CASTE, KINSHIP AND SEX RATIOS IN INDIA

Tanika Chakraborty
Sukkoo Kim

ABSTRACT

This paper explores the relationship between kinship institutions and sex ratios in India at the turn of the twentieth century. Since kinship rules varied by caste, language, religion and region, we construct sex-ratios by these categories at the district-level using data from the 1901 Census of India for Punjab (North), Bengal (East) and Madras (South). We find that the female to male sex ratio varied inversely by caste-rank, rose as one moved from the North to the East and then to the South, was lower for Hindus than Muslims, and was lower for the northern Indo-Aryan rather than the southern Dravidian speaking peoples. We also find that the female deficit was greater in wheat growing regions and in areas with higher rainfall and alluvial soil. We argue that these systematic patterns in the data are largely explained by variations in the institution of family, kinship and inheritance.

Tanika Chakraborty
Department of Economics
Washington University
One Brookings Drive
St. Louis, MO 63130-4899
tchakrab@artsci.wustl.edu

Sukkoo Kim
Department of Economics
Washington University
One Brookings Drive
St. Louis, MO 63130-4899
and NBER
soks@artsci.wustl.edu

I. Introduction

Ever since Sen (1990) proclaimed that more than 100 million women are missing around the world, the case of "missing women" has generated considerable interest. In contrast to Europe and North America where the sex ratio (defined here as the ratio of female to male population) is around 1.05 or higher, the ratio in many Asian countries, such as in India, China, Taiwan, Hong Kong and South Korea, is as low as 0.94.[1] In many of these countries, the sex ratios seem to have fallen over the second half of the twentieth century with development, declining family size and the advent of modern technologies which facilitate self-selective abortion or sex-selection (Park and Cho (1995)).

In India and probably elsewhere in Asia, however, the case of "missing women" has deep historical roots. While it is difficult to identify when the problem of "missing women" first arose in India, British officials were well aware of the problem in North India during the mid-nineteenth century.[2] More reliable evidence from the British censuses conducted during the late nineteenth century show that the problem of "missing women" was clearly a northern rather than a southern or an eastern problem in India. The female to male sex ratio was lowest in northern regions such as Punjab, equal in eastern regions such as Bengal, but was relatively high and favored women in southern regions such as Madras (Visaria (1961), Dyson and Moore (1987)).

---

1 Sex ratio is determined by biological as well as economic and cultural factors. From a biological perspective, scholars generally believe that biology favors the births of males, but the subject is under considerable debate. After birth, because females possess biological advantages in resisting disease, they are more likely to survive than males given equal levels of nutrition and health care. Thus, for any cohort, sex ratios at birth favor males, but favor females over time. Because Europe and North America seem to follow this pattern, scholars tend to treat the trends in sex ratios in these places as largely determined by biological factors. In many parts of Asia, however, where the male sex-bias is prevalent, biological factors are likely to play a minor role in explaining sex ratios. It its beyond the scope of this paper to summarize the large emerging literature on sex ratios, but we refer the reader to Norberg (2005), Qian (2006), Oster (2005), Kishore (1993), Murthi et. al (1995), Dyson and Moore (1983), among others.
2 In North India, the British officials suspected that the Rajputs were practicing female infanticide during the mid-nineteenth century (Parry (1979), Miller (1981)). In 1852, data show that among some of the highest royal clans, the sex ratios of girls to boys ranged from as low as 0.22 to 0.40 (Parry (1979, 216)).

Although the regional differences in sex ratios has narrowed between the northern and southern regions over the twentieth century, the narrowing is largely due to the convergence of southern sex ratios toward the northern figures. For all of India, the overall sex ratio has fallen from 0.972 to 0.933 between 1901 and 2001. Over this period, however, the sex ratio in the historically most masculine Punjab region in the North remained significantly lower than the national average as it ranged from a low of 0.780 to a high of 0.882. While some regions in the South such as Kerala continue to exhibit a significant feminine bias, the figure in Tamil Nadu converged toward those of the North as it went from 1.044 to 0.986 over the twentieth century.

Because the problem of "missing women" in India has existed for more than a century and a half and is an endemic and persistent feature of Indian society, there are strong reasons to believe that the causes of "missing women" are both historically determined and slow-moving. For many scholars, the family and kinship systems, which often determine the rights of women in traditional societies, are the most likely factors for the historically persistent pattern of "missing women" in India. In a well cited paper, Dyson and Moore (1987) argue that northern kinship system based on village exogamy led to lower autonomy of women, lower age at marriage, higher fertility, higher childhood female mortality and lower sex ratios.[3] By contrast,

---

3 Dyson and Moore (1987) argue that in North India, village female exogamy, male household cooperation, male only property inheritance, marriage based on inter-group alliance and low parental benefit from daughters all conspired for poor treatment of girls and women. Indeed, the reduced autonomy of women under the North Indian kinship system has been a persistent theme in the Indian anthropological literature (see Mandelbaum (1970)). Argarwal (1994) explores the importance of kinship and inheritance systems on the autonomy of women in India. She finds that female autonomy, sexual freedom, ownership rights in land were all closely correlated with kinship and inheritance systems where women's rights were stronger. For the post-independence period, Kishore (1993) finds that patrilocal exogamy, measured by the marriage distance of women, is positively correlated with female to male child mortality ratio. Since identifying the causal kinship factors is extremely challenging, Foster and Rosenzweig (2001) attempt to identify the importance of patrilocal exogamy on sex ratios by using India's green revolution as an exogenous technological shock. Since sons contribute to parental incomes and daughters do not, local advances in agricultural productivity are likely to favor boys; however, they also show that in a general equilibrium framework with a marriage market, a productivity increase may also improve the chances of girls as returns to human capital of women increases. Finally, Das Gupta et. al (2003) argue that the commonalities in the kinship systems in India, China and Korea help explain the persistence of low sex ratios in these countries.

the southern kinship system based on cross-cousin marriages increased the autonomy of women and contributed to sex ratios which favored females rather than males.

In this paper, we delve more deeply into the relationship between kinship and sex ratios in India by studying sex ratios by caste, language, religion and region at the turn of the twentieth century.[4] From a kinship perspective, the examination of data by caste is essential since castes at the jati-level were endogamous and because kinship behavior was enforced along caste lines.[5] As the castes were further distinguished by social hierarchy, occupation and income, data by castes also provide useful information on whether kinship behavior varied by status and income. We also explore sex ratios by language and religion since marriage and kinship relationships are likely to differ across peoples who speak different languages and practice different religions. Language not only facilitates communication, but it often codifies norms of kinship behavior.[6] Religious institutions also imposed strong restrictions on kinship and inheritance rules. Finally, since regions possess different factor endowments, economic structures and political institutions, marriage and kinship behavior may differ by geography.

---

4 Miller (1981) represents one of the few studies which examine the link between caste and sex ratios. She argued that upper castes were likely to have lower sex ratios based on their history of female infanticide and the pressures on property-holding families to bear sons as heirs. Based on the examination of 12 major castes in the United Provinces and Madras at the aggregate provincial level in 1931, she found three patterns of juvenile sex ratios: northern propertied castes had extreme masculinity, southern propertied castes exhibited equality or feminity, and that all-India unpropertied castes exhibited masculine sex ratios. However, she does not explore the link between caste and kinship systems.

5 Blunt (1931, p.48): "Caste endogamy is absolutely rigid and immutable, permitting no open evasion. Sometimes even high castes are compelled by a lack of women to make a practice of taking low castes as wives: but in such cases both the husband and his caste connive at their own deception, and if they are willing to ignore custom, are very unwilling to be generally known."

6 For American anthropologists such as Morgan (1871) and Kroeber (1909), language reveals the nature of social and kinship organization. In the South where cross-cousin marriage is practiced, Trautman (1993, p.80-81) writes: the "Tamil [word] *māman* is mother's brother, father's sister's husband, and spouse's father, a geneological relationships which are equated by a presumption that every marriage is between cross-cousins... The Indo-Aryan [northern] scheme could not be more different. Hindi *māma*, almost certainly a cognate of the Tamil word, also means mother's brother, but Hindi has quite separate terms for father's sister's husband (*phūphā*) and spouse's father (*sasur*), and the remaining contents of this generation are differently ordered than in the Tamil... [T]he rules of marriage, the Indo-Aryan system frames these in terms of a notion of proximity, a kind of law of prohibited degrees rather like our onw: near kinsmen may not marry. In Dravidian, on the other hand, it is not proximity but kind of relationship which constrains marriageability."

We construct our data from the 1901 Census of India for the provinces of Punjab (North), Bengal (East) and Madras (South). Using detailed sub-caste or jati-level data for each province at the district level, we find that sex ratios differed significantly by caste, language and region. The most significant feature of the data is the variation in sex ratio by regions. Figure 2 shows the distribution of sex ratio across the provinces of India in 1901. It bears out the North-South disparity in sex ratio. The sex ratio was the lowest in the North followed by the East and then the South where the sex ratio favored females. Figure 3 shows the sex ratio distribution across the districts of our study area. This regional pattern was extremely robust. The pattern was observed when we control for district fixed-effects and when we control for differences in caste composition. In addition, even for each caste, language and religious categories, the same regional pattern emerged.

The data also show that sex ratios varied systematically by caste, language and religion. Sex-ratios varied inversely by caste rank. In each region, the higher religious or landowning castes possessed the lowest sex ratios whereas the lower artisan and menial service castes had the highest sex ratios. Sex ratios were lower among those who spoke the northern Indo-Aryan languages as compared to those who spoke the southern Dravidian language. Even when we control for geography, there seems to be systematic variations across groups who speak different languages. The data show that sex ratios varied by religion. The Hindus had significantly lower sex ratios than Muslims in Punjab and Bengal, but not in Madras where the Muslim population was extremely small. Sex ratios were significantly lower in districts with higher rainfall and greater amounts of alluvial soil. While the length of British rule is negatively correlated with sex ratios, the relationship was not statistically significant.

We argue that the examination of sex ratios by caste, language, religion and region generally confirm the view that kinship systems played an important role in determining sex ratios in India. Regional differences in family and kinship institutions were the most important factor. The sex ratio was lowest in the North where the kinship system provided the least autonomy of women, intermediate in the East where the northern kinship was slightly modified, and was the highest in the South where the women's autonomy was thought to have been the strongest. The inverse relationship between sex ratios and caste rank also suggest the importance of kinship. Women's autonomy was significantly lower for the higher as compared the lower caste women. The former were not allowed to work outside of the home, not allowed to initiate divorce, and their sexual and social behavior were highly regulated by the kin-group. Finally, the variations in sex ratios by language and religion strongly suggest that northern kinship system contributed significantly to lower sex ratios in India.

This paper is organized as follows. In section II, we present our theoretical framework for studying the relationship between family and kinship institutions and sex ratios. In section III, we examine the relationship between kinship institutions and gender bargaining power in India In section IV, we examine the empirical link between kinship and sex ratio by constructing data on sex ratios by caste, religion, language and region in India. Since the data on sex ratio by caste are assembled at the district-level, we can also control for district fixed-effects. In section V, we explore the origins of the regional divergence of family and kinship institutions in India. In section VI, we conclude with a short summary.

II. A Framework for Studying Kinship Institutions and Sex-Ratios

Pre-modern India can be usefully characterized as a "natural state." In a natural state, as defined by North et. al (2006), the political elites form alliances with economic elites to create rents by limiting economic entry and then use those rents to stablize the political system to limit violence and provide order.[7] In India and elsewhere, the elites, in addition to their economic and military resources, used religious and kinship institutions to establish informal norms and beliefs to define property rights and resolve problems of cooperation and conflict (Greif (2004)). Because the formal bureaucratic organization of the elites was relatively limited in India, the informal institution of religion, caste, and kinship played a paramount role in the lives of local peasants.

Importantly, the family and kinship institutions possessed significant distributional consequences for different members of society, especially between men and women (Stone (1998)). In Europe, a kinship system based on bilineal descent, nuclear family and an inheritance system which gave women the right to inherit property contributed to a relatively strong autonomy of women. In many parts of Asia, however, a kinship system based on patrilineal descent, the importance of joint family, inability of women to inherit property, restrictions on widow remarriage, and severe restrictions on women's sexual behavior and general conduct all contributed to a relatively weak autonomy of women. Because the distribution of family resources between the sexes depends on the bargaining power of men and women within marriage and kin-group, the kinship systems are likely to influence sex ratios.

---

7 In India, the political elites, the Royals, the Mughals, and even the British, formed alliances with local landowning elites. In return for land taxes from landowners, the political elites provided order and stability. However, India was characterized by many "natural states." Since the levels of military and bureacratic powers of the political elites varied considerably over time and across space, natural states varied in their geographic scope and in their nature of alliances between the political and economic elites. While India under British rule became more centralized over time, India at the turn of the twentieth century was very much organized as a natural state (Kapur and Kim (2006)).

We motivate our analysis on kinship and sex ratios using Lundberg and Pollak's (1993) separate spheres family bargaining model. In this marriage model, the preferences of husband, h, and the wife, w, are represented by $U_h(x_h, q_1, q_2)$ and $U_w(x_2, q_1, q_2)$ where x_h and x_w are private goods and q_1 and q_2 are public goods. The demands for private and public goods are derived by maximizing the Nash social welfare function: $N = (U_h - T_h)(U_w - T_w)$ where T_h and T_w are husband and wife's respective threat points. As is well known, the distribution of resources between the spouses depends upon the threat point, T_h and T_w (see Figure 1).

Unlike the divorce-threat bargaining model (Manser and Brown (1980) and McElroy and Horney (1981)), where the threat point is determined by outside marriage opportunities after divorce, the threat point in the spheres bargaining model is internal to the marriage. In the spheres model, traditional social norms specify division of labor by gender so that public good q_1 falls on husband's traditional sphere whereas public good q_2 falls on wife's sphere. The threat points T_h and T_w are then determined by a non-cooperative Cournot model where the husband chooses x_h and q_1 given q_2 chosen by the wife and where the wife chooses x_w and q_2 given q_1 chosen by the husband. Since divorce was highly restricted in India, an important implication of the spheres model for our paper is that the bargaining power within marriage is determined by who controls the resources within marriage rather than by the spousal incomes after divorce.

In the next section, we argue that kinships systems, by determining the gender threat points within and outside of marriage, significantly influence the distribution of resources between husbands and wives and more generally between males and females within households and kin groups. We further argue that female bargaining power is likely to be highly correlated

with family resources devoted to female members of the family and are likely to significantly impact health, nutrition and mortality of females.[8]

III. Kinship Institutions, Family Bargaining and Gender Threat Points

By placing restrictions on marriageable partners, rules of descent, and rules of residence, the kinship systems define the nature of the bargaining power among different family, kin-group and endogamous members. Numerous scholars believe that these traditional institutions of kinship play a major role in determining the bargaining power of women (Miller (1981), Agarwal (1994, 1997), Folbre (1997) and others). Table 1 presents the proposed relationship between kinship and womens' bargaining power.

Anthropologists believe that the bargaining power of women is lower in patrilineal, patrilocal as compared to matrilineal, matrilocal societies.[9] In patrilineal society, since consanguine women cannot reproduce the lineage, they are less valuable as allies; however, in matrilineal societies, since sisters reproduce lineages, they are likely to form strong bonds.[10] Women's bargaining power is also likely to be lower in patrilocal rather than in matrilocal societies. When residence is patrilocal, women tend to live further away from their natal homes and have less support of her natal family as compared to when residence is matrilocal.[11]

---

8 See Thomas (1990, 1995), Hoddinott and Haddad (1995) and Lundberg, Pollak, and Wales (1997).
9 In anthropology, there are two major themes: descent and alliance (Fox (1967)). The descent perspective, identified with the British school of social anthropology, sees kinship as the primary mechanism for recruiting property-owning, residential and political groups. The alliance perspective, identified with Claude Levy-Strauss, emphasizes the role of alliance formation through the trade and distribution of women. The bargaining power of family members are likely to be influenced by the restrictions on the alliance formation within and across families and kin-groups as defined by different kinship systems. Also see Stone (1997).
10 Thus, according to Fox (1967), the essence of the patrilineal society is to 'gain control over the wife,' whereas for the matrilineal society, it is to 'hang onto sisters.' In patrilineal systems, men attempt to gain rights over sexual, domestic and reproductive services of the wife; in matrilineal systems, men do not have an incentive to do so since they cannot control lineage reproduction.
11 Most patrilineal societies are patrilocal, but there seems to be a greater residence variation for matrilineal societies. In the latter societies, Fox (1967) argues that women's bargaining power is higher in matrilocal as compared to avunculocal societies where the married couple resides with the man's mother's eldest brother. The

Women's bargaining position seems to be better in societies where cross-cousin marriages are allowed as compared to societies which restrict marriages to non-kins. Since women marry into familiar kin-networks rather than to strange families, they are likely to have more allies. Women's property rights seem to be positively correlated with marriages where women are in close physical proximity to their natal home which is often the case in cross-cousin marriages (Agarwal (1994)). In addition, in cross-cousin marriages, due to the double-descent system, family property always remains within the kin group even if women are granted rights to property as the joint family property is not threatened to devolve with marriage.

