs and norms that historically arose from male absenteeism more persistent. Fourth, I test whether persistence is stronger among women who are married to a man from their own ethnic group.

9.1 Comparing Cohorts

To evaluate whether cultural persistence gets weaker over time, I test if the effect of historical pastoralism on contemporary outcomes is weaker for respondents from younger cohorts as compared to respondents from older cohorts. To this end, I interact historical dependence on pastoralism with a respondent's year of birth. The results from adding this interaction term and year of birth to the baseline specifications are shown in Table 11. For infibulation, the effect of pastoralism on the contemporary likelihood of having undergone the procedure decreases for individuals born in later cohorts. Similarly, the negative effect of historical pastoralism on the number of sexpartners is weaker (closer to zero) for respondents born later. I find no evidence for a significant change of persistence across cohorts for the two outcomes measuring restrictions on mobility. In the case of cheating, the interaction effect is significantly negative, but has the "wrong" sign. This is likely attributable to the fact that there is almost no variation among earlier cohorts, making the results of this regression difficult to interpret.

9.2 Persistence of Pastoralism

While this paper has focused on the persistence of customs and norms that presumably arose as a consequence of practicing pastoralism, it is equally conceivable that the mode of economic production that historically favored their adoption has persisted, too. Importantly, the persistence of pastoralism could be an important part of the explanation of why norms and customs associated with it persist. Of course, such an analysis is purely correlational. If we find that persistence of customs and norms is stronger among people who practice pastoralism today, we cannot say whether this is caused by practicing pastoralism, or whether people who are more adherent to such norms and practices are more likely to continue practicing pastoralism. Nevertheless, it is interesting to see whether persistence differs between present-day pastoralists and non-pastoralists.

To test for such a difference, I use information on whether the household of a respondent owns animals that – at least historically – classify as herding species. 55% of women in my sample live in a household that owns herd animals. There is persistence in terms of economic production: owning herd animals today is positively correlated with historical dependence on pastoralism ($\rho = 0.24$, $p < 0.01$).

However, I do not find evidence that the persistence of pastoralism is stronger among women who live in households that still own herd animals today. Regressing the main outcome variables on historical dependence on herding, an indicator for owning herd animals, and the interaction results in statistically insignificant coefficients on the interaction term. One exception is the number of sex partners, where the sign of the interaction term has the opposite sign of what we should see if persistence was stronger among respondents who own herd animals today. Table A13 in section E in the appendix shows the results.

Overall, I do not find evidence for the persistence of customs and norms constraining female sexuality being driven by the persistence of the production mode that favored their adoption historically.

9.3 Male Absence Today

Historically, the adoption of customs and norms constraining women's sexual freedom was favored by periodic male absenteeism. Consequently, male absence today might perpetuate their persistence. Similarly, strict adherence to customs and norms aimed at constraining women's sexuality might positively affect the likelihood that a man is absent today.

One common reason for men to be absent today, especially in developing countries, is seasonal migration for work. In 21 countries in my sample, men were asked whether they had been away from home for more than one month during the past 12 months. Men who descend from ethnic groups that historically relied more strongly on pastoralism are more likely to have been absent today for an extended period ($\rho = 0.24$, $p < 0.01$). However, the effect of pastoralism on the persistence of customs and norms is not stronger for women whose husband is absent for extended periods today. Table A14 in section E in the appendix presents the results.

9.4 Endogamous Marriages

Finally, I test whether the effect of pastoralism on the persistence of norms and customs is stronger among women whose partner is from the same ethnic group. It is conceivable that norms and customs persist more when partners are from the same ethnic group. Similarly, it could be that people who value ancestral traditions more are more likely to marry a person who shares those values, such as a person who descends from the same ethnic group.

In general, higher ancestral dependence on pastoralism is associated with a higher likelihood of being married to a person from the same ethnic group ($\rho = 0.11$, $p < 0.01$). However, overall, there is no evidence that the effect of pastoralism on present-day norms and customs is higher among women who are in a relationship with co-ethnics. Table A15 in section E in the appendix illustrates the results. Only for infibulation, the interaction term between ancestral dependence on pastoralism and an indicator for being in a relationship with a co-ethnic is statistically significant. Thus, the effect of pastoralism on the likelihood of being infibulated is higher among people who are in a relationship with someone from the same ethnic group. One potential explanation of this result is that girls whose parents believe that they will get married to a person from the same ethnic group, i.e., to someone who presumably also places some value on that ethnic groups tradition, are more likely to get infibulated .

10 Conclusion

Based on a hypothesis that emerges from the anthropological literature, this paper provides evidence on the historical origins of customs and norms aimed at imposing constraints on women's sexual behavior. It shows that contemporary individual-level variation in infibulation, restrictions on women's freedom to move outside their homes, and adherence to stricter norms about female sexual behavior can be traced back to ancestral dependence on pastoralism. Because men were frequently absent in pastoral societies, paternity uncertainty was higher than in other modes of economic production. Therefore, pastoralism provided incentives to constraining female sexuality.

The results have a causal interpretation: pastoralism favored the adoption of customs and norms that constrain women in their sexuality, and these have persisted until today. An instrumental variable approach which uses the fact that pastoralism was largely determined by ecological conditions lends empirical support for a causal relationship.

Furthermore, the paper argues and shows that male dominance – as measured by the importance of men for economic production – alone is not sufficient to generate the observed patterns, but that male absence inducing paternity uncertainty is necessary. Nevertheless, without men dominating economic production the incentives to control female sexuality would be much weaker, if not absent. For example, if women were the sole providers for their offspring, paternity uncertainty would be irrelevant for the reproductive success of men. In that regard, the results presented herein also emphasize the importance of women's contribution to subsis-

tence and control over resources for their empowerment (Ashraf et al., 2010; Anderson and Eswaran, 2009).

Anthropologists have long put forward the idea of functional relationships between modes of economic production and societal phenomena, such as female status (Boserup, 1970; Sanday, 1973, 1981; Aberle, 1973).[35] Similarly, the narrative of this paper fits the idea that the environmental conditions in which humans have lived historically have not only determined their subsistence and their biology, but have also ultimately shaped their 'cultures' (Boyd and Richerson, 1988, 2005; Harris, 1977; Henrich, 2015).

[35]In line with this idea, BenYishay et al. (2017) document that reef density predicts matrilineal inheritance in a sample of 79 societies in the Solomon Islands and in the 186 societies of the *Standard Cross-Cultural Sample* (Murdock and White, 1969).

References

Aberle, David F., "Matrilineal Descent in Cross-Cultural Perspective," in David M. Schneider and Kathleen Gough, eds., *Matrilineal Kinship*, Berkeley, Los Angeles, London: University of California Press, 1973, pp. 655–730.

Alesina, Alberto, Paola Giuliano, and Nathan Nunn, "On The Origins of Gender Roles: Women And The Plough," *Quarterly Journal of Economics*, 2013, *128*, 469–530.

_ , _ , and _ , "Traditional Agricultural Practices and the Sex Ratio Today," *PLoS ONE*, 2018, *13*, e0190510.

