Do Cultural Values Override Incentives? Sex Ratio, Caste, and Marriage in India

Bishnupriya Gupta[1]

Dept of Economics

University of Warwick

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Abstract

A comparison between European and Asian marriage patterns show higher marriage rates in Asia. In India there is universal marriage for women, but marriage rate for men vary by region. The regions represent the cultural diversity and differences demand for sons. A preference for sons have implications for marriage outcomes. Using the census of 1931 in India, the paper finds that the son preference is regional phenomenon and leads to a high rate of celibacy for men. Using caste-level information, the paper finds no evidence that economically advantaged men enjoy an advantage in the marriage market as the theoretical literature suggests. The regional differences in gender bias and marriage market outcomes have persisted over the century and suggest the importance of cultural values. The long run changes show that the *marriage squeeze* has reduced the surplus of men in all regions, however the regional differences in son preference and marriage outcomes remain in 2001.

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"Religion, which in the West makes not infrequently for celibacy, throws its weight in India almost wholly into the other scale. A Hindu man must marry and beget children to perform his funeral rites, lest his spirit wander uneasily in the waste places of the earth. If a Hindu maiden is unmarried at puberty, her condition brings social obloquy on her family, and on a strict reading of certain texts entails retrospective damnation on three generations of ancestors."- Census of India 1901

Universal and early marriage characterizes many Asian societies in contrast to the norm in Europe. In India religion plays an important role in explaining why this is the case. The desire to have a son is an important part of Hindu religion as sons perform the funeral rites. Early marriage is an important social norm too. However the marriage rate among men and women differ significantly. While marriage for women is universal, there is a regional variation in the marriage rate for men. The relatively low marriage rate for men particularly stands out in regions where preference for sons defines the cultural norm.

The term "son preference" has been used widely to describe the gender bias in the demand for children. If this preference translates into a surplus of men in the marriage market, then surely some will not marry nor have children. Therefore what is the optimal outcome in one generation will lead to a sub optimal outcome in another generation as men fail to find partners in marriage. How do we reconcile these apparent inconsistencies?

Dharma Kumar in a well known paper entitled 'Male Utopias or Nightmares?' (EPW, 1983) argued that the law of supply and demand can sort out the problem. If the supply of women is low because of sex selection, they will only become more valuable. However, an excess demand of girls in the marriage market has remained a utopia although the gender bias in sex ratio at birth has risen over the century with the availability of modern technology. One explanation of the persistence of excess demand for males in the marriage market is the *marriage squeeze*. A relative shortage of men in each cohort arises due to population growth and age difference in marriage.

Lena Edlund's (1999) theoretical exploration into the effect of gender bias on marriage pattern finds that if parents want sons, and also want grandchildren, then son preference will be stronger among upper social classes. Men in socially and economically powerful groups will enjoy better prospects in the marriage market. If there is a surplus of men, then richer men will marry and those in the lower social groups will fail to marry. If

there is perfect sex selection, then the upper classes will select to have sons and the lower social classes will have daughters despite their preference for sons as the daughters will marry above their social class. The result will be social stratification by sex. In the absence of perfect selection, there will be a surplus of men in the marriage market and a difference in marriage rate for men and women by social class. Edlund's paper speculates that surplus of men in the marriage market in one generation will reduce gender bias for future generations as there will be a back log of unmarried men. Bhaskar (2011), on the other hand shows the son preference and low marriage rate for men may coexist as equilibrium outcomes.

In the empirical literature on gender bias and marriage, the effects of exogenous shocks to the gender balance in the marriage market have been studied in the context of war and immigration. In the first case, there are more females relative to males and in the second more males relative to females. Abramitzky et al (2008) studies the decline in sex-ratio in France after WWI that increased the "probability of marrying up" for men. Angrist (2002) analyses the implication of more males relative to females in the US due to immigration- and finds that marriage rate increased among females and had a negative effect on female labour force participation. Migration of male workers in Asia created gender imbalances in different regions. In Singapore the excess of young men in the Chinese population in early 20^{th} century led to a lowering of age at marriage for women and a rising age gap. This was reversed as the sex ratio became more balance over time. In the opposite context, emigration of men from Malaysia in the 1950s raised the age at marriage for women and lowered it for men (Smith 1980).

This paper considers the gender bias in the marriage market arising due to parental preferences. When a society values sons more than daughters, what are the implications for the marriage market? Does an imbalance in the marriage market correct itself through social stratification in son preference as suggested by Edlund? Or does the imbalance in the marriage market persist? The early Indian censuses provide information on marriage rate by region and by caste. If caste is a proxy for social status, I can test if upper caste men enjoy an advantage in marriage. Given the linguistic and cultural divide between regions, the region can be a proxy for cultural values. Gender bias reflects cultural norms and the regional differences show differences in cultural preferences. A historical perspective allows us to look at the long term effects too and document the changes gender balance and its effects in the marriage market over the century. Two changes are significant over the century.

Population growth which determines marriage squeeze has increased after 1931. Use of modern technology has also made sex selection viable in recent decades.

The "marriage squeeze", showing to a demographic imbalance in the marriage market must differ across regions of son preference and the rest as there are two opposite effects on marriage squeeze. A bias for male children increase the number of men relative to women. Population growth, on the other hand, increases the supply of women relative to men in the marriage cohorts if there is an age gap at marriage. In India, the age difference at marriage is five years. In the regions of son preference marriage squeeze should be weak and quite strong in the rest.

The paper will focus on the 1931 census for a detailed analysis of the marriage market. The data is classified at the level of the provinces and I can test if regions of son preference have a higher rate of celibacy. This is also the last census to record caste level information and also predates the period of large scale migration. This allows us to test if more men in the lower castes remained unmarried in every region as lower castes also tend to be economically disadvantaged.

Based on the cross sectional analysis, I find that the regions that have a gender-bias also saw a higher proportion of men remaining unmarried in 1931. I find that son preference is greater in higher castes, but contrary to the theoretical prediction, the proportion of never married men is significantly higher in the upper castes. The long run picture reveals that the regional differences across India have persisted over time despite differences in economic development measured in terms of growth rate, structural change, urbanization as well as standard indicators of human development. Preference for sons remain predominant in certain regions, but not in others. The paper tracks the marriage squeeze in different states. A long run analysis of the marriage cohorts suggest that the marriage squeeze due to population growth has created a relative shortage of men in most regions. However, the regions of son preference have less shortage and therefore the marriage squeeze in these areas is less significant. Punjab and Kerala are the two extremes. Punjab continues to have the highest single rate for men. In Kerala there the single rate for women is higher than that for men. When the regional differences in 2001 are compared with that present in 1931, there is little change. The preference for sons has persisted in North India over the century. The share of never married men is higher in the north in 1931 and in 2001.

This paper is organized as followed: section 2 discusses the history of son preference in India. Section 3 discusses the Indian marriage pattern and the regional variations. Section 4 analyzes the region and caste level data from the census of 1931. Section 5 focuses on the long –run implications by tracking the marriage sex ratio over the century in order to find an evidence of a "marriage squeeze". Section 6 concludes.

