Role of Siblings in Marriage and Dowry Practices: Evidence from India *

Arigna Guha Ajinkya Keskar† Sulagna Mookerjee

May 21, 2025

Abstract

We study how sibling gender composition and birth order shape marriage outcomes in rural India, using sibling-level data from the 1999 wave of the Rural Economic and Demographic Survey (REDS). The data contain complete marital histories—including age at marriage, spouse education, and dowry payments—for all siblings within each household. Building on the sibling rivalry framework in Vogl (2013), we find that closely spaced same-sex siblings accelerate the timing of marriage for both women and men. Women with a next-younger sister marry 0.36 years earlier and match husbands with 0.27 fewer years of education; men with a next-younger brother also marry 0.36 years earlier and exhibit a similar decline in spousal education. The effects on dowry differ by gender: families of women with a younger sister pay 12,529 Rupees less in dowry (in 2010 Rupees), while dowries received by men are unaffected; if anything, men with a younger brother receive slightly higher dowries than those with a younger sister. We also document significant birth order gradients: later-born children marry later, attain more education, and, among daughters, pay higher dowries. Finally, we provide descriptive evidence that households with more daughters experience a net decline in both dowry outflows and inflows, suggesting that daughters reduce overall marital transfers. These findings underscore the importance of sibling gender composition and birth order in shaping marriage outcomes in rural India.

Keywords: Marriage markets, sibling rivalry, birth order, dowry, gender, India

JEL codes: J12, D10, I31

*Authors: Guha: Binghamton University (SUNY). Email: aguha2@binghamton.edu. Keskar (†corresponding author): Binghamton University (SUNY). E-mail: akeskar@binghamton.edu. Mookerjee: Binghamton University (SUNY). E-mail: smookerj@binghamton.edu.

1 Introduction

Arranged marriage remains the dominant marriage institution in India, and a longstanding norm requires that same-sex siblings marry in their order of birth. This sequencing rule means that one child's marriage prospects are directly shaped by the timing and characteristics of their nearby siblings. Vogl (2013) documents this interdependence for girls: teenage girls with a closely spaced younger sister tend to marry earlier and to lower-quality husbands than those with a younger brother. This is indicative of a birth-order gradient in the marriage market, especially in a context where marriage is nearly universal. While prior work has documented the impact of birth order on a wide range of human capital outcomes—including early-life indicators such as child health and survival (Jayachandran and Pande, 2017; Coffey and Spears, 2021; Spears et al., 2022), as well as later-life outcomes such as educational attainment, non-cognitive skills, employment, and adult earnings (Black et al., 2005, 2018)—the extent to which birth order shapes marriage market outcomes remains largely unexplored, in part due to data limitations.

Marriages in India also typically involve a dowry payment—a transfer from the bride's family to the groom's at the time of the wedding. These transfers are nearly ubiquitous, with over 80% of marriages involving a dowry, and they often exceed the household's annual income (Anderson, 2007; Chiplunkar and Weaver, 2023). Dowries, in turn, play a role in shaping household resource allocation decisions (Anukriti et al., 2022b). Yet, how these payments vary by birth order and sibling gender composition and how households allocate dowries across multiple daughters within a family remains an open question.

This paper builds on Vogl (2013) and examines how birth order and sibling gender composition jointly impact marital outcomes for *both* women and men in rural India. Using the 1999 wave of the Rural Economic and Demographic Survey of India (REDS), we assemble a sibling-level data with *complete* marital histories—including exact age at marriage, spouse characteristics, and marital transfers—for *all* siblings within each household. The richness of the data allows us to study three questions: (i) the extent of sibling rivalry for *both* men and women in marriage markets—that is, whether an individual's marriage timing and spousal quality depends on the gender of the next-younger sibling; (ii) the impact of sibling rivalry and sibling gender composition on marital payments; and (iii) the birth-order gradient in marriage outcomes, since our data fulfills the requirements for identifying birth-order effects (Blake, 1989; Coffey and Spears, 2021).

We begin with providing novel descriptive evidence on the relationship between (i) an individual's *gender-specific* birth order and marriage order, and (ii) their *overall* birth order and marriage order, and how these relationships vary with demographic and socio-economic characteristics. We find that over 80% of *both* women and men marry in accordance with their gender-specific birth order, while 67% of men and 61% of women marry in line with their overall birth order. Notably, 22% of men marry *after* their birth order—a pattern concentrated among men with a younger sister. In contrast, 34% of women marry *before* their birth order, and this pattern appears largely invariant to the gender of the next-younger sibling. Importantly, adherence to the birth-order norm varies little by religion, caste, or household wealth, suggesting that this sequencing custom is widespread and persistent across socio-economic groups.

Next, we use our sibling-level panel with detailed measures of age at marriage, spouse characteristics, and dowry payments to test the sibling rivalry mechanism proposed by Vogl (2013) for both women and men, employing a similar identification strategy. We compare individuals with a next-younger sister to those with a next-younger brother, controlling for older-sibling-gender-composition fixed effects, birth order, age, state, and a set of household socioeconomic characteristics. Importantly, our data consist of adults with completed marital histories, allowing us to control for family size, an advantage rare in typical demographic data, where many women have not completed childbearing and total family size is not observed. The identification relies on the assumption that, conditional on these covariates, the gender of the next-younger sibling is as good as randomly assigned. We assess the robustness of our estimates to selection on unobservables using the method proposed by Oster (2019).

Consistent with the sibling rivalry mechanism, the presence of a younger sister is associated with a lower age at marriage for women, but this effect is observed *only* when the age gap between siblings is small. Among women whose age gap with their next-younger sibling is less than two years—the median in our sample—we find that having a next-younger sister is associated with marrying 0.36 years earlier than having a next-younger brother (p-value < 0.05).[1] In addition, the presence of a younger sister, *regardless* of age gap, is associated with lower match quality, as reflected in marrying a husband with 0.27 fewer years of education (p-value < 0.01), and with a reduction in dowry paid by the family of 12,529 Rupees ($\approx$ USD 272 in 2011 prices; (p-value

[1]We also find suggestive evidence that the presence of a younger sister is associated with a reduction in the women's years of education, consistent with marriage timing and educational investment being joint decisions for parents of teenage girls in India (Andrew and Adams, 2022).

< 0.01)).

Third, we find evidence of a similar sibling rivalry mechanism at play for men. Among men whose age gap with their next-younger sibling is less than three years—the median in our sample—having a next-younger brother is associated with marrying 0.36 years earlier than having a next-younger sister (p-value < 0.01). Regardless of the age gap, having a next-younger brother is associated with a reduction of 0.23 years in spousal education (p-value < 0.01).[2] However, in contrast to the results for women, we find no evidence that sibling rivalry influences the dowry received by men. If anything, the results suggest that men with a next-younger brother receive slightly higher dowries than those with a next-younger sister.

Next, we estimate the birth order gradient in marital outcomes using OLS regression with family fixed effects, following the approach in Coffey and Spears (2021). We find a clear gradient in age at marriage: higher birth order siblings marry, on average, 0.79 years later than their eldest sibling. When examining *gender-specific* birth order, we find that girls with birth order three and above marry 0.56 years later (p-value < 0.01), have 0.14 more years of education (p-value < 0.1), and marry spouses with 0.32 more years of education (p-value < 0.05) compared to first-born girls. They also pay an additional 12,646 Rupees in dowry (p-value < 0.01).