Alsan, Marcella, "The Effect of the TseTse Fly on African Development," *American Economic Review*, 2015, *105*, 382–410.

Altonji, Joseph G., Todd E. Elder, and Christopher R. Taber, "Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools," *Journal of Political Economy*, 2005, *113*, 151–184.

Anderson, Siwan, "Legal Origins and Female HIV," *American Economic Review*, forthcoming.

_ and Mukesh Eswaran, "What Determines Female Autonomy? Evidence From Bangladesh," *Journal of Development Economics*, 2009, *90*, 179–191.

Anukriti, S, Sonia Bhalotra, and Hiu Tam, "On the Quantity and Quality of Girls: Fertility, Parental Investments, and Mortality," *Working Paper*, 2018.

Ashraf, Nava, Dean Karlan, and Wesley Yin, "Female Empowerment: Impact of a Commitment Savings Product in the Philippines," *World Development*, 2010, *38*, 333–344.

_ , Natalie Bau, Nathan Nunn, and Alessandra Voena, "Bride Price and Female Education," *Working paper*, 2016.

Bahrami-Rad, Duman, Anke Becker, and Joseph Henrich, "Tabulated Nonsense? On the Validity of the Ethnographic Atlas and the Persistence of Culture," *Unpublished Manuscript*, 2018.

Baiardi, Anna, "The Persistent Effect of Gender Division of Labour: African American Women After Slavery," *Working Paper*, 2016.

Barfield, Thomas J., *The Nomadic Alternative*, Englewood Cliffs, NJ: Prentice-Hall, 1993.

Bates, Daniel G., *Human Adaptive Strategies: Ecology, Culture, and Politics*, Needham Heights, MA: Allyn and Bacon, 2001.

Bazzi, Samuel, Martin Fiszbein, and Mesay Gebresilasse, "Frontier Culture: The Roots and Persistence of "Rugged Individualism" in the United States," *Working Paper*, 2018.

Beaman, Lori, Raghabendra Chattopadhyay, Esther Duflo, Rohini Pande, and Petia Topalova, "Powerful Women: Does Exposure Reduce Bias?," *Quarterly Journal of Economics*, 2009, *124*, 1497–1544.

Beck, Jan and Andrea Sieber, "Is the Spatial Distribution of Mankind's Most Basic Economic Traits Determined by Climate and Soil Alone?," *PLoS ONE*, 2010, *5*, e10416.

Becker, Anke, Benjamin Enke, and Armin Falk, "Ancient Origins of the Global Variation in Economic Preferences," *Working Paper*, 2017.

Bellemare, Marc F., Lindsey Novak, and Tara L. Steinmetz, "All in the Family: Explaining the Persistence of Female Genital Cutting in West Africa," *Journal of Development Economics*, 2015, *116*, 252–265.

BenYishay, Ariel, Pauline Grosjean, and Joe Vecci, "The Fish is the Friend of Matriliny: Reef Density and Matrilineal Inheritance," *Journal of Development Economics*, 2017, *127*, 234–249.

Boserup, Ester, *Woman's Role in Economic Development*, London, Allen & Unwin Ltd., 1970.

Boyd, Robert and Peter J. Richerson, *Culture and the Evolutionary Process*, University of Chicago Press, 1988.

__ and __ , *The Origin and Evolution of Cultures*, New York: Oxford University Press, 2005.

Carranza, Eliana, "Soil Endowments, Female Labor Force Participation, and the Demographic Deficit of Women in India," *American Economic Journal: Applied Economics*, 2014, *6*, 197–225.

Chen, M. Keith, "The Effect of Language on Economic Behavior: Evidence from Savings Rates, Health Behaviors, and Retirement Assets," *American Economic Review*, 2013, *103*, 690–731.

Classen, Albrecht, *The Medieval Chastity Belt: A Myth-Making Process*, New York: Palgrave Macmillan, 2007.

Daly, C. D., "The Psycho-Biological Origins of Circumcision," *The International Journal of Psycho-Analysis*, 1950, *31*, 217–236.

Daly, Martin, Margo Wilson, and Suzanne J. Weghorst, "Male Sexual Jealousy," *Ethology and Sociobiology*, 1982, *3*, 11–27.

Darby, Robert, "The Masturbation Taboo and the Rise of Routine Male Circumcision: A Review of the Historiography," *Journal of Social History*, 757, *36*, 737.

Diamond, Jared M., *Guns, Germs, and Steel: The Fates of Human Societies*, New York: W. W. Norton & Company, Inc., 1997.

Doepke, Matthias and Michele Tertilt, "Women's Liberation: What's In It For Men?," *Quarterly Journal of Economics*, 2009, *124*, 1541–1591.

Dupire, Marguerite, "The Position of Women in a Pastoral Society (The Fulani WoDaaBe, Nomads of the Niger)," in Denise Paulme, ed., *Women of Tropical Africa*, Berkeley and Los Angeles: University of California Press, 1963.

El Dareer, Asma, "Complications of Female Circumcision in the Sudan," *Tropical Doctor*, 1983, *13*, 131–133.

Elmusharaf, Susan, Nagla Elhadi, and Lars Almroth, "Reliability of Self Reported Form of Female Genital Mutilation and WHO Classification: Cross Sectional Study," *BMJ*, 2006, *333*, doi:10.1136/bmj.38873.649074.55.

Enke, Benjamin, "Kinship Systems, Cooperation and the Evolution of Culture," *Working Paper*, 2017.

Falk, Armin, Anke Becker, Thomas Dohmen, David Huffman, and Uwe Sunde, "Global Evidence on Economic Preferences," *Quarterly Journal of Economics*, forthcoming.

Fernandez, Raquel and Alessandra Fogli, "Culture: An Empirical Investigation of Beliefs, Work, and Fertility," *American Economic Journal: Macroeconomics*, 2009, *1*, 146–177.

Field, Erica, Seema Jayachandran, and Rohini Pande, "Do Traditional Institutions Constrain Female Entrepreneurship? A Field Experiment on Business Training in India," *American Economic Review: Papers & Proceedings*, 2010, *100*, 125–129.

Galor, Oded and Ömer Özak, "The Agricultural Origins of Time Preference," *American Economic Review*, 2016, *106*, 3064–3103.

__ and Viacheslav Savitskiy, "Climatic Roots of Loss Aversion," *Working Paper*, 2018.

__ , Ömer Özak, and Assaf Sarid, "Geographical Origins and Economic Consequences of Language Structures," *Working Paper*, 2017.

Giavazzi, Francesco, Ivan Petkov, and Fabio Schiantarelli, "Culture: Persistence and Evolution," *Working Paper*, 2018.

Goldin, Claudia, "The U-Shaped Female Labor Force Function in Economic Development," in T. Paul Schultz, ed., *Investment in Women's Human Capital*, Chicago: University of Chicago Press, 1995, pp. 61–91.

__ and Claudia Olivetti, "Shocking Labor Supply: A Reassessment of the Role of World War II on Women's Labor Supply," *American Economic Review: Papers and Proceedings*, 2013, *103*, 257–262.

Gruenbaum, Ellen, "Sexuality Issues in the Movement to Abolish Female Genital Cutting in Sudan," *Medical Anthropology Quarterly*, 2006, *20*, 121–138.