2: Son Preference and Sex Ratio

The evidence of a gender bias for males in certain regions of India goes back to the early censuses in the late 19th century. The imbalance in the overall sex ratio was well established in India in1901 or earlier. Bhaskar and Gupta (2007) show that there is a regional variation in sex ratio in the age group under 5 and this variation dates back to 1931. The early censuses discussed the problem of son preference and female infanticide in certain communities Punjab, United Provinces, Gujarat and Baroda. The Census of 1901 discussed the more widespread neglect of girl children, even when the practice of infanticide was limited.

"Even if there was no deliberate sign of hastening a girl's death, there is no doubt that as a rule, she receives less attention than would be bestowed on a son. She is less warmly clad, and less carefully rubbed with mustard oil as a prohy-lactic against the colds and chills to which the greater part of the mortality amongst young children is due, she is also probably not so well fed as a boy would be and when ill, her parents are not likely to make the same strenuous effort to ensure her recovery."

However when we look at the under 5 sex ratio in the first half of 20th century, there is no evidence that there was bias towards males. In 1931, the ratio was well below the "the biological normal" of 106 boys to 100 girls at birth in all regions. There was a male deficit in all except in Northern states, such as Punjab and in the Southern States of what is now Kerala- Cochin and Travancore. (See table 1) This is not inconsistent with the evidence on gender differences in infant mortality. Biologically females have an advantage as infants. This advantage disappears over the age of five and turns into a disadvantage. For the two outliers the explanations may differ: In Punjab there is qualitative evidence of infanticide and stronger preference baby boys. Cochin and Travancore represent matrilineal societies and a very different social status for women, which may explain positive outcomes for children. There is a gradual worsening of the gender bias against females over the age cohorts. In the cohort 10-15, there was already evidence of differential mortality between boys and girls in

part reflecting biological differences and mortality in early child birth and in part discrimination against girls as suggested in the census. It also reflects in part the poor reporting of girls in this age cohort. What stands out that the sex ratio shows no bias in favour of males in the under 5 age cohort. Female mortality in the under 5 age group was lower for girls until 1941. Life expectation at birth between male and females also stayed the same until 1961, diverging thereafter as male mortality declined faster. (Bhat, 1989: 92).

With rising living standard the male disadvantage diminished as is reflected in the rising sex ratio in the under 5 age group in India after 1961 (See table 2). With better nutrition for mothers infant mortality declines rapidly amongst boys (Sudha and Rajan, 1999) This is suggested by the rise in under 6 sex ratio over the century in all. However, it is worth noting that the increase in the sex ratio in the young was from a figure below normal and the rise has stayed within the "normal level" until recently and reflects improvement in male mortality rather than gender bias. The biggest jump in sex ratio is in 2001. The use of modern technology has facilitated abortion of female foetus and the most recent increase is a likely reflection of sex selection. The increase (and the level) is modest for the Southern states and for the states in the East and Centre. In most states this ratio is well within the figure of 106 boys to 100 girls. In the Northern and Western States there is evidence of increasing gender bias through sex selection in 2001. But the preference for sons is a regional feature and the regional differences can be traced back to the census of 1931.

The regional differences in demographic behaviour have been discussed in terms of economic and social factors. The early censuses talked about the special position of sons in Hindu religion. This cannot explain the regional divide. Women's participation in economic activity may explain the North- South divide in the status of women (Boserup 1970, Bardhan 1973) It is argued that the wheat growing regions of the north have little participation of women in agricultural work.[2] In rice cultivation on the other hand, women have an economic role and there is less discrimination against them. Das Gupta (1987) argues that in the states of Punjab and Haryana with the worst gender bias, women routinely work in agriculture and perform all tasks other than ploughing. Therefore the wheat vs. rice argument is rather weak. Instead what determines the position of women in this cultural is the patrilinial inheritance of property. Genealogies can be reconstructed for men, but rarely for women as the daughter

[2] Alesina et al (2011) find a correlation between plough agriculture and female autonomy.

leaves the patrilineage on marriage, but never becomes part of the husband's lineage. The gender bias in worst in landed communities of *Jats* in Northern India.

Women enjoy more autonomy in the South as a result of the kinship structure. Sons remain at home and women join the husband's household. In North India, a woman's primary role is to ensure continuity of the patrilineal social structure. (Dyson and Moore 1983) Her social standing improves when she becomes the mother of a son. (Karve 1953: 134-35) Cousin marriage is more common in the South and keeps property within the family and increase the value of women in these societies. In this view, village exogamy to be the norm in Northern India as distinct from the South although Rahman and Rao find no significant difference in village exogamy between the North and the South. However, cross cousin marriages are more common in certain communities in the South.

Miller (1981) discusses the variation in son preference across caste with high castes in Northern India showing a pronounced gender bias. There is qualitative and anecdotal evidence on female infanticide in the upper castes in the Indian censuses. However, this evidence remains fragmentary with little quantitative support towards such a claim. Analyzing district level data from Punjab, Bengal and Madras from 1901 census, Chakraborty and Kim (2008) find a strong regional effect. Bias against females is strongest in Punjab in the north and declines as we shift to Bengal and to Madras. The bias also weakens from high to low castes across each region. Their analysis uses the aggregate sex-ratio on the assumption that mortality rates are not different across states in different age cohorts. This is a strong assumption as mortality rates differed cross age cohorts during this period; particularly as maternal mortality was high. The sex ratio in the age group 0-5 is a better indicator of son preference. Section 4 presents evidence for this age group by caste and finds the bias for male children to be stronger in the upper caste at the aggregate level.

3. Indian Marriage Pattern

Marriage in Indian society is early and universal, similar to the pattern in China and Korea and in contrast with the European marriage pattern. In North Western Europe marriage was consensual and men and women married late. A relatively large number of men and women remained single even in the 18^{th} century. Evidence on marriage available for the European aristocracy going back even further indicate a large proportion of never married men and women (Hajnal 1965) Celibacy and late marriage were means to stave off the

Malthusian crisis. (Voitlander and Voth 2010). The age at first marriage began to decline with rising income and industrialization (Wrigley1983) contrary to what we expect in today's developing countries.

Within Asia, early marriage was specific to India. Mean age at marriage in India was 13 years in 1901, while in Taiwan it was 19 in 1906, in the Philippines 21 in 1903. (Banerjee 1998) Having unmarried girls in the parental home once they attained puberty carried a social stigma. Indian literature is full of examples of girls considered too "old" to remain single. At sixteen a girl in Bengal at the turn of the century would be considered "unprotectable".[3] Celibacy was unknown for Indian women and a contrast to the high rate of celibacy among both men and women in Europe (See Table 3)

Consequently arranging marriages in childhood to be consummated at puberty was common. The censuses of the late 19th and early 20th century show large numbers of males and females married in the age group 0-10. The mean age at marriage for females in 1891 was 12.5, for males 19. Child marriage was most common among the Hindus although it was also practised in other communities. Marriage in the Indian context did not mean cohabitation. The practice of two ceremonial weddings is common- the first when the marriage takes place and the second when cohabitation begins. What is considered the age at marriage is the first one. This creates a down ward bias in the documentation of age at marriage and therefore cross country comparisons do not reflect the accurate picture. Very few societies had such a large incidence of child marriage. Within India child marriage was particularly important in some states. The southern states had a lower incidence of child marriage.