Kinship Organization in India

In India, kinship organization and female autonomy varied by caste, language, religion and region (Karve (1953)). While scholars continue to debate as to why the institution of caste arose and persisted over time, the caste, with few exceptions, was an endogamous group whose members were often related to each other by ties of blood or marriage.[12] Within any given locality, endogamous caste leaders or caste assemblies enforced the family, marriage and kinship norms.[13] In an agricultural village economy where land was important, the higher castes owned much of the land whereas the lower castes were artisans, agricultural laborers, and service providers. The kinship ideals are held by all groups, but have more influence among the higher

---

alliance group in matrilocal societies is mother-daughter-sister whereas in the avunculocal societies, it is brother-sister-nephew.

12 According to Lal (2005), the caste system arose in India around the end of the sixth century because it provided an enduring political and economic solution for the Aryans who migrated and settled in the Indo-Gangetic plains. Because the Aryans faced abundant land but shortage of labor, the caste system provided a method of incorporating native tribes as agricultural laborers. Most importantly, it was a decentralized system of control based on local enforcement through the endogamous castes. More recently, Freitas (2006) argues that the caste system persisted because it facilitated trade in services as it lowered the costs of sharing information and enforcing service contracts. Castes may also persist because they provide mutual social insurance (Munshi and Rosenzweig (2005)).

13 Dasgupta (1986), in his study of the lower caste bagdies of villages in Bengal, report that caste councils dealt with various offenses including marriages and sexual relationships which deviated from kinship norms. While caste kinship rules are not entirely rigid, deviants are punished either through fines or ex-communication. Of the 560 marriages for which data were collected in 1960-1961, only 23 deviated from kinship norms.

castes (Mandelbaum (1970)).[14] In addition, a woman's bargaining position within a family or

kin-group is thought to have been higher among the lower rather than the higher castes.[15]

The fact that parents had significantly greater bargaining power over their children in

India also contributed to the lower bargaining power of women. Throughout most of India, a

woman's social status and identity was significantly correlated with marriage and most marriages

were arranged by parents. Forced, arranged marriages generally lowered the bargaining power of

women relative to parents and extended kin-group (Mathur (2007)). In addition, the extremely

low age of Indian women at marriage, which ranged from 11.4 to 15.3 in 1901 (Agarwala

(1951)), also contributed to their lower bargaining power.

From a regional perspective, scholars believe that the most distinctive difference in

kinship organization was between North and South India (Karve (1953), Dyson and Moore

(1987)).[16] Because the northern system was patrilineal and patrilocal whereas the southern

system was based on cross-cousin marriages, scholars generally believe that women's autonomy

was significantly lower in the North than in the South. In addition, a woman's position was

further compromised in the North by the gotra-system (or the marriage avoidance with sapinda-

14 Kolenda (1987) investigates the variations in the prevalence of joint-families by caste and region. She finds that
the share of familes organized as joint families is positively correlated with the prohibition of legal divorce initiated
by the wife, the dowry system, control of land and resources by patrileages as well as few other factors. In general,
these factors are negatively correlated with caste rank so that the prevalence of joint families are least observed
among the lowest caste groups.
15 Gough (1956) argues that in a Tamil village in Tanjore, the women of the low castes, especially the adi dravidas,
were almost equal to men. Unlike the local Brahmans, their patrilineal group is very shallow, residence is not strictly
patrilocal, women are economically independent, receive bridewealth at marriage, and break the authority of the
fathers shortly after puberty. In these low caste families, rank is underplayed, there is equivalence of brothers since
they do not fight for inheritance and women are not cut-off from their natal families and the residence unit is more
likely to be an elementary- rather than a joint-family. By contrast, the Brahman women could not initiate divorce
and could not work outside of the home. Also see (Kolenda (1987), Mandelbaum (1970), Miller (1981)).
16 In her important study, Karve (1953) identified four regional systems - northern, central, eastern and southern -
which overlapped with the dominant languages in these regions - Indo-Aryan (north and central), Austro-Asiatic
(east) and Dravidian (south and central). The most distinctive difference in kinship organization ocurred between
north and south as close-kin marriages were forbidden in the former but allowed in the latter. Yet, despite this
significant difference, scholars such as Dumont (1983) and Trautmann (1981) see many structural similarities
between the northern and southern kinship systems (Uberoi (1993)). The central region exhibited a mixture of
northern and southern systems whereas the less important eastern system was identified with tribal peoples such as
the Mundari.

kin), hypergamy, early arranged marriages, village exogamy, restrictions on daughters marrying into same villages, levirate, restrictions on widow remarriage, importance of joint family, the strict restrictions on the behavior and movement of women, and the severance of relationship between the women and her natal family.[17]

The southern kinship system varied more considerably. While most societies were patrilineal and patrilocal, some such as the Nayars in Kerala were matrilineal and matrilocal. However, the prevalence of close-kin marriages significantly increased the autonomy of women in the South. For large numbers of castes, a man's marriage preference was as follows: first, his elder sister's daughter; second, his father's sister's daughter; and third, his mother's brother's daughter. However, there was a general taboo against marriage with a man's mother's sister's daughter or a man's younger sister's daughter. Marriage between close-kin narrowed the circle of kin-groups and married women lived near their natal families and continued to have close relationships with them after marriage. While levirate was prohibited, widow remarriage, except for the Brahmins, was allowed.

The regional differences in inheritance practices also provided lower access to property for women in the North than in the East and the South (Agarwal (1994)).[18] In North India, according to the customary Hindu inheritance laws found in the ancient legal treatises, the

17 In the North, high castes in good position are bound by the rule of Sapinda which prohibits marriage of two persons who have a common ancestor not more than 6 degrees removed on the male side or 4 degrees removed on the female side. Since relatives were likely to be in closer proximity, the Sapinda rule increased the distance of marriage for brides. For lower castes, the rules were less restrictive and followed the avuncular rule which prohibits unions of paternal and maternal uncle and aunt. It bars marriages between any first-cousins or between a woman and any descendant of any of her first cousins (Blunt (1931, p.60)). Also see Miller (1954) and Gould (1960) for discussion and evidence of marriage distances of high and low castes.
18 Kolenda (1987) argues that the regional variations in inheritance laws had a significant impact on when joint families dis-integrated. In the South, the break-up occurs when sons, shortly after marriage, seek their shares of land and establish separate nuclear families; in the East, the break-up occurs upon the marriage of brothers or upon the father's death; in the North, however, the joint family of brothers tended to be much more stable. Thus, the existence and stability of the joint family was the strongest among the northern Rajputs, Thakurs and the Jats. For empirical analysis on joint family structure and household partitions, see Caldwell, Reddy and Caldwell (1984), Khuda (1985) and Foster (1993).

Dhamashastras and their commentaries, except for the succession of kings, inheritance was multigeniture rather than primogeniture.[19] Under the Mitakshara legal doctrine which held sway in most of this region, sons became equal co-parceners of the joint family or ancestral property (as opposed to self-acquired individual property) at birth whereas daughters were only entitled to maintenance and marriage expenses.

In the East, however, under Dayabhaga law adopted in Bengal and Assam, sons did not acquire rights to property by birth but only at the death of the father. As a result, fathers possessed significant bargaining power over their children as he could control the size and share of property obtained by sons.[20] For women, their rights to property were slightly more favorable under Dayabhaga as a chaste widow in the absence of sons inherited the rights to manage the property although she was not given the rights to alienate it. While property rights of women were limited throughout most of India including the South, there were at least three regions in South India where pockets of communities practiced matrilineal and bilateral inheritance.[21]

While some scholars such as Goody (1973), Tambiah (1973) and Botticini and Siow (1993) interpret dowries as a form of pre-mortem inheritance for women, Agarwal (1994) argues that only a handful of groups in South India practiced dowry in this form. Miller (1981), based on a survey of ethnographic evidence, finds that while dowry was practiced throughout India, its practice was more prevalent in the North and among the propertied classes. In addition, in the North, Agarwal (1994) writes that the dowry was transferred to the groom's parents whereas in the South, it remained the property of the wife.

---

19 The two legal treatises are based on the Yajnavalkya-smrti. The Mitaksara, written by Vajnanesvara around the 11th century is an elaborate commentary on Yajnavalkya-smrti; however, the Dayabhaga was written sometime after the 11th century by Jimutavahana.

20 The doctrine of customary right of property by birth limited the father's power over property. Jimutavahana favored smrti-texts which gave sole property rights to the father (Sontheimer (1977)).

21 In South India, Nangudi Vellalars of Tamil Nadu practiced bilateral inheritance and several groups including the Nayars and Tiyyars of Kerala, and the Mappilas of north Kerala practiced matrilineal inheritance. In Northeast India, the Garos, Kahsis and the Lalungs also practiced matrilineal descent (Agarwal (1984)).

Finally, there were significant differences in kinship and inheritance rules between the Hindus and Muslims in India. The Muslim kinship system shared similarities with the southern Dravidian system in that close cousin marriages were preferred and women were allowed to inherit property.[22] However, male-biased social hierarchy also existed in Muslim families as a son inherited twice as much a daughter, a brother twice as much as a sister, and a husband twice as much as a wife (Nasir and Kalla (2006)).

IV. Empirical Evidence on Kinship and Sex-Ratios in India

This section presents the empirical evidence on sex-ratios by caste, religion, language and regions for three British India provinces - Punjab, Bengal and Madras - using the data from the 1901 Census of India. While the British collected data on castes in the earlier censuses of 1865, 1872 and 1881, the caste definitions were based on the four-fold Varna categorization of Brahmans, Kshatriyas, Vaishyas and Sudras.[23] In 1891, however, due to the influence of Nesfield (1885), Ibbetson (1881) and others, census officials collected detailed caste data by occupations.[24] The 'jati' sub-caste definitions used between 1891 and 1931 are useful for our study because a 'jati' is endogamous. Bayly (1999) also notes that the counting of women was a great novelty in India and that it was not until 1872 when women were included as members of individual castes by the compilers of local population districts.

We construct data at the district-level for each of the three provinces. Since data on population by caste, language and religion are available only for the aggregate female and male

22 Bittle (2002) reports that 23% of Muslims in India practiced consanguineous marriages in 1992-1993. For other religious groups, the figures were 17.1% for Buddhists, 10.6% for Hindus, 10.3% for Christians, 4.3% for Jains, and 1.5% for Sikhs.
23 Census procedure for collecting data on caste changed from decade to decade. In 1881, the census enumerators were instructed to collect data for 207 castes for whose populations were 100,000 or more. Castes were organized under the varna classfication, but were also grouped into various occupations.
24 Two important views of castes emerged in India. Risley (1892) and Thurston (1909) held a racial view whereas Crooke (1896), Ibbetson (1916), Logan (1887), and Blunt (1931) held an occupational view.

persons rather than by different age-groups, we construct sex ratios by dividing the former by the

latter. Using the anthropological documents of the British Census we categorize the numerous

sub-castes into broad social or occupational categories: religious, landowner, cultivator,

professional, trader, artisans (and service), agricultural laborer, and unknown (see Appendix I for

detailed classification).[25] Similarly, using the 1901 Census reports and various other sources we

classify the different languages into the following categories: Aryan (North, East, South),

Dravidian, Munda, Tibetan, Pahari (North, East), Tribal (North, East, South), foreign and

unknown (see Appendix II). For religion, we examine sex ratios by Hindus and Muslims as the

other religious categories were sufficiently small.

Since sex ratio is measured using the aggregate population figures for females and males,

this figure can be influenced by a variety of factors. Visaria (1961) presents a detailed

investigation of the causes of variations in sex ratios found in the Censuses of India between

1901 and 1941. Based on a rich array of direct and indirect evidence, Visaria concludes the root

cause of low female to male sex ratio is most likely due to female disadvantage in mortality after

birth.[26] While the data on age-specific death rates indicate that female disadvantage is

concentrated between the ages of 15-40, the data also show that the regional differences in

---

25 For Punjab, we follow Ibbetson (1916); for Bengal, Risley (1892); for Madras, Thurston (1909).
26 Visaria (1961) systematically investigates the various potential determinants of the aggregate population sex
ratios including the omission of females from the censuses, migration, differentials in sex ratios at birth, and
differentials in sex ratios after birth. First, based on special censuses conducted in regions where reported sex ratio
was particularly low, there is considerable evidence that the sex ratio is not caused by under-reporting of females.
Second, given that internal migration in India was extremely low, migration is unlikely to significantly affect
aggregate population sex ratios. For example, in Punjab, in-migration from villages of the same district constituted
only 2.8% of total population whereas in-migration from other districts constituted a mere 0.05%. Moreover,
migration was evenly distributed between female and male migration (see Report on Census of India 1901, Punjab).
Third, while birth registration data seem to suggest that there are significant variations in sex ratios at birth, Visaria
concludes that these differences are likely caused by biases in registration rather than in actual births. In particular,
in maculine biased regions, births of girls are likely to be under-reported. When sex ratios are calculated using live
birth records from hospital centers, the regional variation in sex ratios diminish considerably. Finally, at least for
Punjab, there seems to be reliable evidence that female disadvantage in mortality is experienced throughout the
entire lifespan. While it is difficult to determine the exact causes of excess female mortality, Visaria considers the
effects of childbearing, famines and diseases such as tuberculosis.

female/male mortality is concentrated in the early ages between 0-15. In Appendix I, we also examine the sex ratios by different age-cohorts for the three provinces under our study.

Table 2 presents the general population descriptive statistics for the three provinces. The average district population was around 0.4 million in Punjab, 1.4 million in Madras, and 1.5 million in Bengal.[27] Population density was highest in Bengal with 413 people per square mile, followed by Madras, 270, and Punjab, 179. In terms of the religious diversity, Punjab's population was composed of 42% Hindus and 50% Muslims whereas the figures for Bengal were 63% and 33%, respectively, and for Madras was 89% and 6%, respectively.[28] In terms of caste and language, however, the data show that Punjab was culturally more homogenous than the other two regions. Punjab had significantly fewer languages and caste groups than Bengal and Madras. Although Bengal had a much larger number of castes, it is likely that Madras was culturally more varied as a region, its people spoke 75 different languages as compared to 45 for Bengal. However, within any given district, the average number of different languages spoken was slightly higher for Bengal than for Madras.

As noted by numerous writers, India was a land of agricultural villages. In 1901, there were 32,663 villages in Punjab, 203,476 villages in Bengal and 54,605 villages in Madras, and each village contained about 622, 367 and 706 persons, respectively (Table 2). While village-level data on caste are unavailable for 1901, anthropologists have conducted numerous village-level studies during the mid-twentieth century (see Appendix IV). These studies provide a useful picture of caste organization at the village-level. In the villages in all regions, the data show that the higher castes own most of the land, but the landowning castes differ by region. In the North,

---

27 The summary statistics for Punjab include North West Frontier Provinces although in our analysis we focus only on the part of Punjab in the British territory.
28 Other religious groups - Sikhs, Christians, Jains, Parsis, Buddhists, Jews and Tribals - formed a very small minority in most regions.

the landowning castes are dominated by Rajputs, Jats, and Thakars; in the East and the South, the landowning castes are dominated by Brahmans. In addition, especially in Punjab, the landowning castes significantly outnumber other castes in their villages whereas in the East and the South, the upper castes are significantly outnumbered by those in the middle and lower castes.

