Essays on Social Norms and Status of Women in Northeastern India

Dissertation

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To her.

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Contents

List of Figures

List of Tables

Glossary

- **Agantic:** a relationship that can be traced by the male descent.
- **Ambilocality:** a living arrangement under which husband and wife continue to live with their respective parents and the husband visits the wife in her home.
- **Avunculocal:** a living arrangement where married individuals live with or near an uncle.
- **Bilateral descent:** recognized through both the father and the mothers sides of the family.
- **Bridewealth or brideprice:** payments made to the bride's family by the grooms family before marriage.
- **Clan:** a social division within descent groups who are united by the known links to a common ancestor.
- **Cogantic:** a relationship where kinship can be traced through both parents, as practised in most western societies.
- **Cross-cousin marriage:** a custom permitting marriage between children of siblings of opposite sex. Examples include marriage with father's sister's daughter, mother's brother's daughter, or widower marrying sister of his deceased wife **(sororate)** or a wife marrying brother of her deceased husband **(levirate)**.
- **Descent:** commonly understood by lineage from a common ancestor that provide members with a sense of identity and social support based on ties of shared ancestry.
- **Dowry:** payment made to the grooms family by the bride's family before marriage.
- **Duolocal:** a marriage custom in which each spouse continues to reside with their kin after marriage.
- **Ecological niche:** a geographical location, in which an ethnic group resides in relation to its natural environment or a habitat that supplies the factors supporting subsistence of said ethnic group.

- **Ecosystem:** the complex of an ethnic group and its environment functioning as an ecological unit in nature.
- **Endogamy:** a marriage custom that restricts marriage outside geographic units (village endogamy), or ethnic groups (community endogamy or clan endogamy).
- **Environment:** the external surrounding conditions, such as temperature, precipitation, forest cover, or soil properties of a geographic location.
- **Equigeniture:** where the all the children inherit equal share of property.
- **Ethnic group:** a distinct group of individuals with common linguistic, biological or cultural features.
- **Excommunication:** a process of expelling an individual or family from a society or social divisions by the members of the respective society.
- **Extended family:** share a household with at least three-generations.
- **Exogamy:** a custom that restricts marriage within one's own clan, community or village.
- **Family:** a group of individuals who are in blood relation.
- **Geographical region:** a territorial region consisting of largely similar climatic, soil, and terrain characteristics.
- **Household:** a group of related or unrelated persons who reside together.
- **Joint family:** a very large extended family where multiple generations reside together.
- **Kinship:** a term used to describe culturally recognized ties between members of a society or family, and the normative behaviors associated with it.
- **Kinship system:** the pattern of culturally recognized relationships between members of a society or family.
- **Lineage:** a group that traces its descent from a common progenitor or ancestor.
- **Matriarchal society:** where women have the full authority to take decisions.
- **Matrilineal descent:** a kinship relation where descendants can be traced through female ancestors.
- **Matrilocal:** a marriage custom where the groom reside with the bride's parental house

- **Moiety:** an endogamous halves or sub-division within an ethnic group.
- **Neolocal:** a kind of post marital residence where the couple sets up a new household in a locality independent of either of their parental homes.
- **Patrilineal descent:** a kinship relation where descendants can be traced through male ancestors.
- **Patrilocal:** a post-marital residence custom in which a married couple resides with the groom's parental house.
- **Phratry:** a kinship unit of two or more clans formed on the basis of brotherhoods within which marriages are forbidden.
- **Polygyny:** a custom in which a man can have multiple wives at the same time, as opposed to **monogamy**, where an individual has a single spouse or polyandry when a woman has multiple husbands.
- **Primogeniture:** where the first-born child inherits all property.
- **Role** is a set of expected behaviors of an individual according to their status.
- **Shifting cultivation:** (also known as **jhum cultivation)** a type of cultivation in hilly terrain, which is performed by clearing a forest patch with a slash and burn method for about two to four years, after which the land is left for regeneration of forest, and a new patch of land is selected for cultivation.
- **Stem family:** a sub-type of an extended family where an older couple and one of their adult children live with a spouse (or spouses) and children.
- **Status:** any culturally-assigned position a person in a particular society.
- **Ultimogeniture:** where the last-born child inherits all property.
- **Unilineal system:** involves descent through either father's lineage (patrilineal) or mother's lineage (matrilineal) which is opposite to bilateral descent where the lineage can be traced from both father's side and mother's side, typically prevalent in western societies.
- **Wet cultivation:** a type of paddy cultivation that requires irrigation.

Introduction

Institutions impact economic development. The macroeconomic effects of institutions are visible on per capita income (Acemoglu, Johnson, and Robinson, 2001), trade (Dollar and Kraay, 2003), and long run growth (Sokoloff and Engerman, 2000). There are two approaches to what constitutes an institution. The first approach considers institutions as a set of humanly, politically, or socially determined rules or constraints (North, 1990). Individuals take these rules or constraints as exogenously given and are aware of the costs of their actions when they interact with the market or society at large. Alternatively, institutions are self-enforcing (Williamson, 2000). In the equilibrium, the self-enforcing and predictable patterns of behavior emerges due to agents are unlikely to change their behavior that are optimal given the choices of other agents.

Douglas North (1990) classify institutions on the basis of enforcement and formality. The formal institutions are constitutional, legal, and political. The informal institutions include socially sanctioned behaviors or norms which are socially enforced. These social norms (e.g., customs, traditions, taboos) evolve due to coordinated repeated interaction of humans in a society. Williamson (2000) classify institutions in four hierarchy-based schemes. At the first level, informal institutions (social norms, customs, traditions) are embedded in the social structure. These exogenous life-ways of a society persist over a very long horizon, usually from 100 to 1,000 years. The remaining three higher levels of institutions relate to rules of the game, play of the game, and allocation mechanisms. The frequency of change of these higher levels of institutions is less than 100 years. I focus on social norms, which are persistent, exogenous and informal institutions, embedded in the society.

The fundamental building block of a society is the family formed by marital alliances and regulated by kinship systems (Fox, 1934). In its simple exposition, the kinship system proscribe social norms on how a set of individuals, families and societies are organized and

related (Radcliffe-Brown, 1950). Furthermore, kinship systems determine how individuals and families trace their social group (ethnicity, clan, sub-clan, moiety, or phratry) affiliations through social norms regarding lineage, descent, and inheritance (Lowes, 2020). I concentrate on the effects of social norms that are relevant to the status of women in a society, which affects the bargaining within the households (Lowes, 2020). Intra-household bargaining and the decisions taken by spouses within marriage has important effects on the functioning of the economy (Becker, 1991). Spousal decisions over labor supply, fertility choices, and human capital investment in their children can have important bearing on the economy as a whole. Marriage-specific social norms also determine how the spouses are matched, their living arrangements, and the distribution factors within the marriage. Certain pro-women social norms can change status of women and can lead to more favorable outcomes for women and female children. This can be directly interpreted as improved outside options of women, which directly affects their bargaining power, and hence favorable distribution factors in accordance with their preferences. In this dissertation I empirically estimate the effects of these pro-women social norms, which are both exogenous and persistent on the contemporary outcomes for women and children (La Ferrara and Milazzo, 2017; Alesina, Brioschi, and La Ferrara, 2016; Milazzo, 2014)

Building the foundation for this empirical research is not trivial. In a carefully chosen cross-cultural setting, at the outset, I attempt to limit the scope by only considering ethnographic data coming from qualitative studies of various ethnic groups. This limitation facilitates empirical feasibility. Coding the qualitative ethnographic data in accordance with the universal patterns of variation from culture to culture and from society to society was the next challenge. Two graduate students, one from the ethnology and the other from the economics played special roles in the time and effort intensive double-blind coding of the qualitative ethnography. The student in ethnology worked with me at the inception stage, helping me to review the literature on the theories of universal patterns of social norms (Dole, 1965). I incorporate these anthropological insights into economic analysis. The graduate student from economics department, who worked with me later, used a set of definitions of 30 social norms to code the social norms. For little above one-third of the sample ethnic groups, the codes of both the students are identical. For the remaining ethnic groups, the two coders frequently agree, and where they disagreed — initially ranging between 5% and 33% of social norms — their disagreements were

resolved after reconsidering the qualitative texts and harmonizing the codes. For this dissertation, I select 92 aboriginal ethnic groups from the marginalized sections of the society, presuming that the effects of modernization would be limited on their traditional customs.

The ethnographic atlases form the micro-foundation for the wealth of literature on 'social capital'. My attempt to code the ethnography is twofold: (a) to understand how historical social norms and social roles change over time, and (b) to link historical social norms with present day outcomes. Within the universal framework of marriage and kinship, I code for wealth transactions at marriage (dowry and brideprice), marital composition (monogamy and polygamy), domestic organization (nuclear or stem family), transfer of marital residence (patrilocal, matrilocal or neolocal), kinship marriage (prevalent forms of cousin marriages and exogamy, descent and inheritance norms. To assess the position of women within marriage, I code divorce rules, alimony rights, child custody rights, and ease of remarriage. For the gender roles, I code the subsistence economy (use of plough, agriculture, gathering, hunting, fishing, and animal husbandry), labor gender, and economy (female participation in agriculture, gathering, hunting, fishing, animal husbandry, weaving, basketry, and politics), as well as community organization of housing and property (settlement patterns, community ownership of land).

My study area is set in the northeastern states of India for following five reasons. First, northeastern India is one of the most diverse places on earth. The 2001 Indian census lists 243 tribal groups (commonly referred to as 'Scheduled Tribes' under article 342 of the Constitution of India) speaking more than 200 languages, and comprising a population of 39 million, which offers sufficient variation in ethnic diversity by international comparison. Second, the northeastern states comprise a relatively small, politically homogenous area that is replete with almost all kinds of subsistence activities with substantial variations. This geographic area is culturally distant from the rest of India, due to the ethnic variations it still preserves and nurtures, even today. This allows a study of effects of ancestral lifestyles in isolation because the zone has much less exposure to modernization in the rest of India. Third, in order to examine the persistence of cultural traits, we need a reference ethnography from the pre-industrial period. Since the ethnography coded and used in this study are relatively recent, for comparison over time. In the widely used Murdock's (1967) ethnographic atlas, there are 50 ethnic groups coded for

Indian subcontinent, 41 fall within the present day geographic boundaries of India[1]. Of these, I can trace 16 ethnic groups which can be georeferenced in the northeastern zone of India. Fourth, to the best of my knowledge, the strand in literature that focuses of kinship institutions in India has left the northeastern zone out of their analysis despite its enormous cultural diversity. Fifth, we are interested in the tribal community because of the practice of their primitive traits, distinctive culture, geographical isolation, shyness of contact with the mainstream communities at large, and backwardness, even after the waves of modernization (Government of India, 1955). In comparison to the all-India average of the 'scheduled tribe' population, 8.6% as per Census data of 2011, in the eight northeastern states, the proportion of scheduled tribes is as high as 27%.[2]

I contribute a relatively large dataset to the research community, which combines ethnography with the nationally-representative samples from India's Demographic and Health Surveys. Thus far, a growing body of literature utilizes either the Standard Cross-Cultural Samples or Murdock's ethnographic atlas, especially in the African context, because, for the rest of the world, the coverage of these popularly used ethnography are both scattered and scant. Compared to ethnic diversity of India, the Murdock's atlas covers 41 ethnic groups. In this dissertation, I introduce an Indian ethnographic atlas called the People of India, containing the ethnography of 4635 ethnic groups, hitherto unused by economists. During October 1985 and March 1992, the Anthropological Survey of India conducted a publicly funded survey called People of India. The ethnographic profiles were collected by 600 ethnographers, who collectively spent 26,000 days in the field to identify, locate and study the ethnicities. These are publicly available in a multi-volume compendium of books. For each ethnicity, the social norms surrounding the birth, marriage, separation, death, lineage, and inheritance are covered. The other source, namely the Demographic and Health Surveys, covers information on demography, health, and nutritional aspects of individuals. The combined datasets open up a new possibility for more nuanced analysis. The third source is to integrate the environmental factors,

[1]Adi, Aimol, Angami, Ao, Baiga, Bengali, Bhil, Bihari, Chakma, Chenchu, Garo, Gond, Gujarati, Hill Bhuiya, Ho, Indo-Iranian, Kachari, Karbi, Kashmiri, Kerala, Khasi, Khond, Kodavas, Kohistani (in Pakistan), Kol, Koya, Kuki, Kurukh, Lhota, Madia, Magar (in Nepal), Marri (in Pakistan), Muria, Pahari, Punjabi (in Pakistan), Purum, Reddi, Rengma, Santal, Sema, Shina (in Pakistan), Sindhi (in Pakistan), Sinhalese (in Sri Lanka), Tamil, Telugu, Thado, Toda, Uttar Pradesh, Vedda (in Sri Lanka), Yusufzai (in Pakistan).

[2]The proportion of 'scheduled tribe' population as per Census 2011 data was 20.6% in Sikkim, 64.2% in Arunachal Pradesh, 89.1% in Nagaland, 34.2% in Manipur, 94.5% in Mizoram, 31.1% in Tripura, 85.9% in Meghalaya, and 12.4% in Assam.

such as land suitability for various types of subsistence patterns linked to the probable ancestral homeland of the aboriginal ethnic groups.

I take up two topics relating to women's status that use cross-sectional data combined with ethnography and environmental variables.

In the first essay, titled *"Social Norms, Women's Status and Spousal Violence: Evidence from India's North-East"*, I estimate the long-run effects of ancestral social norms and ancestral female productive roles in subsistence on spousal violence. I georeference 92 aboriginal ethnic groups for their ancestral homelands, as well as their ancestral life-ways living in northeastern zone of India. Using the stated ethnic identity of the respondents in the third wave of the National Family and Health Survey(NFHS), I combine both the ancestral characteristics and environmental characteristics with the cross-sectional data on 6,400 married women and 4,400 married men. The outcomes of interest are spousal violence experienced by women and attitudes of women and men towards spousal violence. The explanatory variables are ancestral female productive roles, conjugal living arrangements , descent rules, and ease of divorce norms.

The main results are as follows. First, ancestral female productive roles predict reduced incidence of sexual atrocities today. Second, matrilineal descent significantly reduces the experience of physical and sexual violence and reduces the average number of atrocities ever experienced by a married woman by about one quarter. The endorsement of spousal violence is less among men in societies with matrilineal decent norms. Third, in societies where an easier divorce regime is prevalent, women are prone to justify violence, while men justify violence less. Consistent with received theories of the marriage, these results suggest that increased productive roles of women enhance the well-being of women, and the persistence of pro-women social norms minimize the ill-being of women. Even though these results do not allow causal interpretations, improved status of women in a society can improve their well-being in the marriage.

While the first chapter discusses the effects of social norms on spousal violence, in the second chapter, titled *"Social Norms, Subsistence Patterns and Gender Bias: Evidence from India's North-East"*, I investigate the effects of ancestral female productive roles in subsistence activities and ancestral social norms relevant for women's social status on gender bias experienced by contemporary infants and children. Similar to the first chapter, I assemble both ethnographic and environmental characteristics for 92 aboriginal ethnic

groups, and I pool over 51,000 child-level and 22,000 mother-level observations from the second and third waves of the NFHS. The outcomes of interest are succeeding birth interval, incidence of last birth, breastfeeding spell, incidence of total vaccination, protein intake by children, and child mortality under the age of three years. The explanatory variables are an indicator for whether the child is a female child and its interaction with the identical set of variables used in the first chapter. Since the first three dependent variables have censored observations, I estimate Cox's Proportional Hazard Models. For the remaining dependent variables, I use OLS.

My findings are as follows. First, in societies where women ancestrally participate in agriculture and allied productive activities, a female child is less likely to experience the birth of her next younger siblings in tight interval. Similar beneficial effects for female child are observed in ethnicities with ancestral social norms that improve women's status. Second, the incidence of last birth for a female child increases when the divorce norms are easier and less costly. Third, the risk of breastfeeding stop is reduced in societies where women ancestrally participate in agriculture, and the living arrangement of the wife is not with her husband's family (non-patrilocal residency). Fourth, the likelihood of protein intake by children increases in ethnic groups that follow matrilineal descent, non-patrilocal residency, and easier divorce regimes. The estimated hazard ratios and marginal effects are identical even after I include the contemporary occupation status for women as an explanatory variable. However, the effect of contemporary female employment is not statistically associated with the outcome variables. Although it is difficult to claim causal interpretations, these estimates are consistent with the predictions from economic theories. Overall, it appears that in ethnic groups where women are valued, due to their ancestral productive roles, and their status is high, due to ancestral social norms, a female child is less likely to face discrimination and disadvantage.

In hindsight, it was never my intention to write a dissertation on social norms focusing on kinship organizations. As I progress in the pursuit to understand the constraints that societies impose on women by keeping them from being empowered, and as the results of each paper become reinforcing, the next question came up. Throughout this research process, I overcome the initial phase of struggling with the concepts and formal definition (see glossary) beyond the formal boundaries of disciplines, especially by reading and exploring literature from sociology, psychology, and anthropology. The largest possible

gap in the economist's knowledge is the rigorous theory of social norms that largely determines the economic outcomes. My work, although limited in its reach across the disciplines, might help other researcher close the gap in both theory and empirics.

CHAPTER 1

Social Norms, Women's Status, and Spousal Violence: Evidence from India's Northeast

Abstract

Conventional wisdom suggests patriarchal social norms hinder the well-being and empowerment of women in the process of development. I investigate the link between social norms that define women's status in society and spousal violence. The empirical setting is India's Northeast, where there is substantial variation regarding patriarchal versus matriarchal customs. In my econometric analysis, I combine information on ancestral social norms from a comprehensive ethnographic atlas with individual-level survey data on spousal violence. Consistent with the established economic theories, the more female-empowering variants of the persistent antediluvian social norms, such as easier divorce regime, non-residence with husband's kin, and matrilineal descent improve women's reservation utility and bargaining power within the extant marriages and curtail spousal violence and its acceptance. Ancestral female productive roles enhance women's value in society and reduce spousal violence.

1.1 Introduction

There has been substantial progress in economic and human development over the last two decades around the world, especially in Asia (World Bank, 2017), but violence against women continues to be a global problem. In high-income countries and Europe, the incidence of spousal violence stands at 23% and 25%, respectively. The incidence of spousal violence is even higher in Africa (37%), South and South-East Asia (38%) (World Health Organization, 2013), and South Asia (41%) (Roy et al., 2019). These figures are at odds with Sustainable Development Goals 5, which address gender equality. Apart from being detestable, spousal violence has adverse bearings on women's and children's malnutrition (Ackerson and Subramanian, 2008), higher child mortality (Koenig et al., 2010; Ahmed, Koenig, and Stephenson, 2006; Jejeebhoy, 1998), adverse effects on women's employment (Lindhorst, Oxford, and Gillmore, 2007; Staggs and Riger, 2005), and adverse physical, mental, and sexual health outcomes (Carbone-López, Kruttschnitt, and Macmillan, 2006). It also associates spousal abuse with malign consequences on women's reproductive health (García-Moreno et al., 2015; Salam, Alim, and Noguchi, 2006), higher gynecological morbidity (Stephenson, Koenig, and Ahmed, 2006), and increased incidence of HIV (Jewkes et al., 2010).

A body of extant research has addressed the determinants of spousal violence among women. Devries et al. (2013) finds that spousal violence is spared from social critic which leads to the perpetuation of spousal violence. The received work on contemporaneous determinants and justification of spousal violence postulates cultural patterns and social norms as an exogenous risk factor that perpetuates the peril (e.g., Dasgupta, 2019b; Krause et al., 2016; Tran, Nguyen, and Fisher, 2016; Jayachandran, 2015; Yount et al., 2013; Rani and Bonu, 2009), without estimating the effects of these social norms. There is plenty of theoretical work and many case studies on the effect of social norms on women's well-being (e.g., Anderson, Bidner, and Sadania, 2017, 2020). However, except for Alesina, Brioschi, and La Ferrara (2016, 2019), little is known, on how social norms ruling gender relations in a society systematically affect women's integrity in marriage.

In this paper, I estimate the long-run effects of ancestral female productive roles and social norms on the ruling gender relations, spousal violence in particular. The empirical setting is in the northeastern zone of India. Here many aboriginal groups live in

ethnic isolation in a relatively small, politically homogeneous area. These ethnic groups exhibit considerable variation in their marriage organization, divorce, descent and inheritance customs, and subsistence patterns. For spousal violence, I use individual-level data from India's National Family Health Survey (NFHS-3) carried out in 2005-06. For ancestral norms, I use the ethnographic atlas *People of India* (Singh, 1998), a multi-volume compendium, which presents qualitative abstracts on each ethnic group in India. I systematically tabulate the ancestral subsistence patterns and social norms surrounding marriage, separation, and inheritance for 92 aboriginal ethnic groups using the respective state series for the northeastern states (Dhamala et al., 1993; Dutta and Ahmad, 1995; Das and Imechen, 1994; Horam and Rizvi, 1998; Goswami, Nunthra, and Sengupta, 1995; Ganchaudhuri, Sailo, and Datta, 1996; Pakem, Roy, and Basu, 1994; Bardoloi and Athaparia, 2003). The empirical innovation of this paper is to tabulate this qualitative information systematically, comparable to the well-known ethnographic atlas by Murdock (1967). I use the stated ethnic identity of the respondent in NFHS to combine the data on spousal violence and other covariates with the social norms data of the ethnic group coded from the *People of India*. Further, I georeference each aboriginal ethnic group to assemble the environmental data showing relative suitability of subsistence patterns from the data provided by Beck and Sieber (2010). The resultant novel dataset permits analysis of ancestral predictors of spousal violence. Using a cross-sectional approach, I estimate the effect of the ancestral female productive roles and social norms prevailing in her ethnic group on the lifetime experience of spousal violence for women. Furthermore, I control for a host of variables at individual, ethnic group, and environmental levels. The principal estimations are conducted in a sample close to 6,400 married women and 4,400 married men from 92 ethnic groups.

The main findings are as follows. First, regarding ancestral female participation in productive roles, societies where women are traditionally productive exhibit less incidence of sexual atrocities. Second, matrilineal descent significantly reduces the experience of physical and sexual violence and corresponds with roughly a 25 percent reduction in the average number of atrocities ever experienced by a married woman. The endorsement of spousal violence is less among matrilineal men. Third, regarding separation norms, in societies where an easier divorce regime is prevalent, women are prone to justify violence, and men justify violence less. Fourth, regarding post-marital residence norms, I find no

statistically significant association.

The pattern of these results conveys two fundamental lessons. First, productive women have greater reservation utility, which curtails spousal violence. Second, the wife's reservation utility is greater where social norms favor the elevated status of women. Hence a greater balance of power within the marriage for women is conducive to protecting them from spousal violence. Consistent with received theories of the marriage, these results suggest that increased productive roles of women enhance the well-being of women, and the persistence of pro-women social norms minimize the ill-being of women. Alternatively phrased, these empirical results carry wider implications for women's welfare in the process of economic development.

This paper contributes to three strands of literature. The first one is on the ancestral determinants of spousal violence. Tur-Prats (2019) in her study in Spain shows that societies where joint families (families where two or more generations co-reside) are traditionally predominant, women experience less spousal violence due to their productive contribution in agriculture. In the developing country context, Leyaro, Selaya, and Trifkovic (2017) estimate the cultural roots of spousal violence, exploiting the variation in characteristics of traditional subsistence livelihoods. They find that women in sea-fishing communities in Tanzania are better equipped to decide, more independent and less vulnerable to spousal violence than in lake-fishing communities. More related to my approach, Alesina, Brioschi, and La Ferrara (2019) use an empirical approach and data for Sub-Saharan Africa that are like mine. However, they focus primarily on the effect of women's economic value in traditional agricultural production on contemporary spousal violence and less on traditional marriage and descent norms. Furthermore, their empirical strategy is somewhat limited, as they estimate the effect of social norms on spousal violence individually. My contribution to this strand of literature is threefold. First, I consider a comprehensive set of marriage norms (detailed in Data appendix). Second, I control for a larger set of additional variables in my estimations, and conduct a multivariate regression analysis, which strengthens the econometric viability of my findings. Third, to the best of my knowledge, this is the first study of its kind in a South Asian context, where women's status is unusually vulnerable, and spousal violence is higher in international comparison.

The second quickly growing literature that this paper speaks to examines the effects of ancestral characteristics on various current development outcomes (e.g., Bau, 2019; Anderson, 2018; Alesina, Giuliano, and Nunn, 2018; Michalopoulos, Putterman, and Weil, 2019; Moscona, Nunn, and Robinson, 2017; Michalopoulos and Papaioannou, 2013; Alesina, Giuliano, and Nunn, 2013; Nunn and Qian, 2011; Nunn and Wantchekon, 2011), the effects of the ancestral division of labor on contemporary women's participation in the workforce (Alesina, Giuliano, and Nunn, 2013; Baiardi, 2016), the effects of ancestral customs on women's education outcomes (Ashraf et al., 2020), the effects of women's traditional gender roles in productive activities on their value in the society (Becker, 2020; Xue, 2018; Carranza, 2014, 2012, 2011; Qian, 2008). These studies, and many others, rely on ethnographic characteristics from Murdock (1967). To my knowledge, this paper is the first to tap a valuable and systematic ethnographic source undetected by economists, the *People of India*. I show the long-term effects of the ancestral marriage norms, where the effects conform to well-established theoretical mechanisms. Ancestral norms of several divorce regimes — not coded in Murdock's atlas — is novel.

My third contribution is the economic literature on the legal reforms of divorce laws in developing countries. Regarding marriage dissolution norms more narrowly, in most of the extant literature, the study object is legal change in high-income countries' divorce legislation or cross-sectional variation in divorce laws. For example, unilateral divorce (Rasul, 2006) and the link between unilateral divorce and labor supply (Gray, 1998). Chiappori, Fortin, and Lacroix (2002) examine the inter-linkages among unilateral divorce, property division, enforcement of alimonies, and consideration of professional and academic degrees and labor supply. Divorce laws can affect divorce rates (Peters, 1986; Friedberg, 1998; Wolfers, 2006). However, the link between spousal violence and divorce legislation is ambiguous and contradictory (Dee, 2003; Stevenson and Wolfers, 2006). I make two contributions to this strand of literature. First, instead of modern legal reforms, I consider ancestral divorce norms. Second, in my identification strategy, I control not only for individual characteristics of respondents but also for ancestral structural economic characteristics, in particular subsistence patterns, environmental characteristics, and settlement patterns.

I organize the rest of the paper as follows. After presenting a conceptual framework, I propose hypotheses in Section 1.2. In Section 1.3, I describe the data and its construction.

Section 1.4 outlines the empirical approach, and I discuss the results in Section 1.5. In Section 1.6, I perform robustness checks and heterogeneous analyses before concluding in Section 1.7.

1.2 Conceptual framework and hypotheses

Existing non-cooperative bargaining models of spousal violence predict that an increase in women's empowerment through ancestral productive roles and supportive social norms will decrease the occurrence of violence (Farmer and Tiefenthaler, 1997). In their non-cooperative model, husbands maximize utility through violence and income transfer subject to the wife's reservation utility (the minimum exogenous utility outside the marriage), where a wife's utility includes husband's utility. If the marital utility of the spouses falls short of their reservation utility, the marriage dissolves. Such divorce should prevent spousal violence from a discontinued unfortunate marriage. In the extant marriage, the husband refrains from violent behavior since he is aware of the reservation utility of the wife. The comparative static properties suggest that the increase in husband's income can enable him to "buy" more violence by increasing income transfer to the wife. Through an increase in the wife's income from her economic roles, the husband reduces violence. Otherwise, her reservation utility is breached, and she ends the marriage. Farmer and Tiefenthaler (1997) write, "[a]nything that raises the women's utility outside of the marriage [...] will increase the probability that she leaves and, therefore, lower the level of violence if she stays". Within this broader benchmark theoretical model, I include social norms (such as non-patrilocal residence, ease of divorce, and matrilineal descent) and ancestral productive roles that increase their earning potential and, I develop four inter-related hypotheses.

For the first hypothesis, I test concerns the effects of ancestral female productive roles in a subsistence economy on the current incidence of and attitude towards spousal violence. Economically productive women are more valued and enjoy greater social dignity. It leads to the evolution of women-favoring social norms that persist until today (Alesina, Giuliano, and Nunn, 2013), which can reduce spousal violence (Alesina, Brioschi, and La Ferrara, 2019). Higher economic independence owing to their productive roles can improve women's reservation utility, and intra-household allocations are more aligned

to her preferences (Lundberg and Pollak, 1996) and reduce spousal violence. Higher female participation in agriculture also predicts lower spousal violence (Tur-Prats, 2019). Ancestrally productive women have greater self-worth, and their rationality constraints are such that they will either not tolerate or be less supportive of spousal violence (Aizer, 2010). Husbands recognize the worth of ancestrally productive women[1] and perceive the need to preserve and protect women's health and productivity (Alesina, Brioschi, and La Ferrara, 2016). They will refrain from harming women or justifying violence to avoid loss of women's productive contribution to the subsistence. I include gender roles in the subsistence economy that proxy for the economic value of women. If this hypothesis holds good, I expect that ancestral female participation in agriculture and allied production should reduce actual violence. Both spouses should exhibit their aversion towards spousal violence and should not endorse spousal violence.

The next set of hypotheses intertwines the traditional living arrangement of a married couple, lineage institutions, and ease of dissolution of marriage. The prior is present in societies where the post-marital residence is patrilocal. In non-patrilocal residences, the likelihood of external intervention by the kin and family member is greater (Tauchen, Witte, and Long, 1991), which should reduce spousal violence. Women in non-patrilocal societies have closer access to seek help from their kin and have greater social capital (Robinson and Gottlieb, 2019). They should less justify spousal violence. The husbands consider the non-monetary costs of external interventions (such as sanctions from the society) while they maximize the expected utility (Tauchen, Witte, and Long, 1991). Thus, men should display lesser proclivity towards violence attitude. Thus, in my second hypothesis, I expect actual violence and attitude towards violence to be lower in non-patrilocal residence.

In matrilineal societies, women have greater bargaining power, and men lack authority over their wives and children (Lowes, 2020). Matrilineal descent endows women with property rights, which reduce physical and emotional abuse (Oduro, Deere, and Catanzarite, 2015). The long-term expectation of resource entitlements for women in matrilineal inheritance (Robinson and Gottlieb, 2019) can remove the gender disparity over generations, and women exhibit lesser justification of spousal abuse. The male authority over

[1]The gains from intra-household bargaining power by women may be unacceptable for some men and can increase violence as a controlling instrument (Eswaran and Malhotra, 2011; Tauchen, Witte, and Long, 1991). Men with such motives for the defense of male authority (Chin, 2012; Macmillan and Gartner, 1999) and compulsive masculinity (Straus, 1976) can legitimize spousal violence.

female erodes (Tran, Nguyen, and Fisher, 2016) as the distribution of authority shifts away from husbands. Men in the matrilineal society work in the fields belonging to their wives (Panda and Agarwal, 2005), and her matrilineal kin should not endorse spousal violence. Overall, I draw up the third hypothesis that actual violence and attitude towards violence should be lower matrilineal societies.

In culturally conservative societies, the threat of divorce is costlier with the associated social stigma and, therefore, need not be credible (Luke and Munshi, 2011; Srinivasan and Bedi, 2007) for women to separate from an abusive marriage. Social norms that make the threat of divorce more credible (Brassiolo, 2016) can transfer bargaining power to the wife (Stevenson and Wolfers, 2006) and improve her reservation utility. The incidences of spousal violence should be lower because divorce threats can dissuade husbands from inflicting violence within extant marriages or because actual divorce will end the unfortunate marriage and violence. In an easier and less costly divorce regime, the husband's endorsement of and engagement in wife beating reduces since he knows that his wife will divorce if her utility falls below her reservation utility (Brassiolo, 2016).

All of these would not matter if the women loves her husband. Committed women who love their abusive husbands (Farmer and Tiefenthaler, 1997) can justify certain wife beating. Apart from the narrower context of all the four mechanisms described above, all of those improve a woman's reservation utility and shift the balance of power in favor of women, reducing the unfavorable outcomes for women.