We find a similar later-born advantage for men. Compared to first-born sons, men with birth order three and above marry 1.16 years later (p-value < 0.01), have 0.28 more years of education (p-value < 0.05), and marry spouses with 0.26 more years of education (p-value < 0.01). They also receive 6,399 Rupees more in dowry payments (p-value < 0.1). Together, these results suggest that women and men in India have a later-born advantage in the marriage market.

Finally, we conduct a descriptive analysis to examine how the gender composition of siblings influences marital transfers. We document the following pattern: conditional on the total number of siblings, an increase in the number of daughters is associated with a decrease in both the dowry paid at a daughter's wedding and the dowry received at a son's wedding. This finding suggests that daughters exert a net negative effect on household dowry flows.

This paper makes three primary contributions to the literature on marriage markets and intra-household dynamics. First, we provide evidence that the sibling rivalry mechanism documented by Vogl (2013) extends to both women and men. Using sibling-level data representative of rural

[2] We also find that the presence of a younger brother is associated with a reduction in men's years of education. However, the result is not robust to assessing the degree of selection on unobservables using Oster (2019).

India with complete marital histories, including the exact age at marriage and dowry information, we build on prior work that used age at home leaving as a proxy for marriage. While this proxy is reasonable for women in patrilocal societies, it is not valid for men, who typically live with their parents after marriage in a joint family (Khalil et al., 2024). By using observed marriage ages, we show that closely spaced same-sex siblings accelerate marriage timing not only for women but also for men, with effects of similar magnitude. Second, we document novel evidence that sibling rivalry also affects marital transfers. Specifically, we show that both the gender of the next-younger sibling and the overall sibling gender composition influence dowry payments, and how these effects vary for women and men. Lastly, we estimate birth order gradients in marriage outcomes and find that later-born children have distinctly different marriage experiences than first-born siblings. These results extend the birth order literature in developing countries beyond child mortality and health (Jayachandran and Pande, 2017; Coffey and Spears, 2021) to encompass marital decisions. Our outcomes of interest also capture policy-relevant aspects of arranged marriage in this context. In our sample, the mean age at marriage is 20.4 years for men and 17.6 years for women.[3] While much of the literature has focused on the consequences of early marriage for girls—including lower human capital accumulation, earlier childbearing, and reduced autonomy in fertility decisions (Field and Ambrus, 2008; Andrew and Adams, 2022)—recent work highlights that early marriage also imposes substantial costs on boys. These include reduced educational attainment, weaker labor market outcomes, and poorer match quality due to lower emotional maturity at the time of marriage (Chauhan and Sekher, 2024; Mukherjee and Sekher, 2017). As the primary earners in most households, the loss of human capital among men who begin supporting a family at an early age has important long-term consequences for household welfare.

The rest of the paper is organized as follows. Section 3 describes the data and measurement. Section 4 reviews the related literature and situates our contributions. Section 5 outlines the empirical strategy. Section 6 presents the main results, and Section 7 concludes.

[3] According to the National Family Health Survey (NFHS-5, 2019–21), the age at marriage in India has been rising steadily. Among women aged 20–49, the median age at first marriage increased by 2.0 years over the last 15 years, from 17.2 years in 2005–06 (NFHS-3) to 19.2 years in 2019–21 (NFHS-5). For men aged 25–29, the median age rose from 22.6 to 24.9 years over the same period.

2 Related literature and contributions

This paper builds on the seminal work of Vogl (2013), which demonstrates that in societies where arranged marriage is prevalent—as in much of South Asia—social norms often dictate that same-sex siblings marry in the order of their birth. Under such norms, one sibling's marriage timing can have direct implications for the marital outcomes of other siblings. In this section, we situate our analysis within the broader literature on marriage decisions and marital transfers in India, particularly how institutional features and intra-household dynamics impact age at marriage, spousal selection, and dowry payments.

We begin by outlining key institutional features that distinguish the Indian marriage market. First, marriage in India is nearly universal, and formal dissolution of marriage is exceedingly rare. According to Jacob and Chattopadhyay (2016), only 0.29% of the population reports being separated. Data from the 2011–2012 India Human Development Survey (IHDS) show that over 80% of women are married by age 25, and a similar share of men are married by their early 30s. Second, arranged marriage remains the dominant form of spousal selection—not only in India but also across much of Asia, Africa, and the Middle East (Anukriti and Dasgupta, 2017). In this setting, parents and extended kin typically play a central role in determining marriage matches, with young adults often having limited influence over partner choice (Banerjee et al., 2013; Beauchamp et al., 2021). According to the IHDS, 72% of women report that their spouses were chosen by their parents or other relatives. Third, beyond the practice of arranged marriage, a widely observed social norm in South Asia dictates that same-sex siblings marry in the order of their birth (Vogl, 2013). For daughters in particular, age at marriage plays a central role in determining spousal match quality, creating an intertemporal tradeoff for parents who must jointly optimize daughters' schooling and marriage decisions (Field and Ambrus, 2008; Andrew and Adams, 2022). When a younger sister is nearing marriageable age, this constraint may induce parents to hasten the marriage of the older daughter, potentially at the expense of her match quality. Vogl (2013) documents evidence for such sibling spillovers using Demographic and Health Survey (DHS) data from Bangladesh, India, Nepal, and Pakistan (Parish and Willis (1993) show similar results for oldest daughters in Taiwan). The author shows that the presence of older sisters delays, while the presence of younger sisters accelerates, a girl's marriage, using whether she has left her natal home as a proxy for marriage in South Asian contexts. The findings suggest that teenage girls with next-younger sisters are approximately 3 percentage points more likely to have left their natal homes than those with next-younger brothers. We extend this line of research in two ways using sibling-level data with *complete* marriage histories from rural India. (i) We document novel descriptive patterns in the relationship between birth order and marriage order, and explore how these patterns vary systematically by gender, caste, and family background. (ii) We construct a rich sibling-level dataset that includes detailed information on the marriage histories of *all* siblings—capturing age at marriage, education, spousal characteristics, and dowry payments. This allows us to revisit and expand upon the sibling rivalry mechanism proposed by Vogl (2013), using more granular measures of marriage outcomes. Notably, our data permit separate estimation of sibling effects for both sons and daughters, shedding new light on gender-specific dynamics in marriage sequencing and parental investment.

Fourth, dowry payments—wealth transfers from the bride's family to the groom or his family at the time of marriage—remain nearly universal and economically significant in India (Rao, 1993; Anderson, 2007; Chiplunkar and Weaver, 2023). Chiplunkar and Weaver (2023) document an increase in the prevalence of dowry between 1935 and 1975, with real dowry amounts rising from 1945 to 1975 before declining thereafter. Despite this decline, dowry values remain substantial, often amounting to one to two times the household's annual income (Rao, 1993). Since 1975, more than 80% of Indian marriages have involved the payment of a dowry.[4]

Dowry payments have been shown to influence a wide range of behaviors and outcomes, including girls' well-being before marriage (Alfano, 2017; Bhalotra et al., 2020), parental savings behavior (Anukriti et al., 2022b), women's post-marital well-being (Zhang and Chan, 1999; Bloch and Rao, 2002; Srinivasan and Bedi, 2007; Brown, 2009; Makino, 2019; Calvi and Keskar, 2021, 2023), and migration decisions (Bau et al., 2023). We contribute to this literature by documenting two novel patterns. First, we show that dowry payments are shaped by sibling rivalry in the marriage market: the gender of the next-younger sibling influences the marital transfer an individual receives or pays. Second, we examine how dowry amounts vary with gender-specific birth order, overall birth order, and the gender composition of siblings. Together, these findings highlight the importance of intra-household dynamics in shaping marital transfers.