Hall, Thomas D., "The Ecology of Herding: Conclusions, Questions, Speculations," in P. Nick Kardulias, ed., *The Ecology of Pastoralism*, Boulder: University Press of Colorado, 2015, pp. 267–280.

Harris, Marvin, *Cannibals and Kings: The Origins of Culture*, New York: Random House, 1977.

Hayes, Rose Oldfield, "Female Genital Mutilation, Fertility Control, Women's Roles, and the Patrilineage in Modern Sudan: A Functional Analysis.," *American Ethnologist*, 1975, *2*, 617–633.

Heger Boyle, Elizabeth, Miriam King, and Matthew Sobek, *IPUMS - Demographic and Health Surveys: Version 5 [dataset]*, IPUMS and ICF International, http://doi.org/10.18128/D080.V5, 2018.

Henrich, Joseph, "The Evolution of Costly Displays, Cooperation and Religion: Credibility Enhancing Displays and Their Implications for Cultural Evolution," *Evolution and Human Behavior*, 2009, *30*, 244–260.

__ , *The Secret of Our Success: How Culture is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter*, Princeton University Press, 2015.

Hicks, Esther K., *Infibulation: Female Mutilation in Islamic Northeastern Africa*, New Brunswick, N.J.: Transaction Publishers, 1996.

Hijmans, Robert J., Susan E. Cameron, Juan L. Parra, Peter G. Jones, and Andy Jarvis, "Very High Resolution Interpolated Climate Surfaces for Global Land Areas," *International Journal of Climatology*, 2005, *25*, 1965–1978.

Kardulias, P. Nick, "Pastoralism as an Adaptive Strategy," in P. Nick Kardulias, ed., *The Ecology of Pastoralism*, Boulder: University Press of Colorado, 2015, pp. 1–15.

Kennedy, John G., "Circumcision and Excision in Egyptian Nubia," *Man*, 1970, *5*, 175–191.

Kulzcycki, Andrzej and Sarah Windle, "Honor Killings in the Middle East and North Africa: A Systematic Review of the Literature," *Violence Against Women*, 2011, *17*, 1442–1464.

Lightfoot-Klein, Hanny, "Pharaonic Circumcision of Females in the Sudan," *Medicine and Law*, 1983, *2*, 353–360.

__ , "The Sexual Experience and Marital Adjustment of Genitally Circumcised and Infibulated Females in the Sudan," *The Journal of Sex Research*, 1989, *26*, 375–392.

Lowes, Sara, "Matrilineal Kinship and Spousal Cooperation: Evidence from the Matrilineal Belt," *Working Paper*, 2017.

__ **and Eduardo Montero**, "The Legacy of Colonial Medicine in Central Africa," *Working Paper*, 2018.

Mackie, Gerry, "Ending Footbinding and Infibulation: A Convention Account," *American Sociological Review*, 1996, *61*, 999–1009.

__ , "Female Genital Cutting: The Beginning of the End," in Bettina Shell-Duncan and Ylva Hernlund, eds., *Female "Circumcision" in Africa: Culture, Controversy, and Change*, Boulder, Colorado: Lynne Riener Publishers, Inc., 2000, pp. 253–282.

Mazumder, Soumyajit, "War, Women, and the Violent Origins of Gender Equality," *Working Paper*, 2017.

Meng Xue, Melanie, "High-Value Work and the Rise of Women: The Cotton Revolution and Gender Equality in China," *Working Paper*, 2016.

Michalopoulos, Stelios, "The Origins of Ethnolinguistic Diversity," *American Economic Review*, 2012, *102*, 1508–1539.

__ **and Elias Papaioannou**, "Pre-Colonial Ethnic Institutions and Contemporary African Development," *Econometrica*, 2013, *81*, 113–152.

__ **, Louis Putterman, and David N. Weil**, "The Influence of Ancestral Lifeways on Individual Economic Outcomes in Sub-Saharan Africa," *Journal of the European Economic Association*, forthcoming.

Murdock, George P., *Ethnographic Atlas*, University of Pittsburgh Press, 1967.

__ **and Douglas R. White**, "The Standard Cross-Cultural Sample," *Ethnology*, 1969, *8*, 329–369.

Nunn, Nathan and Leonard Wantchekon, "The Slave Trade and the Origins of Mistrust in Africa," *American Economic Review*, 2011, *101*, 3221–3253.

OECD, *Atlas of Gender and Development* 2010.

Olivetti, Claudia, M. Daniele Paserman, and Laura Salisbury, "Three-Generation Mobility in the United States, 1850-1940: The Role of Maternal and Paternal Grandparents," *Explorations in Economic History*, forthcoming.

Oster, Emily, "Routes of Infection: Exports and HIV Incidence in Sub-Saharan Africa," *Journal of the European Economic Association*, 2012, *10*, 1025–1058.

__ , "Unobservable Selection and Coefficient Stability: Theory and Validation," *Journal of Business Economics and Statistics*, forthcoming.

Pazhoohi, Farid, "On the Practice of Cultural Clothing Practices That Conceal the Eyes: An Evolutionary Perspective," *Evolution, Mind and Behaviour*, 2016, *14*, 55–64.

__ , Martin Lang, Dimitris Xygalatas, and Karl Grammer, "Religious Veiling as a Mate-Guarding Strategy: Effects of Environmental Pressures on Cultural Practices," *Evolutionary Psychological Science*, 2017, *3*, 118–124.

Phillips, Steven J. and Miroslav Dudik, "Modeling of Species Distributions with Maxent: New Extensions and a Comprehensive Evaluation," *Ecography*, 2008, *31*, 161–175.

__ , Robert P. Anderson, and Robert E. Schapire, "Maximum Entropy Modeling of Species Geographic Distribution," *Ecological Modelling*, 2006, *190*, 231–259.

Poyker, Michael, "Regime Stability and the Persistence of Traditional Practices," *Working Paper*, 2018.

Qian, Nancy, "Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance," *Quarterly Journal of Economics*, 2008, *123*, 1251–1285.

Robinson, Patricia Murphy, "The Historical Repression of Women's Sexuality," in Carole S. Vance, ed., *Pleasure and Danger: Exploring Female Sexuality*, Boston, Mass.: Routledge & K. Paul, 1984, pp. 251–265.

Safronov, Mikhail and Bruno Strulovici, "Contestable Norms," *Working Paper*, 2018.

Salzman, Philip C., *Pastoralists: Equality, Hierarchy, and the State*, Boulder: Westview, 2004.

Sanday, Peggy R., "Toward a Theory of the Status of Women," *American Anthropologist*, 1973, *75*, 1682–1700.

__ , *Female Power and Male Dominance: On the Origins of Sexual Inequality*, Cambridge University Press, 1981.

Schulz, Jonathan F., "The Churches' Bans on Consanguineous Marriages, Kin-Networks and Democracy," *Working Paper*, 2017.