The incidence of child marriage declined in all communities until 1921, but showed a rise in 1931. This reflects the pre emptive action taken before the implementation of the Child Marriage Restraint Act or the Sarada Act of 193, which set a lower bound on the age at which marriage could take place. All over India, there was a rush to marry girls under the age of 14 before it was implemented. The hysteria about having unmarried girls in the house was such that anecdotal evidence refers to instances of low caste males marrying high caste brides and

[3] Tagore's short story with a similar title is a fictional depiction of the sad life of an unmarried young woman in Bengal.

high caste girls being married to men with disabilities, otherwise considered a social taboo. (Census of 1931)

The practice of early marriage has declined since then but even in the 1981 census; the proportion of married women in the age group 15-19 was about 44% and just under 7% in the age group 10-14. The corresponding figures were 84% and 44% in 1931.[4] This proportion is large compared to countries outside south Asia, which show a similar marriage pattern. The figure for Korea was 15% in 1955 and for Turkey 22%.

Marriage and Social norms

Economic models of marriage are based on gender specific roles within the family with men as breadwinners and women as homemakers. (Becker 1981) In these models, increases in educational attainment for women reduce demand for marriage and explain rise in age at marriage with economic development. In the family context, an increase in the woman's income delay marriage as it allows women to search longer, but an increase in male income increase the incentive to marry early. Bergstorm and Bagnoli's (1993) theoretical argument within the framework of assortative mating suggests that for men waiting has the advantage in making a better match as their labour market performance signal status. Edlund, on the other hand, shows that richer men will marry young if there is a surplus of men in the marriage market and poorer men will marry late and some of them will fail to marry. In the context of search based explanations of marriage, Loughran (2002) finds that increasing wage inequality for men increases the incentive for women to search longer and therefore raises the age at first marriage.

In India age at marriage has increased with increasing years of education. (Jensen and Thorton 2003) Recent work by Desai and Andrist (2008) find that based on survey data of 2005, secondary and college education increase age at marriage by nearly 5 years, but wage employment lead to early marriage in India. This may also explain why women who work in the modern sector marry later, but there is little difference in the age at marriage for non-working women and women working in the traditional sectors marry. Urbanization in most Asian countries has led to an increase in age at marriage and is correlated with education and

[4] The incidence of reported child marriage could be lower than the actual given that laws regulating the age at marriage were in place.

occupation in modern industry, another difference between 18th century England, where age at marriage declined with urbanization and the industrial revolution.

These incentive based arguments do not explain why in some societies late marriage goes back to preindustrial times and in others marriage is early. Nor does it explain why marriage patterns vary across different regions in India. This is the Hajnal divide with early marriage to the east of a line joining St Petersburg and Trieste. Hajnal's distinction relies on social conventions of family formation. In North Western Europe, a typical household rarely had three generations living in it. It was common for a household to have living in servants rather than older children. An independent household was formed with marriage and in agricultural societies where earnings peak late, late marriage was the norm. The system of primogeniture may also explain why the second and the third son were at a disadvantage in the marriage market as they did not inherit family. (Smith 1980) Late marriage and a low marriage rate was historically a social norm to the west of the Hajnal line.

The marriage pattern was very different to the east of the line. The line goes through Eastern Europe dividing the Balkan and the Baltic societies by social conventions of marriage. In the Western parts, marriage was late and in the east early. In the Czech and Polish regions of the Baltic, nuclear family and primogeniture were the norms, while in the Balkan nuclear families belonged to a larger kinship network with common ownership of property. (Sklar 1974) Sklar refers the religious divide between Islam in the east and Christianity in the West and the strong kinship ties arising from Islamic law. The cost of setting up a new nuclear household delayed marriage in North Western Europe. (Hajnal 1965, Goody 1996)

In societies, where marriage leads to an addition to the household and not the formation of a new one, the economic requirements of setting up and independent household are absent. Therefore delaying marriage has no economic advantage. On the contrary additional labour in the household may bring some benefit. In Romania, marriage was not postponed at times of economic crisis, such as poor rainfall, where as this was true in North Western Europe. Joint families could bear the shocks better than nuclear families. This is also true of the extended family system in many Asian countries. India is a case in point. In India "marriage and earnings were two separate things. Marriage was a social, familial and

religious obligation, while earning was a matter of circumstances." (Smith 1980 referring to P Tandon)[5]

De Moor and van Zanden (2010) suggest the importance of consensual marriage as an explanation of late marriage in North Western Europe. In consensual marriage, the search cost in time can be high. Evidence from Baltic parts of Eastern Europe shows that sex ratio in the marriage cohorts worsened against women as men migrated to the cities and with a time lag, young women migrated to the cities in search of partners. (Skar 1974)

As a contrast, in societies where marriage is arranged by the family, the family network provides the search input. Information flows within the caste or community may lead to early commitment to marriage. The system of child marriage before cohabitation indicates such an effect. In the Islamic societies in Eastern Europe, search of marriage partners was also left in the hand of the parents rather than by consent and the outcome was early marriage. (Sklar 1974) Bergstorm and Bagnoli's argument of the value of waiting may not apply in the Indian context for yet another reason. In agricultural societies, with low education level and little prospect of income gains with age, early marriage may be the natural outcome, particularly when living in extended families is the social norm. The value of waiting increases with urbanization and economic development or in societies where new households are formed with marriage. If marriage takes place within rigid boundaries of linguistic and caste differences, then the value of waiting may be further reduced.

In Asia, although early marriage is the social norm, there is a large variation in age at marriage and the prevalence of celibacy. In Burma and Sri Lanka, where Buddhism has been a dominant religion, celibacy has historically been higher. In the Islamic societies control over female sexuality in particular has been as strong as in Hindu society, where it was a social taboo to have unmarried girls in the parental home after puberty. In both cultures marriage for girls was early and universal marriage for women. Iyer (2002) finds that after controlling for economic factors, there is no significant difference in the age at marriage between Hindus and Muslims in India. Christians marry later. The social convention also dictates that daughters must be married before sons and therefore marriage of sons is delayed to a later age and in part explain the large age gap at marriage. (Caldwell 1983)

[5] Das Gupta (2005) suggests that in rural Punjab, this was not necessarily the case as marriage for younger sons was postponed in times of economic downturn.

The North – South divide in marriage patterns in India is similar to the divide other in demographic characteristics. Broadly speaking, the North shows higher fertility, a bias for male children and early marriage. Higher fertility may also reduce the desire to see all children married to see a grandchild. A study of the two contrasting regions in India from 1885 to 1946 finds on the basis of district level data that Madras presidency already had lower fertility compared to Punjab (Saito et al 2005) Banerjee (1998) distinguishes between the late marriage and early marriage states. Kerala, Tamil Nadu and Karnataka in the South fall in the first category and Bengal, Maharashtra and Uttar Pradesh in the second. (See table 5) The latter are from three different regions in India and belong to different cultural contexts. Punjab has later marriage than other states in North India.