Lastly, a substantial body of literature documents the effects of birth order on individual well-

[4]There is a large theoretical literature on the origins and functions of dowry, interpreting it either as a pre-mortem bequest to daughters and/or as a market-clearing transfer in the marriage market (Srinivas et al., 1984; Botticini and Siow, 2003; Anderson, 2007; Anderson and Bidner, 2015). For a comprehensive summary, see Calvi et al. (2022).

being. Black et al. (2005, 2018), using data from Norway, finds that children born at higher birth orders experience significantly worse educational and labor market outcomes compared to their earlier-born siblings. In the context of India, Jayachandran and Pande (2017) show that a strong preference for eldest sons leads to a birth order gradient in resource allocation among children within a family, resulting in worse health outcomes—measured by height and weight—for later-born children. Jayachandran and Kuziemko (2011) find that under son-biased fertility preferences, breastfeeding duration increases with birth order, especially near the target family size. Finally, Coffey and Spears (2021) find a significant effect of birth order on neonatal mortality in India, with later-born siblings having a steep survival advantage. We contribute to this literature by providing novel evidence on birth order gradients in marital outcomes, documenting systematic differences in age at marriage, spousal quality (as measured by spouse's education), and dowry payments across birth order ranks.

3 Data and measurement

Table 1: REDS Sibling-level Data: Summary Statistics

	Observations	Mean	St.Dev.	Median	Minimum	Maximum
$\mathbb{1}$ [Women]	26747	0.45	0.50	0.00	0.00	1.00
Total number of Siblings	26747	5.16	1.82	5.00	2.00	10.00
Age (Women)	12118	43.49	11.07	43.00	20.00	79.00
Age (Men)	14629	46.01	11.34	45.00	20.00	82.00
Age at Marriage (Women)	12118	18.15	3.57	18.00	7.00	50.00
Age at Marriage (Men)	14629	21.47	4.58	21.00	7.00	50.00
Years of Education (Women)	12118	2.64	3.44	1.00	0.00	21.00
Years of Education (Men)	14626	4.90	4.56	5.00	0.00	21.00
Dowry Given ($\times 10^3$) [2010 Rupee]	8873	77.79	127.69	28.49	0.00	1,042.37
Dowry Received ($\times 10^3$) [2010 Rupee]	10637	71.39	121.06	23.82	0.00	1,045.30
Father's Education (Years)	26744	1.48	2.84	0.00	0.00	20.00
Mother's Education (Years)	26738	0.49	1.53	0.00	0.00	12.00
$\mathbb{1}$ [Hindu]	26747	0.89	0.32	1.00	0.00	1.00
$\mathbb{1}$ [SC,ST,OBC]	26747	0.54	0.50	1.00	0.00	1.00
Family Land	26415	4.89	2.85	5.99	0.00	8.70
Observations	26747					

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). SC, ST, and OBC refer to Scheduled Castes, Scheduled Tribes, and Other Backward Classes, respectively. Family landholding is measured as the natural logarithm of acres of land owned.

We use the 1999 wave of the Rural Economic and Demographic Survey of India (REDS), a nationally representative survey of rural households. The first REDS round was conducted in 1969, with subsequent rounds conducted in 1970, 1971, 1982, 1999, and 2006. We focus on the 1999 wave for two key reasons. First, it contains detailed information on marital payments, spousal characteristics, and socioeconomic indicators not only for the household head and their spouse but also for *all* of their siblings and parents. This unique feature allows us to construct sibling-level data with *complete* marriage histories. Second, unlike the 2006 wave, which records information on gift exchanges during marriage, the 1999 wave includes direct and explicit questions on dowry payments. Moreover, the 2006 round lacks comprehensive information on the marriage histories of all siblings of the household head and their spouses. In addition, it allows us to examine the impact of sibling dynamics on actual age at marriage, rather than relying on age at home-leaving, which Vogl (2013) uses as a proxy for marriage timing among women. While this proxy is appropriate in contexts where women leave the natal home upon marriage, it is less suitable for men in patrilineal societies like India, where grooms typically remain in the parental household. The availability of actual marriage age data for both genders in our dataset thus allows us to capture sibling effects on marriage timing more accurately, particularly for men.

We construct our analysis sample by creating two sibling-level datasets: (i) the household head and all his siblings, and (ii) the spouse of the household head and all her siblings. For each dataset, we apply the following sample selection criteria. First, we retain only families in which all siblings are married. Second, we exclude families where the year of birth is missing or implausible, as we use this information to construct the birth order variable.[5] Third, we drop families with missing or inconsistent years of marriage, which is required to compute both marriage order and the outcome variable, age at marriage.[6] Fourth, we restrict the sample to families with at least two and no more than ten siblings. Fifth, we convert all dowry payments into 2010 rupees and recode dowry amounts as missing for outlier observations—defined as values below the 1st or above the 99th percentile—for both dowries received by men and dowries paid by women. Finally, we drop families with implausible age gaps between siblings.[7]

Applying these criteria yields a sibling dataset for the household head, comprising 3,288 families and 14,769 siblings, and a corresponding dataset for the household head's spouse, comprising 2,695 families and 11,978 siblings. We then append the two datasets, resulting in a combined analysis dataset of 26,747 siblings across 5,983 families.

[5] We exclude families in which any sibling was born before 1917 (above age 82 in 1999) or after 1979 (below age 20 in 1999).

[6] We exclude families where any sibling married before 1940.

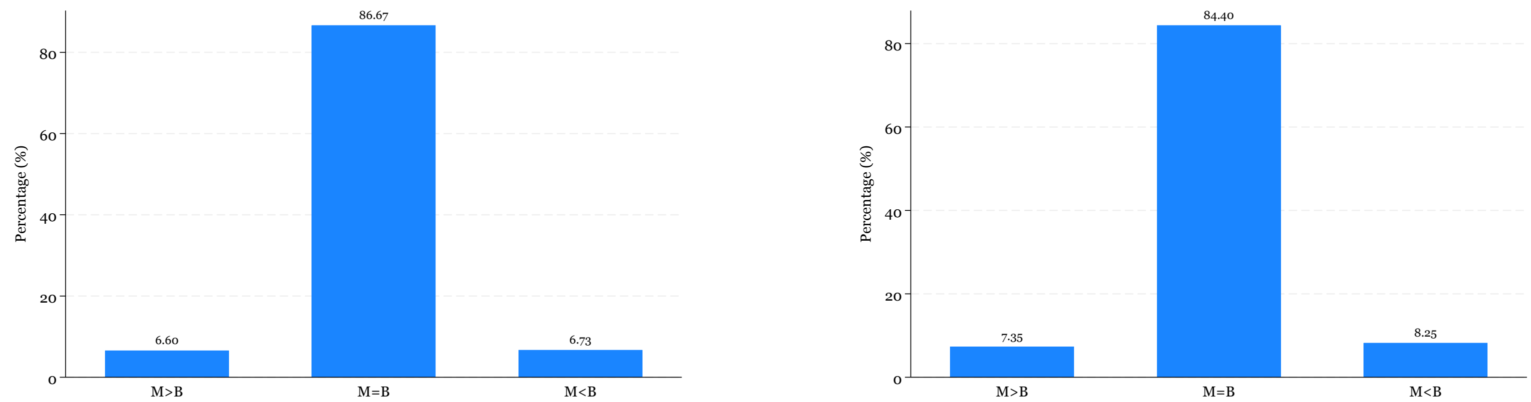
[7] We exclude families whose age gap between siblings falls below the 1st percentile or above the 99th percentile of the sibling age gap distribution.