Because the caste categories, at least from an occupational point of view, are not strictly comparable across regions, we must exercise some caution when interpreting the variations in sex ratios by castes. For example, the composition of the religious and landowning castes differ somewhat across the regions. In the East and the South, as noted above, the Brahmans, who have been included in the religious category in our study, also owned significant amounts of land but not in the North. As a result, the landowning castes in the North (Rajputs and Jats) are likely to be somewhat higher in rank than the landowning castes in the East (Sadgop, Chaudhuri, Ahir etc.) and South (Vellala, Lingayats etc.). Also, some occupational castes such as fishers and traders are prevalent in the South but not in the East and the North. Nevertheless, these broad caste categories should provide a useful picture of sex ratios by kinship, status and occupation.

Table 3 presents data on sex ratios by caste constructed at the district-level for Punjab, Bengal and Madras. Despite some concerns on the comparability of the caste categories across regions, the data show a remarkable pattern of sex ratios by caste and region. Sex ratios varied systematically by both caste rank and by region. Within each region, sex ratios varied inversely by caste rank. Sex ratios were significantly lower for the religious and landowning castes but significantly higher for the artisans, laborers and service castes. Moreover, within each caste category, sex ratio declined systematically as one moved from the North (Punjab) to the Northeast (Bengal) and then to the South (Madras).

For all regions, as shown in Figure 4, sex ratios improved in favor of females as one moves along the caste rank from the higher landowners to lower ranking menial service castes. For the religious and landowning castes, there were on average 947 and 937 females per 1,000 males for religious and landowning castes respectively; however, for artisans and service workers, the respective figures were 987 and 1,026. In addition, as shown in Figure 5, sex ratios for every caste rose as one moved from Punjab to Bengal and then to Madras. For the religious caste, females per 1,000 males rose from 822 in Punjab to 975 in Bengal to 1,004 in Madras; similarly, for the service caste the figures went from 873 in Punjab to 1034 in Bengal to 1,123 in Madras. Thus, for the study of sex ratios in India, it is important to study the data by castes.

For Bengal, based on Risley's (1892) ethnographic evidence, we find limited correlation between caste rank and the practice of dowry suggesting only a partial correlation between dowry and sex ratios. Risley's volumes contain information on the practice of dowry or bride price for about 111 castes.[29] While we find that 100% of the higher caste religious and professional castes practiced dowries as compared to only 0%, 12% and 33% for the lower caste agricultural laborers, artisans and service workers respectively, we also find that the frequency of dowry practice among the other higher castes such as landowners, cultivators and traders were relatively low at 13%, 21% and 25% respectively. In addition, all of the tribal castes in the sample practiced bride price but their sex ratio was lower than that of the cultivating and professional castes.

Table 4 presents the population sex ratios by religion for the three regions. The data suggest that regional differences in sex ratios seem more important than the religious differences.

---

[29] For those castes for which the practice of dowry or bride price could be identified in Risley (1892), we find the following distribution. The number of castes who practice dowry rather than bride price out of the total identified castes by groups are as follows: for religious, 5 of 5; for landowner, 1 of 8; for cultivator, 4 of 19; for for trader, 2 of 8; for professional, 2 of 2; for agricultural laborer, 3 of 26; for service, 2 of 6; and for tribal, 0 of 20.

For each religious group, sex ratio rises from Punjab to Bengal to Madras. However, there were important differences in sex ratios by religion in Punjab and Bengal. In Punjab, the Sikhs who comprise about 9% of the population had by far the lowest sex ratio of 0.77, and were followed by Hindus at 0.845 and then Muslims at 0.877. In Bengal, however, where the Muslim figure might be influenced by migration, Muslims had a lower sex ratio than Hindus. In Madras, the sex ratios of the three religious groups – Hindus, Christians and Muslims- were relatively similar.

Table 5 presents data on sex ratios by language for Punjab, Bengal and Madras. Since regional populations are relatively homogenous in terms of language, it is difficult to disentangle the effects of language and the effects of geography. For example, the data show that in Punjab, most of the population, except for those of tribal origins, speak only the northern Indo-Aryan language; thus, the variation in sex ratio by language is likely to be confounded by regional variations in sex ratios unrelated to language. However, when we examine the sex ratio of the Central Aryan language speaking peoples who are found throughout India, the data suggest that the dominant factor in sex ratio is geographic rather than language orientation. In Madras, the sex ratio of the Central Aryan speaking peoples was 0.941 whereas in Bengal and Madras, the figures were 0.791 and 0.715 respectively.

Yet, even though the most important difference in sex-ratio may be geographical, there seems to be some variation in sex ratio by language as well. In general, the sex ratio is much lower for the northern Indo-Aryan as compared to southern Dravidian languages within each region. When we examine the overall distribution of sex ratio across the different languages, we find that the languages of Northern origin, viz. North Aryan (found mainly in Punjab), Central Aryan (found mainly in Rajputana), Northern Hilly, and Northern Tribal languages, perform much worse compared to those of Southern Dravidian origin or Eastern origin. Particularly,

20

while the Central and North Aryan languages of the North had only 797 and 786 women to 1,000 men, respectively, Tamil, Telegu and other Dravidian languages of the South had 945, 969 and 968 women per 1,000 men, respectively.

Since we constructed data on sex ratios by caste, religion, and language at the district-level for the three regions, we are able to present descriptive statistical analysis which control for regional and district fixed-effects. We present these regressions in Tables 6-9.

In Table 6A, we present simple dummy variable regressions where sex ratios of different castes are compared with the artisan castes as the omitted category. In Punjab, for every 1000 males, compared with the artisans, the religious, landowner, and trader castes had 82, 60 and 41 fewer females respectively; in Bengal, the deficiency was 19, 75, and 37; in Madras, it was 42, 26, and 38. However, there were more significant variations across the regions, especially between Punjab and the other two regions. For the cultivator and agricultural laborer castes, sex-ratio was significantly lower than artisans in Punjab but not in Bengal or Madras; for the service castes on the other hand, the sex ratio was significantly higher than the artisan castes in Bengal and Madras but not in Punjab.

When we pool the data for all three provinces and control for district fixed-effects, we find very similar results. Table 6B indicate that the religious, landowner, traders and cultivator castes had significantly lower sex ratios than artisans, but that opposite was true of service castes. The data show that even after controlling for caste composition and district fixed-effects, Punjab had 161 fewer females per 1,000 males than Madras whereas the figure was 51 for Bengal. When we control for the caste population size, we find that women have fared worse in larger-sized castes as higher population led to lower sex-ratios. We also find that the sex ratio was significantly lower for the Hindu castes as compared to the Muslim castes.

In Table 7, we examine sex ratios by religion. The regressions indicate that even when we control for district fixed-effects and caste composition, the Muslims had a favorable sex ratio than Hindus in Punjab and Bengal. In Madras, where there were few Muslims, there were no significant differences in the sex ratios by religion. Interestingly, our data also show that variations in sex ratios by caste were observed for Hindus but not for Muslims.

In Table 8A, we analyze the relationship between sex ratios by language groups. Since there is little geographic overlap of languages in different regions, the regressions do not include geographic dummy variables. We find that sex ratios among the southern Dravidian languages differed significantly from those who spoke Aryan languages in the Northern and Northwestern regions, but not for languages of Aryan origin in the East or the South. In column (1) we omit all the Dravidian languages and run the summary variable regression. It shows that compared to Dravidian languages, Central Aryan and North Aryan had 155 and 132 fewer females per 1000 males. On the other hand the Munda languages had 150 more females. In column (2) we further break the Dravidian languages into the 4 major southern languages of Canarese, Malayalese, Tamil and Telegu. In this case the omitted category is all other Dravidian languages. Again we find the Central and North Aryan languages had fewer females than Dravidian. Moreover, except for the Malayalese speaking peoples in the Malabar region who had significantly lower sex ratios than the other Dravidian languages, there were no observable differences compared to peoples who spoke in the other eleven categories.

Since there is little geographic overlap of languages in different regions, it is difficult to identify the impact of language on sex ratio. In Table 8B, we overcome this constraint to an extent by using the 1921 Census data to construct groups of bordering districts which enable us to track people of same language across different provinces. For the districts in the provinces of

Rajputana, Kashmir and United Provinces which bordered the districts in the provinces of Punjab, we constructed sex ratio by different language groups. Since all of these districts should exhibit little geographic variation, we should be able to identify the effect of language controlling for geographic effects. The data show that sex ratios differ by language. As compared to the Punjabi language speaking societies, there were relatively more females within the Hindi, Hilly, Rajasthani and Gujrati speaking communities. However, even after controlling for the language variation, there were significantly fewer females in Punjab compared to Kashmir but not against the other two provinces.

Since all the regressions bear out the significant geographic variation in sex ratios which remains unexplained by variation in caste distribution, we examine the role of agricultural variation across the regions in determining the widely varying sex ratios. Bardhan (1974) notes, that the economic value of women is driven by differences in female intensity of agricultural production. He argues that rice is more intensive in female labor compared to wheat and hence survival chances of girls should be higher in rice growing areas compared to wheat growing areas. In Table 9 we use area under crops data from 1901 to see how sex ratio varied with rice or wheat intensity of agriculture. We find that as the proportion of area under wheat cultivation increases, sex ratio in a district falls. However, no significant relation emerges between rice cultivation and sex ratio.

We further examine the implication of geographic and climatic variation in determining sex ratios. In particular, we regress sex ratios on various geographic and climatic characteristics such as rainfall, soil (alluvial, red, black), coastal dummy, and the length of British rule. The results are shown in Table 10. While these geographic measures are crude, they are likely to capture the variations in agricultural crops (Kapur and Kim (2006)). We find that higher rainfall

and the presence of alluvial soil are negatively correlated with sex ratios.[30] More importantly, even after controlling for possible geographic and historical factors, Punjab a had significantly lower sex ratio than Madras, suggesting that cultural factors such as kinship systems are likely to be important even after controlling for economic factors. Interestingly, the length of British rule was negatively correlated with sex ratios but was not statistically significant.

In summary, we argue that the data confirm the view that family, kinship and inheritance institutions in India contributed significantly to determining the sex ratios in India. As noted by numerous scholars, sex ratio was the lowest in the North (Punjab) where the society was patrilineal, patrilocal and extremely exogamous and was highest in the South (Madras) where the practice of close kin marriages provided more favorable kinship relationships for females. Moreover, in the East (Bengal), where the northern kinship and inheritance rules were modified, sex ratio improved over those in the North but remained lower than those in the South.

Since the ideal norms of kinship were held more strongly by the higher castes, the inverse relationship between sex ratios and caste rank provides additional evidence on the importance of kinship. However, because caste rank is also correlated with wealth and income, it is difficult to separately identify the effects of wealth and kinship on sex ratios. Women from low castes often earned significant family income so that their bargaining power within the family and kin-group were likely to be high whereas women of high caste typically did not bring in any income. Yet, it is also important to note that kinship norms had a significant influence on the labor market of women. High caste women were forbidden to work outside of the home and their bargaining power was based on the rearing of children, especially sons.

---

30 However, Rose (1999) finds that favorable rainfall shocks, defined as transitory deviation from its 21-year mean for each district, were positively correlated with higher survival rates of girls relative to boys for India between 1969-1971.

In the South, however, the low sex ratio of the higher castes poses a puzzle. If the cross-cousin marriages were taken more seriously by the higher castes, then one might expect a higher sex ratio for the higher castes. We believe that the low sex ratio of the high caste Brahmans in the South may be accounted for by the fact that the Brahmans brought with them the vestiges of northern family norms when they migrated south. Even though the southern Brahmans adopted cross-cousin marriages, Gough (1956) argues that the Brahman family relationships were characterized by northern family hierarchy.[31]

Finally, the examination of sex ratios by language and religion seem to indicate the importance of kinship. Even when we control for geography, societies who speak the northern Indo-Aryan language, especially Punjabi, exhibited significantly lower sex ratios. Similarly, even in the North and East, Muslims whose kinship norms were similar to those of the Dravidian South possessed lower sex ratios than their Hindu counterparts, even after we control for caste rank. However, while our data analysis do not include the Sikhs, the very low sex ratios observed for the Sikhs in Punjab present a significant puzzle as their religious principles were based on the equality of men and women.

V. On the Origins of Kinship Systems in India

Why did kinship and inheritance systems differ across the regions in India? Most scholars believe that the origin and the spread of the northern kinship system can be traced to the historical path of the Indo-Aryan conquest. When the indigenous Indus civilization disintegrated around 1500BC, Aryans started migrating into northwestern India and brought with them new

---

[31] In contrast to the relatively egalitarian relationships among the lowest castes, for the southern Brahmins "the father was superordinate to the son, the elder brother to the younger brother, the husband to the wife ... (Kolenda (1987)). In addition, the rates of close kin marriages among the Brahmans seem to be lower than those of other castes (Mandelbaum (1970, p.70), Caldwell, Reddy and Caldwell (1984)).

technologies of agriculture as well as military and political organization. However, the diffusion of Indo-Aryan civilization in India did not arise in one "natural state" but many different natural states as the Aryans adapted to different local geographic, economic and political factors. The variations in the relationships between the political and economic elites in different regions also led to variations in their family, kinship and inheritance institutions.

In the northwestern Indo-Gangetic plain, the Aryans developed a stable, decentralized, lineage-based, political, and kinship system which survived for centuries. Yet, as the Aryans marched to the eastern Bengal frontier, their political and kinship institutions were modified to form a more centralized state bureaucracy. The royal political elites formed alliances with local Brahmans who in turn formed alliances with local elites. However, in the South, the slow diffusion rather than the invasion of Aryans and their ideas created a distinctly different Aryan-Dravidian society that was much more varied, localized and segmentary (Stein (1994)). In the South, the Aryans adopted the southern practice of cross-cousin marriages. This indigenous marriage system can be traced back as early as 62-106 AD among the Sātavāhana royal dynasty through the royal inscriptions (Trautman (1981)).

A: Political and Kinship Organization in Punjab

The Indo-Aryan culture arose in the Northern Gangetic plain where the monsoon rainfall was moderate and irrigated agriculture prior to British rule was limited. From a pastoral society that raised cattle, a mature settled agricultural society emerged in this region. The dominant form of agriculture was wheat and millet, but in places of sufficient water supply, rice was also cultivated. According to Thapar (1982), the rise of settled agriculture coincided with the rise of a kinship lineage society which was to last for centuries. By the medieval period, the local and regional political structure was based on the warrior Rajputs kinship clans and their networks.

26

Each clan composed of its maximal lineages controlled a compact area of 12-84 villages.[32] Even when the territory was organized under the Mughal Empire, these Rajput clans retained significant control of their local territories.

Given the importance of the kinship clan as a political and economic institution in the North, its kinship system fostered the alliance of kin-networks over its maximal lineages. However, the kin political alliance system achieved stability by significantly reducing the bargaining power of women. At the clan level, marriages between the families of the same maximal lineage can threaten the political balance within the clan as these families can use marriage to build a more powerful political coalition. By requiring women to marry outside of her gotra or sapinda and by requiring her to marry outside of the villages of the maximal lineages, the northern system insured the political stability of the maximal clan lineage. At the level of the joint family, marriages also threatened the break-up of the family property since wives had an incentive to seek partition of joint property. By severely restricting the rights of women, the northern system limited the power of women to exercise her autonomy over her husband and her joint family.[33]

B: Political and Kinship Organization in Bengal

In the fifth and sixth centuries, the Indo-Aryan culture gradually marched eastward toward the Bengal jungle frontier. The Hindu Brahmans brought with them the technology of

---

32 Rajputs, Jats, Bhuinhar, and Ahir, were militarily and politically powerful at the regional and local level (Pradhan (1966) and Fox (1971)). At the apex of the caste hiearchy was the rajput raja or jat chaudhry who was the head of an extended territory. For the jats, each clan, composed of a maximal lineage, thok, controlled a compact area of 12-84 villages known as khap (Pradhan (1966)). In an era of a weak centralized state, property rights of any individual warrior caste member depended greatly on the strength of his kin-group both as protection from outsiders and to control lower castes villagers who provided labor and services for the exploitation of land.