Shell-Duncan, Bettina and Ylva Hernlund, "Female "Circumcision" in Africa: Dimension of the Practice and Debate," in Bettina Shell-Duncan and Ylva Hernlund, eds., *Female "Circumcision" in Africa: Culture, Controversy, and Change*, Boulder, Colorado: Lynne Riener Publishers, Inc., 2000, pp. 1–40.

Silverman, Eric K., "Anthropology and Circumcision," *Annual Review of Anthropology*, 2004, *33*, 419–445.

Smith, Lesley, "Chastity Belts and Birthing Girdles," *Journal of Family Planning and Reproductive Health Care*, 2007, *33*, 285–286.

Teso, Edoardo, "The Long-Term Effect of Demographic Shocks on the Evolution of Gender Roles: Evidence from the Transatlantic Slave Trade," *Working Paper*, 2016.

Trivers, Robert L., "Parental Investment and Sexual Selection," in Bernard Campbell, ed., *Sexual Selection and the Descent of Man, 1871–1971*, Chicago: Aldine Pub. Co., 1972, pp. 136–179.

Vandello, Joseph A. and Dov Cohen, "Male Honor and Female Fidelity: Implicit Cultural Scripts That Perpetuate Domestic Violence," *Journal of Personality and Social Psychology*, 2003, *84*, 997–1010.

Vogt, Sonja, Nadia A. M. Zaid, Hilal El Fadil Ahmed, Ernst Fehr, and Charles Efferson, "Changing Cultural Attitudes on Female Genital Cutting," *Nature*, 2016, *538*, 506–509.

Voigtländer, Nico and Hans-Joachim Voth, "Persecution Perpetuated: The Medieval Origins of Anti-Semitic Violence in Nazi Germany," *Quarterly Journal of Economics*, 2012, *127*, 1339.

Xia, Xuhua, "Uncertainty of Paternity Can Select Against Paternal Care," *The American Naturalist*, 1992, *139*, 1126–1129.

Table 11: Heterogeneity in Persistence: Comparing Cohorts

	Dependent variable:									
	Respondent Is Infibulated [0/1]		Husb. Decides On Visits [0/1]		Beating OK: Go Out [0/1]		# Sexpartners in Life [Std.]		Cheated Last Year [0/1]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hist. Past. [Std.]	2.78**	2.17**	-0.74	-0.14	0.75	0.81*	-2.96***	-3.06***	2.55***	2.51***
	(1.25)	(0.97)	(0.69)	(0.44)	(0.61)	(0.45)	(1.06)	(1.06)	(0.48)	(0.46)
Year of Birth	0.0018**	-0.019*	0.0020**	-0.0076***	-0.0023***	-0.014***	-0.0093***	0.0047	0.0058***	0.0032***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Pastoralism * Year of Birth	-0.0083**	-0.0065**	0.0025	0.00055	-0.0022	-0.0024*	0.0089***	0.0092***	-0.0079***	-0.0077***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Historical Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	76915	76915	311323	311323	456036	456036	284243	284243	445076	445076
R^2	0.077	0.109	0.137	0.155	0.162	0.187	0.134	0.138	0.085	0.093

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls include traditional plow use and year of observation. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A Pastoralism

A.1 Historical Data

Figure A1 illustrates the variation in dependence on pastoralism for 1,202 societies in the *Ethnographic Atlas*. About one third of societies do not subsist on pastoralism at all, and about 5% do so to only a very small extent. Most societies range between 10% and 50% in their dependence on pastoralism, and there are only a few societies that almost exclusively depend on it.

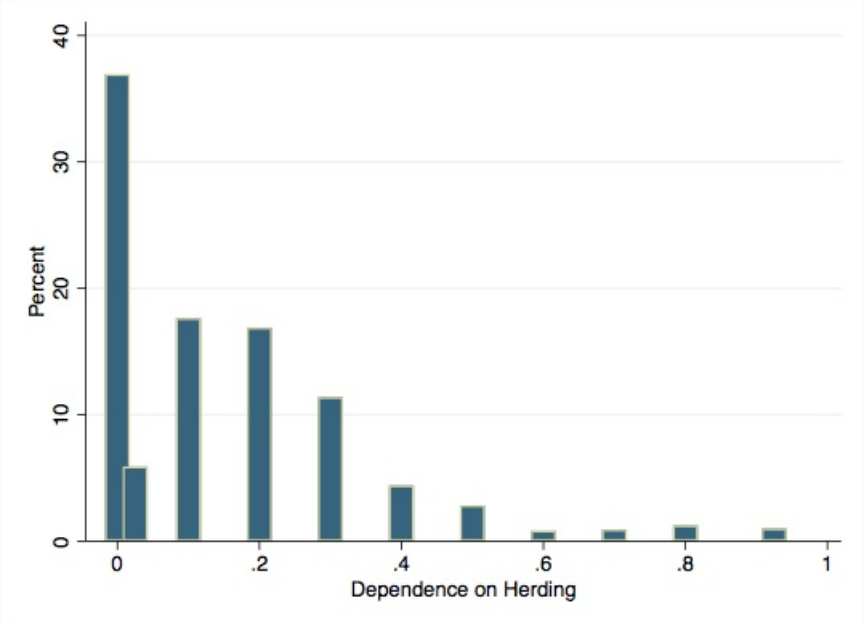


Figure A1: Distribution of dependence on pastoralism across 1,202 societies in the *Ethnographic Atlas*.