The conventions on widow remarriage also vary across regions. Communities where widow remarriage is socially unacceptable, the gender bias in the marriage market is large as widowers re-enter the market, but not widows. Bengal had a deficit of women in the marriage context despite a balanced sex ratio as widow remarriage was a taboo.[6] The share of widows in the population was twice as high in Bengal compared to United Provinces which had a similar level of life expectancy (Banerjee 1998) In Punjab and UP the biased sex ratio at birth translated into a surplus of men in the marriage market. But widows re entered the market and reduced the shortage of brides. In Punjab widows were only 8% of the women in the age group 15-40, 10% in UP, 14% in Maharashtra and 20% in Bengal. (Banerjee 1998)

We can distinguish between economic factors influencing marriage patterns and the cultural factors that are persistent. Education, income, urbanization will fall in the first category. Gender bias and marriage conventions fall in the second. Table 3 shows the differences in the single rate across Europe and Asia. What stands out for India is the high, near universal marriage rate for men and women and the large age gap at marriage. The second characteristic is that proportion of single men in the age group 45-50 is greater than that for women and is a contrast to the high correlation of 0.84 for never married men and women in most societies. (Dixon 1971). Figure 1A shows the cross country correlation in gender specific singles rate at age 50 in 1900 using Hajnal's data set[7]. Figure 1B shows a

[6] The social reform movement in Bengal in the 19th century tried to change this practice: The Hindu Widows Remarriage Act of 1856.
[7] 1950s for most developing countries)

similar correlation for different states in India in 1931. Here the correlation is weaker. While marriage was universal for women, the marriage rate varied for men varied by state.

Caste, marriage and sex ratio:

The caste system in India provides an ideal context of assortative matching in marriage. Rules guiding marriage are an important part of the caste system. The two main aspects are endogamy, which rules that people marry within the caste and second is exogamy, by which they are forbidden to marry those with whom they have a common ancestor. These rules make the group an important part of the marriage system and therefore allows for suitable arrangements to emerge within the network. A third rule is *Hypergamy* or" marrying up" is a custom which forbids a woman of a particular group to marry a man of a group lower than her own in social standing, and rules that he women can marry within the group or above it. On the other hand, men of the group can marry in it or below it. The children belong to the caste of the father.

The marriage rules, therefore, have implications for societies where son preference prevails. Hypergamy is likely to encourage a bias towards male children among the upper castes and a more balance sex- ratio in the lower castes or social stratification in terms of gender bias as Edlund suggests. Hypergamy implies greater competition for men in the uppercase, increasing the probability that lower caste men remain unmarried. (Edlund 1999, Snehi 2003) The prohibition on widow remarriage was more prevalent in the upper castes and therefore many widowers entered the marriage market a second time, but not widows and contributed to the excess of males in the upper castes and a further disadvantage for men in the lower castes. Widow remarriage was less of a taboo for the lower castes. In ancient India it was not uncommon about the labouring classes as was the practice of taking another partner by women if there were no sons (Sharma 1973: 120)

There are others outcomes of gender bias in the marriage market. Different communities had different rules to deal with the imbalance in the marriage cohorts. In some high castes in Bengal and Malabar, the eldest sons had to marry within the caste , but the younger sons could marry down, among the landowning caste of Patidars in Gujarat all sons could find a bride from the lower castes. (Pocock 1989: 331-2) Polygamy came to prevail in some high caste communities such as the Kulin Brahmans of Bengal. In Punjab, a state with one of the worst gender imbalances, two brothers often married the same girl. The decision making in the joint family system rests with a family as the unit rather than the couple.

Consequently, the practice of fraternal polyandry in some communities in Punjab is a way to deal with surplus of men in the marriage market (Dasgupta 2005). In some isolated communities in the hills of UP, fraternal polyandry was practised as there were fewer women than men (Berreman 1993: 227) Lower caste men in a village in Uttar Pradesh had to find their marriage partner from a more distant villages. The shortage of women also meant that daughters found marriage partners closer to home than sons. (Gould 1960) There are similar outcome in other counties too. The evidence from China suggests that more men remained single in the lower economic strata. In the 16th century, the gentry married young relative to the less affluent. Telford (1992) In the 19th century, two Yangtze boatmen, who were low in the social hierarchy, married or cohabited with the same woman. The census of 1901 stated:

"Let X represents a caste divided into the three hypergamous groups A, B, and C. A man of the A group can marry a woman of his own or of the two lower groups; a man of B can marry into B or C, while a man of C is confined to his own class, and cannot marry a woman from either of the classes above him. Conversely, a woman of the C class can get a husband from A, B, or C, and a woman of the B class from A or B; but a woman of the A class cannot find a husband outside of her own group. Excluding polygamy and polyandry, and supposing the women of each group to be evenly distributed among the groups they are entitled to marry into, the result of the first series of marriages would be to leave two-thirds of the women in the A group without husbands, and two-thirds of the men in the C group without wives."

5: Empirical tests:

There are many anecdotal and case study based evidence that son preference had implications in the marriage context and that hypergamy worked to the advantage of upper caste men. However, systematic quantitative analysis is lacking. The census data of 1931 provides a good data set to fill this gap in the literature. The census data is at the level of provinces and shows the sex ratio in the population by age cohorts and the single rate by age cohort. These subregions are divided into five broad regional categories- North, South East, West and Central. The census data is reported by caste groups as well and I construct the relevant variables by each caste. The castes are then divided into high and low castes by taking into account the occupational status of each sub caste. Sex ratio is defined as the number of males per 100 females.

There are two testable hypothesis:

1. At the level of the region, biased sex ratios for under five lead to a high singles rates for males in the age group over 50.

2. At the caste level, the under five sex ratio is more biased in the upper caste and this leads to a higher proportion of single men in the upper caste unless hypergamy is widespread. If hypergamy is the norm, then the proportion of single men should be higher in lower castes than upper castes.

The variable of interest is the PROPORTION OF SINGLES at Age 45-50 for males.

The findings:

1. The Region Effect

There is a positive correlation between the sex ratio of the under 5 in the population and proportion of never married and this is also true when we take the aggregate sex ratio (See figure 1) The single rate for males is higher in states with higher sex ratio and is captured at the regional level. Table 6 shows the sex ratio by age cohorts and proportion of singles in the population by gender at age 50. The North has a higher sex ratio than the average for the country in all age cohorts. The sex ratio in the early years is higher than in other regions, but well within the biological norm. The surplus of men in the marriage age cohorts is higher than in other regions and the north has the highest share of never married in the population. In other regions, the gender bias increases with age and is likely to reflect maternal mortality in part and the share of never married men is small. There is near universal marriage among females, whereas the marriage rate varies for males by region mainly reflecting imbalance in the marriage market. The regional variation in the marriage rate is correlated with the son preference. The North has a higher than average sex ratio in the age group 0-5 and also a higher single rate.

Regressing the under 5 sex ratio and the single rate on regional dummy variables finds a statistically significant effect of the North for the proportion of never married at age 50. For the under 5 the difference is not statistically significant. The sex ratio becomes significantly different from the rest of India for the age group 15-20. (See Table 6)

2. Caste Effect:

I now turn to the difference between high and low castes. As in the regional analysis, I break down the sex ratio by age cohort and focus on the single rate above age 44. I find that the upper caste has a bias towards males for each age cohort. (See table 7) The regression analysis shows that the caste difference is statistically significant in the under 6 cohort as well

as at the aggregate level. The difference is also significant in the marriage age cohort 23-44 and in the share of never married men above the age of 44.