Table 1 presents the summary statistics from our analysis sample. First, 45% of individuals in the sample are women. Families have, on average, 5.2 siblings, and the sample skews older, with mean ages of 46 for men and 43 for women—reflecting our restriction to families in which all siblings are married. Approximately 89% of households identify as Hindu, and 54% belong to Scheduled Castes, Scheduled Tribes, or Other Backward Classes, representing historically marginalized groups in India. Parental education levels are low, with the median years of education being 1 year for fathers and 0 years for mothers. Second, the median age at marriage is 18 for women and 21 for men. Women in the sample have an average of 2.6 years of education, compared to 4.9 years for men. Finally, dowry payments are substantial. On average, men receive 77,790 Rupees (≈ USD 1,691), and women pay 71,390 Rupees (≈ USD 1,552) in dowries (reported 2010 Rupees and US dollars). The distribution of dowries is highly right-skewed: the median dowry received is 28,490 Rupees (≈ USD 620), and the median dowry paid is 23,820 Rupees (≈ USD 518). Figure A10 assesses how closely the leading digit distribution of dowries given (for women) and received (for men) follows Benford's Law (Benford, 1938), by the gender of the next-younger sibling, following the approach in Calvi and Keskar (2023). We find slightly greater deviations from Benford's Law for women and men with a next-younger sister compared to those with a next-younger brother.

Lastly, the sibling-level data with complete marital data for all siblings enables us to estimate the effects of sibling rivalry and birth order on marital payments for both boys and girls. Blake (1989); Coffey and Spears (2021) note that observing all births to the mother by the time of the survey is a necessary data requirement to separate birth order from sibling size. Note that our data meets this criterion and facilitates the estimation of birth order effects with family fixed effects in the regression.

4 Marriage Queuing Norm

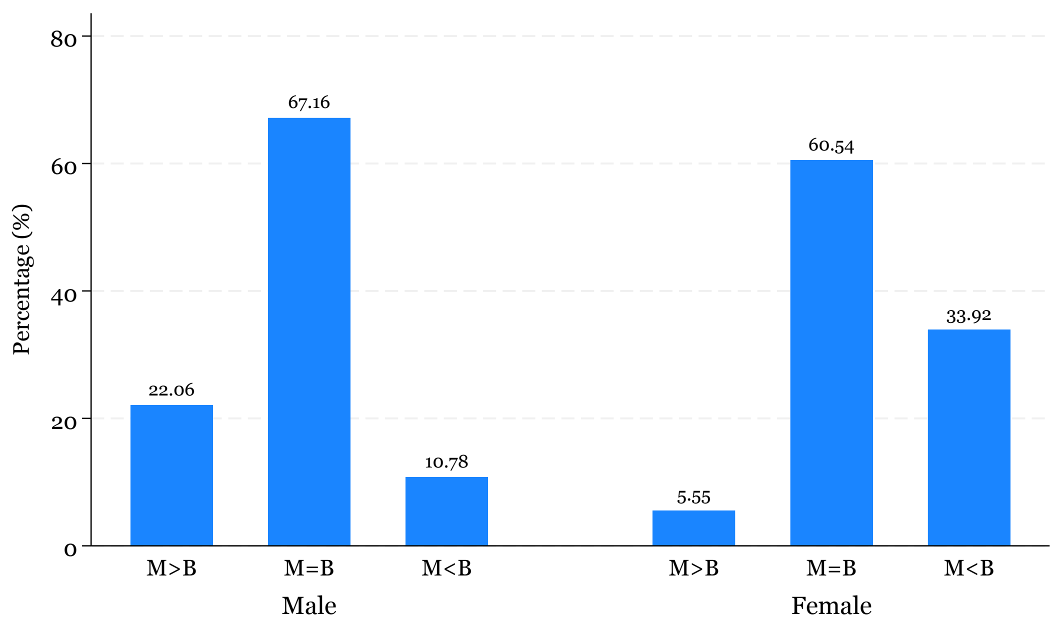
Figure 1: Gender-Specific Marriage Order-Birth Order: Queuing Norm



(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Sample restricted to at least two sisters for women and at least two brothers for men.

Figure 2: Overall Marriage Order-Birth Order: Queuing Norm



Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). M stands for marriage order, and B stands for birth order.

The central insight of Vogl (2013) is that in settings where arranged marriage is prevalent—as in much of South Asia—social norms often require that same-sex siblings marry in the order of their birth, resulting in interdependent marriage decisions within families. In this section, we present novel descriptive evidence on the prevalence of this birth-order norm and examine how adherence to it varies across key demographic characteristics using our sibling-level data.

First, we examine the relationship between *gender-specific* birth order and marriage order. Figure 1 provides evidence consistent with the sibling rivalry mechanism in marriage decisions among same-gender siblings: approximately 87% of women and 84% of men marry per their gender-specific birth order. Second, this relationship remains relatively stable across families with varying numbers of same-gender siblings. Even in larger sibling groups, around 80% of both women and men marry according to their gender-specific birth order (see Figures A1 and A2 in the Appendix). Third, the pattern holds across socio-economic groups. The prevalence of gender-specific birth order marriage is similar across religious groups (Hindu vs. non-Hindu), caste categories (Scheduled Castes, Scheduled Tribes, and Other Backward Castes vs. others), and wealth quintiles. Appendix Tables A7, A8, and A9 document these comparisons.

Next, we examine the alignment between individuals' *overall* marriage and birth orders, separately for men and women. Figure 2 shows that 67% of men and 61% of women marry in the same order as their birth rank, suggesting widespread adherence to the queuing norm. Among men, the next most common pattern is marrying after their birth order: 22% marry later and 11% marry earlier than their birth order. In contrast, women are significantly less likely to marry out of sequence—only 5.5% marry after their birth order, while 34% marry earlier. This asymmetry likely reflects that age at marriage is a more binding constraint for women than men in arranged marriage settings, where match quality is strongly age-dependent (Field and Ambrus, 2008; Andrew and Adams, 2022). The gendered nature of this constraint is further evident when we disaggregate by sibling gender composition. Among men with a next-younger sister, 41% marry after their birth order, compared to only 16% of those with a next-younger brother. In contrast, for women, the prevalence of marrying out of order is substantially lower regardless of sibling composition—consistent with stronger enforcement of queuing norms for daughters (see Figure A6 in the Appendix). Second, we find no substantial differences in adherence to the queuing norm by religion. As shown in Figure A7 in the Appendix, the prevalence of marriage-order alignment is similar for Hindu and non-Hindu families, for both women and men. Likewise, we observe no meaningful variation in adherence to the norm across caste groups. Figure A8 shows that families belonging to Scheduled Castes, Scheduled Tribes, Other Backward Classes, and other caste groups follow similar patterns for both genders. Lastly, we examine heterogeneity in the queuing norm by socioeconomic status, proxied by wealth quartiles. Figure A9 illustrates that adherence to the birth-order marriage norm is comparable across all wealth quartiles for both women and men. In sum, we find strong and widespread adherence to the queuing norm across religious, caste, and socioeconomic groups, with the modal outcome being women and men marrying according to their birth order.