A.2 Ecological Determinants of Pastoralism

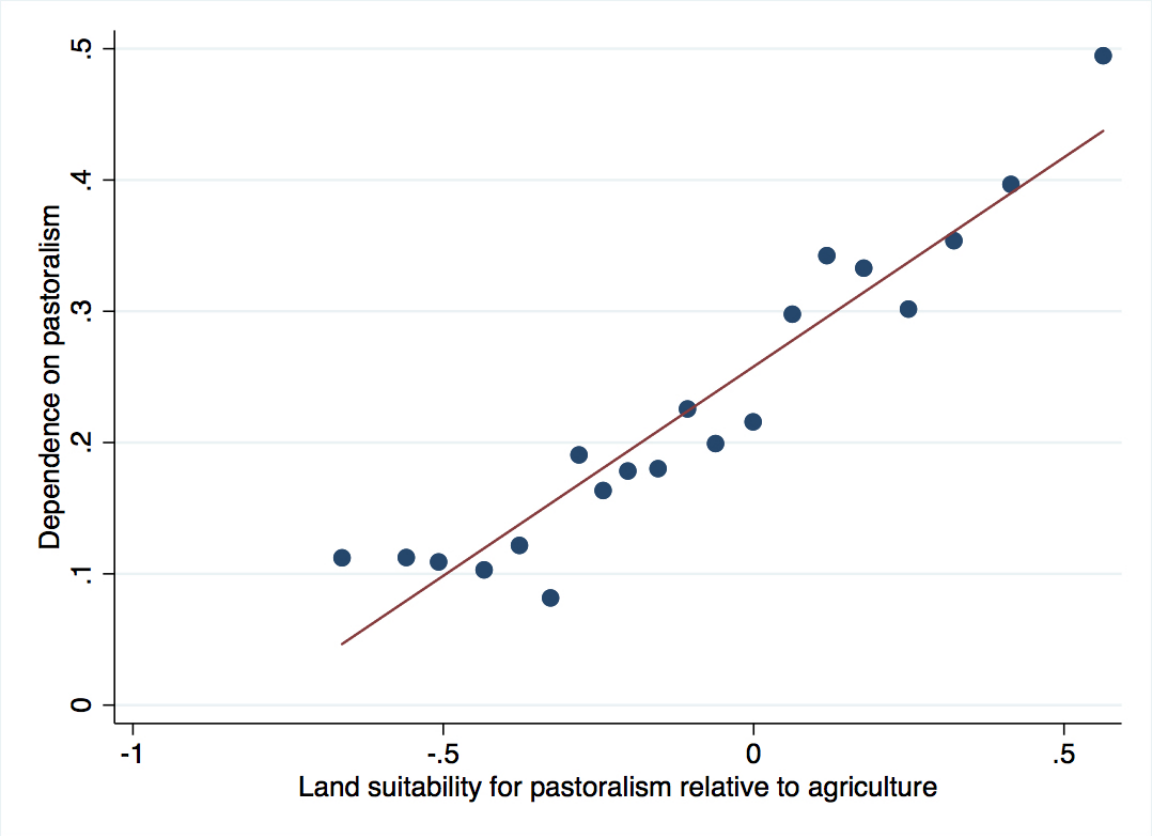


Figure A2: Binscatter plot: dependence on pastoralism and land suitability for pastoralism relative to agriculture for 750 societies in the *Ethnographic Atlas* conditional on continent fixed effects.

A.3 Historical Validity of the Hypothesis

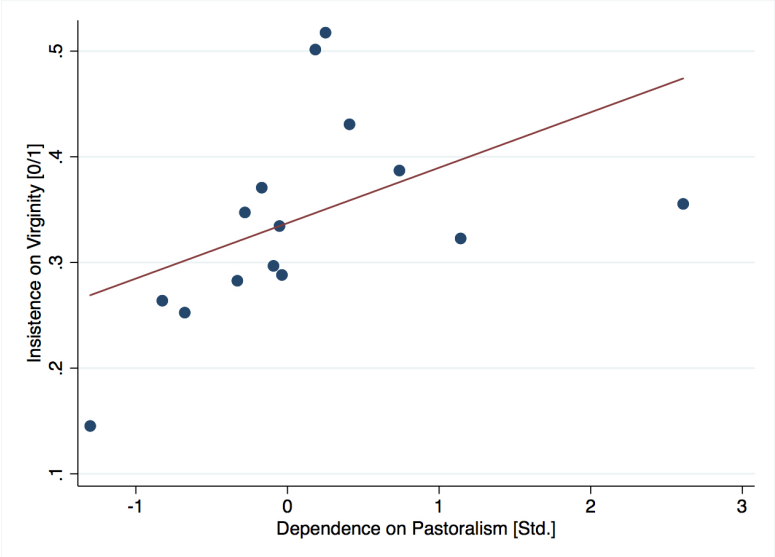


Figure A3: Binscatter plot, $N = 592$ societies, data from the *Ethnographic Atlas*. Association between insistence on female virginity in a society and a society's dependence on pastoralism, residualized of continent fixed effects.

Table A1: Sex Differences in Pastoralism, Animal Husbandry, and Agriculture (Ethnographic Atlas)

Subsistence	Predominantly Male*	Predominantly Female**	Participation Equal but Differentiated	Participation Equal, No Differentiation
Pastoralism	67.8%	6.1%	16.6%	6.6%
- Sheep, Goats	45.5%	15.9%	9.1%	22.7%
- Cattle	70.8%	5.2%	18.7%	5.3%
- Equines	75.0%	0%	7.7%	1.9%
- Deer	69.2%	15.9%	0%	7.7%
- Camelids	68.8%	0%	31.6%	0%
Other Animal Husbandry	17.9%	56.7%	1.5%	14.9%
Agriculture	33.0%	35.0%	12.4%	19.3%

Percentages in rows do not necessarily add up to 100: two omitted categories (sex differentiation not specified; activity absent or unimportant in the society).

* Denotes the share of societies in which either males alone performed the activity, or males did appreciably more than females.

** Denotes the share of societies in which either females alone performed the activity, or females did appreciably more than males.

B Main Results

B.1 Infibulation

Table A2: Historical Pastoralism and Contemporary Infibulation: Probit Estimates

	Dependent variable: Respondent is Infibulated [0/1]			
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	0.28***	0.25***	0.14***	0.14*
	(0.082)	(0.075)	(0.055)	(0.074)
Country FE	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	Yes
Historical Controls	No	No	Yes	Yes
Add. Controls	No	No	No	Yes
Observations	76915	76915	76915	65701
Pseudo R^2	0.102	0.113	0.130	0.161

Notes. Probit estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls include traditional plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

B.2 Restrictions on Women's Mobility

Table A3: Historical Pastoralism and Female Mobility: Probit Estimates

	Dependent variable: Husband Decides on Visits to Relatives [0/1]			
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	0.15***	0.11***	0.11***	0.12**
	(0.032)	(0.032)	(0.033)	(0.050)
Country FE	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	Yes
Historical Controls	No	No	Yes	Yes
Add. Controls	No	No	No	Yes
Observations	353333	311323	311323	278200
Pseudo R^2	0.116	0.123	0.123	0.156

Notes. Probit estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls include traditional plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Less Tolerance of Domestic Violence in Areas Unrelated to Women's Mobility

	Dependent variable: Diff. in Tolerance of Violence for Leaving House... Versus Burning Food		Versus Neglecting Kids	
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	0.0098	0.0077	0.013***	0.011***
	(0.006)	(0.005)	(0.003)	(0.003)
Country FE	Yes	Yes	Yes	Yes
Ind. & Hist. Controls	No	Yes	No	Yes
Observations	473265	473265	478750	478750
R^2	0.080	0.088	0.029	0.033

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls are age and year of interview fixed effects. Historical controls are traditional plow use and year of observation. Additional controls include (at the individual level) religion fixed effects, a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

B.3 Norms about Women's Sexual Behavior

Table A5: No Effect of Historical Dependence on Pastoralism on Sexual Violence

	Dependent variable: Has Experienced Sexual Violence [0/1]			
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	-0.0041	-0.0038	-0.0041	-0.0078
	(0.005)	(0.005)	(0.005)	(0.006)
Country FE	Yes	Yes	Yes	Yes
Ind. Controls	No	Yes	Yes	Yes
Hist. Controls	No	No	Yes	Yes
Add. Controls	No	No	No	Yes
Observations	132861	132861	132861	111753
R^2	0.038	0.041	0.041	0.059

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls are age and year of interview fixed effects. Historical controls are traditional plow use and year of observation. Additional controls include (at the individual level) religion fixed effects, a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Historical Pastoralism and Norms About Faithfulness of Married Women: Probit Estimates