33 The role of women in the break-up of the joint family property is a common theme in Indian literature. Mandelbaum (1970, p.103) writes: "Village exogamy seems to be an outcome not only of a special need for filial-fraternal solidarity, but also of special fear for the fragility of those bonds. The wives in a family and their natal kinsmen are apparently perceived as potential sources of family disruption. Hence the wives should be isolated from their original kin which also means that their husbands, in their role as brothers, are equally isolated from their own beloved sisters." Also see Mathur (2007).

settled agriculture, but due to the abundance of rainfall, the new Bengalis adopted wet rice agriculture. Unlike the pastoral, wheat and barley agriculture of the Indo-Gangetic plain in Punjab, wet rice agriculture was intensive in capital and labor as it involved building and maintaining tanks and irrigation channels, planting, transplanting, monitoring of water levels, and harvesting. While wet rice agriculture was probably associated with a significant increase in productivity, it was also much more risky as few other crops could be grown in submerged water. As a result, the lives of villagers were more likely to be tied to the fortunes of the annual rice crop.

The regional political structure which emerged in Bengal differed in important respects from Punjab. In Bengal, the imperial state seems to have achieved significant level of centralization. Thus, unlike in Punjab, a warrior Kshatriya kin-group did not emerge as a regionally dominant military and political force. Instead, the level of centralization by the imperial state seems to have been achieved by building alliances with Brahmans and other dominant castes who were granted land and protection for tribute and taxes. The Brahmans, in turn, formed local alliances with other dominant Sudra castes to strengthen their local power. Thus, individual Brahmans were able to acquire large territories through the imperial and local alliance.

In Bengal, the northern kinship system was modified. Since the political stability of the maximal lineage was not important, evidence suggests that the gotra or the sapinda rule and the rule of village exogamy were not enforced in Bengal. In addition, as noted in section II, the inheritance rule was modified in Bengal from the rights of equal division of property by sons at birth to rights of the father to divide property at his death. Given that the patriarchal father had significant rights over his property, marriages did not threaten the devolution of family property.

Thus, in Bengal, there were fewer benefits from suppressing the autonomy of women. In addition, Bengal was much more diverse in terms of ethnic groups as evidenced by the greater numbers of language and castes as compared to Punjab. The greater indigenous cultural diversity may also have mitigated a stricter enforcement of a uniform kinship system in Bengal.

C: Political and Kinship Organization in Madras

In the South, the mountainous track which runs from east to west along the Tropic of Cancer impeded the march of the Indo-Aryan culture to its region. Despite the various military excursions from the North, the northern Indo-Aryan culture diffused slowly throughout the Dravidian South by slow absorption rather than by conquest. In the fertile irrigated river valleys, several major kingdoms – Pallavas, Cholas and Pandyas – achieved centralized tributary states whereas in the less fertile drier areas, they were ruled by numerous minor kingdoms and chiefdoms controlled by dominant land-holding groups (Stein (1981, 1998), Ludden (1985), Dirks (1993)). In the fertile regions, local elites such as the Vellalas granted villages to Brahmans (brahmadeya) and adopted the Sanskritic traditions.

According to Stein (1994), the political organization in the South was much more localized and segmentary due to its geography. However, there were no warrior, Kshatriya lineage-based territories in the South. Instead, territorial integrity was based on alliances between kings, local chiefs and dominant land-owning castes. For tribute and military alliance with the king, local chiefs and villagers received protection. At the village level, the higher land-owning castes built alliances with dominant Sudra castes such as the vallala to control the lower caste laborers, artisans and service workers.

In the South, the kinship system diverged significantly from that of the North.[34] Even for the Brahmans who migrated from the North, the preferred marriage arrangement was between cross-cousins which were not allowed by traditional Hindu law. Stein (1994) argues that the adoption of cross-cousin marriages was consistent with the widespread existence of political and social localism caused by the South's segmentary political organization. Because wet rice agriculture in the South required the development of extensive irrigation works and the close working cooperation of the landholding group, cross-cousin marriages may have increased the efficiency of the agriculture in Madras.[35]

More importantly, Trautman (1981) suggests that the main reason for adopting the Dravidian kinship system in the South was for the royal lineages to preserve their localized hereditary kingships. Unlike the northern Indo-Aryan marriage rule of exogamy, the Dravidian cross-cousin marriage system allowed the formation of strong family alliances which lasted over time. As evidence for his hypothesis that kinship systems in the South were servants of the political elites, Trautman shows how the Dravidian cross-cousin marriage system was altered in

---

34 In South Kerala, the political and kinship systems differed significantly from the rest of Madras (Gough (1961)). The land in each village was owned by either a chieftain of the Raja, the royal lineage itself, a Brahman-managed temple, or a Nambudiri Brahman family. The indigenous Nayars, however, held hereditary rights of long-term tenure called kanam from the landlord and leased the land to Tiyyars or farmed the land using lower caste serfs who were attached to Nayar lineages. Unlike the rest of the South India, the Nayar men formed a military caste who served the royals. Because the Nayar men were often away from their homes and villages for extended periods, the Nayar women formed the nucleus of the land-holding group. For the Nambudiri Brahmans, their kinship system was patrilineal, patrilocal and through their marriage rule practiced primogeniture (Gough (1961), Mencher and Goldberg (1967)). Only the eldest son was allowed to marry with other Nambudiri Brahmans and inherit family property; the younger sons married Nayars and had no rights to family property or its lineage. For the Nayars, however, their kinship was matrilineal and duolocal. The hereditary kanam rights to land was inherited through the female line. For Mencher (1966), the Brahman-Nayar political alliance and local geography explain the rise of Nayar's matrilineal system. Since Nayar boys were recruited and trained as soldiers and left their natal homes at early ages, only Nayar women provided local continuity. However, Mencher argues that geographic factors were also very important. In South Kerala, where rainfall was abundant and reliable and where its lateritic soil absorbed moisture rapidly, there was no need for cooperation between families for agriculture. Thus, the villages and settlements were dispersed rather than nucleated.

35 For the Kallars in Pudkkottai, Dirks (1993, p.206) writes that lineages within a natu, which averaged between twelve and eighteen villages, were not allowed to marry lineages outside of their natu. Thus, the rule of natu endogamy as well as cross-cousin marriages contributed to stable lineage-based territorial subdivisions.

Kerala and Sri Lanka to serve the local political elites. In Kerala, where the prevalent kinship system was matrilineal, the royal rule of succession became matrilateral rather than patrilateral; in Sri Lanka, however, the marriage of patrilateral parallel cousins was consistent with a lateral – brother-to-brother – royal succession.

VI. Conclusion

The institutions of family and kinship ordered the lives of individuals in pre-modern societies as they defined the social rules of society. These informal institutions specified the rules of behavior as well as rights to inheritance and property and reduced the uncertainties in human interactions (North (1981, 2005)). These informal institutions, however, did not operate in a political vacuum. While the causal linkages between politics and kinship are poorly understood, there are reasons to believe that the two are inextricably linked. Moreover, just as many modern formal institutions originated as instruments to govern society for the benefit of political elites, the informal kinship institutions were also likely to have served similar functions for political elites in traditional societies.

In this paper, we find considerable evidence that the family and kinship institutions significantly influenced gender relationships in society. The northern Indo-Aryan kinship system seems to have fostered the "son preference" of families and significantly reduced the female population through selective neglect. In northeastern Bengal, where the kinship and inheritance system diverged somewhat, the sex ratio was slightly improved. However, the southern Dravidian kinship system based on the acceptance of close kin marriages seems to have fostered relative gender equality. Thus, we find that sex ratio in southern Madras actually favored females

31

at the turn of the twentieth century. In addition, northern Indo-Aryan speaking societies and Hindus as compared to Muslims seem to exhibit "son preference."

In addition, we also argue that it is extremely important to investigate sex ratios by caste in India. Because castes were endogamous, sex ratios by caste are likely to capture variations in kinship behavior by different caste groups. Our data on sex ratios by castes exhibit a remarkably stable pattern across all the regions. In each region, "son preference" inferred from sex ratios was positively correlated with caste rank. Even in southern Madras, the higher landowning and religious castes possessed significantly lower sex ratios than the lower artisan and service castes.

The fact that most societies adopt one kinship system suggests there are social economies to a uniform informal rule of behavior. However, just as many formal institutions favor political elites at the expense of general population, the informal kinship systems may also have significant distributional consequences. To the extent that the kinship rules favored the higher caste elites in each region, the adoption of one kinship system may have reduced the welfare of low castes in each region. Relative to their optimal kinship rule, the low castes may have too few women in the North and to many women in the South. In the North, the low castes may have forgone the benefits of economically productive women whereas in the South a cross-cousin marriage system may have increased the genetic costs without providing much alliance benefits.[36]

Despite the fact that the family and kinship systems arose in ancient India, these institutions continue to influence the lives of modern Indians. Even as the economic value of women has risen over time with the growing importance of education as well as employment opportunities in manufacturing and services, the traditional family and kinship institutions have contributed to a growing "son" rather than "daughter" preference in Indian society.

36 See Bittle (2002) for evidence on the link between consanguinity, genetic disorders and morbidity in India.

Unfortunately, modernization and the introduction of formal western institutions seem to have reduced the importance of the southern indigenous kinship system and introduced the emergence of "son preference" even in southern India. Thus, a better understanding of the causes of the persistence northern kinship system is likely to provide insights on how to foster greater gender equality in India and other northern Asian countries.[37]

---

37 Greif (2006) and Carsten (1996) provide insights as to why informal institutions based on personalized exchanges may persist even when they become inefficient. Also see Munshi and Rosenzweig (2005).

Figure 1
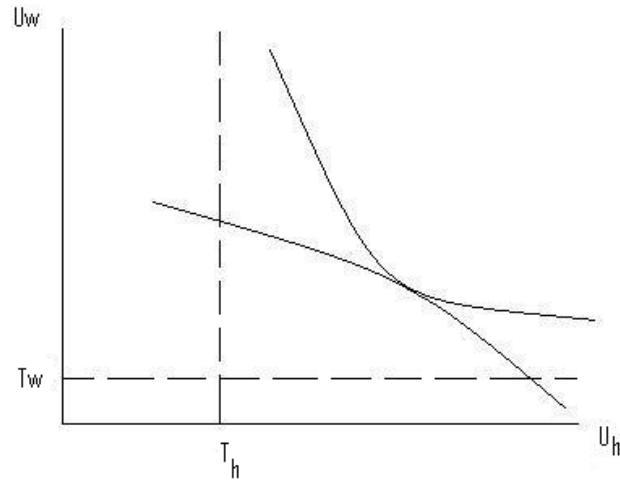
Note: U_w denotes utility of wife and U_h denotes utility of husband. T_w and T_h are the respective threat points of the wive and the husband.

Table 1

Kinship and Bargaining Power of Women

Patrilineal	Negative	North
Patrilocal	Negative	North, South
Matrilneal	Positive	South (Kerala)
Matrilocal	Positive	
Duolocal	Positive	South (Kerala)
Close-Kin	Positive	South, Muslims
Exogamy	Negative	North
Gotra/Sapinda	Very Negative	North, Brahmins/High Caste
Joint Families	Negative	Land Owning Castes
Arranged marriage	Negative	India
Low age at marriage	Negative	India, East
Inheritance		
Mitakshara	Negative	North
Dayabhaga	Slightly Negative	East
Dowry	Possibly Negative	North, High Caste
Bride price	Positive	South, Low Caste
Women's right to Property	Positive	South
No Divorce	Negative	High Caste
No Market Labor	Negative	High Caste
Behavioral Restrictions	Negative	High Caste