1.3 Data

I restrict my analysis to nationally representative cross-sectional data from the third wave of the National Family and Health Survey (NFHS-3) for two reasons. First, the previous rounds (NFHS-2 and NFHS-1) neither cover both men and women, their attitude towards spousal violence, nor the types of violence. Second, for the fourth round (NFHS-4) the stated ethnicities of the respondents are not publicly available. Each observations in NFHS-3 has their self-reported ethnic identities. Using these ethnic names, I combine both ethnographic and ecological data with the cross-sectional observation in NFHS-3 by way of the following five broad procedures. First, the ethnic identity is available as text data, which are largely ridden with spelling variations and spelling errors. For the 92 abo-

riginal ethnic group names, I manually correct the spellings such that I can match NFHS observations with their ethnicities. I collect 1,269 clan and sub-clan names (Appendix Table 1.12) for the 92 aboriginal ethnic groups such that it can match more observations with their ethnicities. After running these extensive spelling correction modules to homogenize the ethnic names identical to the ethnic names mentioned in the *People of India*, I arrive at a 79 percent matched ethnicity sample, for both women and men (see Table 1.1). Second, I code 30 ancestral social norms and subsistence patterns from the qualitative abstracts on 92 ethnic groups from *People of India*. I merge this coded ethnography with the NFHS data using the cleaned ethnic names. Appendix Table 1.11 describes the variations in of ancestral lifeways for both female and male sample. The number of ethnic groups following any of the social norms is identical across the female and male sample. Since many of these social norms are complementary to each other, using variance inflation factors (Appendix Table 1.14), I use three social norms that determine women's relative status in the society. Third, using the description about their ancestral geographic location for each 92 aboriginal ethnic groups, I georeference them within the bounding box (Latitude: 22.89 — 28.91 and Longitude: 88.03 — 96.20) for the northeastern zone of India. Appendix Table 1.13 presents the approximate geographic coordinates and the source of indicative excerpts from *People of India*. Fourth, I merge the predicted data from Beck and Sieber (2010) for suitability of soil and climate for four major subsistence patterns using the georeference of each ethnic group. Following Becker (2020), I construct three indicator variables that capture the suitability of soil and climate for hunting-gathering, pastoralism, and animal husbandry relative to agriculture for my analysis. The detailed methods for data construction are available in the data appendix.

I present the detailed definition, description, and construction procedure for dependent and independent variables in Section 1.A to 1.D of the Appendix. I summarize the dependent variables in Panel A of Table 1.2. For married women, I use three indicator variables ('violence ever', 'physical violence ever', 'sexual violence ever'), which are self-reported lifetime incidences of spousal violence. The first row shows that thirty-nine percent of married women have experienced at least one form of spousal violence in their lifetime. It is close to the national average for India, which suggests the sample is nationally representative. For married women aged 15 to 49, thirty-four percent of women have experienced physical violence in their lifetime. Twelve percent of women experienced

sexual violence. To measure the intensity of atrocities, I construct a 'violence intensity index', which is a sum of distinct types of aggression. This index ranges from zero to four since it captures none or more than one of the four violence indicators, namely'emotional violence' (Panel B of Table 1.2), 'less severe violence', 'severe violence' (Panel C of Table 1.2), and 'sexual violence' (Panel D of Table 1.2). For both the women and men, I construct an indicator variable called 'violence attitude'. This variable take the value one if the respondent (woman or man) believes that wife beating is justifiable in at least one of the five circumstances (Panel E of Table 1.2).

Table 1.1: Matching of ethnic groups in NFHS to ethnic groups in *People of India*

Matching methods	Cumulative observations (1)	Percentage observations (2)	Number ethnicities (3)	Percentage ethnicities (4)
		Female sample		
Direct match by ethnic groups	7438	36.75%	76	82.61%
Match by clan or sub-clan names	8530	42.15%	81	88.04%
Match by spelling variations in ethnic groups	15520	76.69%	88	95.65%
Match by spelling variations in clan/sub-clans	16089	79.50%	92	100.00%
Not matched/ misspecified	4149	20.50%	...	...
		Male sample		
Direct match by ethnic groups	4696	38.95%	73	79.35%
Match by clan or sub-clan names	5334	44.24%	76	82.61%
Match by spelling variations in ethnic groups	9218	76.46%	88	95.65%
Match by spelling variations in clan/sub-clans	9504	78.83%	92	100.00%
Not matched/ misspecified	2552	21.17%	...	...

Notes: NFHS-3 reports ethnic identity by households, women and men. For eight northeastern states of India, there are 20,238 women (aged 15 to 49) and 12,056 men (aged 15 to 54). Using the state volumes of *People of India*, I tabulate 30 social norms and subsistence patterns (see Annexure Table 1.11) for 92 aboriginal ethnic groups. I collect a comprehensive list of 1,269 clan or sub-clan names for these 92 ethnic groups (see Annexure Table 1.12) for improved and accurate matching. I georeference each of these 92 ethnic groups using indicative information about their ancestral homelands (see Annexure Table 1.13).

The weighted sample mean shows that 45 percent of women and 30 percent of men justify wife beating in at least one circumstance. This gender gap in acceptability of wife beating is consistent with the literature (Jayachandran, 2015) and suggestive of socially appropriate behavior (Schuler, Lenzi, and Yount, 2011; Schuler and Islam, 2008) by women and under-reporting by men (Yount et al., 2013). To assess the degree to which the respondent thinks it is justifiable to beat wives, I construct a violence attitude index', which sums the number of circumstances in which wife beating is justified. The

weighted average number of the justifiable situation is 1.2 (out of 5) for women and 0.62 for men. These measures of attitude towards violence are causally meaningful predictors of actual violence (Dasgupta, 2019a). Considering the possibility of under-reporting by women in fear of reprisal in a patriarchal society, Table 1.2 suggests that spousal violence is widespread despite several matriarchal societies populating my study area.

Many of these social norms and subsistence patterns are complementary to each other and hence inter-related. To avoid multicollinearity problems, based on the variance inflation factors (see Appendix Table 1.14), I select a set of five explanatory variables (ancestral female roles in agriculture, ancestral female roles in agriculture and allied production, post-marital residence, ease of divorce, descent) and describe those in Panel A of Table 1.9. Panel B of Table 1.9 summarizes these explanatory variables, nine contemporary control variables (age, education, household size, nuclear family dummy, wealth index, rural residence dummy, family history of parental violence dummy, alcoholic partner dummy, and altitude higher than 1,000 meters dummy), four religion fixed effects, eight control variables at the ethnic group level (ancestral subsistence on agriculture, gathering, hunting, fishing, husbandry, pastoralism, settlement patterns, community land ownership), and two ecological control variables at georeferenced ethnic group levels (suitability of soil and climate for hunting-gathering and pastoralism relative to agriculture). Panel B of Table 1.9 illustrates that the central tendencies for both female and male samples are comparable, except for age, education, and the wealth index. The average age of men is thirty-seven years, and the average age of women is thirty-one years. Men have greater years of education. The randomly selected female respondents are from relatively wealthier households than male respondents. The average prevalence of ancestral characteristics is similar for men and women because these measures are at ethnic group levels (Panel C of Table 1.9). For ecological variables at georeferenced ethnic group levels, the suitability of soil and climate for agriculture is greater for men (36 percent) than women (28 percent). I construct two suitability measures for hunting-gathering and pastoralism relative to agriculture (Panel D of Table 1.9) since animal husbandry is not suitable for agriculture in my entire study area. I account for the missing number of observations for each of the data restrictions in Table 1.10, which explains the sample size used in the regression analysis.

Table 1.2: Summary statistics of dependent variables

	Female sample					Male sample				
	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max	Obs.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A. Dependent variables										
Violence ever	0.39	0.49	0	1	7626	-	-	-	-	-
Violence intensity index	0.67	1.02	0	4	7628	-	-	-	-	-
Physical violence ever	0.34	0.47	0	1	7628	-	-	-	-	-
Sexual violence ever	0.12	0.33	0	1	7628	-	-	-	-	-
Violence attitude (dummy)	0.45	0.50	0	1	7628	0.30	0.46	0	1	5094
Violence attitude index	1.19	1.59	0	5	7628	0.62	1.13	0	5	5094
B. Ever any episode of emotional violence										
Spouse has ever humiliated	0.09	0.29	0	1	7626	-	-	-	-	-
Spouse has ever threatened to harm	0.05	0.22	0	1	7627	-	-	-	-	-
Spouse has ever insulted or made feel bad	0.06	0.24	0	1	7626	-	-	-	-	-
C. Ever any episode of physical violence										
Spouse ever pushed, shook or threw something	0.12	0.32	0	1	7625	-	-	-	-	-
Spouse ever slapped	0.32	0.47	0	1	7628	-	-	-	-	-
Spouse ever punched with fist or something harmful	0.10	0.30	0	1	7628	-	-	-	-	-
Spouse ever kicked or dragged	0.08	0.27	0	1	7628	-	-	-	-	-
Spouse ever tried to strangle or burn	0.02	0.15	0	1	7628	-	-	-	-	-
Spouse ever threatened or attacked with knife/gun or other weapon	0.02	0.14	0	1	7628	-	-	-	-	-
Spouse ever twisted her arm or pull her hair	0.11	0.32	0	1	7627	-	-	-	-	-
D. Ever any episode of sexual violence										
Spouse ever physically forced sex when not wanted	0.12	0.32	0	1	7628	-	-	-	-	-
Spouse ever forced other sexual acts when not wanted	0.05	0.22	0	1	7628	-	-	-	-	-
E. Components of violence attitude index										
(a)*Economic triggers*										
Wife beating justified if she burns the food	0.15	0.36	0	1	7501	0.05	0.23	0	1	5068
Wife beating justified if she neglects the children	0.39	0.49	0	1	7538	0.22	0.42	0	1	5043
(b) *Social triggers*										

(continued..)

Wife beating justified if she argues with him	0.27	0.44	0	1	7417	0.16	0.37	0	1	5007
Wife beating justified if she refuses to have sex with him	0.13	0.33	0	1	7328	0.06	0.23	0	1	4983
Wife beating justified if she goes out without telling him	0.27	0.44	0	1	7540	0.13	0.33	0	1	5042

Notes: Panel B enumerates 3 situations which are classified into emotional violence. NFHS-3 asks 7 questions about 'less severe physical violence' and 'severe physical violence', which are grouped together into physical violence (Panel C). For 'violence index ever' all 4 categories, namely, emotional, severe, less severe, and sexual violence are considered. Panel D shows the 2 situations indicating incidence of sexual violence. Both women's and men's questionnaire asks about 5 situations in which the respondents justify wife beating comprising the violence attitude index (Panel E). As in Alesina et al. (2019), these are classified in (a) economic triggers (relating to gender specialization in subsistence economy) and (b) social triggers (relating to social norms). Sample covers currently married women aged 15 to 49 who are randomly selected and are successfully interviewed. Men aged 15 to 54 who are currently married comprise the men's sample. Reference period is during the lifetime for both women and men. Analytic weights are applied, which are inversely proportional to the variance of an observation.

1.4 Empirical specification

In an important work, Lori Heise (1998) structured socio-ecological risk factors for spousal violence into four groups, namely personal history, microsystem, exosystem and macrosystem. The individual (personal history) factors include witnessing marital violence in childhood, childhood abuse, or father's absence during upbringing. The situational or microsystem factors include male dominance, male control of wealth, and alcohol consumption. Low socioeconomic status, social isolation of women are the exosystem factors that entail spousal violence. Various cultural values comprise the macrosystem factors, including the masculine notion of dominance, inflexible gender roles at the individual and societal level, a sense of entitlement or women ownership among men, and cultural approval of punishing women in a certain context. The vast empirical literature focuses on a variety of individual, family, and society-level risk factors to spousal violence (Koenig et al., 2006; Flake, 2005; Bates et al., 2004; Jewkes, Levin, and Penn-Kekana, 2002; Koenig et al., 1999; Straus and Hotaling, 1980). Incorporating the contemporaneous determinants, I estimate the following equation compatible with the broad ecological framework proposed by Heise (1998):

$$Pr(V_i = 1) = \Phi(\alpha_s + \beta X_{e,i} + \gamma \Gamma_i + \delta Q_{e,i}), \tag{1.1}$$

where Φ is a normal cumulative density function and Pr is probability. I estimate the outcome variable V_i using Probit model when it is a binary indicator variable, namely, the self-reported lifetime experience of any spousal violence, physical spousal violence and sexual spousal violence, and violence attitude for the i^{th} individual. When V_i represents an index (count variable), such as the violence intensity index and violence attitude index, I estimate a Poisson model. α_s represents a vector of fixed effects for eight Indian north-eastern states and four major religions, $X_{e,i}$ represents five dummy explanatory variables, namely, ancestral female participation in agriculture, agriculture and allied production, non-patrilocal post-marital residence, ease of divorce, and matrilineal descent for individual i belonging to ethnic group e. Γ_i represents a vector of current controls, including, age, education, household size, nuclear family dummy, wealth index, rural residence dummy, family history of parental violence dummy, alcoholic partner dummy, altitude higher than 1,000 meters dummy. $Q_{e,i}$ indicates ancestral characteristics of individual i belonging to ethnic group e. These include ancestral subsistence, settlement, and land-ownership patterns. It also includes two exogenous measures of ecological controls, namely, the suitability of soil and climate for hunting-gathering and pastoralism relative to agriculture sourced from Beck and Sieber's (2010) estimates of grid-cell level average suitability (climate and soil conditions) of four basic land use types (hunting-gathering, agriculture, sedentary animal husbandry, and nomadic pastoralism) using Ecological Niche Modeling. I report the average marginal effects of explanatory variables (β) interpreted as a change in V_i for a discrete change in $X_{e,i}$ from its reference category. In line with my description in Section 1.2, I hypothesize that the explanatory variables of interest will reduce the incidence and acceptance of spousal violence (i.e., β is smaller than zero).

1.5 Results

I estimate the Probit model where the outcome is an indicator variable (corresponding to columns 1, 3, 4, 5, and 7 of Table 1.3 and 1.4). Where the outcome variable is count variable (columns 2, 6, and 8 of Table 1.3 and 1.4), I estimate a Poisson model. For both Probit and Poisson models, I report marginal effects for explanatory variables. Besides, I report the number of ethnic group clusters and the mean of the dependent variable for the estimation sample to assess the size of the estimated average marginal effects.

First, I focus on the ancestral productive roles of women, which are implicit in their ancestral productive participation in their subsistence economy, (a) agriculture, and (b) agriculture and allied production activities (husbandry, fishing, weaving, basketry). Where women ancestrally take part in economically productive activities, they are well regarded in society, enjoy greater economic independence, and should gain equal status. The qualitative pattern of results in Table 1.3, for ancestral female participation in agriculture, is consistent with this interpretation, as the estimated coefficients appear negative for all forms of actual violence. There is about a six percent reduction in the likelihood of sexual violence (Column 4 in Table 1.3) — the only effect that is statistically significant at the 5 percent level. This is a large effect making up about 50 percent of the mean. This finding is in the spirit of the recent empirical application. For example, wives who live with their mothers-in-law can contribute more to agricultural work and experience less violence (Tur-Prats, 2019). Further, the social dignity of ancestrally productive women can shape women-favoring attitudes and leads to a lesser incidence of spousal violence. However, I do not find a statistically significant association regarding the violence attitude measures for women and men in my sample. With the alternative estimation method (logit), the association between ancestral female productive roles and the occurrence and endorsement of violence is no longer discernible (see Table 1.5). The sensitivity to the estimation methods makes me reluctant to draw a strong conclusion on these effects.

Table 1.3: Effects of gender roles in subsistence and social norms on spousal violence

	Female sample						Male sample	
	Actual violence				Acceptance of violence			
Dependent variable:	Violence ever	Violence intensity index	Physical violence	Sexual violence	Violence attitude	Violence attitude Index	Violence attitude	Violence attitude Index
Estimation method:	Probit	Poisson	Probit	Probit	Probit	Poisson	Probit	Poisson
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ancestral female role: agriculture	-0.045	-0.084	-0.012	-0.056**	0.036	0.163	0.067	0.126
	(0.039)	(0.092)	(0.032)	(0.028)	(0.048)	(0.146)	(0.056)	(0.188)
Ancestral female role: agriculture and allied production	0.036	0.085	0.060	-0.045	-0.032	0.204	-0.070	-0.163
	(0.040)	(0.119)	(0.041)	(0.033)	(0.069)	(0.204)	(0.082)	(0.244)
Non-patrilocal residence	0.050	0.136	0.053	0.008	-0.057	0.121	0.060	0.168
	(0.035)	(0.093)	(0.041)	(0.025)	(0.068)	(0.201)	(0.054)	(0.143)
Ease of divorce	0.004	-0.052	0.005	-0.019	0.032	0.233*	-0.106**	-0.265**
	(0.020)	(0.050)	(0.021)	(0.013)	(0.037)	(0.131)	(0.046)	(0.133)
Matrilineal descent	-0.021	-0.149**	0.035	-0.087***	-0.003	-0.115	-0.072*	-0.299
	(0.030)	(0.074)	(0.033)	(0.026)	(0.084)	(0.306)	(0.039)	(0.203)
Number of ethnic groups (clusters)	84	84	84	84	84	84	82	82
Mean of dependent variable	0.37	0.61	0.31	0.11	0.46	1.21	0.55	1.20
Observations	6,433	6,433	6,435	6,435	6,435	6,435	4,410	4,410

Notes: Panel B enumerates 3 situations which are classified into emotional violence. NFHS-3 asks 7 questions about 'less severe physical violence' and 'severe physical violence', which are clubbed together into physical violence (Panel C). For 'violence index ever' all 4 categories, namely, emotional, severe, less severe, and sexual violence are considered. Panel D shows the 2 situations indicating incidence of sexual violence. Both women's and men's questionnaire asks 5 situations in which the respondents justify wife beating comprising the violence attitude index(Panel E). As in Alesina et al. (2019), these are classified in (a) economic triggers (relates to gender specialization in subsistence economy), and (b) social triggers (relates to social norms). Sample covers currently married women aged 15 to 49 who are randomly selected and are successfully interviewed. Men aged 15 to 54 who are currently married comprise the men's sample. Reference period are during the lifetime for both men and women. Analytic weights applied, which are inversely proportional to the variance of an observation.

Most ethnic groups in my sample (83 percent) are patrilocal, where the ancestral social norms prescribe that after marriage, the couple lives with the husband's kin and family members. Co-residence with the husband's family and kin can disempower the wife. When couples follow matrilocal customs, women have closer access to their clan members and more empowered (Robinson and Gottlieb, 2019). In neo-local residence, the relative positions of husband and wife would be neutral in terms of access to positions of power from their respective clan and family. Therefore, in non-patrilocal residences (matrilocal and neo-local), husbands endorse less violence, and women justify violence less. With the probability of intervention greater in non-patrilocal residence, the balance of power in favor of women should lower the occurrence of violence. While no statistically significant relationship emerges for the residence patterns variable, it is consistent with the previous empirical literature. Across Africa, Alesina, Brioschi, and La Ferrara (2016) find no statistically significant association between residence norms and spousal violence. Although my sample is smaller relative to the African sample, 83 percent of respondents are patrilocal in northeastern India, compared to 85 percent in Africa. This rationalizes my conclusion on the lack of association between residence patterns and spousal violence.

Kinship institutions drive both the customs regarding marital residence and descent. Since I find no evidence from the residence patterns, I explore whether descent norms can explain spousal violence. Implicit in matrilineal descent, inheritance goes through female line, which should lead to a gain in bargaining power for women both within the household and outside in the society, and thus, reduce the occurrence of violence. I find an eight percent reduction in the likelihood of sexual violence (Column 4 in Table 1.3) among descendants of matrilineal ethnic groups. This effect is statistically significant at the 1 percent levels. The magnitude of this effect is large compared to the mean. Also, the fifteen percent reduction in the intensity of violence (Column 2 in Table 1.3) reinforces the support to my hypothesis that the shift in the balance of power inherently favors women. The magnitude and statistical significance for both these marginal effects are invariant to estimation methods. Consistent with my hypothesis, I attribute these welfare-enhancing effects to matrilineal property rights of women, which should increase women's bargaining power (Lowes, 2020). Women's empowerment through ownership of real assets proxies higher bargaining power for women, which leads to a lower incidence of physical violence in Ecuador and lower emotional abuse in Ghana (Oduro, Deere, and Catanzarite, 2015).

A similar prediction is available for India (Panda and Agarwal, 2005).

The lower endorsement of spousal violence either by the wife or by the husband lead to lower odds of spousal violence. For the female sample, both the measures of attitude towards violence (Columns 5 and 6 in Table 1.3) indicate negative marginal effects, although these effects are not statistically significant. The qualitative interpretation supports my hypothesis that women's entitlement to the property via matrilineal inheritance is associated with lesser acceptance of spousal violence among women. Regarding men's behavior in matrilineal ethnic groups, I find the distribution of authority (over his wife and children) shifts away from the husbands who work in the field owned by their wives. This decrease in male authority over female behavior (Tran, Nguyen, and Fisher, 2016) should reduce the proclivity for husbands to inflict violence and a seven percent reduction in their endorsement of wife beating (Column 7 in Table 1.3). The estimated marginal effects for the violence attitude index are thirty percent lower, which is very large and about one-fourth of the mean. The husband's lower endorsement can also originate from the socially desired response in the survey (Yount et al., 2013), where matrilineal men fearing reprisal do not endorse wife beating.

Finally, I consider the customary norms regarding divorce as an exogenous determinant of spousal violence and test whether easier divorce regimes improve women's well-being. When considering this relationship, among the four realizations for divorce norms, it is intuitively appealing to consider mutual consent divorce is easier than the other three regimes as reference category (civil court divorce, society/family-approved divorce, and discouraged divorce regimes). This marginal effect for this dichotomous variable called 'ease of divorce' displays a relatively larger reduction in men's attitudinal index, by twenty-six percent (Column 7 in Table 1.3). It comes with a ten percent reduced endorsement of atrocities admitted by the husbands (Column 8 in Table 1.3). Apart from statistical significance, these effects are economically meaningful and consistent with the theoretical predictions. With an easier, cheaper, and credible divorce regime, husband's incentive to endorse violence is lower since he knows that wife can dissolve the marriage if her utility falls below the reservation utility. Examining a divorce law reform in Spain that reduced the costs of divorce, Brassiolo (2016) estimates a thirty percent reduction in spousal violence, suggesting the role of bargaining position within the marriage because of cheaper and credible divorce laws. With a greater incidence of divorce in northeastern

states than in the rest of India (Jacob and Chattopadhyay, 2016), women are aware of things that can be and cannot be bargained over. With curtailed bargaining agency, women accept male authority and justify twenty-three percent more wife beating. This effect is statistically significant at the 10 percent level. Women who are committed to a violent relationship can resign themselves to accept a wife beating to some extent for the love of the abusive husband (Farmer and Tiefenthaler, 1997).

Table 1.4: Effects of gender roles in subsistence and social norms on spousal violence

	Female sample						Male sample	
	Actual violence				Acceptance of violence			
Dependent variable:	Violence ever	Violence intensity index	Physical violence	Sexual violence	Violence attitude	Violence attitude Index	Violence attitude	Violence attitude Index
Estimation method:	Probit	Poisson	Probit	Probit	Probit	Poisson	Probit	Poisson
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ancestral female role: agriculture	-0.044	-0.173	-0.012	-0.075**	0.050	0.164	-0.023	-0.037
	(0.060)	(0.128)	(0.051)	(0.035)	(0.068)	(0.206)	(0.069)	(0.231)
Ancestral female role: agriculture and allied production	0.027	0.074	0.067	-0.053	-0.041	0.137	-0.076	-0.183
	(0.045)	(0.124)	(0.048)	(0.036)	(0.069)	(0.208)	(0.078)	(0.243)
Women's entitlement index(reference category: patriarchic residence, divorce and descent norms)								
Women's entitlement index=1	0.009	-0.005	0.002	-0.010	0.031	0.251*	-0.056	-0.181
	(0.021)	(0.056)	(0.020)	(0.015)	(0.043)	(0.132)	(0.045)	(0.150)
Women's entitlement index=2	0.017	0.050	0.074*	-0.044**	-0.045	0.113	-0.038	-0.162
	(0.037)	(0.101)	(0.040)	(0.022)	(0.092)	(0.277)	(0.071)	(0.242)
Women's entitlement index=3	0.016	-0.284***	0.093	-0.107***	0.009	0.256	-0.325***	-0.693***
(matriarchic residence, divorce and descent norms)	(0.068)	(0.093)	(0.072)	(0.010)	(0.119)	(0.461)	(0.059)	(0.203)
Number of ethnic groups (clusters)	84	84	84	84	84	84	82	82
Mean of dependent variable	0.37	0.61	0.31	0.11	0.46	1.21	0.55	1.20
Observations	6,433	6,433	6,435	6,435	6,435	6,435	4,410	4,410

Notes: Table displays average marginal effects and their associated standard errors in parentheses that are clustered at ethnic group levels. ***, **, * denote statistical significance at the 1, 5 and 10 per cent levels, respectively. Estimates from Poisson model are in columns (2), (5) and (7) since the dependent variables are count variables. Estimates in the remaining columns are from Probit model since dependent variables are indicator variables. Columns (1) to (6) pertain to the women's sample and column (7) and (8) to the men's sample. In addition to the regressors whose coefficients are displayed in the table, all regressions without intercept include the following explanatory variables: two ancestral female participation patterns in agriculture and allied production activities (weaving, basketry, husbandry, fishing), three social norms (non-patrilocal post marital residence, ease of divorce, matrilineal descent), nine respondent-level covariates (age, education, household size, nuclear family dummy, wealth index, rural residence dummy, witnessed parental violence dummy, alcoholic spouse dummy, altitude higher than 1000 meters dummy), six ancestral dependence for subsistence (agriculture, gathering, hunting, fishing, husbandry, pastoralism), one settlement pattern dummy, one community land ownership dummy, two relative land suitability measures (for hunting and pastoralism), eight fixed effects for Indian northeastern states, and four fixed effects for religions. Sampling weights are applied. Mean of dependent variable is for sample used in the regression. Sub-sample for women is currently married women aged 15 to 49 who were randomly selected for domestic violence module and the interview was successfully conducted after ensuring privacy. The men sub-sample covers currently married men aged 15 to 54.

In Table 1.4, I estimate the regressions in Table 1.3 with a composite "Women's entitlement index". This index comprises the three social norm dummy variables, and therefore the index ranges between zero and three. The index takes the value zero if these social norms dummy variables are zero, reflecting patriarchic residence, divorce, and descent norms. If at most one of the three social norms dummy variables takes the value one, then the index takes the value one. The index takes the value two if any two of the three social norm dummy variables takes the value one. The matriarchy prevails when the residence, divorce, and descent norms are pro-female, and the index takes the value three. Essentially, this index derives an ordinal score for women's entitlement in society and ranks them along the complete spectrum from patriarchic to matriarchic tenets. It is realistic to use the composite index since, for the intermediate values of the index (i.e., one and two), the index flexibly accommodates prevalence or absence of any combination of the three women-favoring social norms. The results in Table 1.4 suggests an important pattern that women's wellbeing improves monotonically with the increasing women's entitlement in a society. In particular, the spousal violence is twenty-eight percent less intense (Column 2 in Table 1.4 and 1.6) in societies that have pro-women residence, divorce, and descent norms. The extent of reduction in the likelihood of sexual violence is three percent in societies that has one woman-favoring social norms, which reduces by ten percent when societies are at their matriarchal maximum. In such matriarchal societies, men endorse thirty-two percent lesser violence. Women's ill-fare also reduces as the matriarchal tendencies in a society increase. For example, in societies where any two of the three pro-female norms prevail, the odds of physical violence is about eight percent. This effect completely decays as the societies follow a higher women-friendly social norm. Similarly, women's endorsement of spousal violence loses its statistical significance when her society is fully matriarchal as opposed to a more patriarchal society. These findings underline the preceding hypotheses that women-favoring social norms endow higher social regard for women, which improves women's reservation utility and reduces the threat towards their physical and sexual integrity within the extant marriages.

Table 1.5: Effects of gender roles in subsistence and social norms on spousal violence

	Female sample						Male sample	
	Actual violence				Acceptance of violence			
Dependent variable:	Violence ever	Violence intensity index	Physical violence	Sexual violence	Violence attitude	Violence attitude Index	Violence attitude	Violence attitude Index
Estimation method:	Logit	Neg.bin	Logit	Logit	Logit	Neg.bin.	Logit	Neg.bin
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ancestral female role: agriculture	-0.045	-0.083	-0.013	-0.051	0.037	0.231	0.060	0.091
	(0.039)	(0.088)	(0.033)	(0.031)	(0.049)	(0.190)	(0.059)	(0.179)
Ancestral female role: agriculture and allied production	0.035	0.095	0.060	-0.049	-0.032	0.232	-0.069	-0.161
	(0.041)	(0.114)	(0.042)	(0.039)	(0.070)	(0.236)	(0.082)	(0.265)
Non-patrilocal residence	0.048	0.142	0.049	0.007	-0.060	0.105	0.060	0.222
	(0.035)	(0.093)	(0.043)	(0.028)	(0.070)	(0.255)	(0.053)	(0.164)
Ease of divorce	0.001	-0.050	0.004	-0.021	0.032	0.293*	-0.109**	-0.328**
	(0.020)	(0.049)	(0.022)	(0.014)	(0.038)	(0.151)	(0.047)	(0.145)
Matrilineal descent	-0.017	-0.168**	0.040	-0.083***	-0.007	-0.073	-0.083**	-0.337*
	(0.031)	(0.078)	(0.034)	(0.027)	(0.086)	(0.386)	(0.042)	(0.204)
Number of ethnic groups (clusters)	84	84	84	84	84	84	82	82
Mean of dependent variable	0.37	0.61	0.31	0.11	0.46	1.21	0.55	1.20
Observations	6,433	6,433	6,435	6,435	6,435	6,435	4,410	4,410

Notes: Table displays marginal effects and their associated standard errors in parentheses that are clustered at ethnic group levels. ***, **, * denote statistical signifcance at the 1, 5 and 10 per cent levels, respectively. Estimates from Negative Binomial model are in columns (2), (5) and (7) since the dependent variables are count variables. Estimates in the remaining columns are from Logit model since dependent variables are indicator variables. Columns (1) to (6) pertain to the women's sample and column (7) and (8) to the men's sample. In addition to the regressors whose coefficients are displayed in the table, all regressions without intercept include the following explanatory variables: two ancestral female participation patterns in agriculture and allied production activities (weaving, basketry, husbandry, fishing), three social norms (non-patrilocal post marital residence, ease of divorce, matrilineal descent), nine respondent-level covariates (age, education, household size, nuclear family dummy, wealth index, rural residence dummy, witnessed parental violence dummy, alcoholic spouse dummy, altitude higher than 1000 meters dummy), six ancestral dependence for subsistence (agriculture, gathering, hunting, fishing, husbandry, pastoralism), one settlement pattern dummy, one community land ownership dummy, two relative land suitability measures (for hunting and pastoralism), eight fixed effects for Indian northeastern states, and four fixed effects for religions. Sampling weights are applied. Mean of dependent variable is for sample used in the regression. Sub-sample for women is currently married women aged 15 to 49 who were randomly selected for domestic violence module and the interview was successfully conducted after ensuring privacy. The men sub-sample covers currently married men aged 15 to 54.

As a robustness check, I re-estimate the model specified in equation (1) using a logit model for the dichotomous dependent variables, and a negative binomial model for count variables (Table 1.5 and 1.6). I did this because both the variables violence intensity index and violence attitude index are over-dispersed (variance is larger than mean), which violates the equidispersion assumption of the Poisson model. I conduct a likelihood ratio test comparing the negative binomial model to a Poisson model. The associated chi-squared values[2] suggest that the negative binomial model is more appropriate than the Poisson model. The estimated average marginal effects are robust to the choice of estimation techniques.

1.6 Heterogeneous analyses

In this section, I explore the heterogeneous differences in incidence and acceptance of spousal violence between urban and rural areas. The motivation behind the rural-urban heterogeneous analysis is two-fold: (a) the urban areas resemble the modern society more, which should underline the importance of the faster transition from traditional customs, (b) in rural areas the influence of formal legal institutions from the national political institutions should be weaker. I re-estimate the regressions of Table 1.3 separately by rural and urban samples in Table 1.7. Overall, the magnitudes of marginal effects and their levels of statistical significance are in line with the principal findings. Regarding women's economically productive roles, ancestral female participation in agriculture is the principal driver of lower violence in villages. In urban areas, ancestral female productive roles, besides agriculture, reduces violence. These results do not stem from differences in the attitudes of men. Furthermore, non-residence of women with her husband's family is one of the few explanatory variables for which the results on women's and men's attitudes do not go in the same direction. The socially desirable responses and reporting bias can explain this anomaly. Another possibility is that men in urban areas tend to endorse violence less; it is condemned in a more modern society. Urban women lacking the social capital of kin networks may be more accepting of violence.