	Dependent variable:					
	Married Women Should Be Faithful [0/1]			Cheated on Spouse Past 12 Months [0/1]		
	(1)	(2)	(3)	(4)	(5)	(6)
Hist. Dep. on Pastoralism [Std.]	0.096**	0.10**	0.23***	-0.22***	-0.18***	-0.19***
	(0.048)	(0.051)	(0.051)	(0.040)	(0.032)	(0.042)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Hist. Controls	No	Yes	Yes	No	Yes	Yes
Add. Controls	No	No	Yes	No	No	Yes
Observations	59348	59114	51531	475804	444214	396822
Pseudo R^2	0.046	0.046	0.053	0.085	0.136	0.337

Notes. Probit estimates, standard errors are clustered at the ethnicity level. Individual and historical controls include respondent's age, religion fixed effects, year of interview fixed effects, and the ethnic group's year of observation. There is no variation in historical plow use in this sample. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Revealed Promiscuity and Pastoralism

	Dependent variable: Respondent is HIV positive [0/1]			
	(1)	(2)	(3)	(4)
Historical Dependence on Pastoralism [Std.]	-0.0064***	-0.0051**	-0.0053**	-0.011**
	(0.002)	(0.002)	(0.002)	(0.005)
Country FE	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	Yes
Historical Controls	No	No	Yes	Yes
Add. Controls	No	No	No	Yes
Observations	343426	137792	137792	122937
R^2	0.026	0.059	0.059	0.090

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls include traditional plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: IV Analysis: First Stage

	Dependent variable: Dependence on Pastoralism [Std.]
	(1)
Land Suitability for Pastoralism	1.74***
	(0.494)
Country FE	Yes
Observations	686221
# of Clusters	254
R^2	0.512
$F-$Statistic	12.41

Notes. OLS estimates, standard errors are clustered at the ethnicity level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C IV Analysis

D Additional Analyses

D.1 Other Forms of Female Genital Cutting and Male Circumcision

Table A9 illustrates the results when restricting the sample to husbands of women who have potentially undergone infibulation, i.e. women who stated that they had undergone female genital cutting.

Table A9: Historical Pastoralism and Contemporary Circumcision: Restricted Sample

	Dependent variable: Man Is Circumcised [0/1]			
	(1)	(2)	(3)	(4)
Hist. Dep. on Pastoralism [Std.]	0.0073	0.0015	0.0072	0.013
	(0.005)	(0.002)	(0.005)	(0.009)
Country FE	Yes	Yes	Yes	Yes
Ind. & Hist. Controls	No	Yes	Yes	Yes
Add. Controls	No	No	No	Yes
Observations	17174	17129	17129	15879
R^2	0.035	0.140	0.147	0.202

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age, religion fixed effects, and year of interview fixed effects. Historical controls include traditional plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

D.2 Placebo: Animal Husbandry With Non-Herding Species

D.3 Within Region Evidence

Only for infibulation, the $p-$value is below conventional significance levels ($p < 0.12$ in column 1 and $p < 0.15$ in column 2).[36]

D.4 Excluding the Top 10th Percentile of the Distribution

E Heterogeneity in Persistence

E.1 Persistence of Pastoralism

E.2 Male Absence Today

E.3 Endogamous Marriages

[36]Only 10 percent of the women in my sample have been infibulated. Thus, it is plausible that including 154 subnational region times year of interview fixed effects leaves only little variation.

F List of Variables

F.1 Contemporary Individual-Level Measures: *DHS*

Infibulation Based on g105: indicator that takes value 1 if respondent has undergone infibulation, 0 if she has not undergone infibulation.

Husband decides about visits Based on v743d: indicator that takes value 1 if the respondent's husband decides about visits to relatives and family, and 0 if the respondent alone or the respondent together with her husband decides about such visits.

Number of sex partners in lifetime Based on v836: the number of sex partners a respondent has had in her lifetime.

Cheated last year Based on v766a, which asks the respondent to state the number of people she has had sex with other than her spouse during the 12 months preceding the interview: indicator that takes value 1 if the respondent has had sex with at least one other person, and 0 if she has not had sex with a partner other than her spouse.

Married women should be faithful Based on v851k: Indicator that takes value 1 if respondent agrees with the statement "*Married women should be faithful.*", and 0 if she disagrees.

Women should not have sex before marriage Based on v851g: Indicator that takes value 1 if respondent agrees with the statement "*Young women should wait for sex until marriage.*", and 0 if she disagrees

HIV Status Based on hiv03 of the *DHS* HIV dataset: indicator that takes value 1 if blood test for HIV of respondent is positive, and 0 if blood test for HIV is negative.

F.2 Historical Ethnicity-Level Measures: *Ethnographic Atlas*

Dependence on pastoralism Based on v4 and v40. V4 indicates a society's dependence on animal husbandry between 0 and 100 in 10 intervals. This variable was rescaled to 10 discrete steps (the midpoint of the intervals) between 0 and 1. V40 indicates the predominant domestic animals that a society had. Using information from v40, I generated an indicator that takes value 1 if the predominant animal is a herding animal (sheep or goats, equine animals such as horses or donkeys, deer/reindeer, camels or camelids such as alpacas or llamas, bovine animals such as cattle, water buffalos or yaks). To generate my measure for a society's dependence on pastoralism, I multiplied this indicator with the rescaled variable measuring dependence on animal husbandry.

Dependence on animal husbandry without herding Based on v4 and v40. V4 indicates a society's dependence on animal husbandry between 0 and 100 in 10 intervals. This variable was rescaled to 10 discrete steps (the midpoint of the intervals) between 0 and 1. V40 indicates the predominant domestic animals that a society had. Using information from v40, I generated an indicator that takes value 1 if the predominant animal is a *non*-herding animal (poultry, bees, pigs, dogs, fowls, guinea pigs). To generate my measure for a society's dependence on animal husbandry without herding, I multiplied this indicator with the rescaled variable measuring general dependence on animal husbandry.

Plow use Based on v39. Indicator variable that takes value 1 if a society traditionally used the plow in agriculture.

Settlement patterns Based on v30 which indicates the prevailing type of settlement patterns. 8-step variable: 1=nomadic, 2=seminomadic, 3=semisedentary, 4=impermanent, 5=dispersed homesteads, 6=hamlets, 7=villages/towns, 8=complex permanent settlements.

Polygyny Based on v9 (marital composition of families). Indicator that takes value 1 if polygyny is common.

Kinship score Measure for kinship tightness, based on v43 (major type of descent), v11 (transfer of residence at marriage), v8 (domestic or familial organization), v15 (prevalence of local endogamy and localized kin groups), v27 (degree of distinction between different types of cousins), v9 (marital composition of families), and v24 (allowed cousin marriages). For construction of the index see Enke (2017).

G Overview: Main Sample

The following table gives an overview of the full sample which encompasses all individuals from the *Standard DHS* for which (i) information on their ethnic affiliation was available and (ii) whose ethnic group could be matched to a population documented in the *Ethnographic Atlas*.