Fig 2 : Sex Ratio distribution across provinces of India, 1901
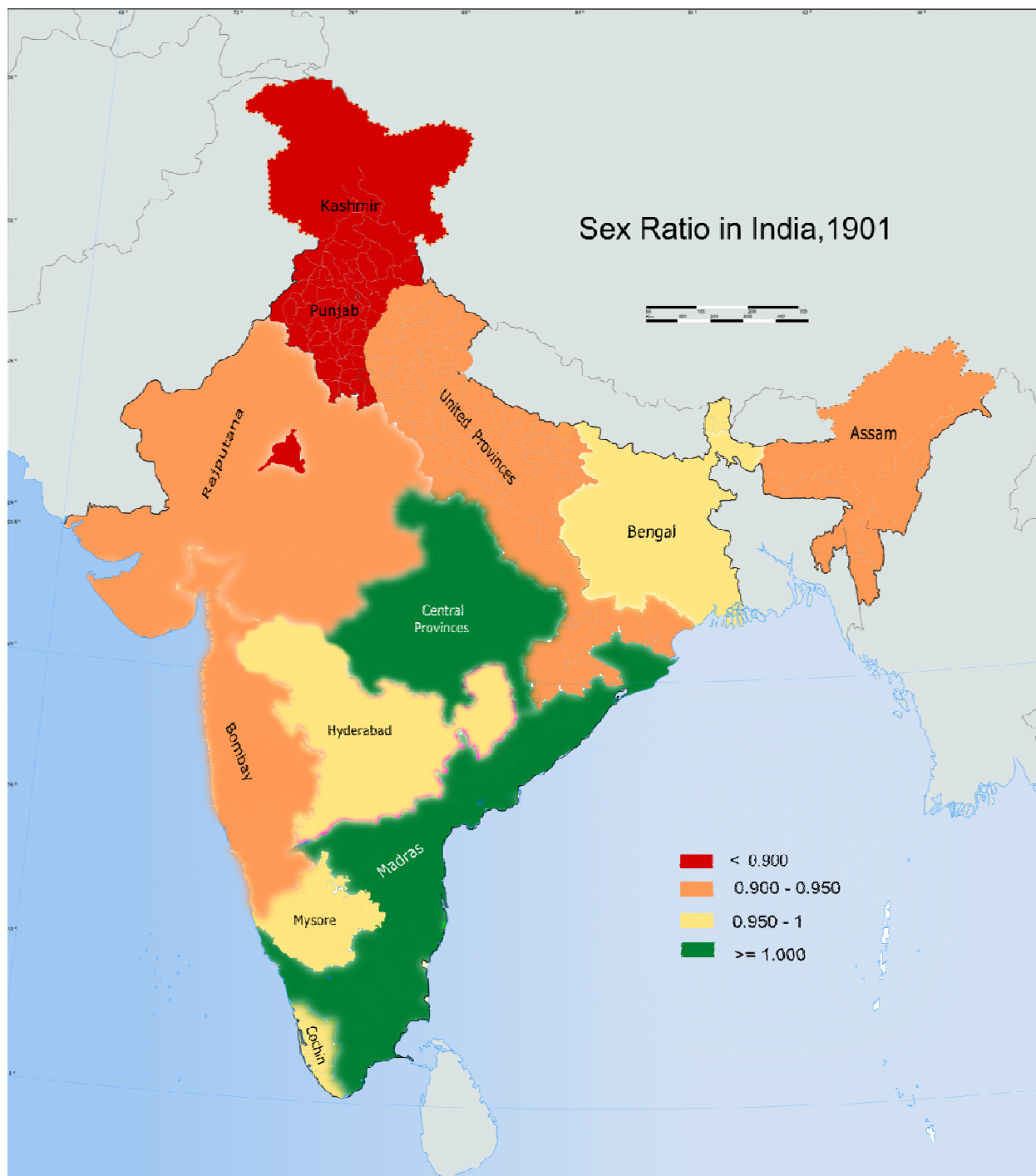
Fig 3 : Sex Ratio distribution across districts within the study area, 1901
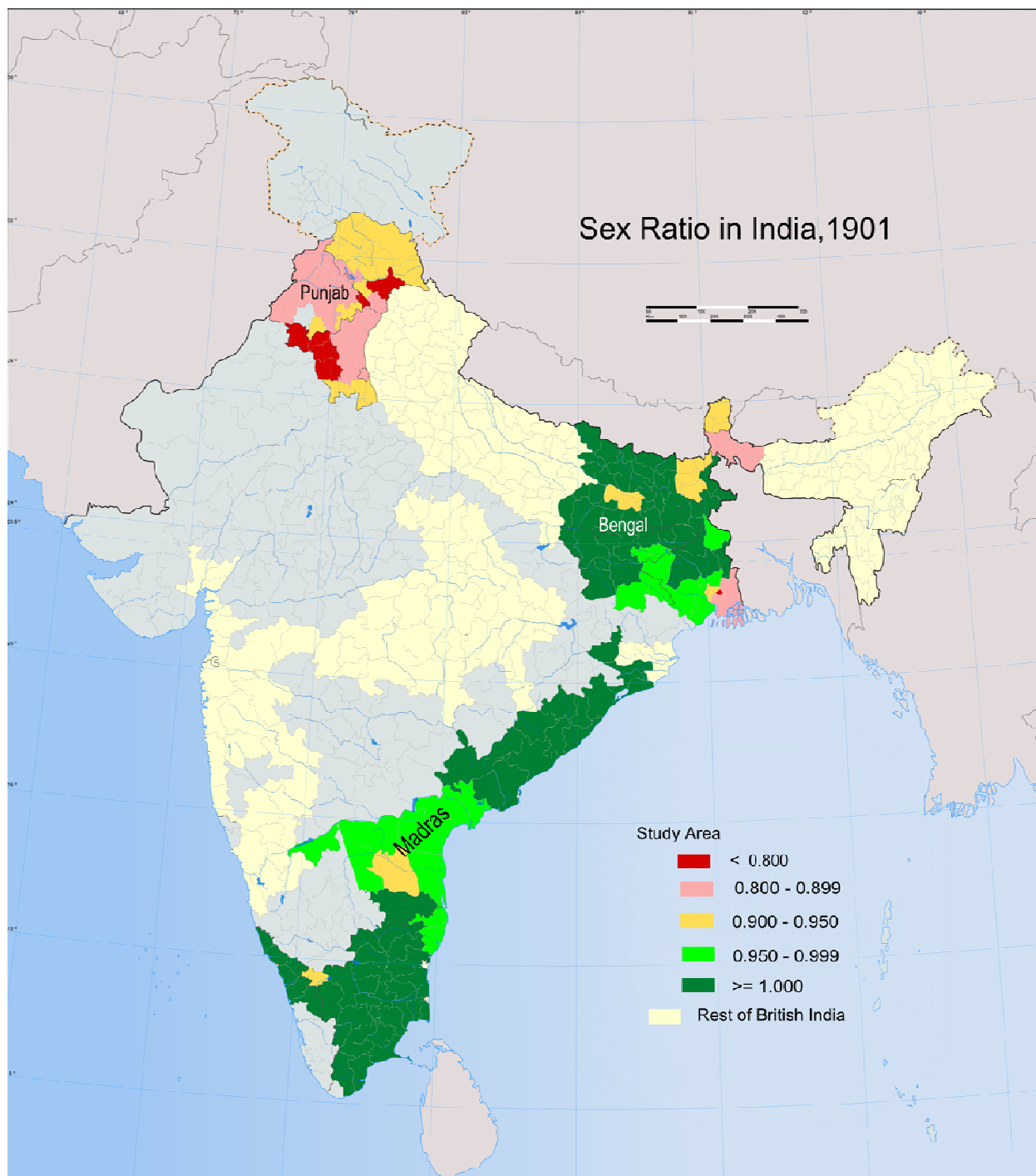
Figure 4: Population Sex Ratio Across Different Caste Groups
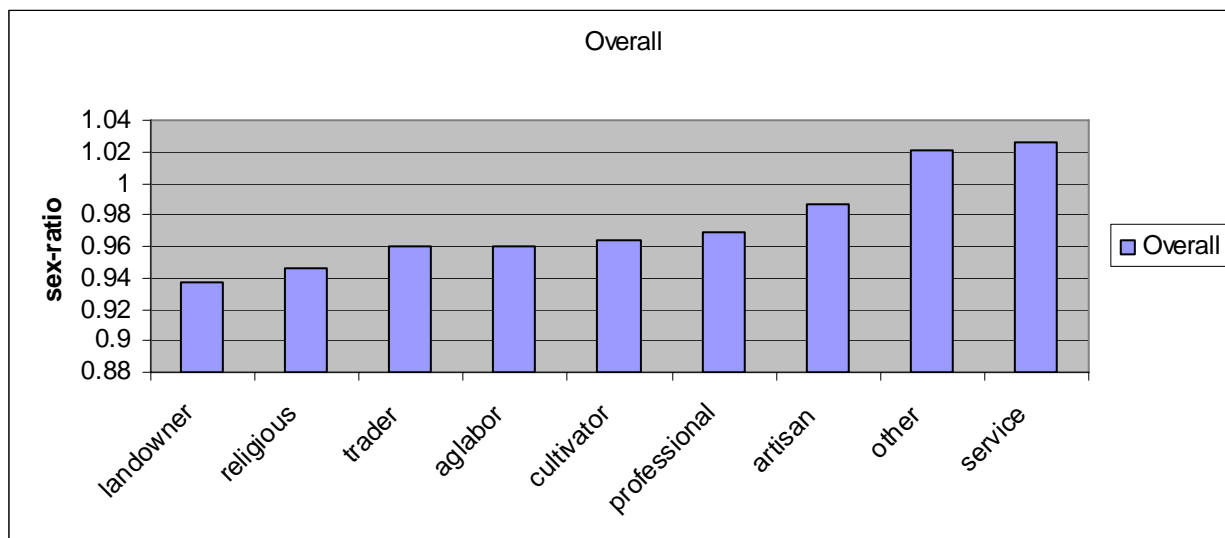
Note: Sex ratio distribution across the different caste categories for the pooled data set with all provinces.

Figure 5: Population Sex Ratio Across Different Caste Groups by Region
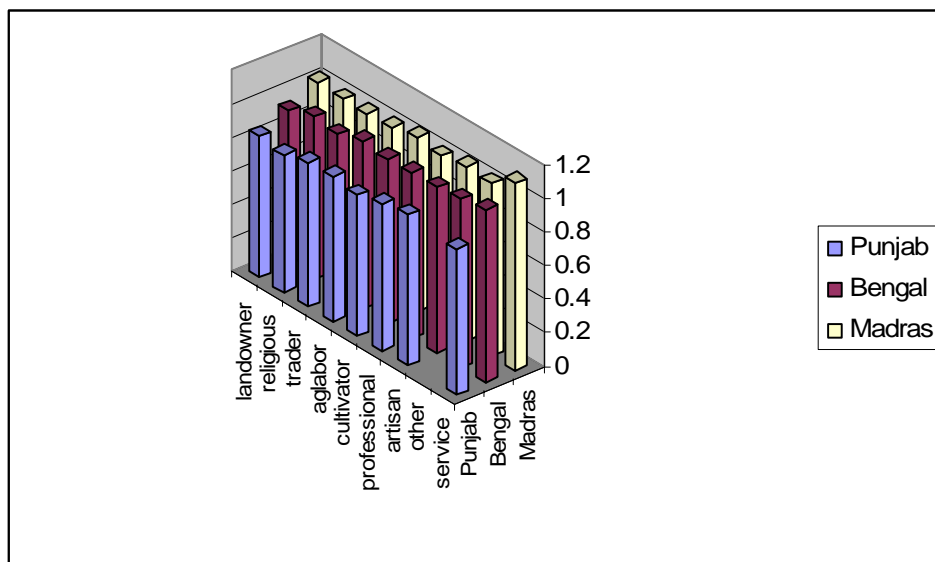
Note: Sex ratio distribution across the different caste categories by province.

Table 2

Descriptive Statistics: Punjab, Bengal and Madras, 1901

	Punjab	Bengal	Madras
Province Total			
Total Population	24,754,737	78,493,410	38,623,066
Area (sq mile)	150,207	189,837	143,221
Density	179.0	413.5	269.7
Total Hindu	10,344,333	49,687,362	34,436,586
Total Muslim	12,159,394	25,495,416	2,477,610
Total Sikh	2130987	-	-
Total Christian	-	278366	1038854
Proportion Hindu	0.42	0.63	0.89
Proportion Muslim	0.49	0.33	0.064
Proportion Sikh	0.09	-	-
Proportion Christian	-	0.004	0.061
Female	11,402,223	39,215,224	19,584,070
Male	13,352,514	39,215,224	19,038,996
Sex Ratio (female/male)	0.854	0.981	1.029
Total Number of Castes	121	380	321
Total Number of Languages	24	45	75
Total Number of Villages[+]	32,663	203,476	54,065
Mean Pop per Village	622	367	706
District Averages			
Districts	29	53	25
Population	485,387	1,494,215	1,379,395
Number of Castes	47	78	65
Number of Languages	5.5	8.5	7.5

Note: The figures for Punjab include Northwest Frontier Provinces
+ British territory

Table 3

Descriptive Statistics: Sex Ratio by Caste and Province, 1901
Mean (SD)

	Punjab	Bengal	Madras	All
Religious	0.822	0.975	1.004	0.947
Landowner	0.844	0.920	1.02	0.937
Cultivator	0.847	0.990	1.044	0.963
Professional	0.883	0.995	1.019	0.969
Trader	0.863	0.958	1.008	0.960
Artisans	0.904	0.994	1.046	0.987
Agri Labor	0.868	1.006	1.011	0.960
Service	0.873	1.034	1.123	1.026
Tribal	0.893	0.942	0.991	0.945
Other		1.011	1.034	1.021
Unknown	0.853	1.042	0.933	1.022
Total	0.869	0.991	1.027	0.977

Note: Sex ratio is defined as female divided by male total population. To eliminate outliers, we dropped observations if sex ratio is greater than 3 or less than 0.3 and if the caste population was less than 300.

Table 4

Descriptive Statistics: Sex Ratios by Religion, 1901

	Punjab	Bengal	Madras	All
Hindu	0.845	1.005	1.029	0.976
Muslim	0.877	0.983	1.031	0.982
Sikh	0.770	-	-	0.770
Christian	-	0.946	1.033	1.014
Total	0.854	0.998	1.028	0.977

Note: The data for Punjab includes North West Frontier provinces.

Table 5

Descriptive Statistics; Sex Ratios by Language, 1901
Mean

Language	Punjab	Bengal	Madras	Total
Aryan (Central)	0.715	0.791	0.941	0.797
Aryan (North)	0.770	-	0.943	0.786
Hilly (North)	0.861	-	-	0.861
Tribal (North)	0.827	-	-	0.827
Malyalese	-	-	0.792	0.792
Aryan (East)	0.705	0.952	1.009	0.950
Aryan (South)	-	0.815	0.958	0.952
Tamil	-	0.661	0.956	0.943
Telegu	-	0.857	0.994	0.970
Canarese	-	-	0.975	0.975
Dravid (Other)	-	0.933	0.973	0.969
Munda	-	1.058	0.985	1.049
Hilly (East)	-	0.915	-	0.915
Tribal (East)	-	0.952	-	0.952
Tribal (South)	-	-	0.930	0.930
Tibetan	-	0.912	-	0.912
Foreign	0.875	0.982	-	0.922
Unknown	0.719	0.962	1.017	0.814

Note: Sex ratio is defined as female divided by male total population. In the Census of 1901, 122 distinct languages were identified in the 3 provinces of Punjab, Madras and Bengal. As shown in the Appendix, these languages were grouped into categories shown above.

Table 6A

Sex Ratios by Caste, 1901

	Punjab	Bengal	Madras
Religious	-0.082***	-0.02	-0.043**
	(0.014)	(0.018)	(0.017)
Landowner	-0.060***	-0.075***	-0.027*
	(0.011)	(0.016)	(0.014)
Cultivator	-0.056***	-0.002	-0.003
	(0.015)	(0.014)	(0.036)
Trader	-0.041**	-0.037*	-0.039**
	(0.017)	(0.015)	(0.017)
Professional	-0.021	0.001	-0.028
	(0.017)	(0.021)	(0.027)
Agri Labor	-0.036**	0.012	-0.035
	(0.014)	(0.018)	(0.027)
Service	-0.031	0.040**	0.076***
	(0.02)	(0.018)	(0.024)
Tribal	-0.011	-0.052***	-0.056**
	(0.022)	(0.019)	(0.024)
Other	-	0.017	-0.012
		(0.014)	(0.015)
Constant	0.904***	0.994***	1.046***
	(0.007)	(0.007)	(0.009)
District Fixed-effects	no	no	no
R-squared	0.042	0.014	0.021
Observations	1117	3187	1410

Note: Artisan is the omitted category. Sex ratio is defined as female divided by male total population. To eliminate outliers, we dropped observations if sex ratio was greater than 3 or less than 0.3 and if caste population was less than 300. We also excluded data on castes for whose occupation could not be identified. *** significant at the 1% level; ** significant at the 5% level; * significant at 10% level.

Table 6B

Sex Ratios by Caste: All Districts

	(1)	(2)	(3)
Religious	-0.040***	-0.042***	-0.043***
	(0.011)	(0.011)	(0.010)
Landowner	-0.050***	-0.050***	-0.053***
	(0.009)	(0.008)	(0.008)
Cultivator	-0.022**	-0.013	-0.020**
	(0.011)	(0.010)	(0.010)
Trader	-0.027**	-0.0392***	-0.042***
	(0.010)	(0.010)	(0.009)
Professional	-0.018	-0.009	-0.004
	(0.014)	(0.014)	(0.013)
Agri Labor	-0.027**	-0.007	0.003
	(0.012)	(0.011)	(0.011)
Service	0.039***	0.035***	0.021*
	(0.013)	(0.012)	(0.012)
Tribal	-0.041***	-0.047***	-0.025*
	(0.014)	(0.013)	(0.012)
Punjab	-	-0.161***	-
		(0.008)	
Bengal	-	-0.051***	-
		(0.006)	
Population (log)	-	-	0.005***
			(0.001)
Constant	0.987***	1.049***	0.852***
	(0.005)	(0.007)	(0.007)
District Fixed-effects	yes	yes	yes
R-squared	0.016	0.076	0.220
Observations	5714	5714	5714

Note: Artisan is the omitted category. Madras is the omitted province. Sex-ratio is defined as female divided by male total population. To eliminate outliers, we dropped observations if sex ratio was greater than 3 or less than 0.3 and if caste population was less than 300. We also excluded data on castes for whose occupation could not be identified. *** significant at the 1% level; ** significant at the 5% level; * significant at 10% level.

Table 7

Sex Ratios by Religion, Province and Caste

	Punjab	Bengal	Madras	All	Hindu	Muslim
Muslim	0.041***	0.053***	0.001	0.044***	-	-
	(0.008)	(0.012)	(0.020)	(0.007)		
Religious	-0.078***	-0.026	-0.041**	-0.044***	-0.045***	-0.032
	(0.014)	(0.017)	(0.017)	(0.010)	(0.011)	(0.020)
Landowner	-0.067***	-0.062***	-0.028**	-0.049***	-0.053***	-0.024
	(0.011)	(0.014)	(0.013)	(0.008)	(0.009)	(0.018)
Cultivator	-0.048***	-0.004	-0.019	-0.015	-0.017	-0.012
	(0.015)	(0.013)	(0.034)	(0.010)	(0.010)	(0.028)
Trader	-0.031*	-0.037**	-0.036**	-0.038***	-0.043***	0.032
	(0.016)	(0.014)	(0.016)	(0.009)	(0.010)	(0.037)
Professional	-0.025	0.020	-0.024	-0.0009	-0.0007	0.007
	(0.017)	(0.020)	(0.026)	(0.013)	(0.014)	(0.031)
Agri Labor	-0.023*	0.033**	-0.035	0.008	0.010	-0.002
	(0.013)	(0.016)	(0.027)	(0.011)	(0.011)	(0.038)
Service	-0.026	0.009	0.074***	0.018	0.020	0.011
	(0.020)	(0.017)	(0.024)	(0.012)	(0.014)	(0.022)
Tribal	0.005	-0.013	-0.045*	-0.019	-0.021	0.074
	(0.021)	(0.018)	(0.024)	(0.012)	(0.013)	(0.102)
Constant	0.886***	0.984***	1.046***	0.980***	0.984***	0.981***
	(0.008)	(0.006)	(0.009)	(0.004)	(0.005)	(0.009)
District Fixed-effects	yes	yes	yes	yes	yes	yes
Obs	1117	2875	1177	5169	4345	824
R-square	0.14	0.2	0.12	0.22	0.23	0.39

Note: Hindu is the omitted religion category; artisan is the omitted caste category. Sex ratio is defined as female divided by male total population. To eliminate outliers, we dropped observations if sex ratio was greater than 3 or less than 0.3 and if caste population was less than 300. We also excluded data on castes for whose occupation could not be identified. *** significant at the 1% level; ** significant at the 5% level; * significant at 10% level.