The single rate for men is twice as high in the upper caste contrary to the prediction of marriage rules and the theoretical model of Edlund and suggests that there is limited upward mobility in marriage for women. Das Gupta's case study based evidence fits in well with this empirical analysis. In rural Punjab, in the land owning community of *Jats,* the celibacy rate was over 12 percent in 1911 and over 4 percent in the landless community of *Chamars* (Das Gupta 2005)

There is a caveat here. Caste could be correlated with region and the share of the population in the upper castes could be much higher in the North. To rule this out, I use a subset of the data, where provides the demographic statistics by caste and region. Controlling for region, I find the caste effect to be statistically positive and significant as shown in Table 8. This exercise in repeated for a similar data set for 1901. The results of 1931 are replicated- The singles rate is higher for the upper caste controlling for region. However in this data set, the coefficient for the dummy variable for the north remains positive and statistically significant. In none of the data sets do I find evidence that lower caste men were more likely to remain single if there was a gender imbalance in the marriage market.

Long run changes:

The census data of 2001 finds that the gender bias has in fact worsened in the North and become more significant in the West. In the marriage market, however, the proportion of single men have declined in all regions, but the regional differences remain. The North continues to have the highest single rate for men in the country and in the South, the single rate for women has begun to rise. The increase in population growth and the large age difference in marriage, can explain these changes.

Men in each age cohort match with women in the cohort 5 years younger. The sex-ratio in the marriage market depends on population growth and on female mortality relative to male mortality. An increase in population growth reduce the number of men relative to each cohort of women. Maternal mortality on the other hand, has the opposite effect if widowers marry, but not widows. Maternal mortality was high in early 20^{th} century. Therefore a large number of men entered the marriage market a second time. There has been a decline in maternal mortality, which has reduced the number of widowers re-entering the

marriage market and therefore reduced the surplus of men in the marriage market. The outcome is a *marriage squeeze* against women during the second half of the 20th century.

Population growth in India began to rise from the middle of the century. The average annual growth hovered around 1% until 1951 and doubled thereafter, slowing down after 1981. The growth in the cohort size 0-6 years was at a high of 2% per year in 1961-71 and slowed down to 1.4 during 1971-1991. Bhat and Halli have documented the changes in the marriage market in the North and the South and the marriage squeeze up to 1991. The proportion of widowers and the surplus of men in marriage cohorts and consequently there has been a decline in the celibacy rate for men in all regions. In 1911, 7 percent of males were never married in 1911 in the North and only 3.5 percent in 1981. By 2001 this figure was 2 percent.

Table 9 shows the groom availability per 100 women assuming the marriage rates to be the same as in 1911. This suggests that the marriage squeeze against women began in the first half of the century and accelerated with the rise in population growth. In 1911, single men in the relevant age cohorts were 87% of single women, By 1991, this figure had declined to less than 55%. The age gap at marriage began to decline from 1951 as population growth reduced the surplus of men in the marriage market and the share of never married men declined too. The rising age at marriage reflects changes in the economic circumstances, such as schooling, workforce participation and urbanization, but also changes in the legal age at marriage.

Although the surplus of men declined, it continues to remain twice as high in the North. Bhat and Halli find the celibacy rate for men to be 7% in the North , 2.7 percent in the South and 2.6 percent in the East in 1911. By 1981, these figures had declined in all regions, but the regional differences remained Table 10 shows the regional differences in the marriage market between 1931 and 2001 at a more disaggregated level. The North as expected has a higher single rate for males even in 2001. In particular Punjab, which also has a high sex bias in the young, shows a high share of never married males in 1931, 1961 and 1971. The single rate in Punjab began to decline sharply from 1981. By this time interregional marriage within the same linguistic groups was also more common.

Despite the decline, there remains there a large gap between the single rate between men and women in the regions of son preference. Kerala is the outlier showing a higher singles rate for women. The single rate for men is around 1% in 2001 in all regions, except the North. Table 11 shows the sex ratio by marriage cohorts for males aged 20-25 matched with females age 15-20. There was a significant surplus of men in the north in 1931, but this surplus was wiped out by an increase in population growth in most states, only to reappear in some areas in 2001. A few states such as Maharashtra and West Bengal show a surplus of men in the intervening years, but not in 1931. This could be due to migration to these regions of industrial concentration. The trend turned after 1981 reflecting the slow down in growth of the youngest cohort. The growth rate of the cohort 0-6 slowed down dramatically in the south after 1981 with all regions other than the North West seeing a decline in fertility. From 1991 the growth rate of this cohort has been below 0.5 percent per year, the south showing a negative rate of growth. The marriage squeeze that tightened up to 1981 has since then turned. The fastest in the rate of celibacy for men occurred between 1961 and 1981. By 2001, all regions show a greater balance in the marriage cohort and a surplus of men in the North. The North- South divide seen in 1931 can be found in 2001 once again.

5: Conclusion

A cross sectional analysis based on the census of 1931 finds a strong regional effect. This we interpret as the effect of cultural norm. The North has a significant son preference and also a high proportion of single males. However bringing caste into the story adds a new dimension and shows the upper castes have a strong gender bias and also a high share of unmarried men. This contradicts the idea that son preference in the upper castes arise due to hypergamy. The empirical results find little support for the social stratification thesis. Instead son preference and a high celibacy rate in Northern India has persisted over the 20th century.

A long run analysis of the marriage cohorts suggest that the marriage squeeze, due population growth and age difference at the time of marriage, can explain the why the pay-off from having a son has not diminished over time. The singles rate has declined due to the marriage squeeze. At the same time, there continues to be a predominance of unmarried males in the north. Press reports have highlighted the shortage of brides in the north and men seeking partners in marriage from other regions. The incentives from the marriage market have had little effect on son preference. The overall picture is the persistence of cultural values and the dominant role of son preferences in certain communities.

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Data Sources:

Census of India, , Age and Civil condition, 1901, 1921, 1931, 1961, 1971, 1981, 2001