Table A16: Ethnic Composition of the Full Sample by Country

Country	**# Obs.**	**Ethnic Groups (DHS)**
Afghanistan	17,102	Hazara, Nuristani, Pashtun, Turkmen
Albania	7,455	Albanian, Greek, Montenegrin
Azerbaijan	32	Russian
Benin	29,551	Betamaribe, Fon (and related), Peulh (and related), Yoruba (and related)
Bolivia	3,380	Aymara, Guarani
Burkina Faso	35,551	Bissa, Bobo, Dioula, Fulfulde/Peul, Gourmantche, Lobi, Mossi, Samo, Touareg/Bella
CAR	5,071	Banda, Gbaya, Haoussa, Mandjia, Mboum, Ngbaka-Bantou, Zande-Nzakara
Cameroon	10,426	Arabe Choa, Bamilike-Central, Bamoun, Banen-Bandem, Banyang, Bassa-Bakoko, Bata, Bendi, Efik-Korop, Ejagham, Fali, Gbaya, Haoussa, Kotoko, Mafa, Mambila, Massa, Mbembe, Mboum, Momo, Mousgoum, Ngoe-Oroko, Peulh, Ring, Samba, Tiv, Wimbum-Yamba
Chad	19,275	Arab, Baguirmi/Barma, Gorane, Kanembou-Bornou, Massa/Mousseye/Mousgoume, Moundang, Peul/Foulbe, Sara, Toupouri
Congo (Brazzaville)	4,139	Baboma, Bakotas, Bambama, Bandja, Bangala, Basundi, Batak, Bayombe, Bomwali, Kota, Mbochi, Sangha, Teke
Cote d'Ivoire	5,781	Aboure, Abron, Agni, Akye/Attie, Alladian, Avikam, Bakwe, Bambara, Bete, Birifor, Dioula, Gagou, Gouro, Koulango, Lobi, Senoufo, Toura, Yacouba, Yacouda/Dan
DRC	292	Lunda

Ethiopia	40,441	Affar, Amhara, Anyiwak, Ari, Basketo, Bena, Burji, Dasenech, Gedeo, Guragie, Hamer, Kefficho, Komo, Konso, Kore, Malie, Mao, Me'enite, Nuwer, Oromo, Sheko, Sidama, Somalie, Tigray, Tigrie, Yem
Gabon	5,310	Fang, Kota-Kele, Myene, Okande-Tsogho
Gambia	7,942	Bambara, Fula/Tukulur/Lorobo, Jola/Karoninka, Mandinke/Jahanka, Serahuleh, Serere
Ghana	31,038	Akan, Akwapim, Asante, Dagarti, Ewe, Fante, Ga-Adangbe, Ga-Dangme, Grusi/Grussi, Gurma, Hausa, Mande, Mole-Dagbani, Twi
Guatemala	9,673	Garifuna, Maya
Guinea	22,119	Kissi, Malinke, Peulh, Soussou, Toma
Honduras	3,845	Garifuna, Lenca, Maya Chorti, Misquito, Tolupan
Kazakhstan	7,662	Chechen/Ingush, Kazak, Russian, Tatar, Ukrainian, Uzbek
Kenya	57,258	Boran, Gabbra, Iteso, Kalenjin, Kamba, Kikuyu, Kisii, Luo, Maasai, Meru/Embu, Mijikenda/Swahili, Pokomo, Samburu, Somali, Taita/Tavate, Turkana
Kyrgyz Republic	1,004	Kazak, Russian, Uzbek
Liberia	7,948	Gbandi, Gio, Gola, Kpelle, Krahn, Kru/Sapo, Mande/Mende, Sarpo, Vai
Malawi	53,055	Amanganja/Anyanja, Chewa, Ngoni, Nkonde, Nyanga, Tonga, Tumbuka, Yao
Mali	46,812	Bambara, Bobo, Dogon, Malinke, Peul/Toucouleur, Sarakole/Soninke/Marka, Senoufo/Minianka, Sonrai, Tamachek/Bella
Moldova	7,348	Bulgarian, Gagauzan, Moldovan, Romanian, Russian, Ukrainian
Mozambique	15,464	Cicewa, Cichopi, Cindau, Cisena, Ciyao, Emakhuwa, Shimakonde, Shona, Xichangana, Xitsonga
Namibia	5,182	Afrikaans, Damara/Nama, Herero, Lozi, San, Tswana
Nepal	2,020	Bangali, Lepcha, Magar, Santhal/Satar, Sherpa
Niger	22,539	Arab, Djerma/Songhai, Gourmantche, Haoussa, Kanouri, Peul, Touareg/Bella, Toubou

Nigeria	51,530	Adra/Adarawa, Afemai, Afo, Anaguta, Angas, Attakar, Auchi, Aulliminden, Babur, Bachama, Badakare/Dakarkari, Baggara, Basa, Bashama, Basso Komo, Baya, Bchama, Berom, Bini/Edo, Birom, Bogom, Bolawa, Buduma, Bura/Babur, Butawa, Buzu, Calabar, Chamba, Dakar Kari, Djerma, Ebira/Igbira, Ebu, Edo, Efik, Egba, Ejagham, Ekoi, Etsako, Fulani, Fulfulde, Gede/Gude/Gai, Gizmawa, Gobiri/Gobirawa/Bogobiri, Gude, Gunganchi, Gwari, Hausa, Honna, Ibibio, Ichen, Idoma, Igala, Igbo/Ibo, Ilaje, Irbira, Isoko, Itsekiri, Jibu, Jukun, Kadara, Kagoro, Kalabari, Kambu/Kangu, Kamuku, Kanakuru, Kanawa, Kanuri, Karekare, Kataf/Atyap, Koro, Koto, Kurama, Ma Takam, Mafa/Maka/Maga, Manga, Marghi/Mangi, Mumuje, Ndola, Ngezim/Ngizim, Nnebe, Nupe, Shuwa, Tarok, Tera, Tiv, Verre/Kila, Wula, Yakurr, Yoruba, Yungur, Zabarmawa, Zuru
Pakistan	9,603	Balochi, Brushaski, Farsi, Kashmiri, Pushto, Shina, Sindhi
Peru	43,370	Aymara, Castellano, Quechua, Spanish
Philippines	18,913	Akeanon/Aklanon, Boholano, Cebuano, Ifugao, Igorot, Manabo, Sama
Senegal	37,337	Diola, Poular, Serer, Soninke, Wolof, Bambara, Diola, Poular, Sarakole/Soninke, Serer, Wolof/Lebou
Sierra Leone	17,665	Fullah, Koranko, Mende, Sherbro, Temne
Sri Lanka	5,569	Indian Tamil, Low Sinhalese, Sri Lankan Tamil, Up Sinhalese
Togo	2,358	Ana, Bassar, Cotokoli, Ewe, Fon, Gourma, Kabye, Konkomba, Moba, Mossi, Yanga, Yoruba
Turkey	5,800	Arabic, Circassian, Georgian, Greek, Turkish
Uganda	17,830	Acholi, Alur, Atesa, Baamba, Bachope, Bafumbira, Baganda, Bahororo, Bakiga, Bakonjo, Banyankole, Banyarwanda, Banyoro, Barundi, Basoga, Batoro, Iteso, Kakwa, Karimojong, Langi, Lendu, Lugbara, Madi, Mufumbira, Muganda, Mugishu, Mukiga, Mukonjo, Munyankole, Munyarwanda, Munyoro, Musoga, Mutoro, Mwamba, Sebei
Uzbekistan	3,945	Iranian, Kazak, Russian, Turkmen, Ukrainian, Uzbek
Vietnam	10,241	Cham, Chinese E De, Khmer, Muong, Vietnamese