Table 8A
Sex Ratios by Language with District-Fixed Effects

	(1)	(2)
Aryan (Central)	-0.155***	-0.171***
	(0.0364)	(0.043)
Aryan (North)	-0.132***	-0.182***
	(0.039)	(0.044)
Hilly (North)	-0.113	-0.108
	(0.077)	(0.066)
Tribal (North)	-0.101	-0.142
	(0.206)	(0.152)
Munda	0.149***	0.081
	(0.049)	(0.049)
Aryan (South)	0.089	-0.017
	(0.063)	(0.057)
Malayalese		-0.177*
		(.101)
Canarese		0.006
		(0.062)
Tamil		-0.025
		(0.058)
Telegu		0.001
		(0.053)
Aryan (East)	-0.041	-0.019
	(0.043)	(0.047)
Hilly (East)	0.046	-0.054
	(0.068)	(0.059)
Tribal (East)	0.024	-0.017
	(0.043)	(0.046)
Tribal (South)	0.048	-0.038
	(0.121)	(0.093)
Tibetan	0.057	-0.056
	(0.113)	(0.088)
Foreign	-0.298***	-0.046
	(0.077)	(0.080)
Population (log)	0.033***	
	(0.004)	
Constant	0.594***	0.969***
	(0.056)	(0.040)
R-squared	0.160	0.156
Observations	668	631

Note: Dravidian (southern) is the omitted category. Sex ratio is defined as female divided by male total population. In the Census of 1901, 122 number of distinct languages were identified. As shown in the Appendix, these languages were grouped into categories shown above. To eliminate outliers, we dropped observations if sex ratio was greater than 3 or less than 0.3 and if population in a language category was less than 500.

Table 8B

Sex Ratio by regional Language groups (Neighboring Districts of North India)

	(1)	(2)
Hilly	0.286***	0.266***
	(0.071)	(0.071)
Hindustani	0.170***	0.176***
	(0.061)	(0.064)
Kashmiri	-0.065	-0.089
	(0.083)	(0.083)
Western	0.233***	0.191**
	(0.074)	(0.077)
Punjab	-	-0.143**
		(0.070)
Rajputana	-	-0.070
		(0.092)
United Provinces	-	-0.148
		(0.097)
Constant	0.647***	0.77***
	(0.049)	(0.081)
R square	0.278	0.298
Obs	66	66

Note: Western language group comprise different Gujrati and Rajasthani languages.

Table 9
Sex Ratio by Type of Agriculture

Dependent Variable: Sex Ratio	
Wheat	-0.385***
	(0.058)
Rice	-0.032
	(0.034)
Constant	1.036
	(0.019)
R-square	0.029
Obs	4241

Note: Wheat and rice denote the fraction of cropped area under these respective crops.

Table 10

Sex Ratios by Caste and Geography

	(1)	(2)	(3)	(4)
Rainfall	-0.000019***	-0.000048***	-0.000021***	-0.00005**
	(0.000004)	(0.000004)	(0.000005)	(0.00002)
Alluvial	-0.057**	-0.025	-0.051**	-0.017
	(0.018)	(0.022)	(0.022)	(0.021)
Black	0.034	0.012	-0.055	-0.0001
	(0.012)	(0.013)	(0.033)	(0.037)
Red	0.031	-0.008	-0.014	-0.009
	(0.007)	(0.007)	(0.025)	(0.021)
Coast	0.038	-0.008	-0.020	-0.013
	(0.008)	(0.008)	(0.028)	(0.028)
British Rule			-0.0009	-0.0005
			(0.0006)	(0.0009)
Punjab		-0.141***		-0.166***
		(0.012)		(0.047)
Bengal		0.018		0.031
		(0.030)		(0.035)
Constant	1.026***	1.09***	1.156***	1.156***
	(0.010)	(0.011)	(0.026)	(0.123)
Cluster by District	yes	yes	yes	yes
Adj R-square	0.0384	0.08	0.07	0.07
Obs	4958	4958	4684	4684

Note: Madras is the omitted province. Sex ratio is defined as female divided by male total population. To eliminate outliers, we dropped observations if sex ratio was greater than 3 or less than 0.3 and if caste population was less than 300. We also omitted data on castes for whose occupation could not be identified.

Appendix I: Definitions of Castes by Occupation

Occupations of castes were defined using the censuses and various ethnographic studies of India: Ibbetson (1916) for Punjab, Risley (1892) for Bengal, and Thurston (1909) for Madras.

<u>Castes of Punjab:</u>

Agricultural labor: chamar, chuhra, dhanak, jhinwar, khatik, mus_chuhra, mus_jhinwar, mus_machhi, bawaria, changar

Artisan: **basketmaker**(dumna)**, blacksmith** (lohar, mus_lohar)**, carpenter** (mus_tarkhan, tarkhan)**, leather** (jaiswara, kori, mus_mochi)**, mason** (barwala)**, metal worker** (mus_sunar, sunar)**, other/labor** (mazbi, mus_jhabel, batwal, chanal, dagi, garri, ghai, kalal, mus_kalal, mus_kanchan, mus_lilahi, mus_penja, mus_qassab, mus_rangrez, mus_teli, nungar, sarera)**, potter** (kumhar, mus_kumhar)**, tailor**(darzi, mus_darzi)**, village watchmen**(mina)**, weaver** (gadaria, julaha, meg, mus_julaha)

Cultivator: ahir, chang, gaddi, ghirath, ghosi, kachhi, kamboh, kanet, lodha, mus_kamboh, mus_mallah, pun_mali, reia, saini, gakkhar, khattar, taga

Landowner: bodla, gujjar, jat, karral, kharral, mahtam, mus_awan, mus_biloch, mus_dogar, mus_gujar, mus_jat, mus_khokhar, mus_meo, mus_pachhada, mus_pun_pathan, mus_pun_rajput, mus_qureshi, mus_rawat, mus_shekh, pun_rajput, rathi, ror

Religious: mus_faqir, mus_pun_jogi, pun_jogi, bishnoi, faqir, mus_sayad, pun_brahman

Professional: kaiath, mirasi, mus_khoja, mus_mirasi, mus_nai, nai

Service: **washermen (**chimba, dhobi)

Trader: banjara, bhabra, bohra, khattri, labana, mus_kunjra, mus_maniar, naik, nat, pahari_mahajan, sud

Tribe: agari, aheri, bazigar, mus_beldar, mus_harni, od, sansi

Unknown: gurkha, mus_kashmiri, mus_pun_moghal, sirkiband

<u>Castes of Bengal:</u>

Agricultural labor: banwar, bauri, dhunia, doai, gangauta, hari, kadar, kaora, kotal, musahar, nagar, nagesia, nagesia_ani, naiya, namasudra, oraon, oraon_ani, pargha, rajwar, sair, savar

Artisan: **basketmaker** (baiti, bantar, bari, dalu, dhamin, dhanua, karanga, majwar_ani, panpanika, patial_patikar, patni, rajbansi_total, turi_ani, turi, dafadar)**, blacksmith** (kamar_lohar, kami,marya)**,carpenter (**barhi, kharadi, sutradhar, kharadi_mus)**, goldsmith** (sonar, mir, sonar_mus)**, leather** (chamar, muchi, sarki, muchi_mus)**, mason** (kandu, barhi_mus, datiya, thawai)**, metal worker** (kansari, thathera, kalaigar) **other** (bedea, bediya, bhaskar, dosadh, ghasi, gorait, halalkhor, halwai, jhora, kalu, laheri, mahuria, malakar, niyari, nuniya, nuri, palwar, patwa, sankhari, sinduria, sokiar, sunrishaha, teli_total, tiklihar, abdal, atashbaz, bediya_mus, besati, bhanr, bhatiya_mus, chik, dhari_mus)**, potter** (kharura, kumhar, mehtar, chunari, kumhar_mus)**, tailor** (damai, darzi, darzi_mus, nagarchi), **weaver** (bagdi, gareri, jogi_jugi, kapali, karni, patra, tanti, chhipigar, dafali, jolaha, patwa_mus)**,**

Cultivator: agaria, atith, atith_ani, bhar, bhat, bhogta_ani, bhogta, chain, chakma, chasi, dhanuk, dhimal, ghani, gonrhi, kahar, kaibartta_total, kaur, kewat, khandait, khatik, khatwe, khawas, kora, koshta, magh, magh_buddhist, mal, malpaharia, malpaharia_ani, markande, mech, mech_ani, naik, pasi, pod, pundaripuro, rajbhar, rarhi, sukli, telaga, turaha, yakha, bhat_mus, dewan, kulu

Landowner: aguri, ahirgoala, ahir_gaura, babhan, bandawat, barui, kachari, kalita, kapuria, kastha, khaira, khambu, kharia, kharwar, khatia, kuki, kurmi, kurmi_ani, mahar, manjhi, rajput, rautia, sadgop, sarak, sunuwar, surajbansi, tamaria, ashraf, chaudhuri

Other: **fishermen** (banpar, berua, lohaitkuri, mallah, malo, muriyari, naliya, tiyar, mallah_mus, naliya_mus)**, other** (besya, deohar, gandharb, kathak, khelta, pawaria, surahiya, telinga, dai, fakir, hijra, khanjar, madaria, nikhari, pawaria_mus, sardar, amat, arakh, nabya, aghori)**, labor** (ajlaf, agri, bahelia, behara, beldar, bhuinmali, dhimar, dom, gharti, kan, lalbegi, murmi, murmi_bud, sudha, sudra, thami, behara_mus, beldar_mus, dhawa, golam, lalbegi_mus, mali, mandal, masalchi, mehtar_mus, sikalgar)

Professional: baidya, ghatwal, kachra, karan, kayastha, rajbhat, sahar, subarnabanik, vaisya

Religious:	aoghar, arya, banjara, brahman_hindu, brahman_agradani, brahman_barna, brahman_daibajan, brahman_nepali, dasnami, gaur, gosain, jagwa, jyotish, kabirpanthi, khandelwal, samanta, sannyasi, seo_narayani, taula, thakuri, kazi, khwandkar, saiad
Service:	**barber** (bhandari, gola, hajjam, napit, bhagawani, hajjam_mus, khan, nau_muslim**), washermen** (dhoba, dhobi), **music and dance** (bhatiya, dhari, gain, kawali, nat, bakho, bhathiara, halalkhor_mus, miriasin, nat_mus)
Trader:	naik_mus, adarki, agaria_ani, agarwala, agarwala_jain, agrahari, asur, bais_baniya, banaudhia, baniya, barnawar, bhakat, gandhabanik, ganrar, gujar, guria, kacharu, kalwar, kasarwani, kathbania, khatri, khen, madhunapit, mahesri, mahuri, marwari, mayra, nichondia, oswal, oswal_jain, rastogi, rauniar, sadhu, saraogi, saraogi_ani, tambuli, bakali, banjara_mus
Tribe:	lodha, toto_ani, bathudi, bhotia, bhotia_buddhist, birhor, garo, gond, gulgulia, gurung, ho, juang, kandh, kandh_ani, kanjar, korwa, korwa_ani, lepcha, limbu, mahli, mahli_ani, malar, malesauria, malesauria_ani, mangar, maulik, munda, munda_ani, murung, parhaiya, santal, santal_ani, tharu, tipara
Unknown:	ajnasi, baghuti, baishnab, balija, banjogi, baola, bhoi, dariadasi, datia, dogara, ghantra, ghusuria, girgiria, godra, gokha, gonr, guni, gurer, hadi, hajang, hayu, irika, jadupetia, kachhi, kadma, kahalia, kallar, kaltuya, kandra, kantabudiya, kartta, kasaundhan, kela, khami, khas, kheturi, khitibansa, khoiri, khyang, kichar, koli, konal, kukihalam, kumuti, kurariar, lushei, malhar, morangia, nahura, nekua, pahira, pankhu, porawal_jain, raju, sabakhia, sanai, shagird, shamri, siamese, sikh_sikh, sinhalese, sitaliyasiyal, siyalgir, surbhang, thoria, tulabhina, ujia, ajat, akhundi, bhisti, chaklai ,chamba ,chatua ,ghazi ,habshi ,jadupetia_mus, kalandar, kasbi ,khoja ,mahifarosh mahimal ,mallik_mus ,mangta ,mehana ,mirdah, mirza ,miyan ,moghal ,nalband ,nanbai ,sabangar ,shah ,shekh ,thakrai, tikulihar ,tutia**,**assamese**,** barnasankar, bengali, bhuiya, brahmo, buddhist, burmese, dhenuar, gangai, guzrati, jain, japanese, madrasi, manipuri, maratha, nanakshahi, nepali, newar, newar_bud, oriya, sikh, tibetian, afghan, afridi, biloch, kashmiri, manipuri_muslim, musalman, pathan, shiah, sunni

Castes of Madras:

Agricultural Labor: cheruman, holeya, mala, malasar, muppan, pallan, paniyan, valayian, vedan

Artisans:	**basketmaker** (bavuri, bellara, gudala, katasan, kichagara, medara, nalakeyava, savara), **blacksmith** (badhyoi, muli), **carpenter** (chaptegara, charodi), **domestic servant** (muvvard, sudra), **drummer** (haddi, relli), **leather** (chakkiliyan, godari, jaggali, madiga, muchhi, samagara, semman, tolkollan), **mason** (eruman, kamsala, kolayan), **oil presser** (chakkan, gandla, ganiga, sappaliga, telli, vaniyan), **other** (ashtalohi, kaniyan, konsari, kattumahrati, pambaikkaran, valluvan, ghontora, katike, chemhotti, sayakkaran, nodha, sunnari, lohara, noliya, magura, chakkiliyan, tondaman, pulluvan, kuttadi, dudekula, tiyan, kadan, pothriya, kallan, kanisan, gudigara, kurumban, jetti, chandala, dammula, kota, meria, ori_ashtalohi, puliyan), **potter** (anduran, kumbara, kumbharo, kummara, kusavan, mal_anduran, mal_kammalan, somara, kuravan), **tailor** (mal_panan, panan), **village watchman** (dandasi, mutracha), **weaver** (chaliyan, dombo, kaikolan, karnabattu, khatri, koliyan, kurni, kuruba, pano, patvegara, ronguni, tonti)
Cultivator:	seppilivan, agaru, ambalakaran, arakala, bonka, gaudo, gayinta, khoira, kondadora, kottiya, kuluvan, malayali, mali, mudugar, odiya, panisavan, pombada, pondra, rona, tel_agaru, tel_arakala
Landowner:	arasu, ballala, agamudaiyan, aiyarakam, alia, aruva, badaga, bant, bhatrazu, bhayipuo, bhumia, boda, bolasi, bosantiya, bottada, chinda, chuvano, devanga, dhakado, dhulia, doluva, gatti, gauda, gayara, heggade, ilamagan, kalingi, kamma, kamunchia, kappiliyan, kapu, khuduba, kolata, kshatriya, kudubi, kudumo, kunnavan, lingayat, majjulu, malaiman, malava, mattia, muriya, muttiriyan, nagaralu, nagavasulu, nattaman, nattan, navayat, omaito, ori_alia, ori_aruva, palli, patra, pentiya, poroja, rajput, sadar, sheik, sudarman, suddho, tel_aiyarakam, udaivan, vakkaliga, valuvadi, vellala
Other:	fishermen (arayan, bagata, bestha, chuditiya, jalari, kabbera, karaiyan, kevuto, kharvi, kondra, kukkundi, mal_arayan, mappilla, mogar, mukkuvan, neyyala, nulayan, paravan, pattanavan, sembadavan, toreya), labor (bedaru, billava, gamalla, halepaik, idiga, iluvan, indra, karumpurattan, shanan, siolo, boya, kudiya, mal_vettuvan, paidi, pulaiyan, samantiya, sonkari, alavan, koraga, kotari, kuruman, parivaram, uppiliyan, urali), lower religious (ambalavasi, andi, boishnobo, dasari,

devadiga, janappan, jangam, jogi, killekyata, mal_ambalavasi, maravan, marayan, moili, muni, occhan, pandaram, pattapu, ravulo, sanjogi, sannasi), shepherd (gauli, golla, idaiyan),

Religious: brahman, can_brahman, elayad, mal_brahman, mussad, ori_brahman, other_brahman, pujari, saiyad, stanika, tel_brahman, can_brahman

Professional: kanakkan, kadupattan, kammalan, karnam, kotegara, mahanti, nise, panchala, pandito, patnulkaran, puluvan, samantan

Service: **barber** (ambattan, bhandari, bhondari, kavutiyan, kelasi, mangala, melakkaran, velakkattalavan), **dancing girl** (dasi, guni, patramela), **washermen** (velan, agasa, agasu, dhobi, nekkara, vannan, veluttedan),

Trader: agarwala, anappan, arab, balija, banajiga, benia, bepari, bondili, bora, can_anappan, chetti, jonagan, kadukonkani, kannadiyan, kavandan, komati, labbai, lambadi, marakkayar, marvari, memon, muttan, panikkan, pathan, rajapuri, senaikkupaiyan, sondi, tarakan, vettuvan

Tribe: aranadan, chenchu, gadaba, hasala, irula, jatapu, karimpalan, kattunayakkan, khond, koyi, kuriochan, mal_aranadan, mannan, mellikalu, paliyan, solaga, yerravala

Unknown: godiya, arsan, dakni, gond, ite, kongan, konkani, moghal, musalman, nutar, saiva, sharif, tohala, vallamban

Appendix II: Definitions of Language Categories

Languages of Punjab: **Central Indo-Aryan** (hindustani, bikaneri, marwari, mewati, hindi), **North Indo-Aryan** (multani, bahawalpu, punjabi, dogri, bagri, gujari, ahirwati, hariani), **East Indo-Aryan** (bengali), **Foreign** (balochi, pashto), **Pahari-North** (pahari), **Tribal-North** (jangli), **Other** (??)