[2]For the female sample, the Chi-squared value with degrees of freedom one is 287.97 and 464.94 for violence intensity index and violence attitude index, respectively. For the male sample, the Chi-squared value with degrees of freedom one is 384.83 violence attitude index. All of these indicate that 'alpha' is non-zero.

Table 1.6: Effects of gender roles in subsistence and social norms on spousal violence

	Female sample						Male sample	
	Actual violence				Acceptance of violence			
Dependent variable:	Violence ever	Violence intensity index	Physical violence	Sexual violence	Violence attitude	Violence attitude Index	Violence attitude	Violence attitude Index
Estimation method:	Logit	Neg.bin	Logit	Logit	Logit	Neg.bin.	Logit	Neg.bin
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ancestral female role: agriculture	-0.048	-0.169	-0.017	-0.075**	0.052	0.222	-0.023	-0.073
	(0.060)	(0.124)	(0.052)	(0.037)	(0.071)	(0.239)	(0.073)	(0.232)
Ancestral female role: agriculture and allied production	0.029	0.082	0.069	-0.058	-0.041	0.189	-0.076	-0.210
	(0.046)	(0.121)	(0.049)	(0.040)	(0.070)	(0.245)	(0.079)	(0.267)
Women's entitlement index(reference category: patriarchic residence, divorce and descent norms)								
Women's entitlement index=1	0.007	-0.005	0.002	-0.008	0.029	0.288*	-0.059	-0.231
	(0.022)	(0.055)	(0.021)	(0.016)	(0.044)	(0.150)	(0.047)	(0.168)
Women's entitlement index=2	0.022	0.040	0.079*	-0.037*	-0.051	0.164	-0.047	-0.220
	(0.037)	(0.103)	(0.042)	(0.022)	(0.094)	(0.354)	(0.074)	(0.293)
Women's entitlement index=3	0.008	-0.279***	0.089	-0.109***	0.009	0.387	-0.325***	-0.764***
(matriarchic residence, divorce and descent norms)	(0.068)	(0.092)	(0.072)	(0.009)	(0.120)	(0.662)	(0.063)	(0.233)
Number of ethnic groups (clusters)	84	84	84	84	84	84	82	82
Mean of dependent variable	0.37	0.61	0.31	0.11	0.46	1.21	0.55	1.20
Observations	6,433	6,433	6,435	6,435	6,435	6,435	4,410	4,410

Notes: Table displays marginal effects and their associated standard errors in parentheses that are clustered at ethnic group levels. ***, **, * denote statistical significance at the 1, 5 and 10 per cent levels, respectively. Estimates from Negative Binomial model are in columns (2), (5) and (7) since the dependent variables are count variables. Estimates in the remaining columns are from Logit model since dependent variables are indicator variables. Columns (1) to (6) pertain to the women's sample and column (7) and (8) to the men's sample. In addition to the regressors whose coefficients are displayed in the table, all regressions without intercept include the following explanatory variables: two ancestral female participation patterns in agriculture and allied production activities (weaving, basketry, husbandry, fishing), three social norms (non-patrilocal post marital residence, ease of divorce, matrilineal descent), nine respondent-level covariates (age, education, household size, nuclear family dummy, wealth index, rural residence dummy, witnessed parental violence dummy, alcoholic spouse dummy, altitude higher than 1000 meters dummy), six ancestral dependence for subsistence (agriculture, gathering, hunting, fishing, husbandry, pastoralism), one settlement pattern dummy, one community land ownership dummy, two relative land suitability measures (for hunting and pastoralism), eight fixed effects for Indian northeastern states, and four fixed effects for religions. Sampling weights are applied. Mean of dependent variable is for sample used in the regression. Sub-sample for women is currently married women aged 15 to 49 who were randomly selected for domestic violence module and the interview was successfully conducted after ensuring privacy. The men sub-sample covers currently married men aged 15 to 54.

Compared to the rest of India, the dissolution of marriage is higher in the northeastern states of India, with a four percent divorce rate in Mizoram and three percent separation rates in Meghalaya (Jacob and Chattopadhyay, 2016) owing to matriarchal of social norms (Leonetti and Nath, 2009). It is the noteworthy feature that ease of divorce predicts men displaying lesser acceptance of violence, and the effects are comparable across rural and urban populations. Although rural women justify a certain extent of violence, urban women do not — since in modern society, they are more empowered — which leads to the lesser intensity of actual violence experienced by them. Matrilineal descent norms predict reduced violence way more than ease of divorce norms, and these effects are quantitatively larger in urban than in rural areas. This suggests that better inheritance rights, at more advanced stages of the society, is more welfare enhancing for women (Agarwal, 1994, 1997).

When I bundle all the three the women-favoring social norms, the average marginal effects are consistent with the initial findings, both in terms of their magnitudes and statistical significance (Table 1.8). Because I split the sample between rural and urban, it limits the estimates to a lower number of observations. I lose power for intermediate values of the index, and these estimates may have some problems of perfect prediction.

Table 1.7: Effects of gender roles in subsistence and social norms on spousal violence

	Female sample						Male sample	
	Actual violence				Acceptance of violence			
Dependent variable:	Violence ever	Violence intensity index	Physical violence	Sexual violence	Violence attitude	Violence attitude Index	Violence attitude	Violence attitude Index
Estimation method:	Probit	Poisson	Probit	Probit	Probit	Poisson	Probit	Poisson
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A: Rural								
Ancestral female role: agriculture	-0.051	-0.085	-0.008	-0.065**	0.059	0.165	0.077	0.082
	(0.048)	(0.113)	(0.039)	(0.031)	(0.055)	(0.171)	(0.056)	(0.181)
Ancestral female role: agriculture and allied production	0.055	0.125	0.079*	-0.044	-0.019	0.290	-0.068	-0.210
	(0.049)	(0.137)	(0.048)	(0.039)	(0.074)	(0.221)	(0.085)	(0.273)
Non-patrilocal residence	0.040	0.117	0.046	0.012	-0.073	0.117	0.089	0.185
	(0.041)	(0.104)	(0.045)	(0.028)	(0.082)	(0.242)	(0.056)	(0.143)
Ease of divorce	0.000	-0.050	0.006	-0.023	0.033	0.261*	-0.101**	-0.280**
	(0.023)	(0.056)	(0.024)	(0.015)	(0.042)	(0.150)	(0.048)	(0.138)
Matrilineal descent	-0.001	-0.120	0.061	-0.096***	-0.015	-0.163	-0.096**	-0.362
	(0.040)	(0.081)	(0.040)	(0.028)	(0.100)	(0.376)	(0.041)	(0.226)
Observations	4,129	4,129	4,130	4,130	4,130	4,130	2,675	2,675
B: Urban								
Ancestral female role: agriculture	0.041	-0.013	0.003	0.030	-0.120*	0.117	0.061	0.465*
	(0.052)	(0.111)	(0.049)	(0.038)	(0.070)	(0.285)	(0.077)	(0.242)
Ancestral female role: agriculture and allied production	-0.143**	-0.121	-0.079	-0.015	-0.144	-0.551	-0.017	0.158
	(0.068)	(0.140)	(0.063)	(0.034)	(0.111)	(0.455)	(0.173)	(0.343)
Non-patrilocal residence	0.049	0.224	0.096	0.013	0.119**	0.210	-0.147**	-0.431**
	(0.064)	(0.137)	(0.072)	(0.033)	(0.059)	(0.172)	(0.072)	(0.203)
Ease of divorce	-0.043	-0.181**	-0.043	-0.025	-0.001	-0.091	-0.130**	-0.281*
	(0.035)	(0.074)	(0.033)	(0.026)	(0.051)	(0.244)	(0.054)	(0.170)
Matrilineal descent	-0.186**	-0.515**	-0.227**	-0.074*	0.082	0.261	0.026	-0.048
	(0.090)	(0.214)	(0.105)	(0.042)	(0.069)	(0.259)	(0.112)	(0.324)
Observations	2,304	2,304	2,305	2,285	2,305	2,305	1,735	1,735

Notes: See Table 1.3.

Table 1.8: Effects of gender roles in subsistence and social norms on spousal violence

	Female sample						Male sample	
	Actual violence				Acceptance of violence			
Dependent variable:	Violence ever	Violence intensity index	Physical violence	Sexual violence	Violence attitude	Violence attitude Index	Violence attitude	Violence attitude Index
Estimation method:	Probit	Poisson	Probit	Probit	Probit	Poisson	Probit	Poisson
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A: Rural								
Ancestral female role: agriculture	-0.055	-0.178	-0.008	-0.083*	0.075	0.238	-0.032	-0.156
	(0.077)	(0.157)	(0.064)	(0.043)	(0.084)	(0.293)	(0.070)	(0.221)
Ancestral female role: agriculture and allied production	0.051	0.126	0.090	-0.060	-0.029	0.296	-0.079	-0.216
	(0.055)	(0.137)	(0.059)	(0.048)	(0.076)	(0.272)	(0.083)	(0.290)
Women's entitlement index(reference category: patriarchic residence, divorce and descent norms)								
Women's entitlement index=1	0.007	0.004	0.006	-0.011	0.030	0.319*	-0.061	-0.221
	(0.026)	(0.066)	(0.023)	(0.020)	(0.050)	(0.178)	(0.048)	(0.177)
Women's entitlement index=2	0.027	0.044	0.086*	-0.046*	-0.072	0.171	-0.032	-0.179
	(0.047)	(0.121)	(0.051)	(0.026)	(0.108)	(0.418)	(0.078)	(0.322)
Women's entitlement index=3	0.017	-0.292***	0.126	-0.117***	-0.011	0.447	-0.327***	-0.770***
(matriarchic residence, divorce and descent norms)	(0.086)	(0.111)	(0.087)	(0.012)	(0.137)	(0.773)	(0.057)	(0.233)
Observations	4,129	4,129	4,130	4,130	4,130	4,130	2,675	2,675
B: Urban								
Ancestral female role: agriculture	0.028	-0.086	-0.039	0.021	-0.066	0.258	0.057	0.261
	(0.066)	(0.151)	(0.065)	(0.040)	(0.093)	(0.441)	(0.090)	(0.293)
Ancestral female role: agriculture and allied production	-0.141*	-0.194	-0.055	-0.010	-0.144	-0.660	-0.059	0.116
	(0.076)	(0.165)	(0.064)	(0.040)	(0.118)	(0.552)	(0.174)	(0.436)
Women's entitlement index(reference category: patriarchic residence, divorce and descent norms)								
Women's entitlement index=1	-0.025	-0.151*	-0.045	-0.018	-0.006	0.013	-0.086	-0.369
	(0.040)	(0.084)	(0.041)	(0.032)	(0.051)	(0.256)	(0.058)	(0.253)
Women's entitlement index=2	-0.058	-0.034	0.032	0.006	0.088	0.166	-0.251**	-0.711**
	(0.074)	(0.206)	(0.088)	(0.038)	(0.084)	(0.355)	(0.104)	(0.336)
Women's entitlement index=3	-0.197***	-0.419***	-0.183***	...	0.224*	0.387	-0.369***	-1.055***
(matriarchic residence, divorce and descent norms)	(0.071)	(0.111)	(0.063)	...	(0.118)	(0.623)	(0.113)	(0.341)
Observations	2,304	2,304	2,305	2,285	2,305	2,305	1,735	1,735

Notes: See Table 1.4.

1.7 Conclusion

I investigate the effect of ancestral way of life of an individual's ethnic group on the contemporaneous occurrence of spousal violence and attitude towards it. I handpick the study area that offers a considerable variation in terms of patriarchic and matriarchic social norms. This small and administratively homogeneous area in the northeastern zone of India almost mimics an ethnological laboratory with many ethnic groups living in ethnic isolation. I establish that the ancestral social norms and the traditions of female participatory roles in economic activities — which are persistent — factor out environmental effects and demographic characteristics on extreme marital distress. First, the rural data on women's ancestral economic roles reveal five percent declines in the odds of sexual atrocities. In urban areas, ancestrally productive women experience fourteen percent fewer likelihood of lifetime spousal violence. Second, as with the living arrangements, non-residence with the husband's family has no discernible effect on spousal violence. Third, I find suggestive evidence of a eleven percent decline in men's endorsement of violence when easier and less costly dissolution of marriage are customary. Women in ethnic groups that adopted divorce by mutual consent still tolerate certain degrees of violence, although these estimates are imprecise. Fourth, I find a striking decline by around fifteen percent in the intensity of spousal violence and eight percent reduction in sexual violence in societies that matrilineal descent. I believe that this decline is driven by eight percent fewer endorsement of violence by men. Finally, the proxy for women's entitlement realistically reveals that increasing inclinations towards female friendly customs are increasingly potent in eliminating atrocities against women.

These findings are open to wider interpretations. The fundamental lesson is that women-favoring social norms endow higher social regard for women. The pro-female ancestral norms lead to favorable outcomes for women because of both the enhanced economic value of women and improved status of women in society. The theoretical underpinning of this finding stems from the non-cooperative bargaining models of the household. Women's reservation utility increase with pro-women social constructions. Theoretical predictions suggest that enhanced reservation utility should set the balance of power more in favor of women, endowing them with greater bargaining power. Together, there should be favorable intra-household distribution effects, which should curtail spousal

violence and its endorsement. These principal findings empirically endorse the idea that changes in family law might affect violence against women more favorably. In "modern times, inheritance reforms that shift inheritance rights of real assets to women can partly simulate the ancestral tradition of matrilineal descent. The next speculation on policy front is to introduce an easier and less costly divorce law. Adoption of 'no-fault' divorce can empower women to divorce abusive husbands and can also be a promising tool to threaten credibly against any untoward atrocities against them. Aware of this potent threat, men can refrain from inflicting unacceptable violence.

For causal interpretation of these estimates, I need two strong assumptions, (a) there is no omitted variable bias, no variables are left out of my analysis which are correlated either with the outcome variables or the explanatory variables, (b) there is no reverse causality, that is causality does not run from outcome variables to the explanatory variables. Reverse causality is probably less of an issue for exogenous ethnic characteristics. I acknowledge both the assumptions are difficult to meet, and it is difficult to control for all potential confounders, even if I have included all the contemporaneous risk factors of spousal violence identified in the literature and control extensive factors at the environment and ethnic group levels. Therefore, I refer to these estimates as conditional correlations. These results need not be the last words on this important, difficult, and policy-relevant link among spousal violence and social norms. The under-reporting of spousal violence is well known and could have induced measurement errors. Future research might consider dealing with the remaining methodological issues and extend the work to the rest of India.

Appendices to Chapter 1

1.A Definition and description of dependent variables

I describe the construction of dependent variables and the underlying survey questions with their realizations in the data.

1. The women-level data on lifetime violence exposure are from the third wave of NFHS. For the randomly selected women aged 15-49, the following twelve questions are asked: (i) spouse has ever humiliated her, (ii) spouse has ever threatened her with harm, (iii) spouse has ever insulted or made her feel bad, (iv) spouse ever pushed, shook or threw something, (v) spouse ever slapped, (vi) spouse ever punched with the fist or something harmful, (vii) spouse ever kicked or dragged, (vii) spouse ever tried to strangle or burn, (ix) spouse ever threatened or attacked with knife/gun or other weapons, (x) spouse ever twisted her arm or pull her hair, (xi) spouse ever physically forced sex when not wanted, (xii) spouse ever forced other sexual acts when not wanted.

2. The categorical variable named "violence ever" indicates whether the women have experienced at least one of the above twelve episodes of violence.

3. The NFHS constructs the following four dummy variables "emotional violence ever", "less severe violence ever", "severe violence ever", and "sexual violence ever" if the responses are affirmative in (a) questions (i) to (iii) above, (b) questions (iv) to (vii), (c) questions (viii) to (x), and (d) questions (xi) and (xii), respectively. I construct an index called "violence intensity index" which is a sum of these four categories ranging between 0 and 4.

4. I restrict the analysis to two forms of aggression. First, I combine the categories "less severe violence ever", "severe violence ever" into "physical violence ever" which is a dummy variable. Second, I use "sexual violence ever" as a categorical dependent variable.

5. Both women and men are asked in NFHS if the respondent (women/men) believes that spousal violence is justified in the following five circumstances: (i) wife goes

out without telling her husband, (ii) wife neglects the house or the children, (iii) wife argues with her husband, (iv) wife refuses to have sex with her husband, (v) wife burns the food.

6. As the dependent variable, I construct a categorical variable called "violence attitude" for both women and men. It equals one if the respondent believes that wife beating is justified in at least one out of five circumstances.

7. From the sum of the five circumstances (outlined in (5) above) in which the respondents believe that wife beating is justified, I construct a "Violence Attitude Index" ranging between 0 and 5.

1.B Definition and description of independent variables

I use a set of contemporary control variables in all of my regression specifications to capture the individual characteristics of both men and women, as available in NFHS-3. Variables, such as age and education for both women and men are measured in years. The household size variable indicates the number of persons lived in the household as of the previous night before the data was collected. The dummy variables are nuclear family, rural, family history of violence, alcoholic partner, and altitude of primary sampling unit higher than 1,000 meters. The wealth index is a categorical variable that measures of various indicators available in the dataset are generated by using the principal component analysis which places the respondent on the wealth distribution reflective of relative position in terms of economic status depending on which of the five quintiles they belong to. This variable is readily available in NFHS-3, which is calculated using data on a household's ownership of certain assets, the house construction material, and access to water and sanitation. To capture unobserved heterogeneity between four religions and eight Indian northeastern states, I control for religion and state fixed effects.

At ethnic group levels, I control for ancestral subsistence patterns. There are six ancestral subsistence on agriculture/gathering/hunting/fishing/husbandry/pastoralism reflecting whether an ethnic group ancestrally depends on any of these subsistence activities. The comparable variables in Murdock's atlas present the extent (0% to 100%) to which an

ethnic group is dependent on agriculture, gathering, hunting, fishing, animal husbandry. In addition to these five indicator variables, I code a dummy variable called "ancestral settlement patterns" equal to one if ethnic groups ancestrally had separated hamlets forming a single community,semi-permanent neighborhoods of dispersed households, semi-nomadic half-year/semi-nomadic settlements. Another categorical variable used as a control variable is community land ownership, which equals to one if the land is ancestrally owned by society/community and two if the ethnic group is ancestrally landless community. The gender-roles in the ancestral subsistence economy are reflected in nine dummy variables that equal one if ancestral female participation in agriculture, gathering, hunting, fishing, husbandry, pastoralism, weaving, basketry, politics were present. For the georeferenced locations of each ethnic groups, I construct three dummy variables that equal one if the soil and climatic conditions are most suitable for hunting-gathering/husbandry/pastoralism relative to agriculture. For eleven activities (metalworking, weaving, leather works, pottery, boat building, house construction, gathering, hunting, fishing, animal husbandry, agriculture) in Murdock's ethnographic atlas, an ethnic group is grouped into nine categories: (i) males alone perform the activity, (ii) both sexes participate, (iii) differentiation of specific tasks by sex but approximately equal participation, (iv) equal participation by both sexes without marked or reported differences, (v) both sexes participate but females do appreciably more than males, (vi) females alone perform the activity, (vii) sex participation irrelevant, (viii) the activity is present but sex participation is unspecified, (ix) the activity is absent or unimportant in the particular society. In contrast, People of India specifies in which of the activities women participate, but do not specify the extent of participation in a specific activity of interest, and thereby the extent of economic contribution of female participation cannot be inferred.

1.C Definition and description of social norms

I describe the construction of explanatory variables from social norms and their respective realizations.

1. Post-marital residence is a categorical variable. Patrilocal residence implies residence in a patrilineal group where bride goes and lives with his husband's family and kin, also referred to as virilocal is coded as zero. The next category is coded

as one, which is Matrilocal or Uxorilocal. Such practices observe the couple to reside with or near the female matrilineal family and kin of the wife. It is generally observed in a matrilineal society also referred to as uxorilocal. The ambilocal/ bilocal/neolocal/duolocal societies are coded as two where marital residence is established optionally with or near the parents of either the husband or wife, depending upon circumstances or personal choice.

2. Ease of divorce is a categorical variable that captures the following social norms observed in different societies for granting divorce among the couples. Here a zero represents civil court proceedings, where married couples approach a legal body for divorce proceedings legally. Mutual consent divorce is when couples decide to divorce by mutually, which is coded as one. In certain ethic groups, divorce is permitted by the societal or the familial approval/agreement, which is coded as two. The last category is where divorce rules are rigid and doesn't permit the couples to divorce is coded as three.

3. Matrilineal descent is a binary variable that is coded as 1 if the matrilineal descent is practiced, where a person can be traced through the female line or female ancestors, generally, female kin are descendants of the mother. Otherwise, the variable takes a value of zero if the patrilineal descent is followed, which can be traced through the male line. Male kin are selected to become the line of descent after the father.

1.D Data construction

The National Family and Health Survey of India covers women aged 15-49 and men aged 15-54 from the randomly selected households across India following the internationally standardized questionnaires and sampling design of the Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys (MEASURE DHS). A woman is randomly selected for the household relations section of the women-only questionnaire on spousal violence using a Kish grid (Kish, 1965) that has eight columns indicating the total number of eligible women (numbered 1 to 8) in the household and ten rows (numbered 0 to 9) for the last digit of the questionnaire number. Out of the national sample of 109,041 households, 124,385 women aged 15-49, and 74,369 men aged 15-54, I use a sub-sample of 20,238 women and 12,056 men for eight northeastern Indian states.

1.D.1 People of India ethnographic atlas and matching with NFHS

Economists popularly use (Nunn and Qian, 2011; Enke, 2019; Alesina, Giuliano, and Nunn, 2013; Michalopoulos, Putterman, and Weil, 2019; Michalopoulos and Papaioannou, 2013) the coded ethnographic atlas (Murdock, 1967). After exploring several other coded ethnographic atlases (including Kirby et al., 2016; Gray, 1999; White et al., 1986; Ember et al., 1992; Barry, 1980), I find none of those sufficiently cover the ethnic diversity in India. Therefore, I identify *People of India* as an alternative to extract information from the qualitative ethnography. The *People of India* is a multi-volume compendium of books presented for each sub-national state within India covering 4,635 ethnic groups, which was collected in a mammoth project ran by the Anthropological Survey of India under the Indian ministry of culture during 1985-1992. Ethnographers spent an average of 5.5 days with each community and recoded various aspects of traditional social norms through first-hand interviews and with the help of the informants. This ethnographic atlas is not yet popular among economists, despite offering greater coverage within India, probably for the qualitative nature of the information. I use a double-blind coding protocol to extract information and to identify the presence or absence of various subsistence patterns among the ethnic groups in my study area. I identify 92 aboriginal ethnic groups for whom I can extract definitive information about the presence or absence of 5 modes of subsistence economy. The ancestral characteristics, customs, and social norms at the ethnic group level are then assigned from the coded ethnography from the *People of India* on each female and male observation. Following a double-blind coding protocol, I code eight marriage customs (marriage payments, clan-exogamy, community-exogamy, and village-exogamy, close kin marriageability, partner selection patterns, polygyny, and post-marital residence), four separation norms (ease of divorce, alimony rights, custody, ease of remarriage), three lineage norms (descent, inheritance, succession), six subsistence patterns (dependence on agriculture, gathering, pastoralism, animal husbandry, hunting, fishing), the traditional use of plough in cultivation, nine gender division of labor indicators (ancestral female participation in agricultural, gathering, fishing, hunting, animal husbandry, pastoralism, weaving, basketry, and politics), settlement patterns, and community land ownership. Appendix Table 1.11 summarizes the incidence of each of

these 30 social norms and subsistence patterns. To combine NFHS observations with the ethnographic data from *People of India*, I use the stated ethnicity of the respondent. The recent NFHS conducted in 2015 (NFHS-4) does not provide the data file for ethnicity. For NFHS conducted in 2005 (NFHS-3), the reported ethnic group affiliation is available for men, women, and households. The reported ethnicity is available for the household head in NFHS conducted in 1998 (NFHS-2), but it does not cover detailed incidence and justification of spousal violence. Thus, I limit my analysis to NFHS-3 cross-sectional data. It is important to highlight that the stated ethnic group names are recorded in the text, which is not free from spelling errors. For spelling variations, most often, the stated ethnic group names in NFHS do not coincide readily with the names of ethnic group names in the People of India. The first step in the process is to identify a set of 92 ethnic groups who are aboriginal inhabitants of northeastern states of India from the People of India and code the qualitative and detailed ethnography for each of them. Building on the matching procedure elaborated in the literature that combines Murdock's ethnographic data with the DHS data (e.g., Alesina, Brioschi, and La Ferrara, 2019; Michalopoulos and Papaioannou, 2014), I develop a four-step matching procedure by reconciling the differences in reported ethnicities in NFHS.

The most straightforward case is where the ethnic group name (text data) is identical in spelling with the text name in the People of India. This trivial process yields 37% women and 76 ethnicities for NFHS-3. The direct match is viable for 39% of men and 73 ethnic groups. To enhance the matched data with ethnic groups, I collect the clan and sub-clan names for the 92 target ethnic groups from the People of India. After carefully studying the chapters on each of the 92 ethnic groups in respective state volumes of People of India, I gather 1,269 clan and sub-clan names (Appendix Table 1.12). This massive exercise widens the direct match possibilities because probably the reported ethnicities might have referred to the respondents' clan or sub-clan affiliation rather than the ethnic groups. On average, each ethnicity has 14 clans or sub-clans, with a maximum of 180 clans and sub-clans for 'Tagin' ethnic group, who are aboriginal inhabitants of Arunachal Pradesh. Second, I conduct another direct match of stated ethnicity (text data) with the collection of 1,269 clan and sub-clan names. For example, the ethnic name "Angami" according to People of India is found in NFHS in terms of their clan and sub-clan names ("Gnamei", "Tsungumi", "Tsungung", "Mour", "Chakroma", "Tengima",

"Chakrama", "Kezami", "Memi", "Dzunokehena", "Zounuo", "Keyhonuo", "Khonoma", "Kezami", "Khezha", "Pezina", "Pepfuma", "Tepa", "Thevo", and "Kemovo") who are known to be kindred to the "Angami" people. This procedure cumulatively matches 42% of women and 81 ethnic groups and 44% men with 76 ethnic groups. The third method is manually correcting the spelling variation in the text data in NFHS for 92 ethnic names. For instance, the stated ethnic names for "Chang" is misspelt in NFHS as "Cahng", "Chanh", "Chnag", or "Cjhang" to illustrate a few of the innumerable possibilities of spelling errors. This laborious spelling correction, however, yields the maximum extent of matches. Cumulatively, after the third method, 76% of women with 88 ethnic groups and 76% of men from 88 ethnic groups are identified. The fourth step is to manually synchronize spelling variations for the 1,269 clan and sub-clan names. This most labor-intensive step did not yield much of incremental matches. After this step, I can get 80% of women and 79% of men from all the 92 ethnic groups. Table 1.1 presents the number of women and men who were matched after each of the four matching methods. In the matched data, there are 92 ethnic groups for both women and men. The womens sample is 16,089, and the mens sample is 9,504. I present all the thirty social norms and subsistence patterns in Appendix Table 1.11. Next, I merge these social norms and subsistence patterns data with the demographic data based on the matched ethnicities of respondents. In table 1.7, I present the final sample that can be used in the analysis and account for missing observations due to several data restrictions.

1.D.2 Combining environmental data with the matched ethnographic NFHS data

The variation in the ancestral ecological conditions largely determine ancestral subsistence patterns. These extra-environmental patterns are exogenous to the social norms, customs, and ancestral subsistence patterns, unless ethnic groups self-select into particular pockets, even within primary sampling units, with special environmental conditions that might suit them the most. To overcome the omitted variable bias — if environmental factors determine social norms — I control for these environmental conditions. NFHS data is not georeferenced. I identify the approximate geographic locations of the 92 ethnic groups in my sample. The minimum perimeter bounding box for the northeastern states of India is between latitude (from 22.89 to 28.91) and longitude (from 88.03 to 96.20). I infer the

geographic referencing of each ethnic group from the description of each ethnic group in the respective chapter in the People of India. I give a greater reliance on a description of their main area of settlement unless the districts, sub-districts, and specific villages are mentioned. I present the excerpts and texts from the People of India chapters of a specific ethnic group that are used to put each ethnic group on the map and assign proxy latitudes and longitudes in Appendix Table 1.13. I use these approximate geographic coordinates for adding soil suitability conditions to the merged data. I add the data provided by Beck and Sieber (2010). They used long-run (1961-1991) average patterns in climatic conditions (temperature, rainfall, altitude) and soil characteristics to predict which climate and soil conditions suit most for the land-use types for four basic subsistence, such as, agriculture, hunting-gathering, animal husbandry, and pastoralism. For each of these four land suitability measures, I calculate mean and median at 20 kilometers, 50 kilometers, and 100 kilometers radii from the geographic coordinates of each ethnic group, as separate variables and presented in Appendix Table 1.13. Following Becker (2020), I construct three linearly independent indicator variables for whether the environment is most suited for (a) hunting-gathering, (b) animal husbandry, (c) pastoralism, relative to agriculture, since in my sample most of the ethnic groups are agrarian societies.

Table 1.9: Summary statistics of explanatory variables and control variables

	Female sample					Male sample				
	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max	Obs.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A. Explanatory variables: Ancestral female roles in subsistence and social norms										
Ancestral female role: agriculture	0.64	0.48	0	1	7628	0.64	0.48	0	1	5100
Ancestral female role: agriculture and allied production	0.06	0.23	0	1	7628	0.07	0.25	0	1	5100
Post-marital residency	0.21	0.49	0	2	7628	0.21	0.49	0	2	5100
Patrilocal/virilocal residence (reference category)	0.83	0.38	0	1	7628	0.82	0.38	0	1	5100
Non-patrilocal residence	0.17	0.38	0	1	7628	0.18	0.38	0	1	5100
Matrilocal/uxorilocal residence	0.13	0.34	0	1	7628	0.14	0.35	0	1	5100
Neolocal residence	0.04	0.19	0	1	7628	0.04	0.19	0	1	5100
Matrilineal descent	0.12	0.33	0	1	7628	0.14	0.34	0	1	5100
Ease of divorce	0.43	0.49	0	1	7628	0.40	0.49	0	1	5100
Women's entitlement index(reference category: patriarchic)	0.41	0.49	0	1	7628	0.43	0.49	0	1	5100
Women's entitlement index=1	0.43	0.49	0	1	7628	0.43	0.49	0	1	5100
Women's entitlement index=2	0.11	0.31	0	1	7628	0.12	0.32	0	1	5100
Women's entitlement index=3 (matriarchic)	0.05	0.22	0	1	7628	0.03	0.16	0	1	5100
B. Control variables: individual level										
Age (years)	31.27	7.81	15	49	7628	37.24	8.37	15	54	5100
Education (years)	5.01	4.56	0	21	7627	6.68	4.74	0	20	5098
Household size	5.06	1.96	1	20	7628	5.42	2.20	1	17	5100
Nuclear family (dummy)	0.32	0.47	0	1	7539	0.38	0.49	0	1	5024
Wealth Index (categorical)	3.27	0.47	1	5	7628	2.89	1.23	1	5	5100
Rural (dummy)	0.84	0.36	0	1	7628	0.83	0.37	0	1	5100
Family history of violence	0.21	0.41	0	1	6984	0.17	0.37	0	1	4687
Alcoholic partner	0.53	0.50	0	1	7626	0.58	0.49	0	1	5100
Hindu (dummy)	0.66	0.47	0	1	7628	0.67	0.47	0	1	5100
Muslim (dummy)	0.06	0.23	0	1	7628	0.03	0.17	0	1	5100
Christian (dummy)	0.23	0.42	0	1	7628	0.25	0.43	0	1	5100
Other religion (dummy)	0.04	0.21	0	1	7628	0.05	0.21	0	1	5100
Altitude higher than 1000 m (dummy)	0.12	0.32	0	1	7628	0.13	0.33	0	1	5100
C. Control variables: ethnic group level										
Ancestral subsistence: agriculture	0.86	0.35	0	1	7628	0.85	0.36	0	1	5100
Ancestral subsistence: gathering	0.94	0.24	0	1	7628	0.94	0.23	0	1	5100

(continued..)