Zambia	38,673	Ambo, Baroste, Bemba, Bisa, Byanja, Chewa, Chikunda, Chishinga, Chokwe, Gowa, Ila, Kabende, Kaonde, Kunda, Lala, Lamba, Lozi, Luano, Luchazi, Lunda/Luapula, Lungu, Luvale, Mambwe, Namwanga, Ngumbo, Nyanja, Senga, Shila, Swaka, Tabwa, Tambo, Toka-Leya, Tonga, Tumbuka, Unga, Yombe

Table A10: Placebo-Test: Animal Husbandry without Herding

	Dependent variable:									
	Is Infibulated [0/1]		Husb. Decides On Visits [0/1]		Beating Justified [0/1]		# Sexpartners in Life [Std.]		Cheated [0/1]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hist. Dep. on Animal Husbandry [Std.]	-0.099	-0.078	0.0059	0.0046	-0.0037*	-0.0054**	0.017***	0.018***	0.0035**	0.0036**
	(0.13)	(0.14)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Hist. Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	77074	77074	353333	353333	481604	481604	284777	284777	476667	476667
R^2	0.040	0.086	0.136	0.147	0.168	0.192	0.127	0.134	0.058	0.078

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls are age and year of interview fixed effects. Historical controls are plow * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: Within Region Evidence

	Dependent variable:											
	Respondent Is Infibulated [0/1]			Husband Decides On Visits [0/1]			# Sexpartners in Lifetime [Std.]			Cheated on Partner Last Year [0/1]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Hist. Dep. on Pastoralism [Std.]	0.016	0.012	0.0063	0.031***	0.028***	0.032***	-0.038***	-0.031***	-0.048***	-0.014***	-0.012***	-0.015***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)
Region and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Historical Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Add. Controls	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Observations	76915	76915	65701	353333	311323	278200	284777	284243	254716	476667	445076	397684
R^2	0.174	0.176	0.206	0.219	0.206	0.230	0.154	0.160	0.164	0.090	0.115	0.228

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age and religion fixed effects. Historical controls include historical plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A12: Analysis for Observations Within the 90th Percentile of Dependence on Pastoralism

	Dependent variable:											
	Respondent Is Infibulated [0/1]			Husband Decides On Visits [0/1]			# Sexpartners in Lifetime [Std.]			Cheated on Partner Last Year [0/1]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Hist. Dep. on Pastoralism [Std.]	0.016**	0.016**	0.0032	0.086**	0.072***	0.076***	-0.10***	-0.081***	-0.086***	-0.032***	-0.025***	-0.011*
	(0.01)	(0.01)	(0.01)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Historical Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Add. Controls	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Observations	71484	71340	60782	334175	295055	267363	269003	268531	244077	450648	419140	377807
R^2	0.027	0.029	0.030	0.144	0.153	0.187	0.128	0.136	0.143	0.053	0.083	0.213

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age and religion fixed effects. Historical controls include historical plow use and year of observation. Additional controls include (at the individual level) a dummy for urban status, marital status fixed effects, educational attainment fixed effects, and at the ethnicity level measures for jurisdictional hierarchy, settlement patterns, polygyny, and kinship structure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A13: The Persistence of Pastoralism and the Persistence of Customs and Norms

	Dependent variable:									
	Respondent Is Infibulated [0/1]		Husband Decides On Visits [0/1]		Beating OK: Go Out w/o Telling Husb. [0/1]		# Sexpartners in Lifetime [Std.]		Cheated on Partner Last Year [0/1]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hist. Dep. on Pastoralism [Std.]	0.054***	0.029**	0.041***	0.036*	0.012	0.00092	-0.058***	-0.056***	-0.018***	-0.014***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)
HH owns herd animal [0/1]	-0.019	-0.019	0.078**	0.020	0.081***	0.027**	-0.15***	-0.10***	-0.059***	-0.024***
	(0.02)	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)
HH owns herd animal * Dep. on Pastoralism	0.050	0.045	-0.044	-0.0096	0.097	0.077*	0.20***	0.22***	0.039	0.054***
	(0.07)	(0.05)	(0.10)	(0.05)	(0.07)	(0.04)	(0.07)	(0.08)	(0.03)	(0.02)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Historical Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Add. Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	57568	48712	181210	144599	262252	215376	205478	182678	244637	217823
R^2	0.102	0.195	0.131	0.180	0.170	0.170	0.129	0.147	0.070	0.231

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age and religion fixed effects. Historical controls include historical plow use and year of observation. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A14: Male Absence Today and the Persistence of Customs and Norms

	Dependent variable:									
	Respondent Is Infibulated [0/1]		Husb. Decides On Visits [0/1]		Beating OK: Go Out [0/1]		# Sexpartners in Life [Std.]		Cheated Last Year [0/1]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hist. Dep. on Pastoralism [Std.]	0.065**	0.026	0.067***	0.045***	0.044***	0.034***	-0.053***	-0.030***	-0.0020***	-0.0015**
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)
Husb.Away	-0.0065	-0.0071	0.020	0.0040	0.031**	0.022	0.00095	0.016	-0.0066***	-0.0068***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.00)	(0.00)
Husb.Away*Herding	0.028	0.038	-0.043	-0.019	-0.11*	-0.092*	-0.034	-0.045	0.016***	0.016***
	(0.04)	(0.03)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)	(0.01)	(0.01)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Historical Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	9765	9765	42221	42221	42135	42135	36534	36534	41995	41995
R^2	0.077	0.112	0.133	0.164	0.113	0.137	0.128	0.138	0.022	0.023

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age and religion fixed effects. Historical controls include historical plow use and year of observation. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A15: Marriages among Co-Ethnics and the Persistence of Customs and Norms

	Dependent variable:									
	Respondent Is Infibulated [0/1]		Husb. Decides On Visits [0/1]		Beating OK: Go Out [0/1]		# Sexpartners in Life [Std.]		Cheated Last Year [0/1]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hist. Dep. on Pastoralism [Std.]	0.0068	-0.00022	0.056***	0.042***	0.023***	0.016**	-0.065***	-0.050***	-0.0020**	-0.0019**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)
SameEthnicity	-0.12***	-0.087***	0.021	0.029***	0.036***	0.038***	-0.091***	-0.10***	-0.0054*	-0.0055**
	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.00)	(0.00)
SameEthnicity*Past.	0.51***	0.34***	0.027	-0.012	0.055	0.032	0.067	0.12*	0.0030	0.0026
	(0.13)	(0.09)	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)	(0.06)	(0.01)	(0.01)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Historical Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	19635	19635	94945	94945	96198	96198	77628	77628	94912	94912
R^2	0.102	0.133	0.141	0.168	0.128	0.147	0.130	0.137	0.054	0.064

Notes. OLS estimates, standard errors are clustered at the ethnicity level. Individual controls include age and religion fixed effects. Historical controls include historical plow use and year of observation. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.