5 Empirical Strategy

We use the sibling-level data with complete marriage histories, described in Section 3, to investigate three empirical questions related to the interdependence of siblings' marital decisions:

First, building on the widespread adherence to the queuing norm documented in Section 4, we examine how the gender of a younger sibling influences an individual's marriage and education outcomes. Specifically, we ask: how do marital and educational outcomes differ for women and men with a younger sister relative to those with a younger brother? Our primary outcomes of interest are age at marriage, years of education, dowry payments, and spousal quality, proxied by the spouse's years of schooling.

Our data offer three key advantages for this analysis. First, we observe completed marriage outcomes for all siblings within a family, allowing us to control for family size in all specifications. This is crucial for disentangling the family size channel from the effect of having a younger sister or brother. This distinction is particularly salient in the Indian context, given the pervasive son preference (Jayachandran, 2017, 2023). Furthermore, all births in our dataset predate 1985, before the widespread availability of ultrasound technology for sex-selective abortion in India. In the absence of such technology, families often exhibited son-stopping behavior, continuing to have children until a desired number of sons was achieved (Anukriti et al., 2022a). For instance, families with two initial girls were more likely to continue fertility after another girl compared to those with a boy. Consequently, without explicit family size controls, the effect of a younger sister would be conflated with family size effects. While Vogl (2013) addresses this confound using a twin analysis where random birth of younger twins increases sibling size, but only female, not male, twins decreased parental residence, the key advantage of our data is the direct ability to control for family size. This allows us to disentangle the family size channel from the sibling rivalry channel. Second, we have direct measures of actual age at marriage for both women and men. Third, we observe dowry payments exchanged for all the married siblings in our sample, allowing us to study the effect of sibling rivalry on dowries received for men and dowries given for women.

Our empirical strategy to study the sibling rivalry mechanism closely follows that of Vogl (2013). We compare girls (or boys) with a next-younger sister to those with a next-younger brother, conditioning on a set of controls: older sibling gender composition fixed effects, family size, individual's age, state of residence and birth order, family-level demographic and socioeconomic characteristics, including total number of siblings, age gap with respect to next-younger sibling, caste group (Scheduled Caste, Scheduled Tribe, or Other Backward Class), and family landholding size.[8] Intuitively, we compare two women (or men) born in the same year, in the same state, at the same birth order, with identical older sibling gender composition, number of siblings, and similar family background, where the only difference is that one has a next-younger sister and the other a next-younger brother. Our identifying assumption is that, conditional on these covariates, the gender of the next-younger sibling is as good as randomly assigned. We assess the potential bias from selection on unobservables using the method proposed by Oster (2019).

The marriage-search model in Vogl (2013) predicts that the effect of a younger sibling's gender on an individual's age at marriage depends on the age gap between them. When the age gap is smaller, the pressure on parents to find a spouse for the older sibling increases, leading to earlier marriage. To account for this theoretical prediction, we estimate an additional specification that interacts the gender of the next-younger sibling with the age gap between the siblings. In particular, we estimate the following two specifications:

$$Y_{iobsc} = \beta_0 + \beta_1 \,\text{NextYoungerSister}_{iobsc} + \beta_2 X_{iobsc} + \gamma_o + \gamma_b + \gamma_s + \gamma_c + \epsilon_{iobsc} \tag{1}$$

$$\begin{aligned} Y_{iobsc} = {} & \beta_0 + \beta_1 \,\text{NextYoungerSister}_{iobsc} + \beta_2 \text{NextYoungerSister}_{iobsc} \times \text{Age Gap}_{iobsc} \\ & + \beta_3 X_{iobsc} + \gamma_o + \gamma_b + \gamma_s + \gamma_c + \epsilon_{iobsc} \end{aligned} \tag{2}$$

The coefficients of interest are β_1, which captures the difference in outcomes relative to having a next-younger brother (the omitted category), and β_2, which captures the differential effect of having a next-younger sister when the age gap is below the median compared to above the median. The outcome variable Y_{iobsc} refers to the marital or educational outcome of individual i, with older sibling gender composition o, birth order b, residing in state s, and belonging to cohort c, defined

[8] Due to sample size limitations in the REDS 1999 data, we cannot disaggregate older sibling composition by exact sex permutations (e.g., Boy-Girl vs. Girl-Boy) as in Vogl (2013). Instead, our specifications incorporate older-sibling-gender-composition fixed effects, treating these permutations as a single category.

based on the individual's year of birth. The variable $\text{NextYoungerSister}_{iobsc}$ is an indicator equal to 1 if the next-younger sibling of individual i is a sister and 0 if it is a brother. Age Gap_{iobsc} is an indicator equal to 1 if the age gap between individual i and their next-younger sibling is below the median–2 years for women and 3 years for men–and 0 otherwise. The fixed effects include: γ_o for older sibling gender composition, γ_b for birth order, γ_c for birth cohort (year of birth), and γ_s for state of residence. The vector of covariates X_{iobsc} includes the total number of siblings, an indicator for belonging to a Scheduled Caste, Scheduled Tribe, or Other Backward Class, and land owned, measured as the natural logarithm of acres of land owned. Standard errors are clustered at the family level.

Second, we study the effect of birth order on siblings' marriage and education outcomes using our sibling-level data, which includes completed marriage decisions for all siblings within a family. The key advantage of our data is that it allows us to estimate birth order effects using within-family variation while controlling for family fixed effects. This approach enables us to account for time-invariant, family-level unobservables—such as preferences and beliefs about marriage and human capital investments (Andrew and Adams, 2022). We adopt a specification similar to Coffey and Spears (2021), and estimate the following specification, with family-level fixed effects:

$$\begin{aligned} Y_{ifcs} = \beta_0 + \beta_1\,\text{Female}_{ifcs} + \beta_2\,\text{Second Child}_{ifcs} + \beta_3\,\text{Third Child}_{ifcs} \\ + \beta_4\,\text{Fourth+ Child}_{ifcs} + \gamma_f + \gamma_c + \gamma_s + \epsilon_{ifcs} \end{aligned} \tag{3}$$

The coefficients of interest are β_2, β_3, and β_4, which capture the differences in outcomes for the second-, third-, and fourth-or-higher-born children, respectively, relative to the first-born sibling (the omitted category). Female_{ifcs} is an indicator variable for female, and the specification includes fixed effects for family (γ_f), birth cohort (γ_c, based on year of birth), and state of residence (γ_s). Standard errors are clustered at the family level.

In addition to the pooled specification, we also estimate separate regressions for women and men, allowing for gender-specific birth order effects. Specifically, we redefine birth order to reflect the individual's rank among same-gender siblings rather than among all siblings. This distinction is motivated by the possibility that parental preferences and intra-household competition may operate differently across sons and daughters.

Lastly, we conduct a descriptive analysis examining the relationship between an individual's dowry payments and the gender composition of their older and younger siblings, conditional on total sibling size. Specifically, we document how average dowry received (for men) and dowry paid (for women) vary with the number of older and younger sisters within the family. This analysis provides suggestive evidence on how intra-household gender composition may influence marital transfers, potentially reflecting strategic household behavior in response to the cumulative dowry burden or sequencing norms.