Languages of Bengal: **Central Indo-Aryan** (hindi, marwari, mahli, gujrati, kachchhi), **North Indo-Aryan** (panjabi, sindhi, kashmiri), **East Indo-Aryan** (bangali, oriya, assamese), **Dravidian** (malto, malhar, telegu, tamil, canarese, malayalm), **Foreign** (singhalese, burmese, arakanese), **Munda** (agaria, asur, birjia, kharia, mundari, bhumij, turia, birhor, kora, korwa, singli), **Pahari-East** (toto, limbu, lepcha, dhimal, mumi, gurung, mangar, khambu, newar, thami, yakha, sunuwar), **South Indo-Aryan** (marathi, goanese), **Tibetan** (tibetian, sikkim_bhotia, sharpa_bhotia), **Tribal-East** (khas, gipsy, ho, santali, karmali, oraon, gondi, manjhi, hayu, mech, kachari, garo, tipara, koch, kuki, manipuri, banjogi, pankhu, khyang, khami, lushei, mru, khasi, hallam), **Unknown** (juang, kandh)

Languages of Madras: **Central Indo-Aryan** (laria, hindostani, hindi, marwari, gujrati, kachchhi), **North Indo-Aryan** (lambadi, punjabi, sindhi), **East Indo-Aryan** (bengali, oriya), **South Indo-Aryan** (konkani, marathi, goanese), **Dravidian** (khond, irula, kota, kurumba, korava, toda, tulu, kodagu, konda, koraga, canarese, malayalam, tamil, telegu), **Foreign** (mahl, burmese, parsi), Munda (gadaba, savara), **Tribal-South** (badaga, gondi, koya), **Unknown** (sanskrit, bellara, gattu, kasuva, patnuli, poroja, bastari, chatgaiya, others)

Appendix III: Interpreting India's Aggregate Population Sex Ratio

Due to data limitations, we construct sex ratios using aggregate population ratios of females to males. However, in this appendix, we argue that this figure is like to reflect "son or daughter" preference of Indian communities. Our analysis suggests that when male sex-bias arises, it is likely to arise in early years of childhood. But because adult mortality rates between the two sexes across the various regions are relatively stable over time, the aggregate population ratios continue to reflect the early childhood sex-bias.

In Figure A1, we present sex ratios by different age groups at the provincial level for the three provinces. While sex-ratios vary by age groups, except for one age-group (10-15) in Bengal, the overall pattern is very similar across the three regions. Sex ratio falls from 0-5 to 10-15 age cohorts and then rises for the next two cohorts (15-20, 20-25), falls again for the next three cohorts (25-30, 30-35, 35-40), and then rises and falls again for the next two cohorts (40-45, 45-50). Importantly, the gap in sex ratios, especially for Punjab and Madras, is observed throughout the different age cohorts. Thus, the aggregate sex ratio is likely to capture the sex-bias for the Indian provinces in 1901.

If sex ratio bias exists and occurs only in the early years, and if other environmental factors do not affect the female to male mortality ratio over time, then we can view the aggregate sex ratio as a weighted average of the sex-bias experiences of many differently aged-cohorts over time. For example, since the 45-50 aged cohort in 1901

49

were born in 1851-1856, the sex ratio for this cohort is likely to capture the sex-bias which occurred during their childhood years between 1851-1865. Interpreted in this manner, the aggregate sex ratio captures the long-run historical average of the sex-bias in Indian society up to 1901.

By comparing sex ratios of 1901 cohorts at different ages over time by locating them in the 1911 census, we are able to identify at what ages the divergence in sex ratios arises. In Figures 2 and 3, the sex ratio of the 1901 cohort (x-axis) is compared to its matched cohort in 1911. Thus, we examine the differences in sex ratios between cohorts aged 0-5 in 1901 with those 10-15 in 1911; 5-10 with 15-20, etc. The data suggest that if sex ratios diverged, then it was likely to occur in the early childhood years rather than in the adult years.

For Punjab, in Figure A2, the divergence in sex ratios occurs in the childhood years but not during adulthood. For cohorts aged 0-5 in 1901, the sex ratio falls significantly as they grow older to 10-15 in 1911; for the next cohort aged 5-10 in 1901, sex ratio falls to a lesser extent as they age to 15-20 in 1911. However, for those cohorts aged 15-20 and higher in the 1901 census, their respective sex ratios do not change as they grow older in 1911. Thus, the cohort evidence suggests that most of the variations in the sex ratios may be driven by the variations in the childhood cohort data.

For Madras, shown in Figure A3, a slightly different picture emerges, but the aggregate sex ratio is also likely to be highly correlated with childhood sex ratios. In Madras, where son preference does not seem to exist, the sex ratio for younger aged cohorts do not diverge significantly as they age over time. However, for the slightly older cohort aged 10-15 in 1901, their sex ratio seems to decline significantly as they aged to 20-25 in 1911, perhaps reflecting the relatively higher female to male mortality caused by maternal deaths for women of childbearing ages. But these differences seem to reverse slightly for the next two aged cohorts. To the extent that maternal deaths impact the over-all sex ratio in Madras, our estimate is likely to provide a downward estimate of son preference in Madras.

Figure A1: Sex Ratio by Age, 1901
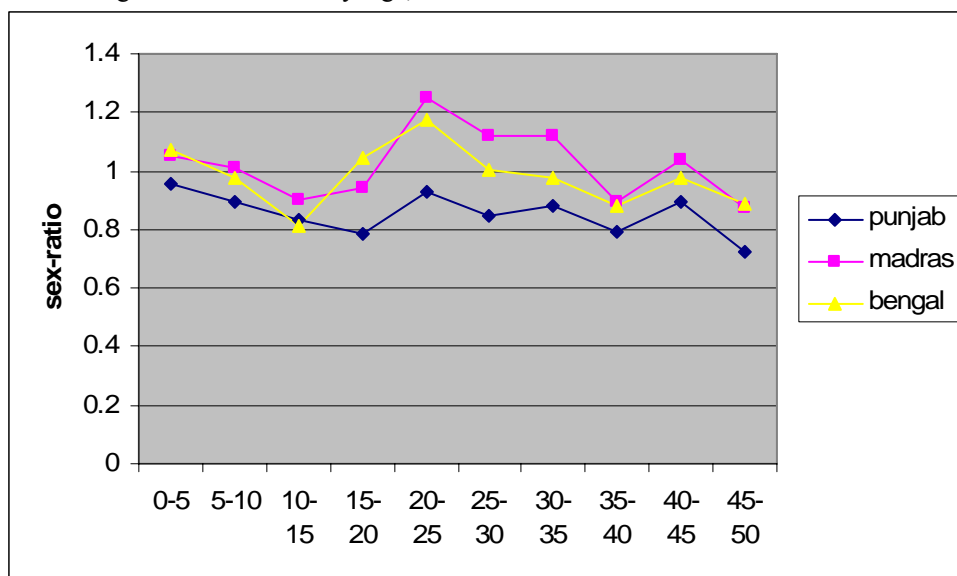
Note: X-axis plots age ranges in the 1901 census. Sex ratio is defined as female/male

Figure A2a: Sex Ratio by Age Cohort in Punjab, 1901-1911
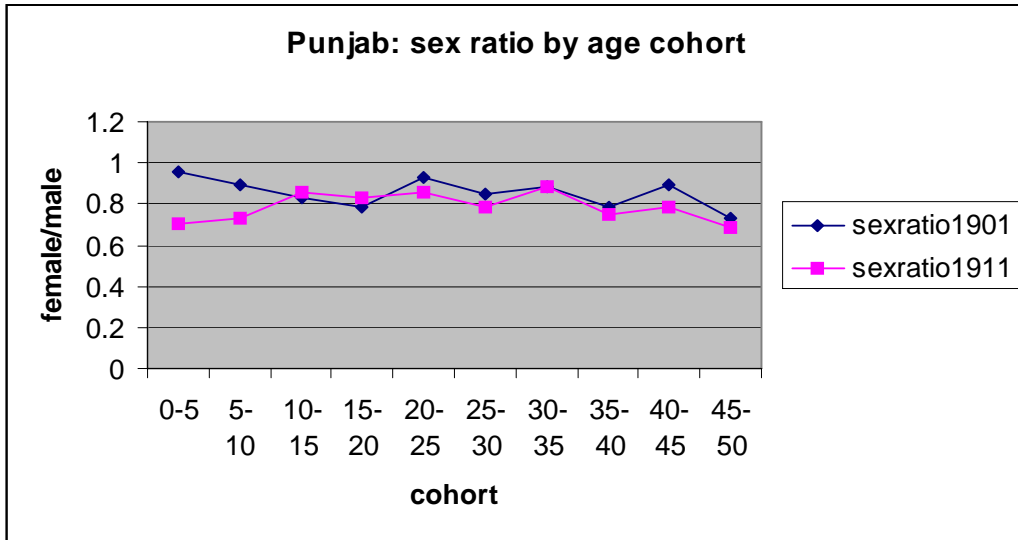
Punjab: sex ratio by age cohort

Note: "cohort" lists age groups for 1901. For instance, the listed 0-5 age cohorts in 1901 (blue line) are compared to 10-15 age cohorts in 1911 (pink line) and so on.

Figure A2b: Sex Ratio by Age Cohort in Madras, 1901-1911
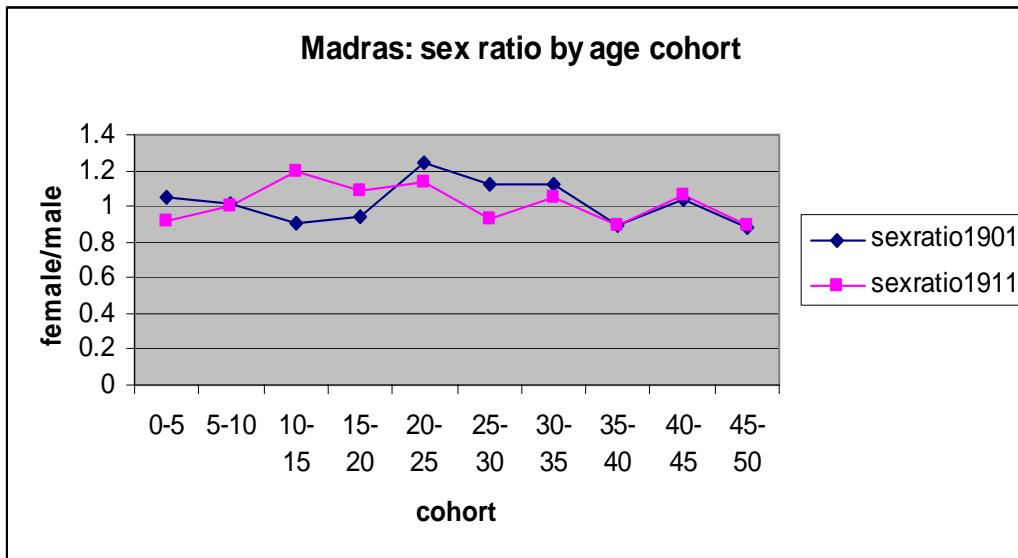
Madras: sex ratio by age cohort

Note: "cohort" lists age groups for 1901. For instance, the listed 0-5 age cohorts in 1901 (blue line) are compared to 10-15 age cohorts in 1911 (pink line) and so on.

Appendix IV: Village Caste Distribution

1. North: Malwa Village in the Princely State - Madhya Predesh, 1952

	Pop (%)	Average Area (acres per person)	
Khati (farmer)	181 (19.8)	Rajput	24.40
Rajput	118 (12.9)	Gosain	15.60
Pinjara Muslim (cotton)	102 (11.3)	Farmer	11.30
Balai (weaver)	85 (9.3)	Gardener	11.25
Camar (tanner)	69 (7.6)	Brahman	10.86
Bhilala	64 (7.0)	Fakir	9.99
Gosain	45 (4.9)	Goatherd	8.81
Teli (oil presser)	29 (3.2)	Tobacco	7.54
Brahman	28 (3.1)	Oil-presser	7.34
Ahir (dairyman)	26 (2.9)	Cotton-carder	6.93
Sutar (carpenter)	25 (2.8)	Bhilala	5.94
Nai (barber)	14 (1.5)	Dairyman	5.88
Nath	14 (1.5)	Potter	5.34
Kumavat (tobacco)	14 (1.5)	Barber	4.18
Mali (gardener)	13 (1.4)	Weaver	4.13
Gari (goatherd)	10 (1.1)	Balai Babaji	3.36
Darzi (tailor)	9 (1.0)	Tailor	2.98
Balai Babaji	9 (1.0)	Mina	2.76
Kumhar (potter)	9 (1.0)	Bairagi	2.69
Bhangi (sweeper)	8 (0.9)	Nath	2.48
Mina	8 (0.9)	Sweeper	1.63
Lohar	8 (0.9)	Carpenter	1.55
Doli	8 (0.9)	Tanner	1.20
Bairagi	5 (0.5)	Drummer	1.12
Bargunda (basketmaker)	5 (0.5)	Blacksmith	0.73
Fakir Muslim	4 (0.4)		
Bharbunjya	2 (0.2)		
Total	912 (100)		

Source: Mayer (1960)

2. North: Eight Hamlets of Mauza Chadhiar, Kangra in the Hill Country North of Punjab, 1897

	Population	Landownership (acres)
Rajput	1280	198
Koli	867	122
Leather-worker	364	63
Weaver	162	28
Brahman	122	19
Girth-cultivator	102	17
Temple priest	67	10
Barber	37	4
Jogi-ascetic	27	5
Goldsmith	15	3
Blacksmith	10	1
Potter	7	1
Musician	1	1

Total	3061	472
	(472 households)	

Parry (1979, p.37-38)

3. North: Rampur Village, Delhi in Punjab, 1953

	Population	
Jats	647	(own most of the land)
Brahmans	110	(some own land)
Camars (leatherworker)	107	
Bhangis (sweeper)	52	
Others	173	
Total	1080	

Others include: Kumhar (potter), Jhinvar (water carrier), Dhobi (washerman), Khati (carpenter), Nai (barber), Chipi (tailor), Lohar (blacksmith).
Source: Lewis (1958).

4. North: Mohana Village, Lucknow, UP, 1952

	Population	Landholdings - pakka bighas
Chamar	139	52 (12.6)
Thakur	122	170 (41.3)
Pasi	108	62 (15.0)
Ahir	64	39 (9.4)
Kumhar	33	35 (8.5)
Dhobi	33	13 (3.1)
Nai	16	1 (0.24)
Barhai	14	9 (2.1)
Kalwar	11	4 (0.97)
Gadaria	12	14 (3.4)
Lohar	7	2 (0.48)
Brahmin	9	9 (2.18)
Bhaksor	6	0
Kurmi	1	1 (0.24)
Total	311	411 (100.0)

Source: Majumdar (1958. p.11-13).