Ancestral subsistence: hunting	0.28	0.45	0	1	7628	0.31	0.46	0	1	5100
Ancestral subsistence: fishing	0.59	0.49	0	1	7628	0.62	0.49	0	1	5100
Ancestral subsistence: husbandry	0.53	0.50	0	1	7628	0.55	0.50	0	1	5100
Ancestral subsistence: pastoralism	0.32	0.47	0	1	7628	0.32	0.47	0	1	5100
Ancestral separated settlement patterns	0.54	0.50	0	1	7628	0.56	0.50	0	1	5100
Ancestral community land ownership patterns	0.97	0.18	0	1	7108	0.96	0.19	0	1	5100
D. Control variables: geo-referenced ethnic group level										
Soil and climate most suited for hunting-gathering	0.62	0.49	0	1	7628	0.64	0.48	0	1	5100
Soil and climate most suited for pastoralism	0.01	0.09	0	1	7628	0.00	0.05	0	1	5100
E. Variables transformed to include in regressions										
Soil and climate most suited for agriculture	0.28	0.45		1	7628	0.36	0.48	0	1	5100
Soil and climate most suited for hunting-gathering	0.62	0.49		1	7628	0.64	0.48	0	1	5100
Soil and climate most suited for husbandry	0	0	0	0	7628	0	0	0	0	5100
Ancestral female role in agriculture	0.64	0.48	0	1	7628	0.64	0.48	0	0	5100
Ancestral female role in gathering	0.68	0.47	0	1	7628	0.66	0.47	0	1	5100
Ancestral female role in hunting	0.00	0.06	0	1	7628	0.01	0.09	0	1	5100
Ancestral female role in fishing	0.26	0.44	0	1	7628	0.27	0.45	0	1	5100
Ancestral female role in husbandry	0.29	0.45	0	1	7628	0.30	0.46	0	1	5100
Ancestral female role in pastoralism	0.01	0.08	0	1	7628	0.01	0.08	0	1	5100
Ancestral female role in weaving	0.41	0.49	0	1	7628	0.40	0.49	0	1	5100
Ancestral female role in basketry	0.19	0.39	0	1	7628	0.18	0.39	0	1	5100
Ancestral female role in politics	0.12	0.33	0	1	7628	0.11	0.32	0	1	5100

Notes: The spatial prediction data on suitability of land of the georeference of ethnic group is obtained from Beck and Seiber (2010) which are computed assuming only soil and climate affects soil-suitability for four basic land use types using Ecological Niche Modeling. The most suitable land-use is constructed three linearly independent indicator variables for whether (i) the environment is most suited for hunting and gathering (48 ethnic groups) (ii) the environment is most suited for husbandry (no ethnic group and not reported) (iii) the environment is most suited for pastoralism (1 ethnic group) with reference category is “soil and climate most suited for agriculture" (43 ethnic group and reference category). The sample composed of currently married women aged 15-49 who were randomly selected for the domestic violence module and were interviewed with privacy ensured. Variables summarized in Panel E are not directly used in regression analysis. Analytic weights applied, which are inversely proportional to the variance of an observation.

Table 1.10: Data restrictions and number of observations

Data restrictions	Female sample	Male sample
Potential observations in NFHS-3(for 8 northeastern states of India)	20238	12056
Restricted to matched ethnic groups	16089	9504
Restricted to unequivocally matched sample	15886	9290
Restricted to selected for domestic violence module	10942	not applicable
Restricted to woman selected and interviewed	10873	not applicable
Restricted to currently married	7628	5100
Restricted to coded social norms: post-marital residence	7628	5100
Restricted to coded social norms: descent	7628	5100
Restricted to coded social norms: ease of divorce	7628	5100
Restricted to coded ancestral subsistence - agriculture	7628	5100
Restricted to coded ancestral subsistence – gathering	7628	5100
Restricted to coded ancestral subsistence – hunting	7628	5100
Restricted to coded ancestral subsistence – fishing	7628	5100
Restricted to coded ancestral subsistence – husbandry	7628	5100
Restricted to coded ancestral subsistence – pastoralism	7628	5100
Restricted to coded ancestral settlement complexity	7628	5100
Restricted to coded ancestral community land ownership	7108	4851
Restricted to coded ancestral female role in agriculture	7108	4851
Restricted to coded ancestral female role in agriculture and allied production	7108	4851
Restricted to age (years)	7108	4851
Restricted to education (years)	7107	4849
Restricted to household size	7107	4849
Restricted to nuclear family dummy	7028	4780
Restricted to wealth quintiles	7028	4780
Restricted to rural residence	7028	4780
Restricted to witnessed parental violence	6436	4415
Restricted to alcoholic spouse	6435	4415
Restricted to altitude higher than 1000 meters dummy	6435	4415
Restricted to relative suitability to hunting-gathering	6435	4415
Restricted to relative suitability to pastoralism	6435	4415
Restricted to state fixed effects	6435	4415
Restricted to religion fixed effects	6435	4415
Restricted to violence attitude	6435	4410
Restricted to ever any violence	6433	not applicable

Notes: For each variable used in the regression a lower bound of observations are indicated which accounts for the different number of observations in the regression tables.

Table 1.11: Social norms and subsistence economy by ethnic groups

	Female sample		Male sample	
	Ethnicity	Obs.	Ethnicity	Obs.
Social norms	(1)	(2)	(3)	(4)
1. Marriage payments	90	13331	90	7336
Neither brideprice nor dowry	18	2810	18	1107
Only brideprice	62	8911	62	5211
Only dowry	6	905	6	498
Both brideprice and dowry	4	705	4	520
2. Kinship, marriage, community organization	91	15702	91	9122
Clan endogamy	20	1538	20	663
Clan exogamy	71	14164	71	8459
Community endogamy	82	12805	82	7002
Community exogamy	9	2897	9	2120
Village endogamy	84	10766	84	5966
Village exogamy	7	4936	7	3156
3. Kinship, marriage	91	15860	91	9281
No consanguinity	39	9406	39	5610
First cousin(fsd/mbd)/sororate/levirate	52	6454	52	3671
4. Marriage, domestic organization	92	15860	92	9290
Monogamy	86	15044	86	8659
Polygyny	6	842	6	631
5. Marriage types	92	15886	92	9290
Arranged marriage	44	4107	44	2462
Love matches	5	3040	5	1170
Both arranged and love marriages	43	8739	43	5658
6. Post-marital residency norms	92	15886	92	9290
Patri/virilocal	72	11731	72	6703
Matri/uxorilocal/ambi/bi/duolocal	6	2134	6	871
Neolocal	14	2021	14	1716
7. Divorce rules	92	15886	92	9290
Civil court divorce	6	982	6	396
Mutual consent	46	6924	46	3772
Society's/family's approval	23	2762	23	1687
Divorce is rare and discouraged	17	5218	17	3435
8. Alimony rights	92	15886	92	9290
No alimony after divorce	64	13146	64	7786
Alimony entitlement	28	2740	28	1504
9. Child custody rights	91	15766	91	9196
Father keeps	33	8797	33	5774
Mother keeps	10	2405	10	1087
Situational/either keeps	48	4564	48	2335
10. Remarriage norms	88	15382	88	8957
Not acceptable & rigid	3	2604	3	2033
Acceptable & flexible	85	12778	85	6924
11. Kinship: descent	92	15886	92	9290
Patrilineal	85	13867	85	8445
Matrilineal	7	2019	7	845
12. Wealth transactions: inheritance	91	15815	91	9264
Equigeniture	61	6537	61	3892
Male inheritance	23	7113	23	4575

(continued..)

Female inheritance	7	2165	7	797
13. Cultivation	89	15353	89	9098
Shifting cultivation	63	11302	63	6510
Wet/plough cultivation	26	4051	26	2588
14. Subsistence economy : agriculture	92	15886	92	9290
No	7	901	7	510
Yes	85	14985	85	8780
15. Subsistence economy : gathering	92	15886	92	9290
No	5	1168	5	839
Yes	87	14718	87	8451
16. Subsistence economy : hunting	92	15886	92	9290
No	58	8613	58	5392
Yes	34	7273	34	3898
17. Subsistence economy : fishing	92	15886	92	9290
No	48	5530	48	2956
Yes	44	10356	44	6334
18. Subsistence economy : animal husbandry	92	15886	92	9290
No	32	8284	32	4578
Yes	60	7602	60	4712
19. Subsistence economy : pastoralism	92	15886	92	9290
No	64	9252	64	4975
Yes	28	6634	28	4315
20. Subsistence economy, gender: agriculture	92	15886	92	9290
No female participation in agriculture	13	3075	13	1534
Yes	79	12811	79	7756
21. Subsistence economy, gender: gathering	92	15886	92	9290
No female participation in gathering	15	4423	15	1696
Yes	77	11463	77	7594
22. Subsistence economy, gender: hunting	92	15886	92	9290
No female participation in hunting	91	15871	91	9279
Yes	1	15	1	11
23. Subsistence economy, gender: fishing	92	15886	92	9290
No female participation in fishing	78	14254	78	8553
Yes	14	1632	14	737
24. Subsistence economy, gender: husbandry	92	15886	92	9290
No female participation in husbandry	52	8646	52	5315
Yes	40	7240	40	3975
25. Subsistence economy, gender: pastoralism	92	15886	92	9290
No female participation in pastoralism	89	15537	89	9138
Yes	3	349	3	152
26. Subsistence economy, gender: weaving	92	15886	92	9290
No female participation in weaving	45	7957	45	4418
Yes	47	7929	47	4872
27. Subsistence economy, gender: basketry	92	15886	92	9290
No female participation in basketry	70	13020	70	7516
Yes	22	2866	22	1774
28. Politics,leadership,gender	92	15886	92	9290
No female participation in politics	88	14539	88	8792
Yes	4	1347	4	498
29. Land ownership patterns	92	15586	92	8724

(continued..)

Private ownership of land	10	1519	10	1286
Society/community	72	13079	72	7438
Landless	8	988	8	445
30. Settlements patterns	92	15886	92	9158
Compact/relatively permanent	42	8724	42	5467
Separated hamlets/semi-permanent neighborhoods	48	6854	48	3691
Semi-nomadic 1/2 year; or semi-sedentary	2	308	2	132

Notes: If a social norms that are not mentioned in the *People of India* ethnographic atlas, then it is coded as missing, which is accounted for in Table 1.2 and regressions. For subsistence economy (variable 14-30) is coded as zero if it is not mentioned in People of India, which is consistent with Murdock's codes for the relative of participation in subsistence by sex and percentage of dependence on subsistence economy.

Table 1.12: List of clan or sub-clan names by 92 ethnic groups

Ethnic groups	Number clans	Clans/sub-clan names
Sikkim		
Bhutia	27	Bhot Bhotia Drukpa Drukul Chumbipas Dhoptapas Trompas Domupas Lachenpa Lachungpa Lhori Tondu Russhi Chechu Thapa Shandarpa Kachopa Shengapa Beb Tsen Gye Gansapa Namchangopa Chungiopa Ithenpa Phenchungpa Phenpunadik Namnakpa Nachangpa
Bhujel	5	Khawa Khusila Kashyap Kashi
Chetri	18	Kshatriya Khas Bista Subadi Basnet Adhikari Nirula Bhandari Paural Thorje Katwal Bhattarai Thapa Andari Karki Kami Damai Sarki
Gurung	28	Gurkhali Ghale Ghonde Lama Lamichane Ghyabre Kyabchne Kurumchhe Jangre Aring Dorjali Rilami Poju Chormi Pom Thin Migi Khatra Yog Paingi Kholali Sogun Thorjami Tu Puru Ko Kidu Chiva
Lepcha	10	Rongkup Mutanchi Rong Monpa Kirate Maris Mayal Rongring Ring Kirati
Limboo	32	Limbu Li Abu Bow Yakthumba Lum Tsong Subba Kiranti Sibakota Tsang Limbuana Sirijunga Jhung Nambang Thagim Libang Tamling Pandhak Sering Laotti Muringlanugo Muringla Nugo Phurumbo Phendua Nambang Thagim Libang Damai Kami Sarki
Mangar	19	Pulami Ala Kepchake Guranga Darlami Pun Lungalim Lamichani Khapangi Loharung Purbachane Rana Mangratey Lumrey Gholey Maske Balangpak Molalay Sitong
Rai	18	Jimdar Khambu Manjh Walla Kura Bantawa Chamling Thulung Kulung Paldorje Bangdel Dungmali Nechali Khaling Chhinamkhong Rajolim Dumi Dukhun
Sherpa	14	Sharya Solukhambu Yukpa Shalakha Rinasha Lama Chayaba Goperma Khambase
Sunuwar	10	Sunwar Mukhiya Barathare Dasthare Jirel Sunupar Sunkoshi Koicha Poinba Grangden
Tamang	37	Tagmaluijin Nishung Moklan Yonjan Lopchan Thing Bomyan Bal Pakkrin Darneih Syangbo Waiba Thokar Jhimba Dong Titung Gyapok Domjan Bropchan Negi Golay Kalden Chising Singon Remba Nyasum Chungma Syangden Yonjan Bomjan

(continued..)

Arunachal Pradesh

Adi Bokar	46	Taluk Tapo Tapir Tapin Yajo Bune Borak Mardo Singlong Tame Taping Ungring Sammame Samine Chije Puing Puder Yuring Yourpin Hemi Pudur Pyasang Pujen Pulom Yourchi Tempin Pudu Popak Lupo Yourgo Yourko Youring Gindo-Dupa Mardo Umlong Komlon Maine Lupo Yourgo Yourko Youring Gindo-Dupa Mardo Umlong Komlom Maine
Adi Gallong	20	Topo Galo Tator Tani Karga Bogum Lodu Kar Taipodia Paktu Karka Ete Loi Loya Lolen Bagra Ang Ado Doke Doje
Adi Minyoung	5	Teli Taki Jamo Siran Moyong
Adi Pasi	9	Dai Rukbo Mengu Yomso Apum Teknyo Yompang Yomain Mekir
Apatani	3	Tani Mith Mora
Chakma	39	Tsakma Tsak Thek Tsakma Sakma Changma Changmyang Tsakthek Chamma Jumia Jummua Dainonak Changchhan Tuichek Chek Takamb Chawngte Dameyi Huttia Barseke Hammey Dachya Bangsa Malima Rangi Baurua Boga Thanya Kukua Angnu Fema Fedengsuri Fagola Hamuja Lachra Homreng Naduktu Karma Fajera
Deori	7	Boderiyo Patriyochau Dupiyao Khottia Hizaru Lapharu Gucharu
Hill Miri	1	Mantai
Khampti	11	Namsoom Nangmao Manwai Mannoi Manpang Manpoong Manchi Manchai Manoi Chowhati Manjakhoon
Miri	8	Oyan Saeng Maying Pator Dambuk Mirang Tamar Nuthunjee
Monpa	39	But Matchopa Bootpa Butpa Shingjee Rahungjee Khoitumjee Khonujee Sunukjee Rinchiadu Yammujee Khoitamjee Runfunjee Ropu Chandok Dunglok Chug Chugpa Gumupa Khumupa Khumuthongkor Ngarmupa Changmuchipa Dirang Tsangla Faichurpa Gunpapa Baqipam Shorthefa Kalaktang Lish Lishpa Kishpi Thankhar Khumu Jamkhar Khumu Khumusangla Borzu Nyarmu Tawang Brahmi Monpa
Mishmi Idu	6	Pulu Mendo Mega Lingi Michichi Harku
Nishi	14	Nishang Dol Dodum Dopum Durum-Dui Dukum-Duri Tasu Likha Chuhu Takyang Yowa Tade Tajing Byabang
Nocte	3	Lowang Channa Mikhiak
Singpho	1	Jingpho

(continued..)

Tangsa	181	Ketna Havi Hawai Mandok Takhe Bontai Nokka Pangtha Solting Songthing Kelum Wangpap Ngaimong Ketchi Mantai Jugli Yougli Taiman Taikhaw Taikin Kolral Kolhriyen Korang Korah Jank Jok Taibi Menti Khonga Khangnyal Kimsing Chamchang Sina Sehang Langtin Latom Maipole Mepok Chhojam Sejam Chaso Changso Cholam Cholum Lungchang Kenglang Khomrang Namai Lulin Tailong Lungphi Yongkhung Tairing Khoipang Morang Mungray Nyamran Tapsang Haile Hailang Palket Kethong Sano Mosang Rangkhaw Lomko Chithang Wakpat Kethung Rangwang Jongkhung Ranka Thampong Teekhaon Muklom Mokolm Monglum Tangha Cohangmi Khimhun Techi Shungkho Rekhung Wangra Tekhil Yangchang Matcha Sayung Ngemu Nalang Kitnal Ronrang Poerah Longti Woety Chumbyu Lishey Chummut Gahja Nokwi Jangloo Shesu Matwa Pechong Kewa Kubu Shama Rigang Nori Ngalo Langhe Joeboi Rewey Diwa Tamkote Morang Kuchit Lomme Nagu Kisha Shosa Wellyo Sangwal Charwan Sangkhu Taipon Taiwai Sangrang Taiboi Telung Sanke Sechu Chasha Keykap Kongrang Kianoo Taorah Nangkong Khokhong Lowey Allon Chuwrah Wanpi Sintak Shongrey Tikhak Tailong Hanglung Taching Tairing Longjing Mokhom Wankhang Momai Jangshong Taimak Taidang Taihu Kamba Taichu Taitha Mungkhom Mowan Tonglim Tyolim Tonglum Chokhang Chunga Dewe Jankhe Khangla Khanyak Khapwing Koje Kunsing Wyonsongm Yongkuk Ngokhom Tailong Taihu Taichu Kamba Taitha
Nagaland		
Angami	23	Tengima Gnamei Tsungumi Tsungung Mour Chakroma Tengima Chakrama Kezami Putir Dzunokehena Zounuo Keyhonuo Khonoma Tengima Kezami Khezha Memi Pezina Pepfuma Tepa Thevo Kemovo
Ao	10	Aor Chunglir Chongli Mongsen Changki Dikhu Melak Tsurong Pongen Lomou
Chang	12	Chongnu Changsang Mazung Duenching Changru Changhlai Kangshau Ong Hongang Ongbou Lakpu Youkoubu
Khiamngan	2	Kelukenyu Yingshanku

(continued..)

Konyak/Wancho	35	Haha Taprongumi Minyumo Nagami Mirirr Chagk Nahngra Lwang Kongnok Angnophang Wanghu Paiknok Matpisun Yanlam Laktu Hu Hentokhu Punlonghu Angwanhu Shishohu Manching Wangnanting Wonghu Wangnayaum Wangchingphong Lwang Angnophang Ang Konyak Tangjan Tsangjan Wangham Wangpan Wangsa Wangsu Bailung
Lotha	3	Kyon Chuwami Eryung
Phom	2	Kahha Nyuthery
Pochury	26	Sapo Kechuri Khury Sozomi Kheza Nyushury Shantary Shomli Tsori Nyusoury Nyuwiry Ngory Phochiry Pojar Katiry Trakha Jurry Fithu Thurr Thupitou Leyri Tsang Nyuwiri Nyutheri Nqouri Nyuwini
Rengma	3	Ntenye Nzong Raimye
Sangtam	2	Tukomi Sangtamrr
Sema	8	Semi Sumi Yathi Igha Kukami Awo-U Asashokipini Khiphur
Yimchunger	13	Yanchunger Yachumi Yimchuger Tikhir Makware Chirr Jankhurnger Janger Khiumger N'daine Kusun Khiunger Limkhiungkhugar
Zeliang	24	Zemei Zemi Liangmei Zeliangrong Rongmei Mpame Newme Nriame Sogome Kenye Hararme Gangmei Pamei Malangmei Riamei Dhangmei N'rongmei Newmei Tinkupen Kedeipeo Kamei Gonmei Gangmei Mu
Chakhesang	12	Chakhru Kheza Chazho Thevo Khamutso Epao Putso Kheza Khutso Lawa Mero Khezha
Kuki	34	Chin Khongshai Khonjai Khosamai Kotsoma Kuki-Chin Lushai Lakher Lua Kumki Choughthu Lnykim Lengthang Singsit Thado Vaiphei Gangte Changsan Kholhou Thangugen Lhangsum Aengna Hauneng Daugel Bangsing Chougloi Haolai Sitlhou Thado Haokip Kipgen Singsin Haosa Thempu
Manipur		
Hmar	8	Sinlung Inpui Inpuisuok Tutluk Tutluksouk Chimsen Chimsensuok Sal
Kabui	7	Rongmei Haumei Kammei Ganmei Langmei Gangmei Khandangmei
Kom	7	Karong Saicho Leivon Tolon Serto Lupheng Mangte
Loi	8	Chakpa Ningthouja Angom Khumal Moirang Luwang Sarang-Leishangthem Khaba-Nganba
Mao	7	Imemi Memei Lepaona Saranami Paomata Kapematta Tolepamatta
Maring	8	Chimkur Dangsa Charanga Kansouwa Mekunga Khulpuwa Lamthakka Hleyowa

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Meitei	8	Manipuri Ningthouja Angom Chengloi Ngongba Looang Khoomon Moirang
Paite/Zou	13	Paihte Tedim Chin Gwite Sukte Nwite Kamhau Nwingalte Akambau Manlun Samte Simte Zoukam Manlun
Pangal	8	Shiekh Sayyed Pathan Shah Khan Choudhury Mia Khaaoraora
Tangkhul	10	Noga Naokhokha Raphei Kashung Reekhang Rem Kamo Kharao Khaorui Chontung
Vaiphei	14	Suantak Vanglua Neilut Thanglet Puakpawl Hansing Saivung Chonlu Khaute Phaltual Chonmang Ellu Keusel Neisial
Mizoram		
Mizo/Biate	20	Baite Biete Duhlian Ngamlai Nampui Chungngawl Zate Tamte Thlihran Royang Thianglai Hmunhring Khurbi Puilo Faihriam Darnei Kampui Ngamlai Ngirsim Thiate
Thadou	14	Chongthu Duhlian Sitthloh Khuangsai Milui Singsuan Lianthang Haukip Kipgen Thongpam Dongel Chawngthu Lal Upa
Tripura		
Haluadas	5	Sonahatia Chhabhaiya Astisuddha Kashyap Rachi
Jugi	13	Jogi Nath Tanti Shiv Ekadashi Masya Halwa Ranrej Kambule Manihari Palangsa Barendra Baidik Nath
Mog	14	Magh Mag Maga Mugg Mogh Marma Kokpyasa Khangsa Cheringsa Marusa Wodgensa Wookkinsa Chakpregia Rakhocha
Mahisyadas	4	Matsyadas Haluadas Halladas Alambayana
Munda	9	Mura Kerketta Kanduru Gondli Hansa Jirhul Bhengra Mundori Porti
Namasudra	2	Kashyap Gaigra
Noatia	12	Naitang Gabing Khaklu Anak Fatuij Mougbai Taugbai Keora Khalni Harbeng Daindak Kerang
Nunia	7	Chouchan Semara Kharhadia Haudihoya Nunchuhua Matkatowa Belderowa
Patni	1	Alimman
Riang	7	Meska Raicha Charkhi Mochha Chompreng Waireng Apaia
Tripuri	18	Tripra Tipera Deb Barman Bachal Siuk Kuatia Daitya-Singh Hujuria Siltia Chatratuia Chatradharia Deunai Subenarayan Sena Julai Beri Dona Daspa
Kapali	3	Kashyap Harihar Alimman
Meghalaya		
Khasi	13	Amwi Lyngam Bhoi War Khynriam Khynrium Syiem Lyngdoh Walang Rayand Songkali Lapang Dorphang
Jaintia	10	Pnar Synteng Syntang Amwi Changpung Jowai Nartia Raliana Sutnga Matabeng

(continued..)

Garo	20	Mande Achik Akawe Awe Chisak Dual Machi Ambeng Abeng Chibok Ruga Ganching Gara Atong Megam Sangma Marak Momin Areng Shira
Rabha	12	Rongdani Naitori Pati Dahuri Pati Dahori Rongdani Maitori Total Kocha Rato
Hajong	16	Khatal Parachungwa Chondi Parakati Baliati Kendegaon Dingar Akshigaon Tokleygaon Sinulgaon Difragaon Kashigaon Phulgaon Ghorabali Koitar Sonamukhi
Assam		
Ahom	12	Raja Burgohain Borgohain Duwara Dihingiya Lahon Sandikai Deodhai Mohan Panch Chiring Tai
Bishnupriya	15	Leimanai Ningthuanai Khoomala Moirang Angam Luwang Mangang Ningthoja Khabananba Mudgalya Angiras Atreya Bharadwaja Kausika Sandilya Gautam
Chutiya	8	Birinchi Borahi Deori Levite Bora Hazarika Chetia Barua
Hira	7	Byash Sanatan Sutor Raghunath Bhewali Medhi Sarandas
Kachari	3	Barman Khunang Dilek
Bodo	3	Swarga-Aroi Basumatary Musa-Aroi
Kaibarta	5	Nadial Jalia Bamunia Haridhwania Sutradhar
Kalita	12	Kulta Kulata Kulalipta Kakati Das Bharali Patahk Medhi Bhuyan Timung Saikia Deka
Karbi	11	Arleng Mikir Dumrali Chintong Ronghang Amri Ingty Inghy Teron Terang Menkiri
Keot		-
Kharia	7	Dudh Dhelki Pahari Suren Barla Dhanwar Kerketa
Kurmi	5	Bedia Kurmi Surya Nath Bahohier Tirower
Lalung	1	Tiwa
Matak	5	Moran Moamaria Senapati Mayamara Khoomon
Meitei	10	Manipuri Meithei Moirang Koomul Ningthouja Angom Chengloi Ngongba Looang Moirang
Munda	1	Haroko
Namasudra		-
Oraon	1	Kurukh
Rajbanshi	8	Koch Pathak Dihidar Phousdar Singha Pradhani Adhikari Maghahia
Ravidas	12	Chamar Muchi Piplang Kachchhap Kush Nona Kanaujia Dushia Jeshwara Bedis Tota Bhojpuria
Santhal	11	Kisku Tudu Hembrom Hasdak Besra Baskey Soren Marndi Core Phatowal Pauris
Sonowal Kachari	14	Bali Khitiari Chiripuria Amarabamiya Dhulial Ujani Kuchia Namoni Kuchia Tipamia Betari Gezepi Memi Makrari Neskatari Hagumiri Nakrari

Notes: Total number of clans and sub-clans for 92 aboriginal ethnic groups is 1,269 as mentioned in the *People of India* chapters.

Table 1.13: Georeferencing of ethnic groups

Ethnic groups	Latitude	Longitude	Excerpts from *People of India* indicative of geo-location of ethnic groups
Sikkim			
Sunuwar	27.2925	88.2457	West district; Hilly terrain; High Altitude; High Humidity; Forest; Heavy Rainfall
Tamang	27.2349	88.5788	Lower Teesta valley, Rangit valley
Bhutia	27.7167	88.5539	North Sikkim;Hilly terrain; High Altitude; Lachung-Pa; Lachen-Pa
Bhujel	27.2312	88.4671	South sikkim, Hilly Terrain, Mean altitude 1500meters; Tokal village
Chetri	27.3720	88.2122	West, South, East districts; Hill slopes; 900 meters-1900 meters; Teesta and Rangit rivers
Gurung	27.2678	88.0776	South, West districts; Hilly terrain; High Altitude; Forest; Heavy Rainfall
Lepcha	27.5098	88.4288	North district; Extreme cold climate; lower altitude in contrast to Bhutias, Not snow-bound places; Dzongu area
Limboo	27.1349	88.1506	Western district;Sparsely forested slopes, 1200 meters to 1900 meters
Mangar	27.1791	88.3305	South district;1200 meters to 1900 meters; Teesta and Rangit River; Good monsoon rainfall.
Rai	27.3073	88.1323	East,West, South district; 900 meters-1900 meters; Few in the North district.
Sherpa	27.1426	88.0682	West district, Okhray, Tikpur, Rumbuk, Ridpi, Bhareng, Sapray-nagi, Burikhop, Soreng, Singling, Dentam
Arunachal Pradesh			
Adi Pasi	28.1213	95.8374	Balek, Rasam, Kalek, Pasighat
Apatani	27.5466	93.8006	Apatani valley, Ziro, Hapoli. Lower Subansiri district
Chakma	27.4866	96.2018	Baijan circle in Lower subansiri district, miao sub-division of changlang district, chowkam circle of lohit district
Deori	27.6635	95.8412	Lekang circle in mahadevpur area, dayun circle in lohit district
Hill Miri	27.6783	93.5131	Ziro and Daporizo Sub-Division of Lower and Upper Subansiri District, majority in lower subansiri
Khampti	26.9902	95.4646	Tirap District, South of Lohit river
Miri	28.0365	95.3141	East Siang, majority lives in Assam
Monpa	27.5861	91.8507	West Kameng District, Tawang District

(continued..)

Mishmi Idu	28.9158	95.6054	DibangValley District
Nishi	27.8026	94.2860	Upper and Lower Subansiri District, near the streams Khru Ranga Dikrang
Nocte	26.9025	95.5086	Khonsa, Namsang, Laju circles of Tirap District, Borduria and Mansang VIllage
Singpho	27.1357	95.7258	Changlang and Lohit district, area drained by rivers Burhi-Dihing, Noa-Dihing, Tengapani
Tagin	27.5368	93.8812	Upper Subansiri district
Tangsa	27.1357	95.7258	Changlang district, Manmao and Nampong circles
Adi Bokar	28.1664	94.6973	West Siang district, Gesing, Pangri
Adi Gallong	28.1637	94.7695	West Siang district, Along, Basar, rugged mountains
Adi Minyoung	28.0619	95.3172	Pasighat, Kabang, Yemsing
Nagaland			
Konyak	26.7219	95.0198	Mon district
Lotha	26.0911	94.2372	Wokha district
Phom	26.4907	94.8049	Tuensang district, Longleng subdivision
Pochury	25.6810	94.6146	Phek district, Meluri sub-division
Rengma	25.7161	94.0068	Kohima district, Tseminyu sub-division
Sangtam	25.8694	94.7833	Tuensang district, Kiphire subdivision
Sema	26.0132	94.5065	Zunheboto district
Yimchunger	26.2366	94.7862	Tuensang district
Zeliang	25.7612	93.8276	South-western part of Kohima district
Chakhesang	25.6297	94.4020	Phek district, cold and hilly
Kuki	25.7612	93.8276	Ghaspani and Dimapur blocks, village Maoua
Angami	25.6747	94.0718	Kohima district,
Ao	26.4352	94.4824	Haathigurya, Tokthoriya, Eserenia, Mokochung district
Chang	26.3137	94.8490	central hilly part of Tuensang district
Khiamngan	26.2026	95.0061	eastern part of Tuensang district
Manipur			
Loi	24.7270	94.0059	Imphal district
Mao	25.4618	94.1966	Senapati district
Maring	24.4433	94.1177	Khudei Khullen village, northern part of Tengnoupal district
Meitei	24.4970	93.7556	Manipur valley
Paite	24.0928	93.2954	Zougam area; unfit for wet cultivation
Pangal	24.6495	93.9702	Imphal, Thoubal, Bishnupur
Tangkhul	24.8600	94.4971	East district; Meikhel village; 12 kms south east of Kohima.

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Vaiphei	24.1454	93.5833	Churachandpur district
Hmar	24.1384	93.9488	southern district Manipur
Kabui	25.1626	93.4611	barrail ranges western part of manipur
Kom	24.9469	93.9779	Village Sinam Kom
Mizoram			
Thadou	24.1135	92.9121	North-eastern part of Mizoram, Darlawn Block, Ratu
Mizo/Biate	24.0137	92.9156	north-eastern part of Mizoram, Aizawl district, Darlawn community development block, Darlawn.
Tripura			
Haluadas	23.9046	91.3410	West Tripura; Plains, warm and temperate climate; High humidity, heavy rainfall.
Jugi	23.8142	91.4065	West Tripura
Mog	23.2826	91.5411	South Tripura,Bilonia Sub-Division
Mahisyadas	23.6059	91.8153	Hilly and Forest Terrain, heavy rainfall, All over Tripura
Namasudra	23.5341	91.4666	South Tripura District, Udaipur Sub-Division
Noatia	23.5224	91.6403	South Tripura District, Amarpur Sub-Division
Nunia	23.8342	91.3576	West Tripura, Plains; Forest;Warm climate; High humidity; Heavy rainfall
Patni	23.8203	91.2124	West Tripura, Plains; Forest;Warm climate; High humidity; Heavy rainfall
Riang	23.5341	91.4666	West Tripura
Tripuri	23.9607	91.3991	West Tripura
Kapali	23.8292	91.6030	all districts, warm and temoerate climate, high humidity, heavy rainfall
Meghalaya			
Rabha	25.7910	90.8401	northern area of east garo hills
Hajong	25.3879	89.8989	plains of south-west of west garohillls
Khasi	25.4223	91.4756	khasi hills
Jaintia	25.4494	92.0565	jaintia hills district
Garo	25.5720	90.5675	garo hills
Assam			
Bishnupriya	24.6798	92.5281	Cachar District
Chutiya	26.9878	94.5729	Goalpara, Kamrup, Darrang, Nowgong, Sibsagar
Hira	26.1611	90.5949	Goalpara (Kusia Kata, Hojalpara, Bistupur), Barpeta (Budarutup, Sundaridlia)
Kachari	25.1373	92.7567	Cachar District
Bodo	26.4132	91.8098	Kokrajhar, Darrang, Goalpara, Kamrup

(continued..)