6 Results

In this section, we detail the three main findings of the paper. First, we test the sibling rivalry mechanism by examining how the gender of the next-younger sibling affects an individual's marital and educational outcomes. Second, we estimate the effects of birth order on marriage outcomes. Third, we document how the gender composition of siblings, particularly the number of older and younger sisters, is associated with dowry payments.

6.1 Sibling Rivalry (Women): Impact of Younger Siblings on Marital Outcomes

Table 2: Sibling Rivalry Effects: Women

	Panel A: Without Age Difference			
	(1) Age at Marriage	(2) Years of Education	(3) Spouse Education (Years)	(4) Dowry Given (2010 Rupee)
Younger Sister	-0.05	-0.11*	-0.27***	-12529.31***
	(0.07)	(0.07)	(0.10)	(3000.57)
Observations	8,730	8,730	8,728	6,328
Control Mean	18.15	2.64	4.57	77,786.20
Bias-Adjusted Point Estimate (Oster,2019)	-0.12	-0.15	-0.36	-11700.25

	Panel B: With Age Difference			
	(1) Age at Marriage	(2) Years of Education	(3) Spouse Education (Years)	(4) Dowry Given (2010 Rupee)
Younger Sister	-0.00	-0.11	-0.24**	-11285.29***
	(0.08)	(0.07)	(0.10)	(3245.97)
Younger Sister × Age Difference<2	-0.36*	-0.02	-0.28	-8954.41
	(0.19)	(0.17)	(0.24)	(8702.46)
Observations	8,730	8,730	8,728	6,328
Control Mean	18.15	2.64	4.57	77,786.20
Younger Sister with < 2 Years Age Gap (Estimate)	-0.36	-0.13	-0.52	-20239.70
Younger Sister with < 2 Years Age Gap (p-val)	0.04	0.42	0.02	0.01

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Note that the indicator variable for the younger sister and the age difference variable are not defined for the youngest sibling within a family. All regressions include fixed effects for birth cohort (year of birth), birth order, older sibling gender composition, and state of residence. Covariates include indicators for belonging to a Scheduled Caste, Scheduled Tribe, or Other Backward Class, parental landholdings (measured as the natural logarithm of acres of land owned), the total number of siblings, and age gap with respect to the next younger sibling. Standard errors are clustered at the family-level. * significant at 10%; ** significant at 5%; *** significant at 1%. Control mean is defined for women with a next-younger brother. Bias adjusted point estimate calculated using Oster (2019).

First, Table 2, Panel A, column (1) presents the effects of the sibling rivalry channel for women using Equations 1 and 2. Overall, we find no significant difference in age at marriage between women with a next-younger brother and those with a next-younger sister. However, Table 2, Panel B, column(1) reveals evidence consistent with the sibling rivalry mechanism. Women with a next-younger sister and an age gap of less than two years—the median sibling age gap among women in our sample—marry, on average, 0.37 years earlier than those with a next-younger brother (p-value

< 0.05). This finding aligns with the marriage search model of Vogl (2013), which predicts that the sibling rivalry effect on a woman's age at marriage varies with the age gap between siblings. In the search model, the elder daughter staying single each period blocks the younger sister from entering the marriage market. That extra "queue cost" makes parents lower their reservation threshold earlier, so they accept a satisfactory groom sooner than they otherwise would. The lower the age gap between the sisters, the stronger the pressure on the elder sister to marry earlier. For wider age gaps, the younger sister is still several periods away from the market, so the opportunity cost of delay is smaller, and the timing effect largely disappears. Averaging across wide gaps hides the timing effect; once the gap is tight (less than two years), the elder sister marries 4.32 months sooner, as the model predicts. To put this result in context, Field and Ambrus (2008) finds that each additional year of delay in puberty postpones marriage for girls by approximately 0.74 years. Therefore, our estimated effect of the sibling rivalry mechanism, 0.36 years, is roughly 50% the magnitude of the impact of age at menarche on girls' age at marriage. Second, Table 2, Panel A, column(2) and Panel B, column(2) show that, compared to women with a next-younger brother, women with a next-younger sister have 0.11 (4.2%) fewer years of education (p-value < 0.1). A girl continues accumulating schooling only while still in the search pool; marriage ends that investment. Because having a younger sister waiting in the queue raises the cost of delay, parents drop their reservation cutoff earlier and accept a match sooner. The shortened search horizon means the elder daughter exits school earlier. This result also aligns with the recent findings in Andrew and Adams (2022), who show that parents attach little intrinsic value to a daughter's education once her marriage is secured and believe the return to education in the marriage market falls quickly as she ages, our finding suggests that the queue-induced early marriage accelerates the point at which parents perceive the value of their daughter's education to have diminished. As a result, they tend to cut her education short, particularly for the elder daughter. While the interaction with age gap is negative, suggesting the penalty grows when the sisters are very close in age, exactly when the queue pressure is greatest, the coefficient is not statistically significant.

Third, Table 2, Panel A, column (3), shows that women with a next-younger sister marry men with 0.27 fewer years of education compared to those with a next-younger brother (p-value < 0.05). Assuming spousal education as a measure of groom quality, this finding is consistent with predictions from the marriage search model: when parents face pressure to marry off the elder daughter quickly, due to a closely spaced younger sister, they are more likely to lower their reservation quality and accept an earlier offer. This hastened acceptance results in a lower match quality on average. Further, from Panel B, column (3), the penalty in groom quality is larger when the age gap is smaller, as indicated by the negative interaction coefficient between younger sister and small age gap. Although the interaction is not statistically significant, the direction of the effect supports the interpretation that queue pressure is greater when the spacing between siblings is smaller, leading to worse match quality.

Lastly, we find a substantial effect of the sibling rivalry mechanism on dowry payments. Families of women with a next-younger sister give, on average, 12,529 Rupees (USD $\approx$ 272) less in dowry payments (in 2010 rupees and USD) compared to families of women with a next-younger brother (p-value < 0.01). To contextualize this effect, the magnitude of the reduction is approximately 45% of that associated with amendments to the Dowry Prohibition Act in India (Alfano, 2017; Calvi and Keskar, 2023). Dowries in this context can be interpreted as a groom price (Anderson and Bidner, 2015) rising with the groom's quality. Since the queuing constraint makes parents relax their reservation cutoff, they settle for a slightly lower-quality husband in the presence of a younger sister in the queue, and as a result the corresponding payment falls. The additional reduction when sisters are less than two years apart (the coefficient on the interaction term in Table 2, Panel B, column (4) is negative but statistically insignificant) reflects the greater queue pressure—parents accept an even lower quality match to clear the queue. Chiplunkar and Weaver (2023) provide a detailed analysis of the quality of dowry payments data in the 1999 wave of REDS. They document measurement issues for dowry data from Karnataka, Gujarat, Orissa, Tamil Nadu, and Maharashtra. In Table A1, we show that our results are robust to excluding these states from the analysis.

To examine the robustness of the estimated effects of having a younger sister on women's marital outcomes to omitted variable bias, we apply the method proposed by Oster (2019). The bias-adjusted point estimates remain directionally consistent with the OLS estimates. Specifically, the estimated effect on *age at marriage* shifts from –0.05 to –0.12, suggesting a meaningful reduction in marriage age persists under moderate selection on unobservables. For *women's own years of education*, the adjusted estimate is –0.15 compared to an OLS estimate of –0.11, and for the *spouse's years of education*, the adjusted estimate is –0.36 compared to an OLS estimate of –0.27.