Figure 1A

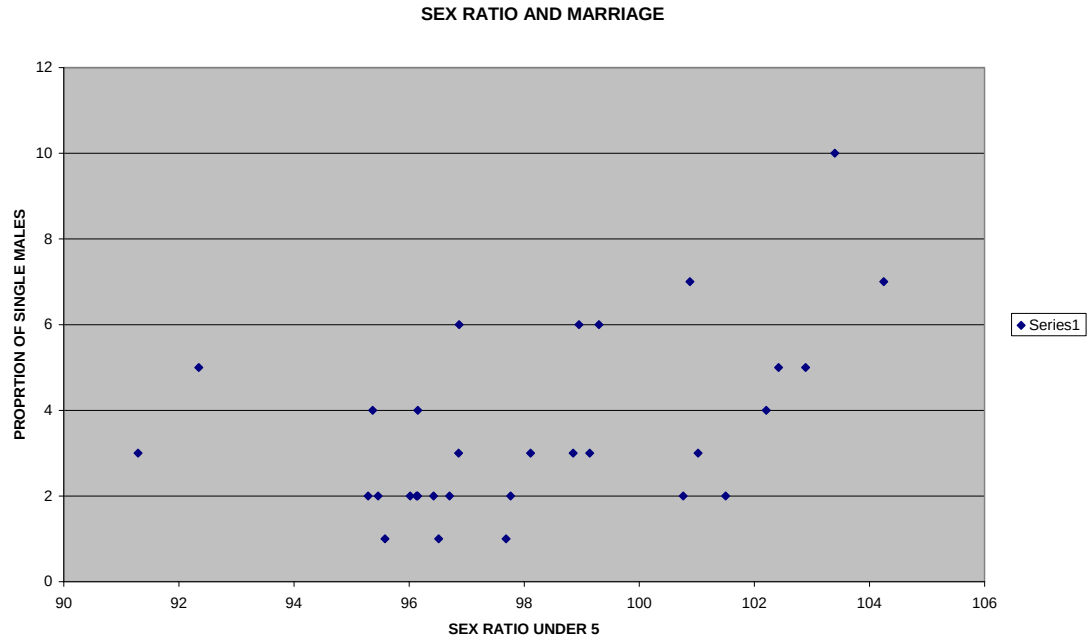

Figure1B

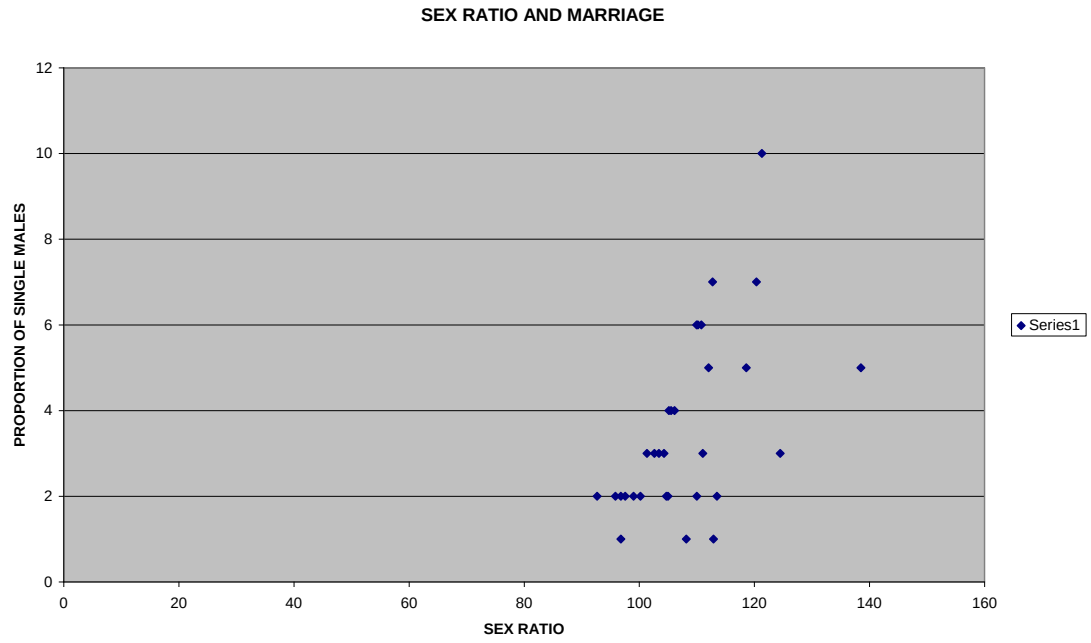

Figure 2A

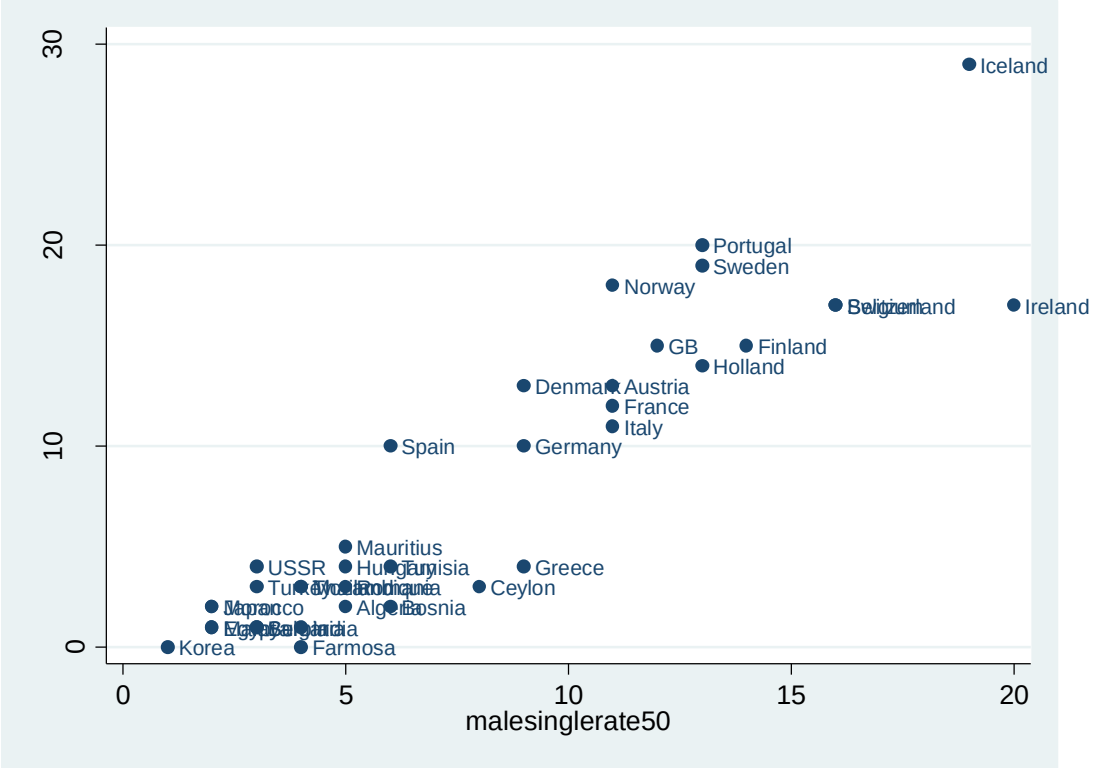

Figure 2B

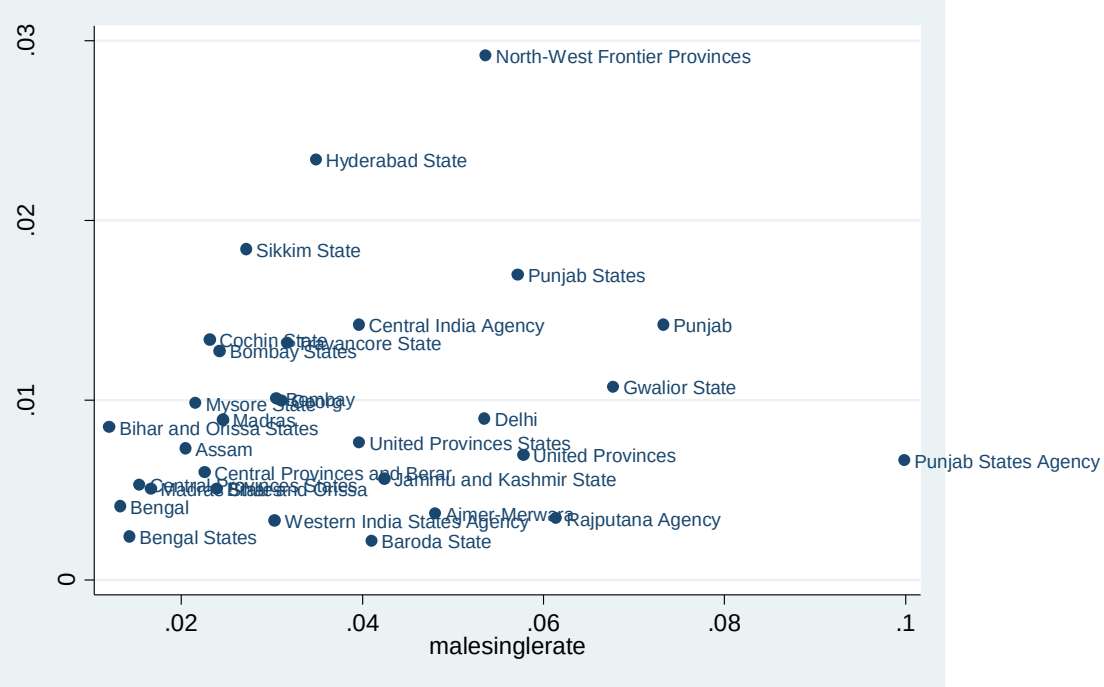

Table 1: SEX RATIO IN THE YOUNG IN 1931

Region/State	0-1	0-5	5-10	10-15
South				
Cochin	100.6	100.8	92.4	102.2
Travancore	100.9	101.0	102.9	103.1
Hyderabad	89.9	91.3	108.5	110.6
Mysore	96.5	96.2	99.9	106.6
Madras	96.6	96.7	101.8	104.2
North				
Rajputana	98.8	99.0	113.7	120.3
United Provinces	99.8	99.3	116.0	122.6
Punjab	102.3	104.2	116.4	122.8
West/Centre				
Bombay	99.8	99.1	111.5	116.3
Central Provinces	98.1	96.1	103.9	106.0
East				
Bihar & Orissa	98.2	95.3	108.7	112.6
Bengal	99.6	97.7	112.6	111.9
All India	98.8	97.9	109.9	113.6

Source: Census 1931

Table 2: Changing Sex Ratio in the Young: Boys per 100 Girls, Years 0-6

	1961	**1971**	**1981**	**1991**	**2001**
South					
Kerala	103.9	102.5	102.6	104.4	104.1
Andhra Pradesh	101.9	100.6	100.6	101.6	102.8
Karnataka	102.4	102.1	102.3	104.2	105.7
Tamil Nadu	102.5	100.9	103.7	105.5	106.2
North					
Rajasthan	107.8	107.0	105.0	109.1	110.0
Uttar Pradesh	106.7	106.4	106.9	107.6	109.3
Punjab	109.2	113.3	109.9	114.3	125.3
Haryana		111.2	111.2	113.8	122.1
West					
Maharashtra	104.7	102.4	102.3	105.7	109.5
Gujarat	107.1	106.5	104.9	107.8	113.2
Central					
Madhya Pradesh	105.9	105.3	102.3	105.0	106.1
East					
Bihar	103.9	103.5	101.7	104.4	105.5
Orissa	102.5	97.5	100.3	103.2	105.0
West Bengal	104.1	97.7	101.4	103.5	104.2

Source: Indian Censuses 1961-2001

Table 3: The Hajnal Divide: European vs. Asian Marriage Patterns

	Singulate age at marriage (years)		Age Difference (years	Proportion never married 45-49 (%)	
	Male	Female		Male	Female
Western Europe					
England&Wales**1901**	27.2	25.8	1.4	11	13.4
Germany 1900	27.8	25.5	2,3	9.2	11.1
Netherlands 1900	28.3	26.4	1.9	13	14
Belgium 1900	27.3	25.4	1.9	16.1	17.1
France 1901	28.0	24.6	3.4	11.4	12.2
Spain 1900	27.4	24.5	2.9	6.4	10.2