Sonowal Kachari	27.4703	94.8826	Plains, Dibrugarh
Kalita	25.4300	90.1100	Between 25.43 and 26.53, 90.11
Kaibarta	26.7429	94.1324	Kamrup, Darrang, Nowgong, Jorhat districts
Karbi	25.8384	93.4078	Karbi Anglong District
Keot	26.1430	91.5628	no specific description given
Kharia	27.8463	95.2873	tea garden
Kurmi	26.2769	94.0630	tea garden
Lalung	26.2351	92.8981	"most of them are found in jowai subdivision of Jayantia distrct, Meghalaya", Nagaon district most, also Lakhimpur, Sibsagar
Ahom	27.1823	94.7271	Brahmaputra Valley, Upper Assam
Matak	26.5431	91.9115	Dibrugarh, Sibsagar, Lakhimpur, Darrang
Munda	27.5678	95.5478	tea garden, Doomdooma area
Oraon	25.5678	94.5478	tea garden
Rajbanshi	26.0257	89.9584	Goalpara, Kokrajhar, Kamrup
Ravidas	24.5678	94.5478	tea garden
Santhal	26.3827	90.0220	tea garden, mostly Kokrajhar, Kachugaon area

Notes: Each ethnic groups are assigned to a geographic location depending on the major concentration as indicated in the *People of India* chapters. Wherever districts are indicated as major concentration, we have considered supplementary information, such as, rivers, valleys, plains, or altitude of preferred settlement of the concerned ethnic groups to determine approximate latitude and longitude for each ethnic groups. In cases where no information is available, we explored census data to find out districts with major concentration after verifying from the district government websites. In the cases specific villages are mentioned as their ancestral homes, those are the georeferenced.

Table 1.14: Variance infation factors (VIFs)

	Women's sample		Men's sample	
Dependent variable:	Violence ever	Violence ever	Violence attitude	Violence attitude
Estimation method:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Non-patrilocal residence	2.76	-	2.45	-
Ease of divorce	1.80	-	2.05	-
Matrilineal descent	2.04	-	1.49	-
Social norm index	-	2.13	-	2.33
Ancestral subsistence: agriculture	1.54	1.49	1.80	1.70
Ancestral subsistence: gathering	1.83	1.58	2.01	1.76
Ancestral subsistence: hunting	2.38	2.26	2.58	2.48
Ancestral subsistence: fishing	2.06	1.93	2.31	2.20
Ancestral subsistence: husbandry	2.37	2.10	2.65	2.39
Ancestral subsistence: pastoralism	2.50	2.34	2.93	2.84
Ancestral female role in agriculture	2.07	1.88	2.25	2.10
Ancestral female role in agriculture and allied production	1.59	1.52	1.43	1.39
Settlement patterns	1.96	1.56	2.05	1.65
Community land ownership	1.93	1.68	2.18	1.97
Age in years	1.12	1.12	1.11	1.11
Education in years	1.35	1.34	1.36	1.36
Household size	1.65	1.65	1.61	1.61
Nuclear family dummy	1.39	1.39	1.43	1.43
Wealth index	2.02	2.01	1.98	1.98
Rural	1.34	1.34	1.36	1.36
Witnessed parental violence	1.09	1.08	1.07	1.07
Alcoholism	1.06	1.05	1.06	1.06
Altitude higher than 1000 meters	1.34	1.33	1.36	1.34
Soil suitability hunting-gathering relative to agri	1.52	1.49	1.71	1.66
Soil suitability pastoralism relative to agriculture	1.23	1.21	1.19	1.18
mean VIF	1.75	1.61	1.81	1.73
VIF tolerance =1/(1-R^2)	1.07	1.06	1.07	1.06
R^2	0.06	0.06	0.06	0.06

Notes: These regressions are run without intercept and do not include fixed effects for eight northeastern states of India and four religions.

CHAPTER 2

Social Norms, Subsistence Patterns and Gender Bias: Evidence from India's Northeast

Abstract

I uncover a complete mechanism of gender disparity from fertility to morality using a novel cross-sectional dataset of 22,000 mothers and their 51,000 children from 92 aboriginal ethnic groups that combine ethnographic and environmental data to demographic data in the northeastern zone of India. Descendants from the ethnic groups with pro-women features tend to discriminate less against their daughters. In ethnic groups which value women more, a typical female child is more likely to be the last born, more likely to experience longer succeeding birth interval, more likely to be breastfed longer, and more likely to receive overall better nourishment. Contemporary female employment status does not drive these effects. Both the magnitude and statistical significance of the effects remain unaltered in regressions with contemporary female employment status. This is because the effects originate from the deep-rooted ancestral female productive roles and pro-women social norms.

2.1 Introduction

Amartya Sen famously declared an estimated over 100 million women are missing (Sen, 1987, 1990, 1992) in China and India because of discrimination against girls and consequent excess mortality. The predicament of "missing women" culminates into short-run effects on marriage and labor market (Angrist, 2002). The long-run unfavorable effects are sustained through the persistence of gender bias (Grosjean and Khattar, 2019). It reveals the gender bias through fertility and sex preference (Clark, 2000; Das Gupta et al., 2003), sex-biased stopping rules (Jayachandran, 2015; Bhalotra and Van Soest, 2008; Das Gupta, 2005; Jensen, 2003; Arnold, Choe, and Roy, 1998), daughter neglect (Pande et al., 2006) in breastfeeding duration (Jayachandran and Kuziemko, 2011), immunization (Oster, 2009) and nutrition (Mishra, Roy, and Retherford, 2004). Not surprisingly, gender equality is a policy priority in both the Millennium Development Goals and Sustainable Development Goals. The limited success (World Bank, 2015) is explained either by economic underdevelopment that exacerbates gender discrimination (Jayachandran, 2015; Qian, 2008; Burgess and Zhuang, 2000) or by the persistence of social norms (Das Gupta et al., 2003; Kishor, 1993) that constricts the opportunities for women and allows the gender bias to persist in society. In this paper, I argue that the latter is the driver of the gender bias because of inefficiencies in the persistent kinship institutions (Chakraborty and Kim, 2010, 2008; Dyson and Moore, 1983), and marriage customs (Pande and Astone, 2007).

Ethnic groups which exalt sons operate on patriarchal social norms and kinship institutions (Dyson and Moore, 1983; Chakraborty and Kim, 2010). In patrilineal kinship, the descent is traced through the male line and therefore, sons are important for the continuity of lineage (Jayachandran, 2015). In patrilocal marriage, after marriage, the bride lives with the groom's kin. Since daughters cannot provide old-age supports to their parents, they are less valued (Chung and Gupta, 2007). Several other complementary patriarchal norms, including dowry, which increases the cost of a daughter (Anderson, 2003), patrilineal inheritance (Botticini and Siow, 2003), and customary divorce norms (Chakraborty and Kim, 2008) diminish women's value in the society. A less regarded female child is unlikely to be the last birth to her parents since son preference triggers a "try again for a boy" fertility preference (Jayachandran, 2017a) sooner after her birth. More recent literature recognize certain less obvious potential factors that can help trace the origins and

persistence of such patriarchal social norms, kinship, subsistence economy (Alesina, Giuliano, and Nunn, 2018), and their manifestation in gender biased parental investments in their children (Barcellos, Carvalho, and Lleras-Muney, 2014). Environmental conditions and gender roles in a subsistence economy can also determine the social and economic relative value of children by sexes (Carranza, 2011; Bardhan, 1974). The natural question emerges: what is the combined effect of women's ancestral productive roles and ancestral pro-women social norms on the gender biased parental investment in their children.

I estimate a complete mechanism on gender discrimination — from fertility to lactation, immunization, dietary care, and mortality. My empirical strategy rests on two pillars. First, I condition on environment by comparing only within a primary sampling unit (PSU), which is a census village or enumeration block in an urban setting. This allows me to factor out the environmental effect on child outcomes. Omitted variable bias can confound the estimated effects of social norms on gender bias unless environmental conditions are fully observed. On average, in my context, the geographic area of a census village[1] is about 6.5 square kilometers. I condition on environmental conditions at the PSU level, which allows me to factor out the environmental effects on child outcomes. Nonetheless, a possible threat to this approach is that even within a small geographic area of a PSU, there might exist niches and specialization. For instance, an ethnic group following their ancestral specialization subsist on fishing irrespective of their current geographic location. I test whether principal subsistence is similar across all ethnic groups within a PSU. Analysis in my sample shows that the principal occupation of household head vary significantly across ethnic groups within a PSU as well as by ancestral subsistence patterns and social norms. Keeping the environmental conditions and mother-level factors constant, it is possible to get closer to causal effects of social norms on child-level outcomes.

The second pillar rests on the postulate that social norms are sticky and persistent. I compare the social norms of the *People of India* (1985-1992) and Murdock's atlas

[1]According to the census of India 2001, the average geographic area per village in Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, and Assam are 16 square kilometers, 23 square kilometers, 14 square kilometers, 11 square kilometers, 27 square kilometers, 12 square kilometers, 4 square kilometers, and 3 square kilometers, respectively. With the entire northeastern states covering 262,179 square kilometers (part of which are not inhabitable) for 40,299 census villages, there is indication that the average land area per village is 6.5 square kilometers. Economists typically rely on geographic units that have a grid resolution of 5 arc-minutes or 81 square kilometers at the equator. Analogously, set at the PSU level, my geographic units are more fine-grained.

(pre-1900) data for 16 ethnic groups covered in both the atlases (Appendix Table 2.19). The broad congruence between the more recent ethnography with the pre-industrial and pre-colonial ethnography suggests that social norms persistent, and ancestral female roles are glacially transient (Alesina, Giuliano, and Nunn, 2013; Voigtländer and Voth, 2012). More formally, I explore whether the ancestral subsistence patterns, ancestral productive roles of women, and ancestral social norms, as coded in *People of India*, can be traced in contemporary cross-section sample of NFHS as a test for persistence or transience of ancestral norms. I find the ancestral female role in agriculture predicts contemporaneous female employment both in and outside agriculture sector (Appendix Table 2.20). Together, I uncover evidence on the stickiness of ancestral female productive roles and social norms.

Since both the ancestral female productive roles and social norms are persistent, the results of my estimations can be interpreted as the effects of ancestral characteristics on parental gender discrimination against female children. My findings on beneficial effects of long-lasting women-favoring gender-roles and social norms are the following. First, both differential birth spacing and birth stopping behavior of parents put a female child at a disadvantage. This disadvantage is reversed when women are ancestrally highly regarded for their productive roles and social norms are pro-women. Second, a typical girl is relatively less likely to be weaned (breastfeeding stop) when they are descendants of ethnic groups where women ancestrally take part in agriculture and follow non-residence with groom's kin. Third, all three pro-women social norms enhance the likelihood of better nourishment for girls. Taken together, in societies where women historically take part in agricultural and allied productive activities, this disadvantage diminishes because women are more valued in those societies. Women-favoring social norms carry smaller effects — both in its magnitude and statistical significance — in reducing the gender bias.

My research complements, connects, and contributes to three strands of literature. The first body of literature that this paper most directly relates to examines the traditional modes of agricultural production and contemporary economic and demographic consequences on women. In a well-cited paper, Alesina, Giuliano, and Nunn (2013) argue that ancient plough use from Murdock's (1967) ethnographic atlas emphasizes the value component of attitude towards current women's labor force participation. The instrument used in their analysis comes from the categorization of six crops that require plough

and non-plough harvesting and computed using geographical crop suitability geographical data from Global Agro-Economic Zones. In this sequel, Alesina, Giuliano, and Nunn (2018) trace the historical origin of cross-country differences in male-to-female sex ratio at birth, which occurs since the descendants in plough-using societies value boys more than girls. Deep tillage predicts suitability of land use for plough agriculture which is the origin of lower demand for female labor in agriculture, the lower economic value of women, and a greater discrimination on women leading to adverse child sex ratio and wider survival differentials between boys and girls (Carranza, 2012, 2014). Further, greater restrictions on women's mobility and sexuality (e.g., female genital cutting, infibulation) are imposed in pastoral societies where men remain absent from their settlements for extended periods and heightened concerns about paternity uncertainty are prevalent (Becker, 2018, 2020). Hansen, Jensen, and Skovsgaard (2015) find current female labor force participation, and women's social value, is determined by the time since the Neolithic agriculture was adopted, which in turn can carry a sizable effect on sex ratio at birth and among children (Fredriksson and Gupta, 2018). However, it is not clear whether the differences of sex ratio at birth are driven by sex-selective abortions, differential spacing or stopping behavior, or biology. My contribution to this strand of literature is that I show that ancestral social norms and historical subsistence patterns can be linked to a complete set of gender biased consequences, from differential spacing and stopping fertility, to discrimination at postnatal stage (lactation, diet, and vaccination) as well as differential outcomes for child mortality.

The second and relatively older strand in the literature that my research complements relates to contemporary female employment opportunities and demographic outcomes for women. Using state-level data, Rosenzweig and Schultz (1982) find that areas in India where female employment rates are higher tend to observe greater female child survival since households allocate greater resources to girls where female earning opportunities are better. Their analysis does not use spatial, environmental (Bardhan, 1974) or historic instruments, such as soil or agro-climatic suitability, as in Carranza (2012). Corroborating their work in a difference-in-difference setting by exploiting a policy experiment (introduction of tea plantations in China), Qian (2008) suggests better market work opportunities for women can improve the sex ratio and girls' education. I contribute to this literature by disentangling the intuitive essence from the cross-cultural studies by simultaneously

considering (a) women's gain in social worth in ethnic groups featuring women-favoring social norms (ease of divorce, non-patrilocal post-marital residence, and matrilineal descent), (b) women's gain in economic worth when women ancestrally pursue agriculture and additional productive activities (such as basketry, weaving, husbandry, and fishing) and traditionally contribute to subsistence as actively as men, and (c) contemporary female labor force participation leading to greater bargaining gains — girls are as valued as boys — which translates into improved gender outcomes.

Another strand in the literature addresses the links between social-norms and demographic, education, labor market outcomes for women. Focusing on the differences in patriarchal norms (patrilocality and patrilineal descent and inheritance) in north India and partial female inheritance in south India, Dyson and Moore (1983) explain the differences in regional demographics by the differences in gender relations. However, they left out the northeastern states which have the greatest diversity in terms of kinship institutions. They analyze only sample means and takes no deference to different agricultural systems or agro-climatic factors. Kishor (1993) simultaneously considers female labor force participation and kinship institutions to explain gender differentials in child mortality using district-level data. The effects of ancestral subsistence patterns, ancestral female participation in subsistence, ancestral social norms, and contemporary female employment on violence against women is documented in Alesina, Brioschi, and La Ferrara (2016), which presents differences in means by the different predictors but lacks simultaneous regression of subsistence patterns and social norms. Prior to inheritance reforms in Ghana in 1985, parents endowed their sons with additional human capital to substitute for the lack of assets they would face by not inheriting. This incentive is mitigated among Ghanaian matrilineal groups by the reforms, where the cap on female inheritance leads to less schooling of boys (La Ferrara, 2007). Matriliny predicts higher child survival in Lowes and Montero's (2017) spatial regression discontinuity along the matrilineal belt in Congo. Their estimates do not differentiate by sex, do not substantially address gender bias, and consider matriliny to be exogenous. The agro-climatic environment can explain the origins of matrilineal inheritance, as more fishing opportunities for men predicts matrilineal horticultural land inheritance for women (BenYishay, Grosjean, and Vecci, 2017). I complement this strand in the literature in two ways. First, a multivariate estimation using ancestral subsistence patterns, ancestral gender-roles in subsistence, and ancestral

social norms strengthens the causal interpretations and allows me to estimate econometrically more robust effects of the ancestral characteristics. Second, in one of the most diverse places on Earth — India's northeastern states — I combine environmental and ethnographic data with the large-scale nationally representative cross-sectional data to document the roots of gender bias in ancestral gender-roles in a subsistence and social norms relevant for womens status.

I organize the rest of the paper as follows. The conceptual framework is in Section 2.2. After describing data in Section 2.3, I proceed to the empirical specification in Section 2.4. I lay results out in Section 2.5. Section 2.6 concludes.

2.2 Conceptual framework and hypotheses

In the Nash bargaining models of intra-household distribution (Lundberg and Pollak, 1993), non-cooperative equilibrium within a marriage refers to an intra-household distribution corresponds to the utility-maximizing strategy taken by each spouse by taking the other spouse's strategy as given. The relative bargaining power of spouses depends on their 'threat point' (the utility of a spouse if the household cannot agree on an allocation). A higher threat point can improve a spouse's position within the household, resources controlled by them, and allocation in their favor. Within this theoretical framework, I focus on ancestral characteristics of women which shift their 'threat points' and formulate four inter-related hypotheses.

First, in the past societies where women took part in agriculture and productive activities, their economic value is perceived high (Alesina, Brioschi, and La Ferrara, 2016). The extent to which women are economically more valuable, due to persistence of values regarding gender roles in the long run, should allow girls to experience reduced discrimination. Such perceptions that viewed women as economically productive and equal to men led to evolution of women-favoring social norms.

The next hypothesis relates to the social norms regarding living arrangements of couples after marriage. The gender bias[2] in parental investments are accentuated in societies

[2]Arnold (1997) complies a few such expressions, such as, "[b]ringing up a daughter is like watering your neighbor's garden", "[m]ay you be the mother of hundred sons", "[a] son is your own, a daughter is someone else's", "even the beams of the house shed tears when a girl is born", "[a] woman should obey her father before marriage, her husband during married life, and her son in widow-hood", "[a] new-born son should be laid on bed, clad in fine clothes, and given precious stones to play with, while a girl at birth should be left on the floor, with only a diaper on and given only pieces of roof-tile to play with."

where men are at the focus of social order (Basu and Basu, 1991; Dyson and Moore, 1983). Societies where patrilocal post-marital residence patterns prevail, investment in daughters (Levine and Kevane, 2003) are likely to benefit the family-in-law since after marriage she moves to her husband's place (Rossi and Rouanet, 2015). On the other hand, sons function as widow-hood insurance for their mothers (Lambert and Rossi, 2016) and old-age supports (Becker, Murphy, and Spenkuch, 2016). The status elevation for mothers in the society and family also occurs once they give birth to sons (Das Gupta et al., 2003) in patrilocal ethnic groups. In patrilocal societies, Bau (2019) finds more human capital investments are directed towards sons relative to daughters. In non-patrilocal societies the opposite would occur.

Another motive for gender biased parental investment in children comes from the descent norms (Rammohan and Robertson, 2012). Anthropologists (Fox, 1934) believe that several kinship institutions place restrictions on the choicest sex of the child. In particular, Chakraborty and Kim (2010) describe the predicted relations between female bargaining power and several kinship institutions. Similar to living arrangement norms, the descent (patrilineal and matrilineal) kinship institutions affect women's bargaining power within marriage (Holden, Sear, and Mace, 2003). Both the lineage and inheritance of real assets (La Ferrara, 2007) are passed on through female line in matrilineal family systems. In contrast to patrilineal societies, daughter preference (Narzary and Sharma, 2013) should emerge. Therefore, the gender biased parental investment (i.e., disproportionate investment in boys as opposed to girls) should be less in matrilineal ethnic groups than in their patriarchal counterparts.

Women fare better in mutual consent divorce regimes (Fernández and Wong, 2017). Bargaining models predict that easier divorce norms should increase wife's bargaining position (Stevenson and Wolfers, 2006), and her preferences should be reflected in intra-household distribution of resources (Gray, 1998). If mothers have more pro-daughter preferences than fathers, then ease of divorce norms should help eliminate gender discrimination against girls.

2.3 Data

I assemble several data sources. To get at a sample of over 51,000 children, I pool two waves of the National Family and Health Survey (NFHS) conducted in 1998 and 2005. These are nationally representative cross-sectional data sets, which survey women across India between the ages of 15 and 49 years whose children are younger than 5 years old. The surveys follow the internationally standardized questionnaires and sampling design of the Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys (MEASURE DHS). The advantage of this data set is that it provides a large sample of children from the complete birth history of a survey respondent — the mother — along with a variety of information on fertility preferences, contraception, child health, and demographic and household characteristics. Each observation in NFHS includes the respondent's self-reported ethnicity. I combine both ethnographic and environmental data with the cross-section observation in the NFHS, using the following six broad steps. First, I clean the text data and correct them for spelling variations and spelling errors to arrive at a homogeneously spelled ethnic group name mentioned in the *People of India* for 92 aboriginal ethnic groups. Second, I aggregate the 1,269 clan and sub-clan names for the 92 ethnic groups. I repeat the previous step for spelling corrections (Appendix Table 2.17). Here, the matching involves the match with clan/sub-clan and then the match with ethnic group. In NFHS-2, the stated ethnic names are available for the household heads only, which are assigned to the children. Overall, I could match 80 percent of women from NFHS-3 and 59 percent of household heads to their corresponding ethnic groups (Table 2.1).

Table 2.1: Matching of ethnic groups in NFHS to ethnic groups in *People of India*

Matching method	**Women's sample in NFHS-3**			
	Cum. obs.	Percent Obs.	Cum. ethnicity	Cumulative % ethnicity
	(1)	(2)	(3)	(4)
Direct match by 92 ethnic groups	7438	36.75%	76	82.61%
Matched by 1269 clan or sub-clan names	8530	42.15%	81	88.04%
Matched by spelling variations in 92 ethnic groups	15520	76.69%	88	95.65%
Matched by spelling variations in 1269 clan/sub-clan	16089	79.50%	92	100.00%
Not matched/ Misspecified	4149	20.50%	...	...
	Household sample in NFHS-2			
Direct match by 92 ethnic groups	3947	31.42%	65	70.65%
Matched by 1269 clan or sub-clan names	4290	34.15%	69	75.00%
Matched by spelling variations in 92 ethnic groups	6961	55.40%	85	92.39%
Matched by spelling variations in 1269 clan/sub-clan	7394	58.85%	89	96.74%
Not matched/ Misspecified	4013	31.94%	...	...

Notes: NFHS-3 reports ethnic groups by households, women and men questionnaire responses. NFHS-2 surveyed only households and women, while the ethnic groups are available only for households. The potential number of women aged 15 to 49 with stated ethnic groups in NFHS-3 is 20,238. For NFHS-2, we have 11,407 households for eight northeastern states of India. I code social norms and subsistence patterns (see Table 2.1) for a set of 92 ethnic groups who are aboriginal to the northeastern states from the state volumes of *People of India*. In addition, we complied a comprehensive list of 1,269 clan or sub-clan names for these 92 ethnic groups (see Table 2.3).

Third, I code a set of thirty social norms and ancestral lifeways (Table 2.16) for all 92 aboriginal ethnic groups. Fourth, I merge the coded ethnography to the NFHS observation using the ethnic identity of each observation. Fifth, I georeference all 92 ethnic groups to their approximate ancestral homelands (Table 2.18). Sixth, within the bounding box for northeastern zone of India (Latitude: 22.89 — 28.91 and Longitude: 88.03 — 96.20), I merge the soil and climate data from Beck and Sieber (2010), which contains predicted suitability for four major subsistence patterns (Table 2.2). Following Becker (2020), I construct three linearly independent indicator variables for whether the environment is most suited for (a) hunting-gathering, (b) animal husbandry, and (c) pastoralism, relative to agriculture since in our sample most of the ethnic groups are agrarian societies. I elaborate the detailed steps for data construction methods in the Appendix (2.A and 2.B).

Table 2.2: Suitability of soil and climate for agriculture,animal husbandry, pastoralism and hunting-and-gathering by children and georeferenced ethnic groups

	By children			By ethnic groups		
	Mean	Std. Dev	Obs.	Mean	Std. Dev	Obs.
	(1)	(2)	(3)	(4)	(5)	(6)
Soil and climate most suited for agriculture	0.33	0.47	51,400	0.46	0.50	92
Soil and climate most suited for husbandry	0.00	0.00	51,400	0.00	0.00	92
Soil and climate most suited for hunting-gathering	0.66	0.48	51,400	0.53	0.50	92
Soil and climate most suited for pastoralism	0.01	0.11	51,400	0.01	0.10	92

Notes: The spatial prediction data on suitability of land at 20 kilometer, 50 kilometer, and 100 kilometer radii of the georeference of ethnic group is obtained from Beck and Seiber (2010) which are computed assuming only soil and climate afects soil-suitability for four basic land use types using Ecological Niche Modeling. The most suitable land use is constructed three linearly independent indicator variables for whether (i) the environment is most suited for hunting and gathering (48 ethnic groups), (ii) the environment is most suited for husbandry (no ethnic group), or (iii) the environment is most suited for pastoralism (1 ethnic group), where the reference category is "soil and climate most suited for agriculture" (43 ethnic group).

Many of these social norms and subsistence patterns are complementary to each other and hence inter-related. To avoid a multicollinearity problem, based on the variance inflation factors, I select a set of 22 explanatory variables. I present summary statistics for these explanatory variables in Table 2.3, both by children and by ethnic groups. Among the subsistence, agriculture left out of the analysis, since it is prevalent in over 90 percent of sample children and ethnic groups and offers the least variation. Among children, 49 percent are girls and 74 percent live in rural areas. Furthermore, among children, 16 percent are descendants of matrilineal ethnic groups, 29 percent belong to societies where their mothers do not have to live with the groom's kin. In 41 ethnic groups, mothers face more liberal options of divorce. The contemporaneous employment of women is high with 49 percent of children's mothers being employed. One-third of mothers of children in my sample work in agriculture, and one-fifth are engaged outside agriculture. Most mothers are educated up to secondary levels (32 percent) with only 4 percent having received higher education. Overall, the mother-level covariates are similar across boys and girls. Therefore, my estimates will not be sensitive to the inclusion of these mother level covariates, since the empirical specification primarily focusses on the sex of the child and its interaction with gender-roles in subsistence and social norms.

Table 2.3: Descriptive statistics by sample children and ethnic groups

	By children		By boys		By girls		By ethnicity	
	mean (s.d.)	Obs.	mean (s.d.)	Obs.	mean (s.d.)	Obs.	mean (s.d.)	Obs.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variables								
Median length of succeeding birth interval (months)	33	51299	34	26400	33	24899	-	-
	(0.13)		(0.19)		(0.18)			
Mean incidence of last birth	0.12	51400	0.13	26456	0.11	24944	-	-
	(0.33)		(0.34)		(0.31)			
Median length of breastfeeding spell (months)	24	9333	24	4,684	24	4649	-	-
	(0.09)		(0.07)		(0.17)			
Mean of total number of vaccination of children (12-23 months)	0.29	9536	0.29	4780	0.29	4756	-	-
	(0.45)		(0.45)		(0.45)			
Mean protein intake by living youngest children (under 3 years)	0.30	10612	0.30	5212	0.31	5400	-	-
	(0.60)		(0.59)		(0.60)			
Mortality rate for children born at least 1 year before interview	0.10	51400	0.10	26456	0.09	24944	-	-
	(0.29)		(0.30)		(0.28)			
Mortality rate for children born at least 2 years before interview	0.09	51400	0.10	26456	0.09	24944	-	-
	(0.29)		(0.30)		(0.28)			
Mortality rate for children born at least 3years before interview	0.09	51400	0.10	26456	0.08	24944	-	-
	(0.29)		(0.30)		(0.28)			
Mortality rate for children born at least 5 years before interview	0.08	51400	0.09	26456	0.08	24944	-	-
	(0.28)		(0.29)		(0.27)			
Mortality rate for children born at least 10 years before interview	0.06	51400	0.07	26456	0.06	24944	-	-
	(0.24)		(0.25)		(0.24)			

(continued...)

Mother-level covariates								
Mother is working	0.49	51338	0.49	26418	0.49	24920	-	-
	(0.50)		(0.50)		(0.50)			
Mother is works in agriculture	0.31	51400	0.31	26456	0.31	24944	-	-
	(0.46)		(0.46)		(0.46)			
Mother is works in non-agriculture	0.22	51297	0.22	26405	0.23	24892	-	-
	(0.42)		(0.42)		(0.42)			
Rural	0.74	51400	0.74	26456	0.74	24944	-	-
	(0.44)		(0.44)		(0.44)			
Female Household Head/Wife of Household Head	0.86	51400	0.86	26452	0.86	24944	-	-
	(0.34)		(0.34)		(0.35)			
Primary education	0.22	51389	0.22	26452	0.22	24937	-	-
	(0.42)		(0.42)		(0.42)			
Secondary education	0.32	51389	0.32	26456	0.33	24937	-	-
	(0.47)		(0.47)		(0.47)			
Higher education	0.04	51389	0.04	26452	0.04	24937	-	-
	(0.2)		(0.2)		(0.2)			
Wealth quintiles	3.12	51400	3.11	26456	3.12	24944	-	-
	(1.21)		(1.21)		(1.21)			
Age at first marriage	18.46	51334	18.46	26431	18.48	24903	-	-
	(3.93)		(3.92)		(3.94)			
Explanatory variables							-	-
Girl	0.49	51400	0	26456	1	24944		
	(0.50)		0		0		-	-
Ancestral subsistence: agriculture	0.93	51400	0.93	26456	0.93	24944	0.92	92
	(0.25)		(0.25)		(0.25)		(0.27)	
Ancestral subsistence: pastoralism	0.40	51400	0.40	26456	0.40	24944	0.30	92
	(0.49)		(0.49)		(0.49)		(0.46)	
Ancestral subsistence: husbandry	0.53	51400	0.53	26456	0.53	24944	0.65	92
	(0.50)		(0.50)		(0.50)		(0.48)	
Ancestral subsistence: fishing	0.61	51400	0.61	26456	0.62	24944	0.48	92
	(0.49)		(0.49)		(0.49)		(0.50)	
Ancestral subsistence: hunting	0.43	51400	0.43	26456	0.43	24944	0.37	92
	(0.50)		(0.50)		(0.49)		(0.49)	
Ancestral settlement complexity	0.41	51400	0.41	26456	0.41	24944	0.54	92
	(0.49)		(0.49)		(0.49)		0.50)	

(continued...)

Ancestral female participation: agriculture	0.78	51400	0.78	26456	0.78	24944	0.86	92
	(0.42)		(0.42)		(0.41)		(0.35)	
Ancestral female participation: agriculture and production	0.06	51400	0.06	26456	0.06	24944	0.08	92
	(0.25)		(0.25)		(0.25)		(0.27)	
Matrilineal descent	0.16	51400	0.16	26456	0.15	24944	0.08	92
	(0.36)		(0.36)		(0.36)		(0.27)	
Ease of divorce	0.44	51400	0.44	26456	0.44	24944	0.50	92
	(0.50)		(0.50)		(0.50)		(0.50)	
Non-patrilocal residence	0.29	51400	0.28	26456	0.29	24944	0.22	92
	(0.45)		(0.45)		(0.45)		(0.41)	

Notes: Data drawn from 1998 and 2005 waves of the National Family Health Survey for India. Ethnicity of children are based on ethnicity of their mothers. Standard deviations are in parentheses.