Finally, the impact on *dowry given* remains economically substantial, with a bias-adjusted estimate of –11,700 Rupees, relative to the OLS coefficient of –12,529. These adjusted values suggest that even under a moderate assumption of selection in unobservables, the presence of a younger sister continues to have an adverse effect on women's marriage outcomes in terms of age, spousal quality, and financial transfers.

6.2 Sibling Rivalry (Men): Impact of Younger Siblings on Marital Outcomes

Table 3: Sibling Rivalry Effects: Men

	Panel A: Without Age Difference			
	(1)	(2)	(3)	(4)
	Age at Marriage	Years of Education	Spouse Education (Years)	Dowry Received (2010 Rupee)
Younger Brother	-0.21***	-0.21***	-0.23***	3775.24
	(0.07)	(0.08)	(0.06)	(2452.84)
Observations	11,754	11,751	11,752	8,546
Control Mean	21.47	4.90	2.52	71392.61
Bias-Adjusted Point Estimate (Oster,2019)	-0.20	0.11	-0.12	2341.64

	Panel B: With Age Difference			
	(1)	(2)	(3)	(4)
	Age at Marriage	Years of Education	Spouse Education (Years)	Dowry Received (2010 Rupee)
Younger Brother	-0.10	-0.25**	-0.27***	5593.34*
	(0.10)	(0.10)	(0.08)	(3121.95)
Younger Brother × Age Difference<3	-0.27*	0.09	0.10	-3888.51
	(0.14)	(0.16)	(0.11)	(4503.51)
Observations	11,754	11,751	11,752	8,546
Control Mean	21.47	4.90	2.52	71392.61
Younger Brother with < 3 Years Age Gap (Estimate)	-0.36	-0.16	-0.17	1704.84
Younger Brother with < 3 Years Age Gap (p-val)	0.00	0.18	0.04	0.63

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Note that the indicator variable for the younger brother and the age difference variable are not defined for the youngest sibling within a family. All regressions include fixed effects for birth cohort (year of birth), birth order, older sibling gender composition, and state of residence. Covariates include indicators for belonging to a Scheduled Caste, Scheduled Tribe, or Other Backward Class, parental landholdings (measured as the natural logarithm of acres of land owned), the total number of siblings, and age gap with respect to the next younger sibling. Standard errors are clustered at the family-level. * significant at 10%; ** significant at 5%; *** significant at 1%. Control mean is defined for men with a next-younger sister. Bias adjusted point estimate calculated using Oster (2019).

Next, we examine the sibling rivalry channel for men using Equations 1 and 2. First, men with a next-younger brother marry, on average, 0.21 years earlier than men with a next-younger sister

(p-value < 0.01) (see Table 3, Panel A, column (1)). This effect is concentrated among men with an age gap of less than three years with their next-younger sibling—the median sibling age gap for men in our sample (see Table 3, Panel B, column (1)). Within this subgroup, having a next-younger brother is associated with a 0.36-year reduction in age at marriage (p-value < 0.01). This finding provides the first evidence for the sibling rivalry mechanism even among men: a closely spaced younger brother accelerates marriage timing, with the magnitude of the effect similar to that of women with a closely spaced younger sister. Second,Table 3, Panel A, column (2) shows that men with a next-younger brother have 0.21 fewer years of education than those with a next-younger sister (p-value < 0.01), and this effect does not vary with the sibling age gap (see Table 3, Panel B, column (2)). Third, Table 3, Panel A, column (3) indicates that men with a next-younger brother marry women with 0.23 fewer years of education compared to those with a next-younger sister (p-value < 0.01), and the effect independent of the sibling age gap similar to the results for women (see Table 3, Panel B, column (3)).

Interestingly, the results on marital payments for men diverge substantially from those observed for women. The presence of a next-younger brother, relative to a next-younger sister, appears to be associated with a weakly positive effect on dowry received by men. While the coefficient in Table 3, Panel A, column (4), is not statistically significant, the specification that includes the age gap interaction (Table 3, Panel B, column (4)) suggests that men with a next-younger brother receive $\approx$ 5,600 Rupees more in dowry (USD $\approx$ 122) (in 2010 rupees and USD) compared to those with a next-younger sister (p-value < 0.1). Results from Table A1 show that once states with potential measurement issues in dowry data (Chiplunkar and Weaver, 2023) are excluded, the gender of the next-younger sibling has no effect on dowry received by men.

Similar to women's outcomes, we use the method of Oster (2019) to assess the sensitivity of the estimated effects of having a younger brother on men's marital outcomes to omitted variable bias. The bias-adjusted estimates indicate that the results for some outcomes are robust, while others are sensitive to potential unobserved selection. Specifically, the effect on *age at marriage* and *spouse's years of education* remains negative with the bias-adjusted coefficient similar to the OLS estimates, indicating some sensitivity but preserving the direction of the effect. However, the estimated impact on *men's own years of education* is not robust: while the OLS estimate is –0.21, the bias-adjusted point estimate flips to a positive 0.11, suggesting that modest selection on unobservables could eliminate or reverse this effect. Finally, the adjusted estimate for *dowry received* remains positive and substantively large (2,342 rupees), albeit smaller than the original OLS estimate (3,775 rupees). Overall, the results provide evidence of the sibling rivalry mechanism for men in the marriage market.

6.3 Birth Order Effects on Marital and Educational Outcomes

We now investigate the effect of birth order on an individual's marital and educational outcomes using Equation 3. First, Table A2, column (1) presents the relationship between birth order and age at marriage. We find strong evidence of a birth order gradient: relative to first-born children, second-born children marry, on average, 0.18 years later (p-value < 0.01), third-born children marry 0.35 years later (p-value < 0.01), and fourth- or later-born children marry 0.79 years later (p-value < 0.01). These results provide further support for the queuing norm hypothesis, whereby eldest-born children marry earlier to make way for younger siblings, resulting in comparatively delayed marriages for later-born children. Table A3 in the Appendix shows the birth order effects by family size, with the number of children varying from two to eight, following the approach in Black et al. (2005). The results show a consistent pattern: in families with three or more children, later-born individuals tend to marry later, reflecting a birth order gradient in marital timing. Second, we find weaker evidence of a birth order gradient in educational attainment (see Table A2, column (2)). While the coefficient for fourth- or later-born children suggests they attain 0.21 more years of education relative to first-born children (p-value < 0.01), the overall pattern does not display a consistent trend across birth orders, in contrast to the gradient observed for age at marriage. These results provide the first evidence that the advantage in neonatal survival observed among later-born siblings (Coffey and Spears, 2021) extends to later-life outcomes, including marriage and education.

Third, we examine the relationship between a woman's sex-specific birth order and her marital and educational outcomes. We find strong evidence of a birth order gradient in age at marriage: second-born daughters marry, on average, 0.22 years later than eldest-born daughters (p-value $<$ 0.01), and third- or later-born daughters marry 0.56 years later (p-value < 0.01) (see Table 4, column (1)). We also find some evidence of a positive association between birth order and years of education, although the effects are weaker. As shown in column (2) of Table 4, third- or later-born daughters attain 0.14 more years of education compared to eldest-born daughters (p-value < 0.1), while the coefficient for second-born daughters is not statistically significant. Furthermore, there is evidence of improvements in spousal quality with higher birth order. Column (3) of Table 4 shows that third- or later-born daughters marry men with 0.32 more years of education compared to eldest-born daughters (p-value < 0.05). Finally, we find evidence that dowry payments increase with birth order. Column (4) of Table 4 indicates that third- or later-born daughters pay, on average, 12,646 Rupees (approximately USD 275) more in dowry (in 2010 rupees and USD) compared to eldest-born daughters (p-value < 0.01).