Italy 1936	28.3	25.3	3.0	9.3	13.9
Greece 1928	28.9	24.0	4.9	7.4	3.8
Eastern Europe					
Poland1900	26.6	23.6	4.3	6.1	7.8
Hungary 1930	26.8	23.8	3.0	5	4
Romania	24.5	20.3	4.2	5	3
Bulgaria 1900	24.2	20.8	3.4	3	1
Serbia 1900	23.0	20.1	2.9	3	1
Asia					
Japan 1931	25.7	21.8	3.8	2	2
Korea 1931	20.8	16.5	4.3	1	0
Turkey 1935	23.1	19.7	3.4	3	3
India 1901	20.1	13.3	6.8	4	1
India 1931	20.8	13.9	6.9	3	1

Source: United Nations, Patterns of First Marriage: Timing and Prevalence, 1990

Table 4: Married Females aged 0-15 per 100 females of that age

Religion	1881	1891	1901	1911	1921	1931
Hindu	208	193	186	184	170	213
Muslim	153	141	131	123	111	210
Jain	189	172	164	130	117	130
Sikh	120	143	101	88	72	86
Christian	33	37	38	39	32	43

Source: Census of 1931

Table 5: Indian Marriage Pattern: Regional Differences 1921

	Age at Marriage		**Age Difference in Years**	**Never Married Men at age 45-54 (%)**	**Proportion of widows**
	Men	**Women**			
Bengal		12.83	8.33	2	.20
Bombay		12.28	6.21	3	.14
Punjab		15.01	6.18	9	.07
UP		12.89	5.42	6	.11
Karnataka		14.47	8.51	4	.16

Source: Census of 1921: District level data.

Table 6A: Sex Ratio by age- group (Males/Females) and the share of never married males at age 45-50 (%)

	West	**East**	**North**	**Central**	**South**	**Total**
0-5	99	97	100	97	97	98
10-15	113	110	121	112	106	113
15-20	105	93	115	101	100	104
20-25	100	93	112	99	94	101
25-20	104	107	116	105	99	107
30-35	106	108	119	102	104	109
35-40	108	113	123	108	106	113
40-45	110	120	123	109	117	118
Male Single Rate	3	2	6	4	3	4

Table 6B: Region Effect

	Dependent Variable		
Explanatory Variable	Sex- ratio in age group 0-5	Sex- ratio in age group 15-20	Proportion of Male Singles in age group 45-50
West	0.01 (0.74)	0.08 (1.71)	0.01 (0.67)
East	-.00(0.06)	-0.03 (0.65)	-0.01 (0.85)
North	.03 (1.69)	0.18 (4.64)*	0.03 (4.6)*
Central	-.00 (0.05)	0.04 (0.92)	0.01 1.21)

Source: Census of 1931.

Note: The reference region is the South. Each region is a dummy variable taking the value 1.