2.4 Empirical specification

I estimate the composite effects of mothers' ancestral roles in subsistence, as well as, the effects of ancestral subsistence patterns at their ethnicity level on gender discrimination of their children, holding the social norms and agro-climatic environment constant in a multivariate analysis. The outcomes of interest are the child's prenatal experience (succeeding birth interval, and fertility stop), neonatal cares by parents (lactation, vaccination, and nutrition inputs), and child mortality. For outcome variables other than the incidence of fertility stop, vaccination, and dietary inputs, the data is right-censored. The remaining outcome variables are succeeding birth interval, breastfeeding, and mortality, which I right-censor. Right censoring is important because it ends the observation before the time of occurrence of an 'event' (succeeding birth takes place, breastfeeding stop, or a child's death) since the censoring time is fixed as the survey ends. Thus, if T is a child's death (in months), we can only observe that T>36; in a sense, a child's death is "singly" right-censored at age 36 months. To keep the estimates relatively robust, I estimate hazard as an unobserved characteristic of a child (not exactly the probability since hazard has no upper bound at one, but it cannot be less than zero) of an event at a specified time t. Using Cox (1972) semi-parametric proportional hazard model allows me to not have to choose some particular probability distribution function to represent survival times. I assume the hazard of a child is a fixed proportion of the hazard for any other child, as long as they belong to the same ethnic groups and remain within the same primary sampling unit. Intuitively, the hazard at time t corresponds to the risk event happening at time t. Essentially, the following equation says that the hazard for child i at time t is the product of baseline hazard $h_{i,m,e}(0)$ (which is left unspecified, except it is non-negative), and a linear function of a set of independent variables, which is exponentiated:

$$h_{i,m,e}(t) = h_{i,m,e}(0)exp(\beta_1 Girl + \beta_2 Girl_{ie}F_{ie} + F'_{i,e}\Psi + X'_{m,e}\Gamma + S'_{m,e}\Phi + \epsilon_{i,m,e}), \quad (2.1)$$

where i indexes children, m mothers, and e ethnic groups. X'_{ime} denotes a vector of mother-level covariates: age, education, religion, wealth quintiles. A dummy variable indicator denotes whether the child is a female ($Girl_{ie}$). $F'_{i,e}$ denotes a vector of indicator variables which equals one if women in an ethnic group participate in agriculture and allied productive subsistence economy (weaving, basketry, fishing, and hunting). $S'_{m,e}$ includes

four subsistence patterns (pastoralism, animal husbandry, fishing and hunting) of each sample ethnic group, as well as, three social norms capturing women's status relative to men (ease of divorce, non-patrilocal residence, matrilineal descent) in that ethnic group. $\epsilon_{i,m,e}$ is the error term. I estimate Cox's proportional hazard models when dependent variables are censored, i.e., birth spacing, breastfeeding spell, and child mortality under the age of three years. The estimated hazard ratios are proportional changes in hazard rate to discrete changes in the independent variables. Hazard ratios taking the value of less (more) than one (β_1) for a female child imply relative hazard is lower (higher) than the baseline hazard. My hypothesis: the estimated hazard ratio for the interaction with the indicator for a female child (β_2) is less than one in ethnic groups where women are ancestrally productive, highly valued, and socially favored.

For incidence of last birth, total vaccination, and protein intake by children, I use a linear probability model. For incidence of last birth, one needs to observe women with completed fertility, which is not directly observable in my sample. I develop a proxy measure of likely completed fertility by focusing on mothers who, at the time of survey, are at their highest parity, are not currently pregnant, have no desire for more children, and have not given birth in last five years. I specify the following linear probability model:

$$Y_{i,m,e} = \beta_1 Girl + \beta_2 Girl_{ie} F_{ie} + F'_{m,e}\Psi + X'_{m,e}\Gamma + S'_{m,e}\Phi + \epsilon_{i,m,e}, \tag{2.2}$$

where $Y_{i,m,e}$ is an indicator variable that equals one if the woman stopped having children, is not currently pregnant, does not have desire for more children, has not given birth in the last 5 years, and is at her highest parity. The remaining notations are similar as in for equation (1), above. Similarly, I apply this OLS specification for additional dependent variables total vaccination (a dichotomous variable) and protein intake by children (an ordered categorical variable).

2.5 Results

I can infer the son preference of parents from differential spacing behavior. This implies that a typical girl is likely to experience a shorter successive birth of her next sibling than a typical boy because her parents are likely to continue having children in the quest for a son. Shorter successive birth intervals for girls are associated with adverse health outcomes

for mothers (Anderson and Ray, 2010). It disfavor girls who are likely to compete for fewer family resources with their younger siblings. The non-parametric estimates of the median birth interval from the Kaplan-Meier (1958) product-limit survival function is 33 months for girls and 34 months for boys. This gender gap in birth spacing is statistically significant at the 1% level[3].

Next, I use regression analysis to test the hypothesis that ancestral gender-roles in terms of women's productive participation in economic activities can enhance persistent cultural values of women and can reduce the disfavor against a female child. I estimate a proportional hazard model, which accounts for the censoring of completed birth intervals since the incidence of succeeding birth is unobserved as the cross-sectional survey ended, and imposes no distributional assumptions on the baseline hazard function. Table 2.4 presents the proportional effects on the hazard rate of succeeding birth as hazard ratios. Controlling for ancestral subsistence patterns, the mother-level covariates, and ancestral female participation in productive activities in all the four columns, I estimate the effects of combinations of women-favoring social norms (two at a time), in order to test the relevance of these social norms in reducing the gender bias against girls. The top row shows that the effect size of the child being female remains stable after adding a standard set of women-favoring social norms. The corresponding hazard ratio of greater than 1, which is statistically significant at the 1% level, suggests that girls have a greater risk of experiencing the birth of a younger sibling relative to boys. In societies featuring women's participation in agriculture and allied productive activities (such as weaving, basketry, fishing and animal husbandry), women's roles are more highly regarded, and a girl is at least as valued as a boy. The estimated hazard ratio for the women's ancestral productive roles interacted with the indicator for a female child is lesser than unity and statistically significant at the 1% level, which decreases the duration between successive birth and the hazard of having a subsequent sibling for a girl relative to the baseline hazard.

[3]The estimated Chi-square test statistic of the log-rank test for equality of survivor functions between sexes is rejected at the 1% level of significance.

Table 2.4: Effects of ancestral social norms and female productive roles on successive birth intervals

Dependent variable:	Length of succeeding birth interval			
Estimation method:	Cox's proportional hazards model			
	(1)	(2)	(3)	(4)
Girl	1.239***	1.233***	1.236***	1.233***
	(0.074)	(0.075)	(0.072)	(0.079)
Ancestral female participation: agriculture x girl	0.957	0.952	0.958	0.955
	(0.040)	(0.040)	(0.039)	(0.041)
Ancestral female participation: agriculture and production x girl	0.854***	0.884**	0.849***	0.865***
	(0.050)	(0.046)	(0.045)	(0.046)
Non-patrilocal residence x girl	0.933		0.922**	
	(0.043)		(0.036)	
Ease of divorce x girl	0.920**	0.928*	0.918**	
	(0.038)	(0.039)	(0.037)	
Matrilineal descent x girl	0.981	0.944*		
	(0.038)	(0.030)		
Social norms index x girl				0.945***
				(0.020)
Number of ethnic groups (clusters)	92	92	92	92
Median of dependent variable (in months)	33	33	33	33
Observations	51,133	51,133	51,133	51,133

Notes: Table displays hazard ratios and their associated standard errors in parentheses, which are clustered at the ethnic group levels. Significance stars (*** p<0.01, ** p<0.05, * p<0.1) are for the null hypothesis that the hazard ratio equals one. Interaction with girl dummy is represented with 'x'. The ancestral female participation patterns in agriculture and production activities includes agriculture, weaving, basketry, husbandry, and fishing. The social norms index is an additive index of three social norms, namely, non-patrilocal residence, ease of divorce,and matrilineal descent. The following control variables are included in all the regressions but are not reported in the table: four ancestral subsistence patterns (pastoralism, animal husbandry, fishing, hunting) and settlement patterns at mother's ethnic group level, eight fixed effects for Indian northeastern states, four fixed effects for religions, a set of four mother-level covariates (age of mother at first marriage, highest level of education of mother, relationship of mother with the head of the household, wealth quintile of the mother) and 18 birth orders at child-level, and two relative land suitability measures (for hunting and pastoralism). Sampling weights are applied. Estimates are stratified by 840 primary sampling units implying equal hazard ratios are estimated across strata but with a unique baseline hazard for each stratum.

Relative to the beneficial effects of women-favoring social norms, the 'value' effects of women's ancestral productivity are stronger, both in its size and statistical significance. Both sizable hazard ratios might endow contemporary women with reduced biases against them if the pre-colonial cultural values regarding the economically productive gender roles and kinship norms favoring women persist[4].

To establish that the gender roles in subsistence patterns and other women-favoring customs persist, I first compare the tabulated patterns and norms in *People of India* — which were collected in the early 1990s — with Murdock's atlas (which claim to be ancestral) for a subset of ethnic groups that show up in both the atlases. A greater degree of congruence (overall 85% of congruence in 13 social customs for 16 ethnic groups, in my sample) inspires the confidence about the continuation of norms (Table 2.19). I further explore the possibility of whether the gender roles regarding contemporaneous economic activities of women can be predicted by traditional gender roles in subsistence patterns and women-favoring customs. I find the persistent effects of ancestral gender roles in subsistence and women-favoring customs on the contemporary occupation of women can be traced in the NFHS sample. For example, ancestral female roles in agriculture predict women's work in agriculture and outside agriculture today (Table 2.20). Women-favoring customs, such as non-patrilocal post-marital residence and ease of divorce, are predictors of current women's working status. Overall, I find some evidence that ancestral gender roles affect contemporaneous female labor force participation. In the instances where these ancestral predictors cannot be traced in the contemporaneous occupation of women, the estimated effects are to be interpreted as pure effects of habituated attitudes and their carry-forward effects on present-day gender bias.

The ideal data for examining the fertility stopping behavior would be to use women's data who had completed fertility and would have data for the entire birth history for all of their children. I restrict observations to women who likely completed fertility by placing 4 restrictions on the sample: (a) women who are at their highest parity, (b) women who are not currently pregnant, (c) women who have not expressed their desire for more children, and (d) women who have not given birth in the last 5 years. These restrictions attempt to ensure that my estimates are not confounding the effect of family size preference. In search of an alternative fertility behavior that can potentially accentuate the gender bias,

[4]With the proof of stickiness of ancestral norms, these estimates should be closer to causal effects of these ancestral norms.

I estimate equation (2.2) to assess the differential stopping behavior that disfavors girls, predicting that parents of a typical girl 'will try another', and it is less likely that a girl will be the last-born child (Jensen, 2003; Barcellos, Carvalho, and Lleras-Muney, 2014). Intuitively, if the child is a boy, then parents stop childbearing. When a girl is born, parents continue to have children. As a result, a girl disadvantageously competes for fewer family resources with her later-born brothers (Jayachandran and Pande, 2017).

Consistent with the findings in Table 2.4, which suggests a girl will have her younger siblings in quicker succession than a boy, I find it is less likely that a girl would be the last-born child. I re-estimate the identical specification in Table 2.5 and find that a girl's parents are less likely to stop having children in the pursuit of a son. In all four columns, coefficients for the female child variable are estimated with greater precision. Parents of a girl are 3 percent less likely to stop having children (in other words, more likely to have children) than if the child is a boy. On the social norms channel, out of three women-favoring norms, only ease of divorce speaks to the general gender bias on the girls. In the societies where women experience greater liberty in divorcing (relative to the societies where there are impediments in divorce customs), are likely to gain in intra-household bargaining. This finding is consistent with theoretical predictions of distribution within the family, especially the divorce threat models of Manser and Brown (1980), McElroy and Horney (1981). Later, Lundberg and Pollak (1994) treat the distribution within the family as a Nash bargaining solution to a cooperative game. However, the women-favoring and more easier divorce customs via greater bargaining power to mothers would matter for the improved well-being of girls only if mothers have more daughter preference (and less son preference or at least indifference) than fathers. Reminiscent of Rosenzweig and Schultz (1984), for any given family size preference, mothers exhibit less strong stated son preference (Jayachandran, 2015) than the fathers, and mothers express greater daughter preference than fathers (see Figure 2.2). The statistical significance for the effects of women-favoring norms are weaker when these norms are bundled in the additive index of social norms (Column 4 in Table 2.5).

Table 2.5: Effects of ancestral social norms and female productive roles on fertility stopping

Dependent variable:	Incidence of last birth			
Estimation method:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Girl	-0.030**	-0.029**	-0.031**	-0.028*
	(0.013)	(0.013)	(0.012)	(0.015)
Ancestral female participation: agriculture x girl	0.005	0.006	0.006	0.005
	(0.007)	(0.007)	(0.007)	(0.007)
Ancestral female participation:agriculture and production x girl	0.014	0.008	0.012	0.010
	(0.012)	(0.011)	(0.012)	(0.014)
Non-patrilocal residence x girl	0.014		0.009	
	(0.010)		(0.010)	
Ease of divorce x girl	0.020**	0.018**	0.020**	
	(0.008)	(0.008)	(0.008)	
Matrilineal descent x girl	-0.009	-0.001		
	(0.011)	(0.010)		
Social norms index x girl				0.008*
				(0.005)
R^2	0.141	0.141	0.141	0.141
Number of ethnic groups (clusters)	92	92	92	92
Mean of dependent variable	0.12	0.12	0.12	0.12
Observations	51,233	51,233	51,233	51,233

Notes: The dependent variable is an indicator variable that equals one if the child is the last-born to his or her mother at the time of interview, the mother has not given birth during the five years preceding the interview, is not currently pregnant and states no desire for more children. Table displays standard errors clustered at the ethnic group level and are in parentheses. Significance stars (*** p<0.01, ** p<0.05, * p<0.1) are for the null hypothesis that the hazard ratio equals one. Sampling weights are applied. For descriptions and definitions of variables see Table 2.4.

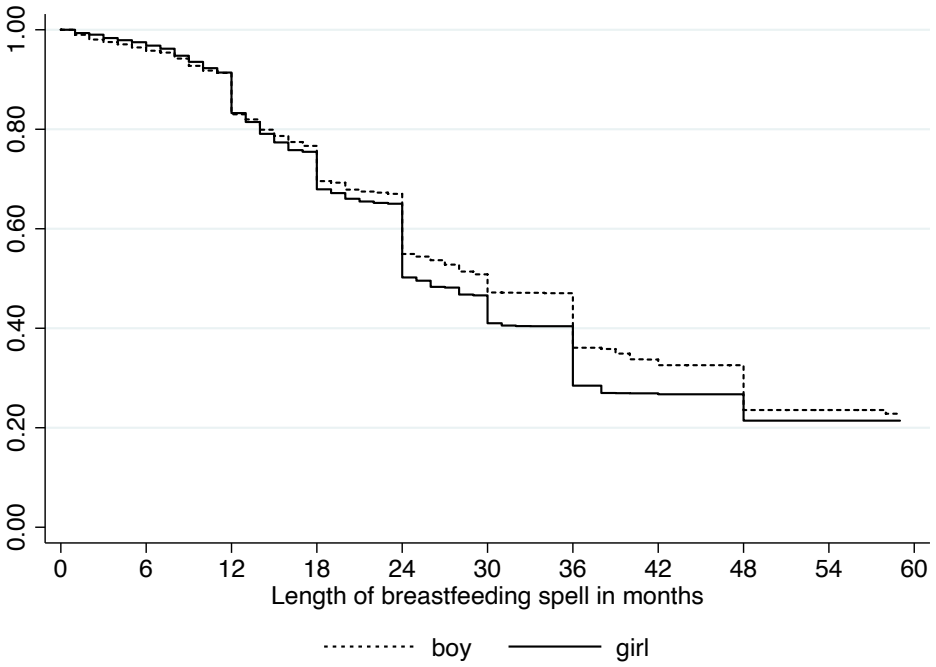

Figure 2.1: Kaplan-Meier survival estimates for breastfeeding, by sex

Notes: I plot the proportion of children, by sex, who are still being breastfed at the duration (age) on the horizontal axis.

To visualize the gender gap in breastfeeding duration, I plot the survival estimates for sons and daughters in Figure 2.1. During the first year, the gender bias is not pronounced (with daughters receiving slightly longer nursing). Beyond the age of 24-60 months, the gender bias becomes accentuated. The non-parametric Kaplan-Meier estimator of median duration of completed breastfeeding does not capture this gender gap and the statistical significance is at the 10% level. In the top row of Table 2.6 displays the hazard ratio is larger than one and statistically significant at the 1% level. It implies significant discrimination observed against the female child. This finding is consistent with the previous literature in India (Jayachandran and Kuziemko, 2011; Carranza, 2011). The extent of discrimination ebbs due to the perceived economic value of investment in a girl in ethnic groups where women ancestrally participate in productive activities. The hazard ratio is much lower than one and statistically significant at the 1% levels, thus suggesting that the sex-selective breastfeeding stop is lower due to higher economic value of women. My findings are consistent with Carranza's (2011) study which concludes significant positive association between relative female labor force participation and breastfeeding of girls.

Table 2.6: Effects of ancestral social norms and female productive roles on breastfeeding duration

Dependent variable:	Length of breastfeeding spell			
Estimation method:	Cox's proportional hazards model			
	(1)	(2)	(3)	(4)
Girl	1.990***	1.922***	1.981***	2.017***
	(0.449)	(0.452)	(0.425)	(0.467)
Ancestral female participation: agriculture x girl	0.688***	0.678***	0.690***	0.674***
	(0.089)	(0.088)	(0.082)	(0.084)
Ancestral female participation:agriculture and production x girl	1.261	1.440	1.252	1.331
	(0.387)	(0.423)	(0.368)	(0.377)
Non-patrilocal residence x girl	0.786		0.774*	
	(0.123)		(0.107)	
Ease of divorce x girl	0.941	0.979	0.938	
	(0.109)	(0.114)	(0.109)	
Matrilineal descent x girl	0.972	0.853		
	(0.218)	(0.170)		
Social norms index x girl				0.900
				(0.071)
Number of ethnic groups (clusters)	92	92	92	92
Median of dependent variable (in months)	24	24	24	24
Observations	9,283	9,283	9,283	9,283

Notes: Table displays hazard ratios and their associated standard errors in parentheses, which are clustered at the ethnic group levels. Significance stars (*** p<0.01, ** p<0.05, * p<0.1) are for the null hypothesis that the hazard ratio equals one. Sampling weights are applied. Estimates are stratified by 840 primary sampling units implying equal hazard ratios are estimated across strata but with a unique baseline hazard for each stratum. For descriptions and definitions of variables see Table 2.4.

Except for protein intake by female children — which is largely associated with women-favoring social norms — the estimated coefficients are not statistically significant for total vaccinations and child mortality. This can be attributed to a smaller sample size for vaccination and low incidence of child mortality. These results are available in the appendix (see Table 2.7, and Table 2.9). For protein intake, the coefficient of the social norms index is quite meaningful. It suggests that a female child on an average is 8 percent more likely to receive protein diets in societies where social norms favor women (see Table 2.8). This coefficient is also statistically significant at the 1% level. Once I unbundle these women-favoring social norms, the favorable effect (12%) appears in societies featuring non-patrilocal post-marital residence. In such circumstances, either the married couple dwell with the bride's kin or sets up a neutral household. In both the cases, women enjoy greater bargaining power than the patrilocal setup.

As a robustness check, I re-estimate all the regressions of Table 2.4 to Table 2.9 by including contemporaneous employment of mothers and the contemporaneous occupation of mothers outside agriculture (Tables 2.10 to 2.15). This brings us closer to causal interpretations by ruling out the mechanism that women's current employment (Basu and Basu, 1991) leads to gender bias estimates in parental desires, preferences, and behaviors. I find that, even after controlling for contemporaneous occupation patterns of women, the estimated coefficients remain unperturbed both in terms of size and statistical significance. Therefore, the channel through contemporaneous women's occupation can be ruled out. More tellingly, this may be construed as a discouraging phenomenon. Women who were ancestrally productive in their economic contribution are more likely to be employed, but they are less likely to have a say on the money they earn, and thus female employment may not lead to economic empowerment and rather be another means for economic exploitation (Bhattacharya, 2015). With the proof of stickiness of norms, as well as, conditioning on the environment, possibly the only mechanism left is the ancestral subsistence patterns and ancestral women-favoring social norms which are still responsible for present-day differences in gender bias that persists.

2.6 Conclusion

This paper presents some preliminary evidence. Within the geographic bounds of India's Northeast that offers considerable diversity, the central observation is that women's productive role enhances their value in the society and promotes more gender-equal outcomes and less sex-biased discrimination by parents. In ethnic groups where ancestral female participation in productive economic activities are predominant, there is less evidence of son-biased differential fertility behavior and breastfeeding discrimination against girls. No statistically significant association is traceable to the immunization and child mortality because of limited sample size and negligible incidence rates leading to lack of power. The economically meaningful direction of effects — disconnected from the current occupation of mothers — highlights the significance of ancestral gender roles as a determinant of present-day gender equality. It underlines the importance of a threat point in the analysis of women's status and the implications for more gender-equal outcomes for their children from a theoretical perspective. Social norms that strengthen women's intra-household and extra-household position define the relevant threat-point within marriage, which yields favorable non-cooperative outcomes that are less gender unequal. This contention opens up the possibility that women and their daughters may benefit from the productive roles in agricultural and other allied productive activities. In summary, these empirical regularities ascertain that the ancestral roots of persistent son-biased preferences of parents which complements that might deserve attention in the parental gender bias literature.

Appendices to Chapter 2

2.A Matching of ethnicity in NFHS with ethnicity in *People of India*

Economists commonly use (Nunn and Qian, 2011; Enke, 2019; Alesina, Giuliano, and Nunn, 2013; Michalopoulos, Putterman, and Weil, 2019; Michalopoulos and Papaioannou, 2013) the coded ethnographic atlas (Murdock, 1967). After exploring several other coded ethnographic atlases (including Kirby et al., 2016; Gray, 1999; White et al., 1986; Ember et al., 1992; Barry, 1980), I find none of those sufficiently cover the ethnic diversity in India. Therefore, I identify the *People of India* as an alternative to extract information from the qualitative ethnography. The People of India is a multi-volume compendium of books presented for each sub-national state within India covering 4635 ethnic groups, which was collected in a mammoth project ran by the Anthropological Survey of India under the Indian Ministry of Culture during 1985-1992. Ethnographers spent on an average of 5.5 days with each community and recoded various aspects of traditional social norms through first-hand interviews and with the help of the informants. This ethnographic atlas is not yet popular among economists, despite offering greater coverage within India, probably due to the qualitative nature of the information. I employ a double-blind coding protocol to extract information and to identify the presence or absence of various subsistence patterns among the ethnic groups in my study area. I identify 92 aboriginal ethnic groups for whom I can extract definitive information about the presence or absence of five modes of subsistence economy. The ancestral characteristics, customs and social norms at the ethnic group level are then assigned from the coded ethnography from the People of India on each child observation. Following a double-blind coding protocol, I coded eight marriage customs (marriage payments, clan-, community-, and village-exogamy, close kin marriageability, partner selection patterns, polygyny, and post-marital residence), four separation norms (ease of divorce, alimony rights, custody, ease of remarriage), three lineage norms (descent, inheritance, succession), six subsistence patterns (dependence on agriculture, gathering, pastoralism, animal husbandry, hunting, fishing), the traditional use of plough in cultivation, nine gender division of labor indicators (Ancestral female participation in agricultural, gathering, fishing, hunting, animal husbandry, pastoralism,

weaving, basketry and politics), settlement patterns, and community land ownership. Appendix Table 2.16 summarizes the incidence of each of these 30 social norms and subsistence patterns. To combine NFHS observations with the ethnographic atlasPeople of IndiaI need the reported ethnicity of the respondent. The recent NFHS conducted in 2015 (NFHS-4) does not provide the data file for ethnicity. For NFHS conducted in 2005 (NFHS-3), the reported ethnic group affiliation is available for men, women, and household. The reported ethnicity is available for the household head in NFHS, conducted in 1998 (NFHS-2). Although NFHS conducted in 1992 (NFHS-1) collected ethnicity it differs considerably in terms of survey design, sample coverage and narrower set of ethnicities (31 numerically coded from 1931 census list) for little over 10000 potential observations. Thus, my analysis is limited to NFHS-2 and NFHS-3 pooled cross-sectional data. It is important to highlight that the reported ethnic group names are text which is not free from spelling errors. Most often those ethnic group names do not coincide readily with the names of ethnic groups documented in the People of India. The first step in the process is to identify a set of 92 ethnic groups who are aboriginal to the northeastern states of India from People of India and code the qualitative and detailed ethnography for each of them. Building on the matching procedure elaborated in the literature that combines Murdock's ethnographic data with the DHS data (for example, Alesina, Brioschi, and La Ferrara, 2019; Michalopoulos and Papaioannou, 2014), I develop a four-step matching procedure by reconciling the differences in reported ethnicities in NFHS.

The most straightforward case is where the ethnic group name (text data) is identical in spelling with the text name in People of India. This trivial process yields 37% women and 76 ethnicities for NFHS-3. The direct match is viable for 31% of households and 65 ethnicities in NFHS-2. To maximize the pooled data, I collect the clan and sub-clan names for the 92 target ethnic groups from People of India. After carefully studying the chapters on each of the 92 ethnic groups in respective state volumes of People of India, I could gather 1,269 clan and sub-clan names (Appendix Table 2.17). This massive exercise widens the direct match possibilities because the reported ethnicities likely might have referred to the respondents' clan or sub-clan micro-affiliation rather than the ethnic groups. On average, each ethnicity has 14 clans or sub-clans, with a maximum of 180 clans and sub-clans for 'Tagin' ethnic group in aboriginal to Arunachal Pradesh. Second, I conduct another direct match of stated ethnicity (text data) with the collection of

1,269 clan and sub-clan names. For example, the ethnic name Karbi according to People of India is found in NFHS in terms of their clan and sub-clan names ("Kulta", "Arleng", "Mikir", "Dumrali", "Chintong", "Ronghang", "Amri", "Ingty", "Inghy", "Teron", "Timung", "Terang", "Menkiri") who are known to be kindred to the "Karbi" people. This procedure cumulatively matches 42% of women from NFHS-3 and 34% household from NFHS-2. The third method is manually correcting the spelling variation in the text data in NFHS for 92 ethnic names. For instance, the ethnic name 'Khasi' is misspelt in NFHS as "Kashi", or "Khahi", or "Khaso" or "Khati" to illustrate a few of the innumerable possibilities of spelling errors. This laborious spelling correction, however, yields the maximum extent of matches. Cumulatively, after the third method, 76% of women and 65% of households are matched. The fourth step is to manually synchronize spelling variations for the 1,269 clan and sub-clan names. This most labor intensive step did not yield much of incremental matches. After this step, I can match 80% of women from NFHS-3 and 59% households from NFHS-2. Table 2.1 presents the number of women and household heads were matched at each of the four matching methods. In the matched data, there are 92 ethnic groups for NFHS-3 and 89 ethnic groups from NHFS-2. Three ethnic groups, namely, "Yimchunger", "Oraon", and "Kom" are not found in the NFHS-2 sample. After cleaning the NFHS ethnic names, I merge those to the child level data. Each child is assigned ethnicity based on their mother's ethnicity in NFHS-3 and based on their household head's ethnicity in NFHS-2. The total pooled sample from two waves of NFHS is 51,400 children.

2.B Combining environmental data with the matched ethnographic-NFHS data

The variation in ancestral subsistence patterns is largely determined by the ancestral environmental conditions. These extra-environmental patterns are exogenous to the social norms, customs, and ancestral subsistence patterns, unless ethnic groups self-select into particular pockets, even within primary sampling units, with special environmental conditions that might suit them most. To overcome the omitted variable bias, if environmental factors determine social norms, I control for these environmental conditions. NFHS data is not georeferenced. My strategy is to identify approximate geographic locations of the 92

ethnic groups in my sample. The minimum perimeter bounding box for the north-eastern states of India is between Latitude (22.89 — 28.91) and Longitude (88.03 — 96.20). I infer the geographic referencing of each ethnic group from the description of each ethnic group in the respective chapter in *People of India*. I give a greater reliance on description about their principal area of settlement unless the districts, sub-districts and specific villages are mentioned. Appendix Table 2.18 presents the indicative evidence in the People of India chapters which are used to put each ethnic group on the map and assign proxy latitude and longitudes. I use these proxy geographic coordinates for adding soil suitability conditions to the merged data. I add the data provided by Beck and Sieber (2010). They used long-run (1961-1991) average patterns in climatic conditions (temperature, rainfall, altitude) and soil characteristics to predict which the climate and soil conditions suits most for the land-use types for four basic subsistence, such as, agriculture, hunting-gathering, animal husbandry, and pastoralism. For each of these four land suitability measures, I calculate mean and median at 20 kilometers, 50 kilometers, and 100 kilometers radii from the geographic coordinates of each ethnic group, as separate variables.

Table 2.7: Effects of ancestral social norms and female productive roles on total vaccination of children

Dependent variable:	Total vaccination			
Estimation method:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Girl	0.021	0.022	0.026	0.008
	(0.062)	(0.063)	(0.060)	(0.061)
Ancestral female participation: agriculture x girl	0.023	0.023	0.018	0.025
	(0.034)	(0.033)	(0.031)	(0.032)
Ancestral female participation: agriculture and production x girl	-0.014	-0.017	0.003	0.002
	(0.072)	(0.063)	(0.062)	(0.053)
Non-patrilocal residence x girl	0.009		0.040	
	(0.041)		(0.034)	
Ease of divorce x girl	-0.034	-0.035	-0.030	
	(0.031)	(0.032)	(0.031)	
Matrilineal descent x girl	0.045	0.050		
	(0.054)	(0.044)		
Social norms index x girl				0.009
				(0.015)
R^2	0.372	0.372	0.372	0.371
Number of ethnic groups (clusters)	92	92	92	92
Mean of dependent variable	0.36	0.36	0.36	0.36
Observations	7,063	7,063	7,063	7,063

Notes: The dependent variable, "Total vaccinations" is an indicator variable that equals one if a child (aged 12-23 months) received each of DPT3 (diphtheria/pertussis/tetanus), polio 3, BCG (Bacillus CalmetteGuerin) and measles vaccines. Table displays standard errors clustered at the ethnic group level and are in brackets. For descriptions and definitions of variables see Table 2.4.

Table 2.8: Effects of ancestral social norms and female productive roles on protein intake of children

Dependent variable:	Protein intake by children			
Estimation method:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Girl	0.036	0.054	0.029	0.028
	(0.091)	(0.091)	(0.092)	(0.092)
Ancestral female participation: agriculture x girl	0.050	0.052	0.054	0.056
	(0.050)	(0.051)	(0.051)	(0.049)
Ancestral female participation: agriculture and production x girl	0.062	0.031	0.052	0.063
	(0.078)	(0.069)	(0.082)	(0.076)
Non-patrilocal residence x girl	0.083		0.126***	
	(0.067)		(0.045)	
Ease of divorce x girl	0.081	0.067	0.090*	
	(0.052)	(0.051)	(0.051)	
Matrilineal descent x girl	0.055	0.105**		
	(0.060)	(0.046)		
Social norms index x girl				0.084***
				(0.024)
R^2	0.390	0.387	0.387	0.385
Number of ethnic groups (clusters)	92	92	92	92
Mean of dependent variable	0.37	0.37	0.37	0.37
Observations	4,211	4,211	4,211	4,211

Notes: Women respondents were asked whether the youngest child (under age 3) staying with the mother, was fed three protein sources, (i) poultry, (ii) other meat, and (iii) fish or egg, during the proceeding day of interview in NFHS-3. An ordered categorical dependent variable is constructed with the following realizations: zero (if none were fed), one (if exactly one was fed), two (if any two out of three were fed), three (if all three were fed). Table displays standard errors clustered at the ethnic group level and are in brackets. For descriptions and definitions of variables see Table 2.4.

Table 2.9: Effects of ancestral social norms and female productive roles on child mortality under age 3 years

Dependent variable:	Incidence of child mortality under 3 yr.			
Estimation method:	Cox's proportional hazards model			
	(1)	(2)	(3)	(4)
Girl	1.024	1.027	1.035	1.051
	(0.214)	(0.216)	(0.210)	(0.213)
Ancestral female participation: agriculture x girl	0.943	0.951	0.939	0.933
	(0.120)	(0.118)	(0.118)	(0.113)
Ancestral female participation: agriculture and production x girl	0.844	0.811	0.861	0.843
	(0.187)	(0.175)	(0.169)	(0.180)
Non-patrilocal residence x girl	1.081		1.123	
	(0.131)		(0.156)	
Ease of divorce x girl	1.166	1.157	1.169	
	(0.116)	(0.113)	(0.115)	
Matrilineal descent x girl	1.063	1.112		
	(0.134)	(0.155)		
Social norms index x girl				1.103
				(0.071)
Number of ethnic groups (clusters)	92	92	92	92
Mortality during first 3 years of life (incidence uncensored obs.)	0.078	0.078	0.078	0.078
Observations	51,233	51,233	51,233	51,233

Notes: Table displays hazard ratios and their associated standard errors in brackets, which are clustered at ethnic group levels. Significance stars are for the null hypothesis that the hazard ratio equals one. Estimates are stratified by 840 primary sampling units implying equal hazard ratios are estimated across strata but with a unique baseline hazard for each stratum.For descriptions and definitions of variables see Table 2.4.