5. East: Ranjana, Midnapur - Bengal, 1960

	Population	
	Male	Female
Brahman	64	77
Sadgope	162	145
Bagdi	196	186
Muci	21	14
Dom	4	4

Tanti,Teli, Ahir	2	5
Santal	30	23
Muslim	13	12

Occupation	Brahmin	Sadgope	Bagdi	Muci	Muslim
Cultivation	6	63	90	7	11
Agri Labor	0	2	45	0	0
Service	12	21	9	0	0
Teaching	9	6	0	0	0
Business	5	4	0	0	0
Priesthood	11	0	0	0	0
Leather/Shoe	0	0	0	1	0
Thatching	0	0	2	0	1
Bell-metal	0	0	14	0	0
Quackery	1	2	0	0	0
Land per family (bighas)	21.88	9.39	0.75	0.65	5.0
Distribution by bighas (6-15 is subsistence)					
0-6	11	27	83	9	3
6-15	7	28	2	0	2
15+	7	11	0	0	0

Note: Since most residents of Ranjana own very small plots of land, cultivation is composed of both small owner cultivation in combination of sharecropping of zamindari land.
Source: Chattopadhyay (1964).

6. South: Kumbapettai, Tanjore - Madras, 1952

	Population
Brahman	
Brahacharnam Smartha	286
Vadama Smartha	7
Ayyangar	11
Kurukkal	15
Telegu Brahman	4
'Clean' non-Brahman	
Vellala (landlord)	3
Kallan (cattle raiding)	39
Padaiyachi (tenant farmer)	8
Agamudaiyan (tenant farmer)	13
Telegu Nayakkan (tenant farmer)	3
Maratha (courtier)	6
Konan (cowherd)	74
Pusali (village temple priest)	16
Kusavan (potter)	19
Tacchan (carpenter)	3
Pattan (goldsmith)	2
Kollan (blacksmith)	2
'Pollutting' non-Brahman	

Tamil Nayakkan (toddy tapper)	39
Nadan (toddy tapper)	13
Ambalakkaran (fisherman)	20
'Pollutting'	
Vannan (washerman)	4
Ambattan (barber)	8
Kuttadi (puppet-player, dancer)	8
Adi Dravida	
Korava (basket-maker, thief)	2
Devendra Pallan (landless laborer)	311
Tekkatti Pallan (landless laborer)	43
Outsider Muslim (native doctor)	3
Total	962

_____

Source: Gough (1960).

References

Ahmad, Sghir. 1977. *Class and Power in a Punjabi Village*. New York: Monthly Review Press.

Agarwal, Bina. 1994. *A Field of One's Own: Gender and Land Rights in South Asia*. New Delhi: Cambridge University Press.

Agarwal, Bina. 1997. "'Bargaining' and Gender Relations: Within and Beyond the Household," *Feminist Economics* 3:1-51.

Agarwala, S.N. 1957. "The Age at Marriage in India," *Population Index* 2: 96-107.

Bardhan, Pranab K. 1974. "On Life and Death Questions," *Economic and Political Weekly*, August, 9 (32-34), Suppl.: 1293-1305.

Baily, F. G. 1957. *Caste and the Economic Frontier: A Village in Highland Orissa*. Manchester: Manchester University Press.

Bayly, Susan. 1999. *Caste, Society and Politics in India from the Eighteenth Century to the Modern Age*. Cambridge: Cambridge University Press.

Bittle, A. H. 2002. "Endogamy, Consanguinity and Community Genetics," *Journal of Genetics* 81: 91-98.

Blunt, E. A. H. 1931. *The Caste System of Northern India*. London: Oxford University Press.

Botticini, Maristella and Aloysius Siow. 1993. "Why Dowries?" *American Economic Review* 93: 1385-1398.

Boserup, Ester. 1970. *Women's Role in Economic Development*. London: George Allen and Unwin LTD.

Caldwell, John C., P.H. Reddy, and Pat Caldwell. 1984. "The Determinants of Family Structure in Rural South India," *Journal of Marriage and the Family* 46: 215-229.

Chattopadhyay, Gouranga. 1964. *Ranjana: A Village in West Bengal*. Calcutta: Bookland Private Limited.

Crooke, William. 1896. *The Tribes and Castes of the North-Western Provinces and Oudh*. Calcutta.

Das Gupta, Monica, Jian Zhenghua, Li Bohua, Xie Zhenming, Woojin Chung, and Bae Hwa-Ok. 2003. "Why is Son Preference so Persistent in East and South Asia? A Cross-Country Study of China, India and the Republic of Korea," *Journal of Development Studies* 40: 153-187.

Dasgupta, Satadal. 1986. *Caste Kinship and Community: Social System of a Bengal Caste*. Madras: University Press.

Dirks, Nicholas B. 1993. *The Hollow Crown: Ethnohistory of an Indian Kingdom*. Second Edition. University of Michigan Press.

Dumont, Louis. 1957. "Hierarchy and Marriage Alliance in South Indian Kinship," *Occasional Papers of the Royal Anthropological Institute of Great Britain and Ireland* No.12. London: Royal Anthropological Institute of Great Britain and Ireland.

Dumont, Louis. 1986. *A South Indian Subcaste: Social Organization and Religion of the Pramalai Kallar*. Oxford: Oxfrod University Press.

Dyson, Tim and Mick Moore. 1983. "On Kinship Structure, Female Autonomy, and Demographic Behavior in India," *Population and Development Review* 9 (1): 35-60.

Edlund, Lena. 1999. "Son Preference, Sex-ratios, and Marriage Patterns," *Journal of Political Economy* 107 (6): 1275-1304.

Eglar, Zekiye. 1960. *A Punjabi Village in Pakistan*. New York: Columbia University Press.

Folbre, Nancy. 1997. "Gender Coalitions: Extrafamily Influences on Intrafamily Inequality," in *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*, edited by L. Haddad, J. Hoddinott, and H. Alderman, Johns Hopkins University.

Foster, Andrew D. 1993. "Household Partition in Rural Bangladesh," *Population Studies* 47: 97-114.

Foster, Andrew D. and Mark R. Rosenzweig. 2001. "Missing Women, the Marriage Market and Economic Growth," mimeo.

Fox, Richard. 1971. *Kin Clan Raja and Rule*. Berkeley: University of California Press.

Fox, Robin. 1967. *Kinship and Marriage*. Middlesex: Penguin Books.

Freitas, Kripa. 2006. "The Indian Caste System as a Means of Contract Enforcement," mimeo.

Goody, Jack. 1973. "Bridewealth and Dwry in Africa and Eurasia," in *Bridewealth and Dowry* edited by J. Goody and S.J. Tambiah. Cambridge University Press.

Gough, E. Kathleen. 1952. "Changing Kinship Usages in the Setting of Political and Economic Change Among the Nayars of Malabar," *Journal of Royal Anthropological Institute* 82: 71-87.

Gough, E. Kathleen. 1955. "The Social Structure of a Tanjore Village," in *Village India*, M. Marriott, editor. Chicago: University of Chicago Press.

Gough, E. Kathleen. 1956. "Brahmin Kinship in a Tamil Village," *American Anthropologist* 58: 826-853.

Gough, E. Kathleen. 1960. "Caste in a Tanjore Village," in *Aspects of Caste in South India, Ceylon, and North-West Pakistan*, E. R. Leach, editor. Cambridge: Cambridge University Press.

Gough, E. Kathleen. 1961. *Matrilineal Kinship* (edited with David M. Schneider). Berkeley: University of Califorial Press.

Gough, E. Kathleen. 1979. "Dravidian Kinship and Modes of Production," *Contributions to Indian Sociology* 13 (2): 265-291.

Gould, Harold A. 1960. "The Micro-Demography of Marriages in a North Indian Area," *Southwestern Journal of Anthropology* 16: 476-491.

Greif, Avner. 2005. "Family Structure, Institutions and Growth: The Origin and Implication of Western Corporation," mimeo.

Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge University Press.

Hershman, Paul. 1981. *Punjabi Kinship and Marriage*. Delhi: Hindustan Publishing.

Hoddinott, John and Lawrence Haddad. 1995. "Does Female Income Share Influence Household Expenditures? Evidence from Cote D'Ivore," *Oxford Bulletin of Economic and Statistics* 57: 77-96.

Ibbetson, Denzil. 1916 [1974]. *Panjab Castes*. Lahore: SH Mubarak Ali.

Kapur, Shilpi and Sukkoo Kim. 2006. "British Colonial Institutions and Economic Development in India," NBER Working Paper #12613.

Karve, Irawati. 1990. *Kinship Organization in India*. Third Edition. New Delhi: Munshiram Manoharlal Publishers.

Khuda, Barkat E. 1985. "The Nuclearization of the Joint Family Household in Rural Areas of Bangladesch," *Journal of Comparative Familiy Studies* 16: 387-400.

Kishor, Sunita. 1993. " 'May God Give Sons to All': Gender and Child Mortality in India," *American Sociological Review* 58: 247-265.

Kolenda, Pauline. 1987. *Regional Differences in Family Structure in India*. Rawat Publications.

Kranton, Rachel E. 1996. "Reciprocal Exchange: A Sefl-Sustaining System," *American Economic Review* 86: 830-851.

Kroeber, Alfred L. 1909. "Classificatory Systems of Relationship," *Journal of Royal Anthropological Institute* 39: 77-84.

Lévi-Strauss, Claude. 1969. *The Elementary Structures of Kinship*. Boston: Beacon Press.

Lewis, Oscar. 1958. *Village Life in Northern India*. New York: Alfred A. Knopf.

Ludden, David. 1985. *Peasant History in South India*. Princeton: Princeton University Press.

Lundberg, Shelly J. and Robert A. Pollak. 1993. "Separate Spheres Bargaining and the Marriage Market," *Journal of Political Economy* 101: 988-1010.

Lundberg, Shelly J., Robert A. Pollak, and Terence J. Wales. 1997. "Do Husbands and Wives Pool Their Resources? Evidence from the United Kingdom Child Benefit," *Journal of Human Resources* 32 (3): 463-480.

Mandelbaum, David G. 1970. *Society in India*. Two volumes. Berkeley: University of California Press.

Manser, Marilyn and Murray Brown. 1980. "Marriage and Household Decision-Making: A Bargaining Analysis," *International Economic Review* 21: 31-44.

Mathur, Divya. 2007. "What's Love Got To Do With It? Parental Involvement and Spouse Choice in Urban India," mimeo.

Mayer, Adrian C. 1960. *Caste and Kinship in Central India*. Berkeley: University of California Press.

Mayer, Peter. 1999. "India's Falling Sex-ratios," *Population and Development Review* 25 (2): 323-343.

McElroy, Marjorie B. and Mary J. Horney. 1981. "Nash-Bargained Household Decisions: Toward a Generalization of the Theory of Demand," *International Economic Review* 22: 333-349.

Mencher, Joan P. 1966. "Kerala and Madras: A Comparative Study of Ecology and Social Structure," *Ethnology* 5 (2): 135-172.

Mencher, Joan P. and Helen Goldberg. 1967. "Kinship and Marriage Regulations Among the Namboodiri Brahmans of Kerala," *Man* 2 (1): 87-107.

Miller, Barbara. 1981. *The Endangered Sex: Neglect of Female Children in Rural North India*. Second Edition. Oxford University Press.

Miller, Eric J. 1954. "Caste and Territory in Malabar," *American Anthropolists* 56: 410-420.

Moffatt, Michael. 1979. *An Untouchable Community in South India: Structure and Consensus*. Princeton: Princeton University Press.

Morgan, Lewis H. 1871. *Systems of Consanguinity and Affinity of the Human Family*. Washington DC: Smithsonian Institution.

Mujumdar, D. N. 1958. *Caste and Communication in an Indian Village*. Bombay: Asia Publishing House.

Munshi, Kaivan and Mark R. Rosenzweig. 2005. "Why is Mobility in India so Low? Social Insurance, Inequality and Growth," mimeo.

Murthi, Mamta, Anne-Catherine Guio, and Jean Dreze. 1995. "Mortality, Fertility, and Gender Bias in India: A District-Level Analysis," *Population and Development Review* 21 (4): 745-782.

Nasir, Rosina and A. K. Kalla. 2006. "Kinship System, Fertility and Son Preference among the Muslims: A Review," *Anthropologist* 8: 275-281.

Nesfield, J. C. 1885. *Brief View of the Caste System of the North-Western Provinces and Oudh*. Allahabad.

North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.

North, Douglass C. 2005. *Understanding the Process of Economic Change*. Princeton University Press.

North, Douglass C., John J. Wallis, and Barry R. Weingast. 2006. "A Conceptual Framework for Interpreting Recorded Human History," mimeo.

Oster, Emily. 2005. "Hepatitis B and the Case of Missing Women," *Journal of Political Economy* 113 (6): 1163-1216.

Park, Chai Bin and Nam-Hoon Cho. 1995. "Consequences of Son Preference in a Low-Fertility Society: Imbalance of the Sex-ratio at Birth in Korea," *Population and Development Review* 21 (1): 59-84.

Parry, Jonathan P. 1979. *Caste and Kinship in Kangra*. London: Rutledge & Kegan Paul.

Pradhan, M.C. 1966. *The Political System of the Jats of Northern India*. London: Oxford University Press.

Qian, Nancy. 2006. "Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance," mimeo.

Risley, H. H. 1892. *The Tribes and Castes of Bengal*. 2 volumes. Calcutta: Bengal Secretariat Press.

Rose, Elaina. 1999. "Consumption Smoothing and Excess Female Mortality," *Review of Economics and Statistics* 81: 41-49.

Russell, R. V. 1916. *The Tribes and Castes of the Central Province of India*. 4 volumes. London. Macmillan and Company.

Sastri, Nilakanta. 1976. *A History of South India*. Fourth Ed. Madras: Oxford University Press.

Sen, Amartya. 1990. "More Than 100 Million Women Are Missing," *New York Times*, Volume 37, Number 20, Dec. 20.

Shah, A. M. 1977. "Lineage Structure and Change in a Gujarat Village," in *Dimensions of Social Change in India*, M. N. Srinivas, S. Seshaiah and V. S. Parthasarthy, eds., Bombay: Allied Publishing House.

Sontheimer, Günther-Dietz. 1977. *The Joint Hindu Family: Its Evolution as a Legal Institution*. New Delhi: Munshiram Manoharlal Publishers.

Srinivas, M. N. 1976. *The Remembered Village*. Berkeley: University of California Press.

Stein, Burton. 1994. *Peasant State and Society in Medieval South India*. Delhi: Oxford University Press.

Stein, Burton. 1998. *A History of India*. Malden: Blackwell Publishing.

Stone, Linda. 1997. *Kinship and Gender: An Introduction*. Boulder: Westview Press.

Tambiah, S. J. 1973. "Dowry and Bridewealth and the Property Rights of Women in South Asia," in *Bridewealth and Dowry* edited by J. Goody and S.J. Tambiah. Cambridge University Press.

Thapar, Romila. 1984. *From Lineage to State: Social Formations in the Mid-First Millennium B.C. in the Ganga Valley*. New Delhi: Oxford University Press.

Thomas, Duncan. 1990. "Intra-Household Resource Allocation: An Inferential Approach," *Journal of Human Resources* 24: 635-664.

Thomas, Duncan. 1994. "Life Father, Like Son; Like Mother, Like Daughter: Parental Resources and Child Height," *Journal of Human Resources* 29: 950-988.

Thurston, Edgar. 1909. *Castes and Tribes of Southern India*. 7 volumes. Madras.

Trautmann, Thomas. 1993. [1979]. "The Study of Dravidian Kinship," in *Family, Kinship and Marriage in India*, P. Uberoi, ed., Delhi: Oxford University Press.

Trautmann, Thomas. 1981. *Dravidian Kinship*. Cambridge: Cambridge University Press.

Visaria, Pravin M. 1961. *The Sex-ratio of the Population of India*. Census of India, Volume 1: Monograph 10. New Delhi: Ministry of Home Affairs.