Table 7A: Sex Ratio by age- group (Males per 100 Females) and the share of never married males (%)

	Sex Ratio		Share of Never Married Males	
	High caste	Low caste	High caste	Low caste
0-6	100	97	99	98
7-13	112	111	92	90
14-16	116	114	78	72
17-23	104	105	56	46
24-43	112	109	16	10
44+	110	112	5.3	3.6
All	107	106		

Table 7B: Caste Effect

	Dependent Variable			
Explanatory Variables	Sex ratio 0-6	Unmarried Sex ratio 24-43	All Single Sex Ratio 24-43	Share of Never Married Males at age 44+
Caste	3.42 (2.29)*	5.38 (2.46)*	6.79 (2.33)*	0.02 (2.61)*
N	92			

Source: Census of 1931

Note: Caste is a dummy variable taking the value 1 for upper caste and 0 otherwise.

Table 8: Caste vs. Region: Dependent Variable: Share of Single Males

Explanatory Variables	1931	1931	1931
Caste	0.01 (6.56)*	0.01 (5.98)*	
West		-0.00	
East		-0.00	
South		-0.01(2.43)*	
North		0.00	
Caste*West			0.02(4.31)*
Caste*East			0.00
Caste*South			0.00
Caste*North			.008(5.1)*
	1901	1901	1901
Caste	0.02 (3.06)*	0.02 (2.95)	
West		0.02 (1.34)	
East		-0.01 (1.22)	
South		-0.00 (0.48)	
North		0.02 (2.26)*	
Caste*West			0.02 (1.47)
Caste*East			0.00 (0.0)
Caste*South			-0.01 (0.81)
Caste*North			0.04 (4.72)
N	498		

Source: Census of 1931

Note: Caste is a Dummy Variable taking the value 1 for upper caste and 0 otherwise. Each region is a dummy variable with Central Region as the reference point.

Table 9: Trends in the Marriage Market

	Total Grooms	Single men	Widowers	Never Married at age 45-54		Singulate Mean Age at Marriage (years)		
	per 100 women	per 100 women	per 100 women	Men	Women	Men	Women	Age gap
1911	100	86.7	17.4	4.2	0.9	19.8	12.9	6.7
1921	96.0	80.5	16.6	4.1	1.1	20.2	13.3	6.9
1931	88.9	76.1	15.3	3.8	0.8	19.0	12.9	6.1
1951	71.0	63.5	12.4	3.7	1.2	20.6	15.2	5.4
1961	68.0	62.3	11.8	3.3	0.5	21.6	15.9	5.7
1971	58.1	54.9	10.7	2.6	0.5	22.4	17.2	5.2
1981	54.4	53.4	10.1	2.2	0.4	23.3	18.3	5.0
1991	56.1	54.6	8.1	2.5	0.7	23.8	19.0	4.8

Souce: Bhat and Halli 1989

Table 10: Changes in the Share of Never Married Men in Different Regions (%)

States before 1947	1931		Comparable states after 1947	1961		1971		1981		2001	
	Male	Female		Male	Female	Male	Female	Male	Female	Male	Female
North	5.6	1.1	**North**	5.03	.33	4.5	.33	2.18	2.02	2.08	.45
Ajmer	5.0	0	Rajasthan	4.5	0.2	3.6	0.1			1.6	0.8
Rajputana States Agency											
Punjab	7	1	Punjab	7.5	0.2	7.2	0.4	6.7	0.2	2.8	0
Punjab States	10	1	Haryana			4.1	0.1			1.8	0.7
Punjab States Agency	6	0									
United Provinces	6	1	Uttar Pradesh	6.1	0.3	4.8	0.3			2.5	0
UP Sates	4	1									
West	3	0.5		2.3	0.4	1.95	0.4		065	0.85	0.55
Bombay	3	1	Maharashtra	2	0.5	1.8	0.5	1.9	1	0.1	0.1
Bombay States	2	1									
Baroda Sate	4	0	Gujarat	2.6	0.3	2.1	0.3	1.9	0.3	1.6	1
W. India States Agency	3	0									
East	1.6	0.7	**East**	1.98	0.55	2.23	0.9	1.18	0.28	0.68	0.5
Bihar & Orissa	2	0	Bihar	2.9	0.6	1.8	0.3	1.2	0.2	0.8	0.2
Bihar & Orissa States	1	1	Orissa	1.2	0.4	1	0.4	0.9	0.4	1.9	1.8
Bengal	1	0	West Bengal	2.5	0.6	2.6	0.6	2.6	0.5	2.5	1.8
Bengal State	1	0									
Central	3.7	1	**Central**	3.15	0.2	2.3	0.2	2.1	0.2	1.6	0
Central Provinces & Berar	2	1	Madhya Pradesh	3.15	0.2	2.3	0.2	2.1	0.2	1.6	0
Central India Agency	4	1									
CP States	2	1									
Gwalior	7	1									
South	2.4	1	**South**	2.13	0.95	2	1.15	1.7	0.98	1.13	1.65
Hyderabad State	3	2	Andhra Pradesh	1.5	0.3	1.2	0.3	1.1	0.2	0.2	0.9
Mysore State	2	1	Karnataka	2.4	0.9	1.9	0.7	1.5	0.5	1.1	1.2
Madras	2	1	Tamil Nadu	1.8	0.4	1.9	0.6	1.6	0.6	1.3	1.2
Madras States	2	0									
Cochin State	2	1	Kerala	2.7	2.2	3	3	2.6	2.6	1.9	3.3
Travancore State	3	1									

Source: Censuses of 1931, 1961, 1971, 1981 and 2001

Table 11: Marriage Age Cohorts- Male 20-25/Female 15-20

	1931		1961	1971	1981	2001
North						
AJMER	117	RAJASTHAN	113	95	93	99
RAJPUTANA STATES AGENCY	92					
PUNJAB	120	PUNJAB	101	91	87	108
PUNJAB STATES AGENCY	119	HARYANA		89	88	109
UNITED PROVINCES	94	UP	110	100	102	105
UP STATES	104					
WEST						
BOMBAY	98	MAHARASTHRA	112	97	95	111
BARODA STATE	98	GUJARAT	112	88	81	105
BOMBAY STATES	98					
WESTERN INDIA STATES AGENCY	98					
EAST						
BIHAR & ORISSA	99	BIHAR	97	89	90	100
BIHAR&ORISSA STATES	89	ORISSA	98	100	95	90
BENGAL	95	W BENGAL	116	110	99	100
BENGAL STATES	95					
CENTRAL						
CENTRAL PROVINCES&BERAR	99	MADHYA PRADESH	100	99	91	106
CENTRAL INDIA AGENCY	106					
CENTRAL PROVINCES STATES	98					
GWALIOR STATE	112					
SOUTH						
HYDERABAD STATE	102	ANDHRA	96	91	91	96
MYSORE STATE	86	KARNATAKA	104	89	89	100
MADRAS	89	TAMIL NADU	100	89	89	94
MADRAS STATES	88					
COCHIN STATE	91	KERALA	91	65	73	96
TRAVANCORE STATE	81					

Source: Censuses of 1931, 1961, 1971, 1981 and 2001