Table 2.10: Effects of ancestral social norms and female productive roles on birth interval

Dependent variable:	Length of succeeding birth interval			
Estimation method:	Cox's proportional hazards model			
	(1)	(2)	(3)	(4)
Girl	1.244***	1.239***	1.241***	1.237***
	(0.077)	(0.079)	(0.076)	(0.083)
Ancestral female participation: agriculture x girl	0.959	0.954	0.959	0.957
	(0.040)	(0.041)	(0.040)	(0.042)
Ancestral female participation:agriculture and production x girl	0.860***	0.890**	0.855***	0.871**
	(0.049)	(0.046)	(0.045)	(0.047)
Mother is working x girl	1.005	1.001	1.007	1.005
	(0.043)	(0.042)	(0.042)	(0.043)
Mother is working outside agriculture x girl	0.975	0.975	0.975	0.976
	(0.051)	(0.052)	(0.051)	(0.052)
Non-patrilocal residence x girl	0.933		0.922**	
	(0.047)		(0.038)	
Ease of divorce x girl	0.914**	0.923*	0.912**	
	(0.039)	(0.039)	(0.037)	
Matrilineal descent x girl	0.981	0.944*		
	(0.038)	(0.030)		
Social norms index x girl				0.943***
				(0.020)
Number of ethnic groups (clusters)	92	92	92	92
Median of dependent variable (in months)	33	33	33	33
Observations	50,968	50,968	50,968	50,968

Notes: See Table 2.4.

Table 2.11: Effects of ancestral social norms and female productive roles on fertility stopping

Dependent variable:	Incidence of last birth			
Estimation method:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Girl	-0.030**	-0.029**	-0.031**	-0.027*
	(0.014)	(0.014)	(0.013)	(0.016)
Ancestral female participation: agriculture x girl	0.005	0.006	0.006	0.005
	(0.007)	(0.007)	(0.007)	(0.008)
Ancestral female participation:agriculture and production x girl	0.012	0.005	0.009	0.007
	(0.012)	(0.012)	(0.012)	(0.015)
Mother is working x girl	-0.003	-0.002	-0.003	-0.003
	(0.010)	(0.009)	(0.010)	(0.010)
Mother is working outside agriculture x girl	0.001	0.001	0.001	0.001
	(0.015)	(0.015)	(0.015)	(0.015)
Non-patrilocal residence x girl	0.014		0.009	
	(0.011)		(0.011)	
Ease of divorce x girl	0.021***	0.020**	0.021***	
	(0.008)	(0.008)	(0.008)	
Matrilineal descent x girl	-0.009	-0.001		
	(0.011)	(0.010)		
Social norms index x girl				0.009*
				(0.005)
R^2	0.144	0.143	0.144	0.143
Number of ethnic groups (clusters)	92	92	92	92
Mean of dependent variable	0.12	0.12	0.12	0.12
Observations	51,068	51,068	51,068	51,068

Notes: See Table 2.5.

Table 2.12: Effects of ancestral social norms and female productive roles on breastfeeding duration

Dependent variable:	Length of breastfeeding spell			
Estimation method:	Cox's proportional hazards model			
	(1)	(2)	(3)	(4)
Girl	1.957***	1.897***	1.955***	1.985***
	(0.428)	(0.429)	(0.408)	(0.441)
Ancestral female participation: agriculture x girl	0.692***	0.683***	0.692***	0.678***
	(0.088)	(0.087)	(0.081)	(0.084)
Ancestral female participation:agriculture and production x girl	1.221	1.394	1.220	1.296
	(0.359)	(0.391)	(0.347)	(0.354)
Mother is working x girl	1.007	0.993	1.007	1.000
	(0.112)	(0.111)	(0.111)	(0.111)
Mother is working outside agriculture x girl	1.097	1.097	1.096	1.103
	(0.168)	(0.168)	(0.168)	(0.169)
Non-patrilocal residence x girl	0.784		0.782*	
	(0.121)		(0.109)	
Ease of divorce x girl	0.940	0.980	0.940	
	(0.107)	(0.112)	(0.106)	
Matrilineal descent x girl	0.994	0.870		
	(0.213)	(0.168)		
Social norms index x girl				0.906
				(0.070)
Number of ethnic groups (clusters)	92	92	92	92
Median of dependent variable (in months)	24	24	24	24
Observations	9,253	9,253	9,253	9,253

Notes: See Table 2.6.

Table 2.13: Effects of ancestral social norms and female productive roles on full vaccination of child

Dependent variable:	Full vaccination			
Estimation method:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Girl	0.026	0.028	0.031	0.014
	(0.065)	(0.066)	(0.062)	(0.064)
Ancestral female participation: agriculture x girl	0.025	0.025	0.021	0.028
	(0.033)	(0.033)	(0.031)	(0.032)
Ancestral female participation: agriculture and production x girl	-0.008	-0.012	0.007	0.006
	(0.071)	(0.062)	(0.061)	(0.052)
Mother is working x girl	-0.005	-0.005	-0.009	-0.010
	(0.029)	(0.028)	(0.028)	(0.028)
Mother is working outside agriculture x girl	-0.053	-0.052	-0.050	-0.051
	(0.050)	(0.051)	(0.050)	(0.050)
Non-patrilocal residence x girl	0.013		0.041	
	(0.042)		(0.034)	
Ease of divorce x girl	-0.030	-0.032	-0.026	
	(0.030)	(0.031)	(0.029)	
Matrilineal descent x girl	0.041	0.048		
	(0.054)	(0.043)		
Social norms index x girl				0.011
				(0.015)
R^2	0.373	0.373	0.373	0.372
Number of ethnic groups (clusters)	92	92	92	92
Mean of dependent variable	0.36	0.36	0.36	0.36
Observations	7,043	7,043	7,043	7,043

Notes: See Table 2.7.

Table 2.14: Effects of ancestral social norms and female productive roles on protein intake by children

Dependent variable:	Protein intake by children			
Estimation method:	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Girl	0.038	0.054	0.031	0.030
	(0.092)	(0.092)	(0.093)	(0.093)
Ancestral female participation: agriculture x girl	0.047	0.048	0.050	0.052
	(0.050)	(0.051)	(0.051)	(0.049)
Ancestral female participation: agriculture and production x girl	0.067	0.040	0.057	0.070
	(0.081)	(0.069)	(0.083)	(0.077)
Mother is working x girl	-0.010	-0.005	-0.011	-0.006
	(0.042)	(0.042)	(0.043)	(0.042)
Mother is working outside agriculture x girl	0.012	0.012	0.014	0.011
	(0.072)	(0.072)	(0.073)	(0.073)
Non-patrilocal residence x girl	0.076		0.118***	
	(0.066)		(0.043)	
Ease of divorce x girl	0.080	0.067	0.089*	
	(0.051)	(0.050)	(0.050)	
Matrilineal descent x girl	0.053	0.100**		
	(0.060)	(0.045)		
Social norms index x girl				0.081***
				(0.024)
R^2	0.391	0.388	0.388	0.386
Number of ethnic groups (clusters)	92	92	92	92
Mean of dependent variable	0.37	0.37	0.37	0.37
Observations	4,198	4,198	4,198	4,198

Notes: See Table 2.8.

Table 2.15: Effects of ancestral social norms and female productive roles on child mortality under age 3 years

Dependent variable:	Incidence of child mortality under 3 yr.			
Estimation method:	Cox's proportional hazards model			
	(1)	(2)	(3)	(4)
Girl	1.032	1.034	1.042	1.056
	(0.216)	(0.217)	(0.210)	(0.213)
Ancestral female participation: agriculture x girl	0.946	0.954	0.943	0.936
	(0.121)	(0.120)	(0.119)	(0.114)
Ancestral female participation: agriculture and production x girl	0.848	0.813	0.864	0.845
	(0.185)	(0.169)	(0.166)	(0.175)
Mother is working x girl	1.019	1.024	1.017	1.023
	(0.134)	(0.136)	(0.133)	(0.134)
Mother is working outside agriculture x girl	0.853	0.853	0.853	0.853
	(0.107)	(0.108)	(0.107)	(0.107)
Non-patrilocal residence x girl	1.087		1.126	
	(0.123)		(0.152)	
Ease of divorce x girl	1.165	1.154	1.167	
	(0.118)	(0.114)	(0.116)	
Matrilineal descent x girl	1.057	1.111		
	(0.135)	(0.156)		
Social norms index x girl				1.103
				(0.070)
Number of ethnic groups (clusters)	92	92	92	92
Mortality during first 3 years of life (incidence uncensored obs.)	0.078	0.078	0.078	0.078
Observations	51,068	51,068	51,068	51,068

Notes: See Table 2.9.

Table 2.16: Ancestral social norms and subsistence patterns by children and ethnic groups

	NFHS-3 Children		NFHS-2 Children	
Social norms	Ethnicity	Obs.	Ethnicity	Obs.
1. Marriage payments	**90**	**27104**	**86**	**17614**
Neither brideprice nor dowry	18	5980	16	5196
Only brideprice	62	17891	61	11127
Only dowry	6	1613	5	434
Both brideprice and dowry	4	1620	4	857
2. Kinship, marriage, organization	**91**	**31075**	**87**	**19953**
Clan endogamy	20	2891	20	2985
Clan exogamy	71	28184	67	16968
Community endogamy	82	26131	78	17277
Community exogamy	9	4944	9	2676
Village endogamy	84	22097	81	17091
Village exogamy	7	8978	6	2862
3. Kinship, marriage	**91**	**31387**	**87**	**19972**
No consanguinity	39	17958	36	9831
First cousin(FSD/MBD)/sororate/levirate	52	13429	51	10141
4. Marriage, domestic organization	**92**	**31413**	**88**	**19987**
Monogamy	86	29287	82	18902
Polygyny	6	2126	6	1085
5. Marriage types	**92**	**31413**	**88**	**19987**
Arranged marriage	44	8629	43	6389
Love marriage	5	6148	4	2044
Both arranged and love marriages	43	16636	41	11554
6. Post-marital residency norms	**92**	**31413**	**88**	**19987**
Patri/virilocal	72	22166	70	14523
Matri/uxorilocal/duolocal	6	4696	6	3420
Neolocal	14	4551	12	2044
7. Divorce rules	**92**	**31413**	**88**	**19987**
Unilateral divorce	6	1847	6	2178
Ease of	46	14133	44	8311
Society's/family's approval	23	5659	21	4266
Divorce is rare and discouraged	17	9774	17	5232
8. Alimony rights	**92**	**31413**	**88**	**19987**
No alimony after divorce	64	26133	61	15954
Alimony entitlement	28	5280	27	4033
9. Child custody rights	**91**	**31141**	**87**	**19970**
Father keeps	33	17164	31	7749
Mother keeps	10	5081	9	4100
Situational/either keeps	48	8896	47	8121
10. Remarriage norms	**89**	**30425**	**85**	**19043**
Not acceptable & rigid	3	4578	3	2276
Acceptable & flexible	86	25847	82	16767
11. Kinship: descent	**92**	**31413**	**88**	**19987**
Patrilineal	85	27115	81	16273
Matrilineal	7	4298	7	3714
12. Wealth transactions: inheritance(immovable,real)	**91**	**31307**	**87**	**19750**
Equigeniture	61	12943	58	9843
Male inheritance	23	13764	22	5925
Female inheritance	7	4600	7	3982

(continued..)

12. Wealth transactions:				
inheritance(movable)	**92**	**31413**	**88**	**19987**
Equigeniture	60	16289	58	11426
Male inheritance	25	10801	23	4580
Female inheritance	7	4323	7	3981
13. Plough	**89**	**30522**	**85**	**19334**
Plough is absent	63	23365	59	14539
Plough existed/aboriginal in society	26	7157	26	4795
Subsistence patterns				
14. Subsistence economy : agriculture	**92**	**31413**	**88**	**19987**
No	7	1865	7	1713
Yes	85	29548	81	18274
15. Subsistence economy : gathering	**92**	**31413**	**88**	**19987**
No	5	2619	5	1708
Yes	87	28794	83	18279
16. Subsistence economy : hunting	**92**	**31413**	**88**	**19987**
No	58	16590	57	12703
Yes	34	14823	31	7284
17. Subsistence economy : fishing	**92**	**31413**	**88**	**19987**
No	48	11101	46	8739
Yes	44	20312	42	11248
18. Subsistence economy : animal husbandry	**92**	**31413**	**88**	**19987**
No	32	15538	31	8667
Yes	60	15875	57	11320
19. Subsistence economy : pastoralism	**92**	**31413**	**88**	**19987**
No	64	18969	61	11876
Yes	28	12444	27	8111
20. Subsistence economy, gender: agriculture	**92**	**31413**	**88**	**19987**
No female participation in agriculture	13	6335	13	5080
Yes	79	25078	75	14907
21. Subsistence economy, gender: gathering	**92**	**31413**	**88**	**19987**
No female participation in gathering	15	8576	14	4925
Yes	77	22837	74	15062
22. Subsistence economy, gender: hunting	**92**	**31413**	**88**	**19987**
No female participation in hunting	91	31392	87	19965
Yes	1	21	1	22
23. Subsistence economy, gender: fishing	**92**	**31413**	**88**	**19987**
No female participation in fishing	78	28009	74	16884
Yes	14	3404	14	3103
24. Subsistence economy, gender: husbandry	**92**	**31413**	**88**	**19987**
No female participation in husbandry	52	16871	49	12080
Yes	40	14542	39	7907
25. Subsistence economy, gender: pastoralism	**92**	**31413**	**88**	**19987**
No female participation in pastoralism	90	30923	86	19281
Yes	2	490	2	706
26. Subsistence economy, gender: weaving	**92**	**31413**	**88**	**19987**
No female participation in weaving	45	15089	44	11051
Yes	47	16324	44	8936
27. Subsistence economy, gender: basketry	**92**	**31413**	**88**	**19987**
No female participation in basketry	70	25369	67	15558
Yes	22	6044	21	4429

(continued..)

28. Politics,leadership,gender	**92**	**31413**	**88**	**19987**
No female participation in politics	88	28758	84	17587
Yes	4	2655	4	2400
29. Land ownership patterns	**92**	**31413**	**88**	**19987**
Private ownership of land	10	3471	10	1877
Society/community ownership of land	74	26019	70	16620
Landless	8	1923	8	1490
30. Settlements patterns	**92**	**31413**	**88**	**19987**
Compact/relatively permanent	42	18002	39	12119
Separated hamlets/semi-permanent/dispersed neighborhoods	48	13028	47	7292
Semi-nomadic 1/2 year; or semi-sedentary	2	383	2	576

Source: *People of India* as coded by author.

Table 2.17: List of clan or sub-clan names by 92 ethnic groups

Ethnic groups	Number clans	Clans/sub-clan names
Sikkim		
Bhutia	27	Bhot Bhotia Drukpa Drukul Chumbipas Dhoptapas Trompas Domupas Lachenpa Lachungpa Lhori Tondu Russhi Chechu Thapa Shandarpa Kachopa Shengapa Beb Tsen Gye Gansapa Namchangopa Chungiopa Ithenpa Phenchungpa Phenpunadik Namnakpa Nachangpa
Bhujel	5	Khawa Khusila Kashyap Kashi
Chetri	18	Kshatriya Khas Bista Subadi Basnet Adhikari Nirula Bhandari Paural Thorje Katwal Bhattarai Thapa Andari Karki Kami Damai Sarki
Gurung	28	Gurkhali Ghale Ghonde Lama Lamichane Ghyabre Kyabchne Kurumchhe Jangre Aring Dorjali Rilami Poju Chormi Pom Thin Migi Khatra Yog Paingi Kholali Sogun Thorjami Tu Puru Ko Kidu Chiva
Lepcha	10	Rongkup Mutanchi Rong Monpa Kirate Maris Mayal Rongring Ring Kirati
Limboo	32	Limbu Li Abu Bow Yakthumba Lum Tsong Subba Kiranti Sibakota Tsang Limbuana Sirijunga Jhung Nambang Thagim Libang Tamling Pandhak Sering Laotti Muringlanugo Muringla Nugo Phurumbo Phendua Nambang Thagim Libang Damai Kami Sarki
Mangar	19	Pulami Ala Kepchake Guranga Darlami Pun Lungalim Lamichani Khapangi Loharung Purbachane Rana Mangratey Lumrey Gholey Maske Balangpak Molalay Sitong
Rai	18	Jimdar Khambu Manjh Walla Kura Bantawa Chamling Thulung Kulung Paldorje Bangdel Dungmali Nechali Khaling Chhinamkhong Rajolim Dumi Dukhun
Sherpa	14	Sharya Solukhambu Yukpa Shalakha Rinasha Lama Chayaba Goperma Khambase
Sunuwar	10	Sunwar Mukhiya Barathare Dasthare Jirel Sunupar Sunkoshi Koicha Poinba Grangden
Tamang	37	Tagmaluijin Nishung Moklan Yonjan Lopchan Thing Bomyan Bal Pakkrin Darneih Syangbo Waiba Thokar Jhimba Dong Titung Gyapok Domjan Bropchan Negi Golay Kalden Chising Singon Remba Nyasum Chungma Syangden Yonjan Bomjan

(continued..)

Arunachal Pradesh

Adi Bokar	46	Taluk Tapo Tapir Tapin Yajo Bune Borak Mardo Singlong Tame Taping Ungring Sammame Samine Chije Puing Puder Yuring Yourpin Hemi Pudur Pyasang Pujen Pulom Yourchi Tempin Pudu Popak Lupo Yourgo Yourko Youring Gindo-Dupa Mardo Umlong Komlon Maine Lupo Yourgo Yourko Youring Gindo-Dupa Mardo Umlong Komlom Maine
Adi Gallong	20	Topo Galo Tator Tani Karga Bogum Lodu Kar Taipodia Paktu Karka Ete Loi Loya Lolen Bagra Ang Ado Doke Doje
Adi Minyoung	5	Teli Taki Jamo Siran Moyong
Adi Pasi	9	Dai Rukbo Mengu Yomso Apum Teknyo Yompang Yomain Mekir
Apatani	3	Tani Mith Mora
Chakma	39	Tsakma Tsak Thek Tsakma Sakma Changma Changmyang Tsakthek Chamma Jumia Jummua Dainonak Changchhan Tuichek Chek Takamb Chawngte Dameyi Huttia Barseke Hammey Dachya Bangsa Malima Rangi Baurua Boga Thanya Kukua Angnu Fema Fedengsuri Fagola Hamuja Lachra Homreng Naduktu Karma Fajera
Deori	7	Boderiyo Patriyochau Dupiyao Khottia Hizaru Lapharu Gucharu
Hill Miri	1	Mantai
Khampti	11	Namsoom Nangmao Manwai Mannoi Manpang Manpoong Manchi Manchai Manoi Chowhati Manjakhoon
Miri	8	Oyan Saeng Maying Pator Dambuk Mirang Tamar Nuthunjee
Monpa	39	But Matchopa Bootpa Butpa Shingjee Rahungjee Khoitumjee Khonujee Sunukjee Rinchiadu Yammujee Khoitamjee Runfunjee Ropu Chandok Dunglok Chug Chugpa Gumupa Khumupa Khumuthongkor Ngarmupa Changmuchipa Dirang Tsangla Faichurpa Gunpapa Baqipam Shorthefa Kalaktang Lish Lishpa Kishpi Thankhar Khumu Jamkhar Khumu Khumusangla Borzu Nyarmu Tawang Brahmi Monpa
Mishmi Idu	6	Pulu Mendo Mega Lingi Michichi Harku
Nishi	14	Nishang Dol Dodum Dopum Durum-Dui Dukum-Duri Tasu Likha Chuhu Takyang Yowa Tade Tajing Byabang
Nocte	3	Lowang Channa Mikhiak
Singpho	1	Jingpho

(continued..)

Tangsa	181	Ketna Havi Hawai Mandok Takhe Bontai Nokka Pangtha Solting Songthing Kelum Wangpap Ngaimong Ketchi Mantai Jugli Yougli Taiman Taikhaw Taikin Kolral Kolhriyen Korang Korah Jank Jok Taibi Menti Khonga Khangnyal Kimsing Chamchang Sina Sehang Langtin Latom Maipole Mepok Chhojam Sejam Chaso Changso Cholam Cholum Lungchang Kenglang Khomrang Namai Lulin Tailong Lungphi Yongkhung Tairing Khoipang Morang Mungray Nyamran Tapsang Haile Hailang Palket Kethong Sano Mosang Rangkhaw Lomko Chithang Wakpat Kethung Rangwang Jongkhung Ranka Thampong Teekhaon Muklom Mokolm Monglum Tangha Cohangmi Khimhun Techi Shungkho Rekhung Wangra Tekhil Yangchang Matcha Sayung Ngemu Nalang Kitnal Ronrang Poerah Longti Woety Chumbyu Lishey Chummut Gahja Nokwi Jangloo Shesu Matwa Pechong Kewa Kubu Shama Rigang Nori Ngalo Langhe Joeboi Rewey Diwa Tamkote Morang Kuchit Lomme Nagu Kisha Shosa Wellyo Sangwal Charwan Sangkhu Taipon Taiwai Sangrang Taiboi Telung Sanke Sechu Chasha Keykap Kongrang Kianoo Taorah Nangkong Khokhong Lowey Allon Chuwrah Wanpi Sintak Shongrey Tikhak Tailong Hanglung Taching Tairing Longjing Mokhom Wankhang Momai Jangshong Taimak Taidang Taihu Kamba Taichu Taitha Mungkhom Mowan Tonglim Tyolim Tonglum Chokhang Chunga Dewe Jankhe Khangla Khanyak Khapwing Koje Kunsing Wyonsongm Yongkuk Ngokhom Tailong Taihu Taichu Kamba Taitha
Nagaland		
Angami	23	Tengima Gnamei Tsungumi Tsungung Mour Chakroma Tengima Chakrama Kezami Putir Dzunokehena Zounuo Keyhonuo Khonoma Tengima Kezami Khezha Memi Pezina Pepfuma Tepa Thevo Kemovo
Ao	10	Aor Chunglir Chongli Mongsen Changki Dikhu Melak Tsurong Pongen Lomou
Chang	12	Chongnu Changsang Mazung Duenching Changru Changhlai Kangshau Ong Hongang Ongbou Lakpu Youkoubu
Khiamngan	2	Kelukenyu Yingshanku

(continued..)

Konyak/Wancho	35	Haha Taprongumi Minyumo Nagami Mirirr Chagk Nahngra Lwang Kongnok Angnophang Wanghu Paiknok Matpisun Yanlam Laktu Hu Hentokhu Punlonghu Angwanhu Shishohu Manching Wangnanting Wonghu Wangnayaum Wangchingphong Lwang Angnophang Ang Konyak Tangjan Tsangjan Wangham Wangpan Wangsa Wangsu Bailung
Lotha	3	Kyon Chuwami Eryung
Phom	2	Kahha Nyuthery
Pochury	26	Sapo Kechuri Khury Sozomi Kheza Nyushury Shantary Shomli Tsori Nyusoury Nyuwiry Ngory Phochiry Pojar Katiry Trakha Jurry Fithu Thurr Thupitou Leyri Tsang Nyuwiri Nyutheri Nqouri Nyuwini
Rengma	3	Ntenye Nzong Raimye
Sangtam	2	Tukomi Sangtamrr
Sema	8	Semi Sumi Yathi Igha Kukami Awo-U Asashokipini Khiphur
Yimchunger	13	Yanchunger Yachumi Yimchuger Tikhir Makware Chirr Jankhurnger Janger Khiumger N'daine Kusun Khiunger Limkhiungkhugar
Zeliang	24	Zemei Zemi Liangmei Zeliangrong Rongmei Mpame Newme Nriame Sogome Kenye Hararme Gangmei Pamei Malangmei Riamei Dhangmei N'rongmei Newmei Tinkupen Kedeipeo Kamei Gonmei Gangmei Mu
Chakhesang	12	Chakhru Kheza Chazho Thevo Khamutso Epao Putso Kheza Khutso Lawa Mero Khezha
Kuki	34	Chin Khongshai Khonjai Khosamai Kotsoma Kuki-Chin Lushai Lakher Lua Kumki Choughthu Lnykim Lengthang Singsit Thado Vaiphei Gangte Changsan Kholhou Thangugen Lhangsum Aengna Hauneng Daugel Bangsing Chougloi Haolai Sitlhou Thado Haokip Kipgen Singsin Haosa Thempu
Manipur		
Hmar	8	Sinlung Inpui Inpuisuok Tutluk Tutluksouk Chimsen Chimsensuok Sal
Kabui	7	Rongmei Haumei Kammei Ganmei Langmei Gangmei Khandangmei
Kom	7	Karong Saicho Leivon Tolon Serto Lupheng Mangte
Loi	8	Chakpa Ningthouja Angom Khumal Moirang Luwang Sarang-Leishangthem Khaba-Nganba
Mao	7	Imemi Memei Lepaona Saranami Paomata Kapematta Tolepamatta
Maring	8	Chimkur Dangsa Charanga Kansouwa Mekunga Khulpuwa Lamthakka Hleyowa

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Meitei	8	Manipuri Ningthouja Angom Chengloi Ngongba Looang Khoomon Moirang
Paite/Zou	13	Paihte Tedim Chin Gwite Sukte Nwite Kamhau Nwingalte Akambau Manlun Samte Simte Zoukam Manlun
Pangal	8	Shiekh Sayyed Pathan Shah Khan Choudhury Mia Khaaoraora
Tangkhul	10	Noga Naokhokha Raphei Kashung Reekhang Rem Kamo Kharao Khaorui Chontung
Vaiphei	14	Suantak Vanglua Neilut Thanglet Puakpawl Hansing Saivung Chonlu Khaute Phaltual Chonmang Ellu Keusel Neisial
Mizoram		
Mizo/Biate	20	Baite Biete Duhlian Ngamlai Nampui Chungngawl Zate Tamte Thlihran Royang Thianglai Hmunhring Khurbi Puilo Faihriam Darnei Kampui Ngamlai Ngirsim Thiate
Thadou	14	Chongthu Duhlian Sitthloh Khuangsai Milui Singsuan Lianthang Haukip Kipgen Thongpam Dongel Chawngthu Lal Upa
Tripura		
Haluadas	5	Sonahatia Chhabhaiya Astisuddha Kashyap Rachi
Jugi	13	Jogi Nath Tanti Shiv Ekadashi Masya Halwa Ranrej Kambule Manihari Palangsa Barendra Baidik Nath
Mog	14	Magh Mag Maga Mugg Mogh Marma Kokpyasa Khangsa Cheringsa Marusa Wodgensa Wookkinsa Chakpregia Rakhocha
Mahisyadas	4	Matsyadas Haluadas Halladas Alambayana
Munda	9	Mura Kerketta Kanduru Gondli Hansa Jirhul Bhengra Mundori Porti
Namasudra	2	Kashyap Gaigra
Noatia	12	Naitang Gabing Khaklu Anak Fatuij Mougbai Taugbai Keora Khalni Harbeng Daindak Kerang
Nunia	7	Chouchan Semara Kharhadia Haudihoya Nunchuhua Matkatowa Belderowa
Patni	1	Alimman
Riang	7	Meska Raicha Charkhi Mochha Chompreng Waireng Apaia
Tripuri	18	Tripra Tipera Deb Barman Bachal Siuk Kuatia Daitya-Singh Hujuria Siltia Chatratuia Chatradharia Deunai Subenarayan Sena Julai Beri Dona Daspa
Kapali	3	Kashyap Harihar Alimman
Meghalaya		
Khasi	13	Amwi Lyngam Bhoi War Khynriam Khynrium Syiem Lyngdoh Walang Rayand Songkali Lapang Dorphang
Jaintia	10	Pnar Synteng Syntang Amwi Changpung Jowai Nartia Raliana Sutnga Matabeng

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Garo	20	Mande Achik Akawe Awe Chisak Dual Machi Ambeng Abeng Chibok Ruga Ganching Gara Atong Megam Sangma Marak Momin Areng Shira
Rabha	12	Rongdani Naitori Pati Dahuri Pati Dahori Rongdani Maitori Total Kocha Rato
Hajong	16	Khatal Parachungwa Chondi Parakati Baliati Kendegaon Dingar Akshigaon Tokleygaon Sinulgaon Difragaon Kashigaon Phulgaon Ghorabali Koitar Sonamukhi
Assam		
Ahom	12	Raja Burgohain Borgohain Duwara Dihingiya Lahon Sandikai Deodhai Mohan Panch Chiring Tai
Bishnupriya	15	Leimanai Ningthuanai Khoomala Moirang Angam Luwang Mangang Ningthoja Khabananba Mudgalya Angiras Atreya Bharadwaja Kausika Sandilya Gautam
Chutiya	8	Birinchi Borahi Deori Levite Bora Hazarika Chetia Barua
Hira	7	Byash Sanatan Sutor Raghunath Bhewali Medhi Sarandas
Kachari	3	Barman Khunang Dilek
Bodo	3	Swarga-Aroi Basumatary Musa-Aroi
Kaibarta	5	Nadial Jalia Bamunia Haridhwania Sutradhar
Kalita	12	Kulta Kulata Kulalipta Kakati Das Bharali Patahk Medhi Bhuyan Timung Saikia Deka
Karbi	11	Arleng Mikir Dumrali Chintong Ronghang Amri Ingty Inghy Teron Terang Menkiri
Keot		-
Kharia	7	Dudh Dhelki Pahari Suren Barla Dhanwar Kerketa
Kurmi	5	Bedia Kurmi Surya Nath Bahohier Tirower
Lalung	1	Tiwa
Matak	5	Moran Moamaria Senapati Mayamara Khoomon
Meitei	10	Manipuri Meithei Moirang Koomul Ningthouja Angom Chengloi Ngongba Looang Moirang
Munda	1	Haroko
Namasudra		-
Oraon	1	Kurukh
Rajbanshi	8	Koch Pathak Dihidar Phousdar Singha Pradhani Adhikari Maghahia
Ravidas	12	Chamar Muchi Piplang Kachchhap Kush Nona Kanaujia Dushia Jeshwara Bedis Tota Bhojpuria
Santhal	11	Kisku Tudu Hembrom Hasdak Besra Baskey Soren Marndi Core Phatowal Pauris
Sonowal Kachari	14	Bali Khitiari Chiripuria Amarabamiya Dhulial Ujani Kuchia Namoni Kuchia Tipamia Betari Gezepi Memi Makrari Neskatari Hagumiri Nakrari

Notes: Total number of clans and sub-clans for 92 aboriginal ethnic groups is 1,269 as mentioned in the *People of India* chapters.

Table 2.18: Georeferencing of ethnic groups

Ethnic groups	Latitude	Longitude	Excerpts from *People of India* indicative of geo-location of ethnic groups
Sikkim			
Sunuwar	27.2925	88.2457	West district; Hilly terrain; High Altitude; High Humidity; Forest; Heavy Rainfall
Tamang	27.2349	88.5788	Lower Teesta valley, Rangit valley
Bhutia	27.7167	88.5539	North Sikkim;Hilly terrain; High Altitude; Lachung-Pa; Lachen-Pa
Bhujel	27.2312	88.4671	South sikkim, Hilly Terrain, Mean altitude 1500meters; Tokal village
Chetri	27.3720	88.2122	West, South, East districts; Hill slopes; 900 meters-1900 meters; Teesta and Rangit rivers
Gurung	27.2678	88.0776	South, West districts; Hilly terrain; High Altitude; Forest; Heavy Rainfall
Lepcha	27.5098	88.4288	North district; Extreme cold climate; lower altitude in contrast to Bhutias, Not snow-bound places; Dzongu area
Limboo	27.1349	88.1506	Western district;Sparsely forested slopes, 1200 meters to 1900 meters
Mangar	27.1791	88.3305	South district;1200 meters to 1900 meters; Teesta and Rangit River; Good monsoon rainfall.
Rai	27.3073	88.1323	East,West, South district; 900 meters-1900 meters; Few in the North district.
Sherpa	27.1426	88.0682	West district, Okhray, Tikpur, Rumbuk, Ridpi, Bhareng, Sapray-nagi, Burikhop, Soreng, Singling, Dentam
Arunachal Pradesh			
Adi Pasi	28.1213	95.8374	Balek, Rasam, Kalek, Pasighat
Apatani	27.5466	93.8006	Apatani valley, Ziro, Hapoli. Lower Subansiri district
Chakma	27.4866	96.2018	Baijan circle in Lower subansiri district, miao sub-division of changlang district, chowkam circle of lohit district
Deori	27.6635	95.8412	Lekang circle in mahadevpur area, dayun circle in lohit district
Hill Miri	27.6783	93.5131	Ziro and Daporizo Sub-Division of Lower and Upper Subansiri District, majority in lower subansiri
Khampti	26.9902	95.4646	Tirap District, South of Lohit river
Miri	28.0365	95.3141	East Siang, majority lives in Assam
Monpa	27.5861	91.8507	West Kameng District, Tawang District

(continued..)

Mishmi Idu	28.9158	95.6054	DibangValley District
Nishi	27.8026	94.2860	Upper and Lower Subansiri District, near the streams Khru Ranga Dikrang
Nocte	26.9025	95.5086	Khonsa, Namsang, Laju circles of Tirap District, Borduria and Mansang VIllage
Singpho	27.1357	95.7258	Changlang and Lohit district, area drained by rivers Burhi-Dihing, Noa-Dihing, Tengapani
Tagin	27.5368	93.8812	Upper Subansiri district
Tangsa	27.1357	95.7258	Changlang district, Manmao and Nampong circles
Adi Bokar	28.1664	94.6973	West Siang district, Gesing, Pangri
Adi Gallong	28.1637	94.7695	West Siang district, Along, Basar, rugged mountains
Adi Minyoung	28.0619	95.3172	Pasighat, Kabang, Yemsing
Nagaland			
Konyak	26.7219	95.0198	Mon district
Lotha	26.0911	94.2372	Wokha district
Phom	26.4907	94.8049	Tuensang district, Longleng subdivision
Pochury	25.6810	94.6146	Phek district, Meluri sub-division
Rengma	25.7161	94.0068	Kohima district, Tseminyu sub-division
Sangtam	25.8694	94.7833	Tuensang district, Kiphire subdivision
Sema	26.0132	94.5065	Zunheboto district
Yimchunger	26.2366	94.7862	Tuensang district
Zeliang	25.7612	93.8276	South-western part of Kohima district
Chakhesang	25.6297	94.4020	Phek district, cold and hilly
Kuki	25.7612	93.8276	Ghaspani and Dimapur blocks, village Maoua
Angami	25.6747	94.0718	Kohima district,
Ao	26.4352	94.4824	Haathigurya, Tokthoriya, Eserenia, Mokochung district
Chang	26.3137	94.8490	central hilly part of Tuensang district
Khiamngan	26.2026	95.0061	eastern part of Tuensang district
Manipur			
Loi	24.7270	94.0059	Imphal district
Mao	25.4618	94.1966	Senapati district
Maring	24.4433	94.1177	Khudei Khullen village, northern part of Tengnoupal district
Meitei	24.4970	93.7556	Manipur valley
Paite	24.0928	93.2954	Zougam area; unfit for wet cultivation
Pangal	24.6495	93.9702	Imphal, Thoubal, Bishnupur
Tangkhul	24.8600	94.4971	East district; Meikhel village; 12 kms south east of Kohima.

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Vaiphei	24.1454	93.5833	Churachandpur district
Hmar	24.1384	93.9488	southern district Manipur
Kabui	25.1626	93.4611	barrail ranges western part of manipur
Kom	24.9469	93.9779	Village Sinam Kom
Mizoram			
Thadou	24.1135	92.9121	North-eastern part of Mizoram, Darlawn Block, Ratu
Mizo/Biate	24.0137	92.9156	north-eastern part of Mizoram, Aizawl district, Darlawn community development block, Darlawn.
Tripura			
Haluadas	23.9046	91.3410	West Tripura; Plains, warm and temperate climate; High humidity, heavy rainfall.
Jugi	23.8142	91.4065	West Tripura
Mog	23.2826	91.5411	South Tripura,Bilonia Sub-Division
Mahisyadas	23.6059	91.8153	Hilly and Forest Terrain, heavy rainfall, All over Tripura
Namasudra	23.5341	91.4666	South Tripura District, Udaipur Sub-Division
Noatia	23.5224	91.6403	South Tripura District, Amarpur Sub-Division
Nunia	23.8342	91.3576	West Tripura, Plains; Forest;Warm climate; High humidity; Heavy rainfall
Patni	23.8203	91.2124	West Tripura, Plains; Forest;Warm climate; High humidity; Heavy rainfall
Riang	23.5341	91.4666	West Tripura
Tripuri	23.9607	91.3991	West Tripura
Kapali	23.8292	91.6030	all districts, warm and temoerate climate, high humidity, heavy rainfall
Meghalaya			
Rabha	25.7910	90.8401	northern area of east garo hills
Hajong	25.3879	89.8989	plains of south-west of west garohillls
Khasi	25.4223	91.4756	khasi hills
Jaintia	25.4494	92.0565	jaintia hills district
Garo	25.5720	90.5675	garo hills
Assam			
Bishnupriya	24.6798	92.5281	Cachar District
Chutiya	26.9878	94.5729	Goalpara, Kamrup, Darrang, Nowgong, Sibsagar
Hira	26.1611	90.5949	Goalpara (Kusia Kata, Hojalpara, Bistupur), Barpeta (Budarutup, Sundaridlia)
Kachari	25.1373	92.7567	Cachar District
Bodo	26.4132	91.8098	Kokrajhar, Darrang, Goalpara, Kamrup

(continued..)

Sonowal Kachari	27.4703	94.8826	Plains, Dibrugarh
Kalita	25.4300	90.1100	Between 25.43 and 26.53, 90.11
Kaibarta	26.7429	94.1324	Kamrup, Darrang, Nowgong, Jorhat districts
Karbi	25.8384	93.4078	Karbi Anglong District
Keot	26.1430	91.5628	no specific description given
Kharia	27.8463	95.2873	tea garden
Kurmi	26.2769	94.0630	tea garden
Lalung	26.2351	92.8981	"most of them are found in jowai subdivision of Jayantia distrct, Meghalaya", Nagaon district most, also Lakhimpur, Sibsagar
Ahom	27.1823	94.7271	Brahmaputra Valley, Upper Assam
Matak	26.5431	91.9115	Dibrugarh, Sibsagar, Lakhimpur, Darrang
Munda	27.5678	95.5478	tea garden, Doomdooma area
Oraon	25.5678	94.5478	tea garden
Rajbanshi	26.0257	89.9584	Goalpara, Kokrajhar, Kamrup
Ravidas	24.5678	94.5478	tea garden
Santhal	26.3827	90.0220	tea garden, mostly Kokrajhar, Kachugaon area

Notes: Each ethnic groups are assigned to a geographic location depending on the major concentration as indicated in the *People of India* chapters. Wherever district are indicated as major concentration, we have considered supplementary information, such as, rivers, valleys, plains, or altitude of preferred settlement of the concerned ethnic groups to determine approximate latitude and longitude for each ethnic groups. In cases where no information is available, we explored census data to find out districts with major concentration after verifying from the district government websites. In the cases specific villages are mentioned as their ancestral homes, those are the georeferenced.

Table 2.19: Degree of congruence of ancestral social norms and subsistence patterns between Murdock's atlas and People of India

Ancestral norms	Angami	Ao	Chakma	Garo	Kachari	Karbi	Khasi	Kuki	Lepcha	Lotha	Mog	Rengma	Santhal	Sema	Sherpa	Thadou	Congruence %
Non-patrilocal residence	√	√	√	√	yes/no	√	√	no/yes	√	√	√	√	√	√	√	√	87.50%
Matrilineal descent	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100.00%
Subsistence:Gathering	√	√	√	√	√	√	√	yes/no	√	√	√	√	√	√	√	√	93.75%
Subsistence:Hunting	√	√	yes/no	no/yes	√	√	no/yes	yes/no	√	yes/no	√	√	no/yes	√	√	√	62.50%
Subsistence:Fishing	√	√	yes/no	yes/no	yes/no	√	√	yes/no	√	√	√	√	no/yes	√	√	√	68.75%
Subsistence:Husbandry	√	√	√	yes/no	√	√	√	yes/no	√	√	√	√	√	√	√	√	87.50%
Female role in agriculture	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100.00%
Female role in gathering	√	√	√	√	no/yes	√	√	√	√	√	√	√	√	√	√	√	93.75%
Female role in hunting	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100.00%
Female role in fishing	√	yes/no	√	yes/no	no/yes	yes/no	√	yes/no	√	√	√	√	√	yes/no	√	√	62.50%
Female role in husbandry	√	√	√	√	yes/no	√	√	no/yes	√	√	√	√	√	√	√	√	87.50%
Female role in weaving	√	√	√	√	no/yes	√	√	√	yes/no	√	no/yes	√	√	√	√	√	81.25%
Settlement pattern	√	no/yes	√	√	√	√	√	√	√	√	√	√	no/yes	√	√	√	81.25%

Notes: The congruence of social norms and subsistence patterns are inferred from identical codes between Murdock's Atlas and People of India Atlas.These are indicated with "". Instances where these norms and patterns are diferent between Murdock's codes and People of India codes are specifed with a pair of entries separated by a "/". The Murdock's codes ("yes" or "no") is followed by People of India codes ("yes" or "no"), separated by "/". A subset of 16 ethnic groups which are are coded both in Murdock's ethnographic atlas and People of India are considered. Non-patrilocal residence is derived from variable ea010, ea201, ea011, ea012, ea013 of Murdock's atlas since these codes for marital residence with kin for first years, change after frst years, transfer of residence at marriage(prevailing pattern),marital of residence with kin(prevailing pattern), and transfer of residence at marriage (alternate pattern), respectively. Matrilineal descent is derived from variables ea017-ea020 of Murdock's atlas which codes patrilineal or matrilineal exogamy.Dependence on gathering/hunting/fishing/husbandry are derived from the variables ea001, ea002, ea003 and ea004 of Murdock's atlas, which reports the share of subsistence from each of the activities in a scale from 0 (implying no dependence) to 100 (implying full dependence, as indicator variable with 1 implying some dependence and 0 implying no dependence. Similarly, female roles in agriculture/gathering/hunting/fishing/husbandry/weaving is derived from variables ea054, ea050, ea051, ea052 ea053, ea045 of Murdock's atlas, respectively. These variables are similarly rescaled alike the dependence on subsistence. This adjustments are necessary to code qualitative data from People of India, which does not numerically indicate the extent of dependence, but only the absence of presence of such subsistence activities. Settlement patterns is derived from variable ea030 which codes nomadic/sedentary/isolated/compact settlements.

Table 2.20: Ancestral predictors of contemporary occupation of women

Dependent variable:	Contemporary		
	Women's working status	Women's work in agri.	Women's work outside agri.
Estimation method:	OLS	OLS	OLS
	(1)	(2)	(3)
A.			
Ancestral female participation: agriculture	0.01	0.02**	0.03**
	(0.01)	(0.01)	(0.01)
Ancestral female participation:agriculture and production	0.00	-0.01	0.01
	(0.02)	(0.02)	(0.02)
Non-patrilocal residence	0.09***	0.04***	0.04*
	(0.02)	(0.02)	(0.03)
Ease of divorce	0.04***	0.01	0.01
	(0.01)	(0.01)	(0.01)
Matrilineal descent	-0.02	-0.02	-0.06***
	(0.03)	(0.02)	(0.02)
R^2	0.15	0.19	0.06
B.			
Ancestral female participation: agriculture	0.00	0.02**	0.03**
	(0.01)	(0.01)	(0.01)
Ancestral female participation:agriculture and pro	-0.01	-0.02	-0.00
	(0.02)	(0.02)	(0.02)
Social norms index	0.04***	0.01	-0.00
	(0.01)	(0.01)	(0.01)
R^2	0.14	0.19	0.06
C.			
Ancestral female participation: agriculture	0.01	0.02**	0.03**
	(0.01)	(0.01)	(0.01)
Ancestral female participation:agriculture and pro	-0.02	-0.02	-0.00
	(0.02)	(0.02)	(0.02)
R^2	0.14	0.19	0.06

Notes: In the three panels above, we regress mother's contemporary occupation (A) on all three women-favoring social norms, (B) on an additive index of three social norms, and (C) without social norms. The 3 dependent variables are contemporary women's working status, contemporary women working in agriculture, and contemporary women working outside agriculture for women aged 15-49. Coefficients for each explanatory variable of interest are reported in the rows. Standard errors are reported in parentheses and are clustered at ethnic group level. Sampling weights are applied. ***, ** , and * indicate significance at 1%, 5%, and 10% levels, respectively.For descriptions and definitions of variables see Table 2.4.

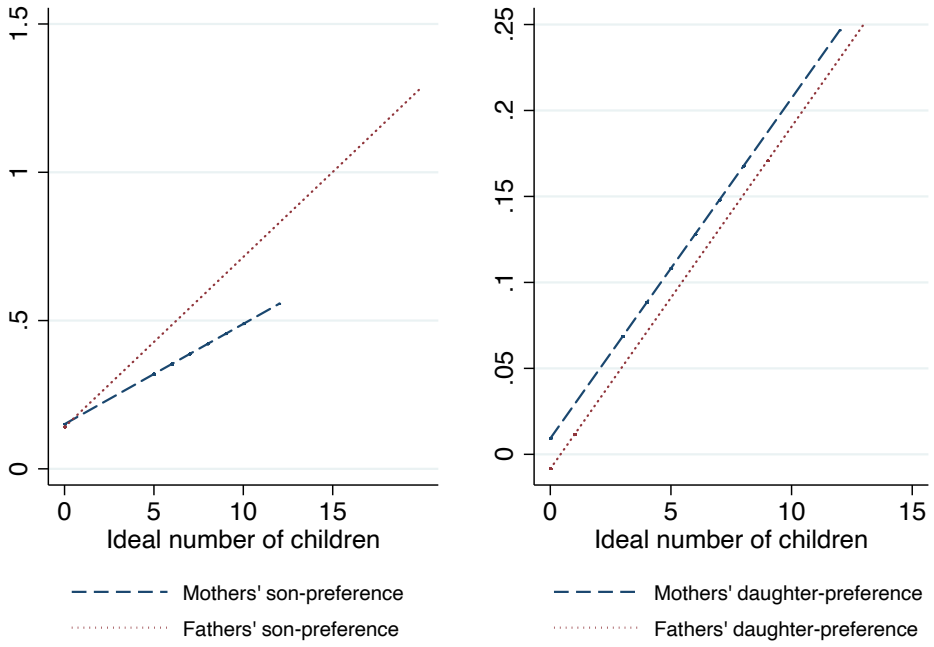
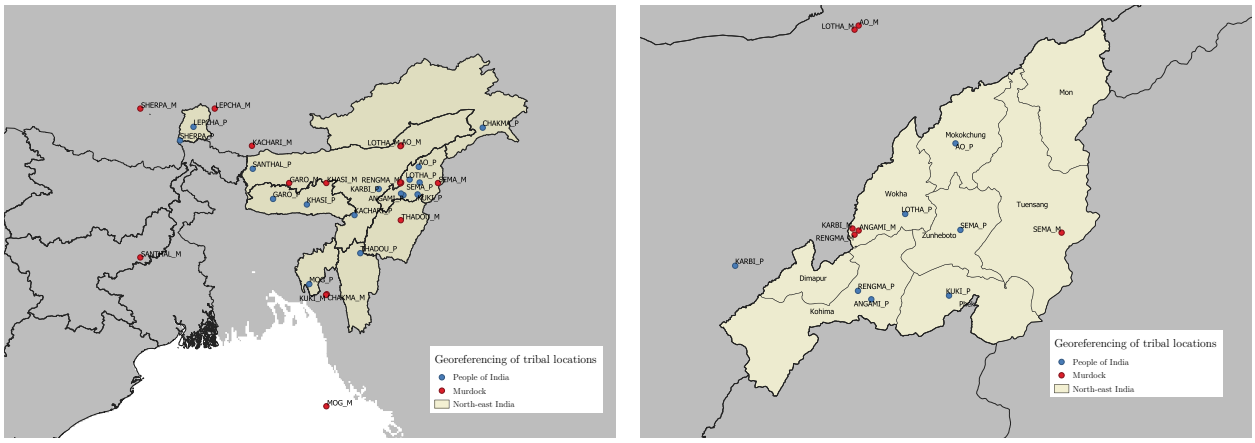
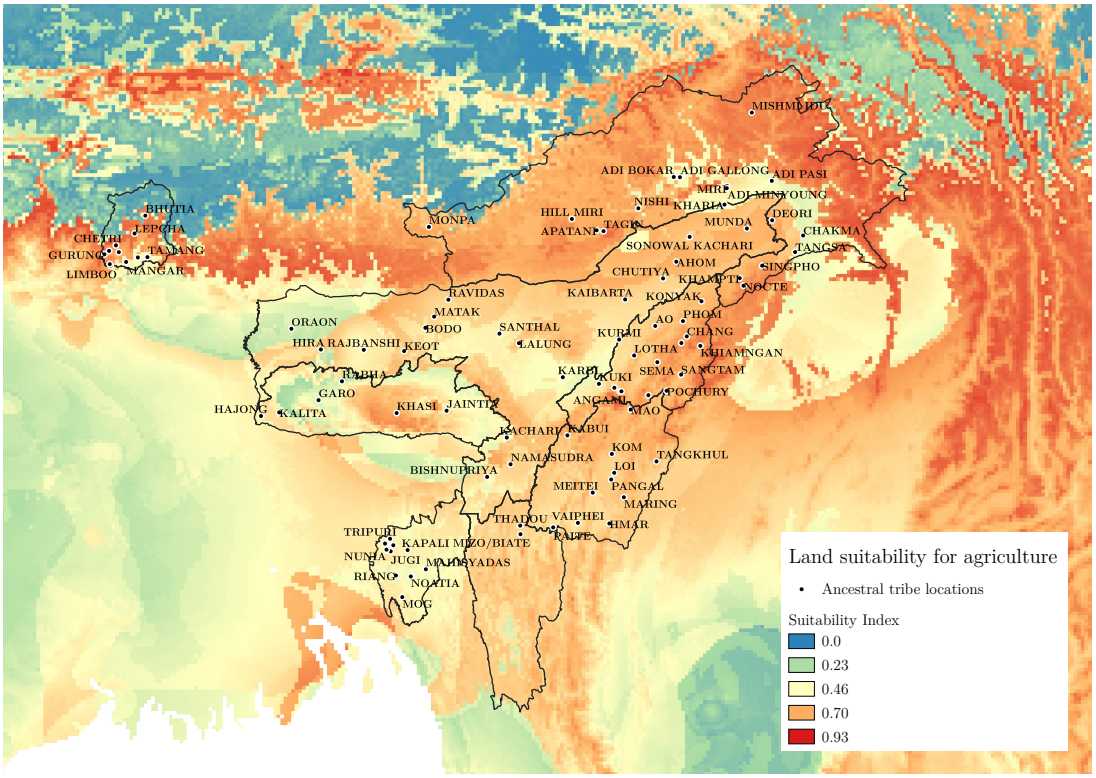


Figure 2.2: Son preference and daughter preference of women and men
Notes: A residualized measure following (Jayachandran, 2017b) is plotted on the vertical axis over the desired fertility on the horizontal axis. In the left-panel, I derive the residualized stated son-preference by regressing "wants more boys than girls" variable on the desired number of children, for both women and men. In the right panel, the residualized stated daughter-preference is plotted and derived by regressing "wants more girls than boys" variable on the desired number of children.

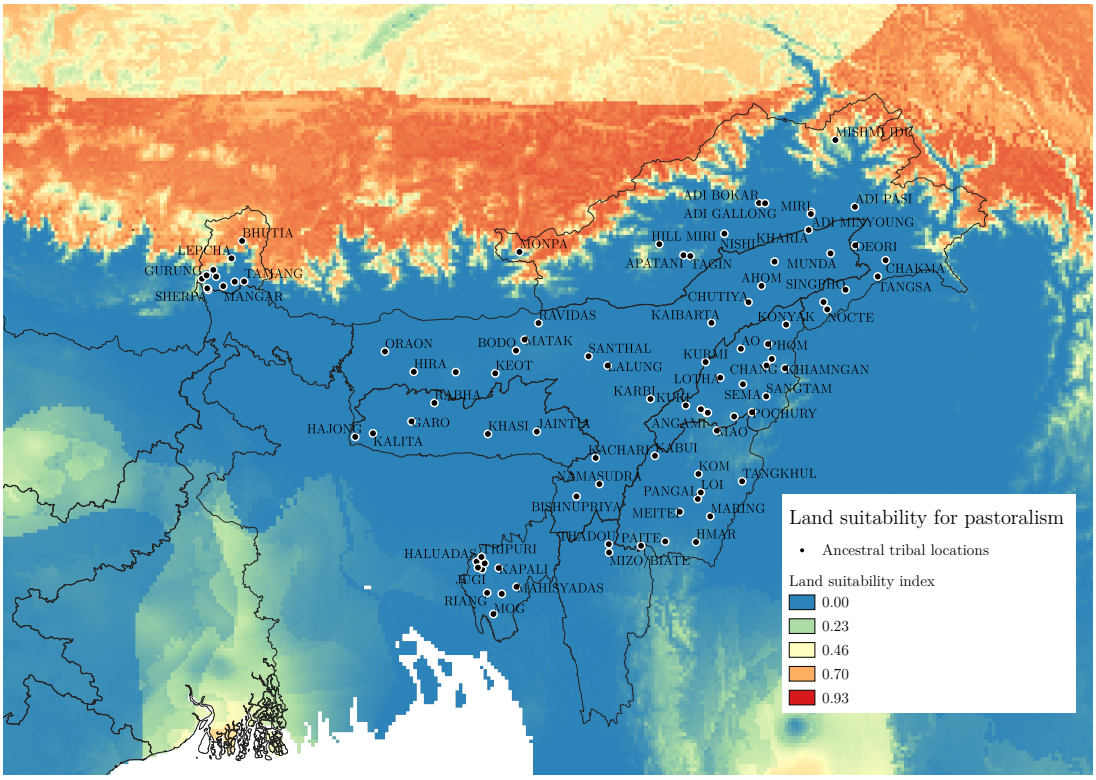


(a) *North East India* **(b)** *Nagaland*

Figure 2.3: Comparative geolocations of ethnic groups: Murdock and *People of India*
Source: Authors' comparative analysis of People of India and Murdock's ethnographic atlas.

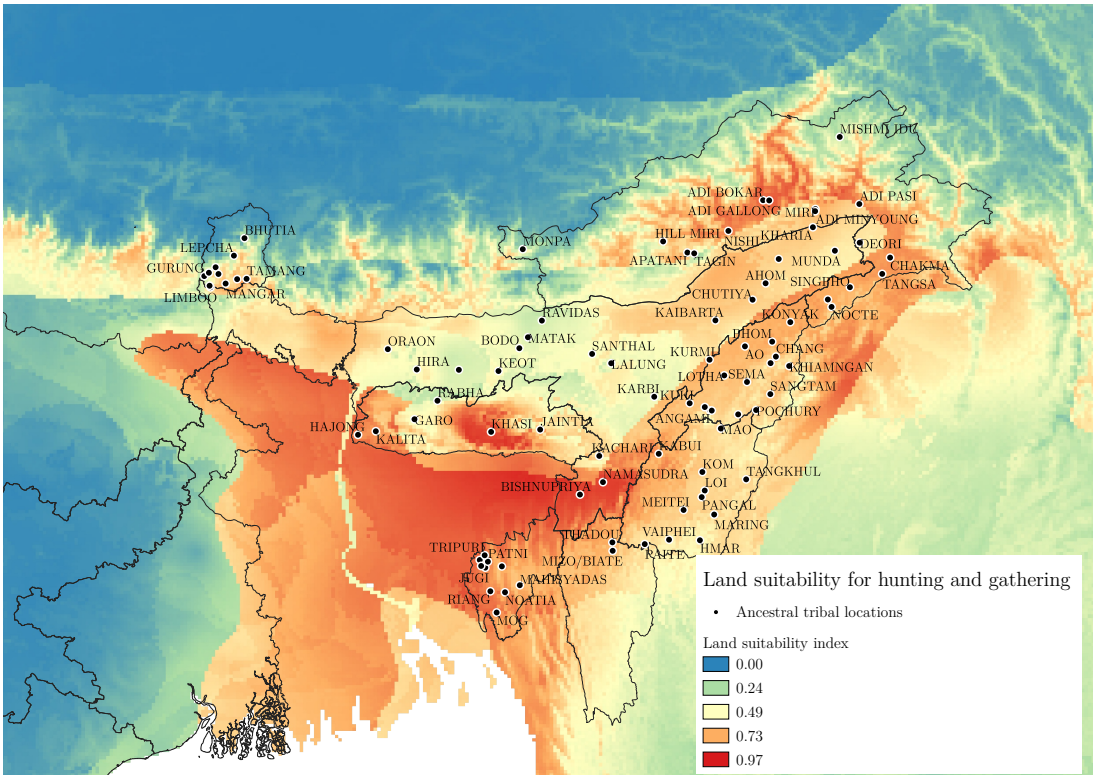


(a) *Agriculture*

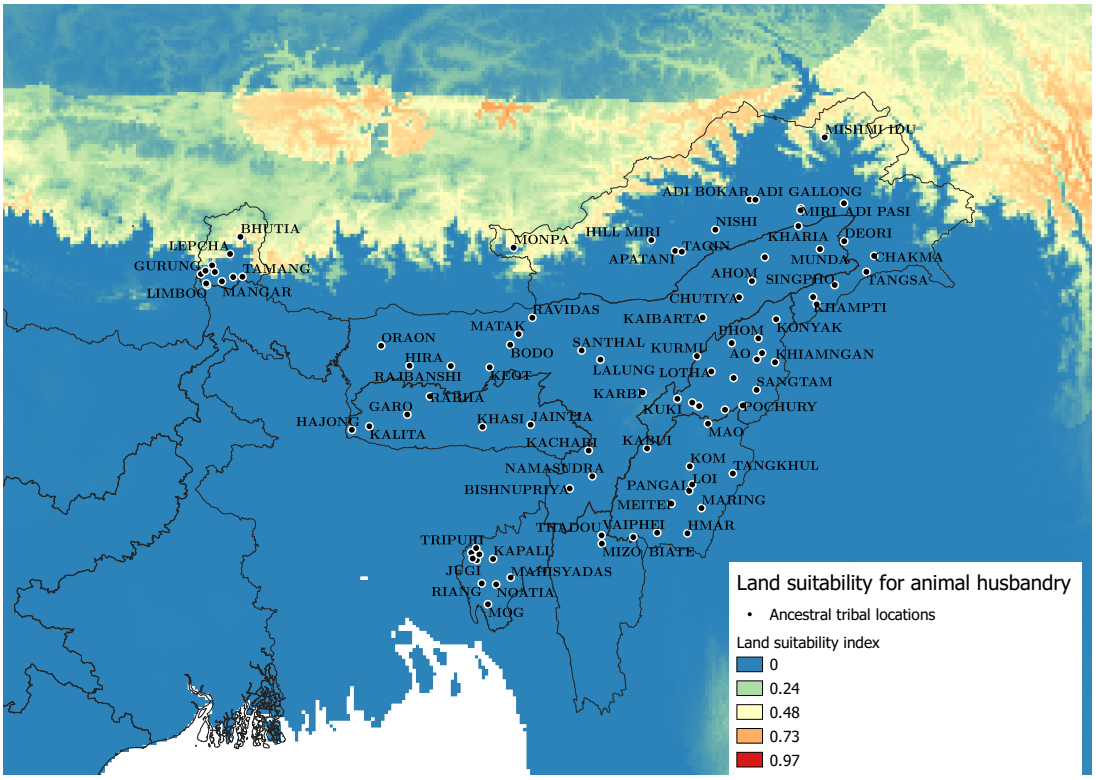


(b) *Pastoralism*

Figure 2.4: Land Suitability: Agriculture and Pastoralism
Source: Predicted land suitability data from Beck and Sieber's (2010) Ecological Niche Model

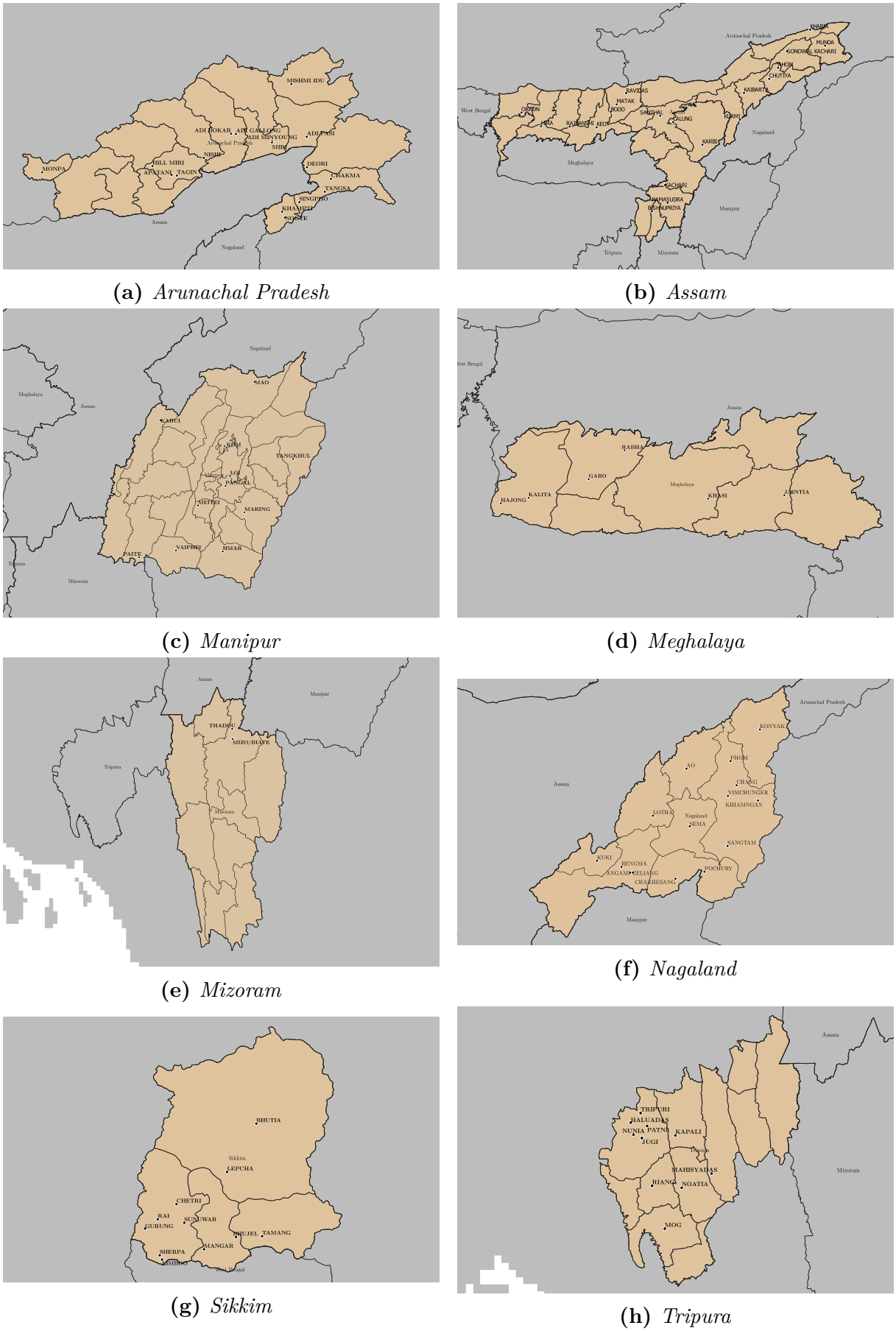


(a) *Hunting and Gathering*



(b) *Animal Husbandry*

Figure 2.5: Land Suitability: Hunting and Gathering and Animal Husbandry
Source: Predicted land suitability data from Beck and Sieber's (2010) Ecological Niche Model



(a) *Arunachal Pradesh* **(b)** *Assam*

(c) *Manipur* **(d)** *Meghalaya*

(e) *Mizoram* **(f)** *Nagaland*

(g) *Sikkim* **(h)** *Tripura*

Figure 2.6: Geolocations of ethnic groups
Source: Authors' analysis of People of India ethnographic atlas.

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