Table 4: Sex-specific Birth Order Effects: Women

	(1) Age at Marriage	(2) Years of Education	(3) Spouse Education (Years)	(4) Dowry Given (2010 Rupee)
Second Girl	0.22***	-0.02	0.08	2815.03
	(0.08)	(0.05)	(0.08)	(2530.10)
Third and Above Girl	0.56***	0.14*	0.32**	12646.21***
	(0.12)	(0.09)	(0.13)	(4128.81)
Observations	10,519	10,519	10,514	7,336
First Born Girl	18.09	2.43	4.30	82,265.54

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). All regressions include family fixed effects and fixed effects for birth cohort (year of birth), and state of residence. Standard errors are clustered at the family-level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Fourth, we examine the relationship between a man's sex-specific birth order and his marital and educational outcomes. We find strong evidence of a birth order gradient in age at marriage: second-born sons marry, on average, 0.57 years later than eldest-born sons (p-value < 0.01), and third- or later-born sons marry 1.16 years later (p-value < 0.01) (see Table 5, column (1)). We also find some evidence of a positive association between birth order and years of education. As shown in column (2) of Table 5, third- or later-born sons attain 0.28 more years of schooling compared to eldest-born sons (p-value < 0.05), while the coefficient for second-born sons is statistically insignificant. Furthermore, there is evidence of improvements in spousal quality with higher birth order. Column (3) of Table 5 shows that third- or later-born sons marry women with 0.26 more years of education compared to eldest-born sons (p-value < 0.01). Finally, we find evidence that dowry receipts increase with birth order. Column (4) of Table 5 indicates that third- or later-born sons receive, on average, 6,400 Rupees (≈ USD 139) more in dowry (in 2010 rupees and USD) compared to eldest-born sons (p-value < 0.1).

Overall, the birth order results provide support for the queuing norm in marital decisions for both women and men, with later-born siblings marrying systematically later than their eldest-born counterparts. The overall patterns for spousal quality and dowry payments also suggest advantages for later-born individuals in the marriage market.

Table 5: Sex-specific Birth Order Effects: Men

	(1) Age at Marriage	(2) Years of Education	(3) Spouse Education (Years)	(4) Dowry Received (2010 Rupee)
Second Boy	0.57***	-0.05	0.04	1312.66
	(0.08)	(0.07)	(0.06)	(2245.76)
Third and Above Boy	1.16***	0.28**	0.26***	6398.84*
	(0.13)	(0.11)	(0.09)	(3412.42)
Observations	13,345	13,343	13,341	9,336
First Born Boy	21.49	4.55	2.25	72,208.30

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). All regressions include family fixed effects and fixed effects for birth cohort (year of birth), and state of residence. Standard errors are clustered at the family-level. * significant at 10%; ** significant at 5%; *** significant at 1%.

6.4 Sibling Composition Effects on Dowry Payments

Lastly, we present a descriptive analysis of the relationship between sibling composition and dowry payments. Column (1) of Table 6 shows that, holding the total number of siblings constant, each additional sister is associated with a reduction of 8,493 Rupees (approximately USD 185) in dowry payments made for daughters (p-value < 0.01). Column (2) of Table 6 reports similar patterns for dowry receipts among men. Each additional sister is associated with a reduction of 4,144 Rupees (approximately USD 90) in dowry received. These findings provide descriptive evidence that sibling gender composition systematically shapes the magnitude of marital transfers. In particular, a greater number of daughters in the family lowers net marital payments, consistent with the sibling rivalry channel (Vogl, 2013) and saving constraints faced by parents of daughters who must accumulate resources for multiple marriages (Anukriti et al., 2022b).

Table 6: Sibling Composition Effects on Dowry Payments

	(1) Dowry Given (2010 Rupee)	(2) Dowry Received (2010 Rupee)
Number of Girls	-8492.98***	-4143.89***
	(1713.94)	(1571.82)
Number of Children	4242.18***	2722.32**
	(1203.98)	(1178.21)
Observations	8,773	10,522
Mean	77,786.20	71,392.61

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). All regressions include fixed effects for birth cohort (year of birth) and state of residence. Covariates include indicators for belonging to a Scheduled Caste, Scheduled Tribe, or Other Backward Class, as well as parental landholdings (in acres). Column 1 shows the results for women, and Column 2 shows the results for men. * significant at 10%; ** significant at 5%; *** significant at 1%.

7 Conclusion

This paper builds on the sibling rivalry framework in Vogl (2013) and shows that sibling gender composition and birth order play an important role in shaping marriage outcomes for *both* women and men in rural India, using sibling-level data with complete marital histories. First, we find that closely spaced same-sex siblings accelerate marriage timing and reduce spousal match quality for both genders. Second, we document a novel pattern in marital transfers: while younger sisters reduce the dowry paid for a woman's marriage, younger brothers have no corresponding effect on the dowry received by men. Third, we uncover meaningful birth order gradients in age at marriage, educational attainment, and dowry payments—later-born children, especially daughters, tend to marry later and pay higher dowry amounts. Finally, we provide new descriptive evidence that households with more daughters experience a net decline in both dowry outflows and inflows, suggesting that families internalize the financial implications of having more daughters on both sides of the marriage market. Together, these findings underscore how family structure, through the interplay of sibling rivalry, gender, and birth order, shapes marital outcomes.

8 Declaration of generative AI in scientific writing statement

This Declaration of generative AI in scientific writing is regarding our paper "Role of Siblings in Marriage and Dowry Practices: Evidence from India" While preparing this work, the authors used ChatGPT to improve the manuscript's readability and language. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the article's content.

References

ALFANO, M. (2017): "Daughters, dowries, deliveries: The effect of marital payments on fertility choices in India," *Journal of Development Economics*, 125, 89–104. [6], [18]

ANDERSON, S. (2007): "The economics of dowry and brideprice," *Journal of economic perspectives*, 21, 151–174. [1], [6]

ANDERSON, S. AND C. BIDNER (2015): "Property Rights Over Marital Transfers," *The Quarterly Journal of Economics*, 130, 1421–1484. [6], [18]

ANDREW, A. AND A. ADAMS (2022): "Revealed beliefs and the marriage market return to education," Tech. rep., IFS Working Papers. [2], [4], [5], [11], [14], [17]

ANUKRITI, S., S. BHALOTRA, AND E. H. TAM (2022a): "On the quantity and quality of girls: Fertility, parental investments and mortality," *The Economic Journal*, 132, 1–36. [12]

ANUKRITI, S. AND S. DASGUPTA (2017): "Marriage markets in developing countries," . [5]

ANUKRITI, S., S. KWON, AND N. PRAKASH (2022b): "Saving for dowry: Evidence from rural India," *Journal of Development Economics*, 154, 102750. [1], [6], [23]

BANERJEE, A., E. DUFLO, M. GHATAK, AND J. LAFORTUNE (2013): "Marry for what? Caste and mate selection in modern India," *American Economic Journal: Microeconomics*, 5, 33–72. [5]

BAU, N., G. KHANNA, C. LOW, AND A. VOENA (2023): "Traditional Institutions in modern times: Dowries as pensions when sons migrate," Tech. rep., National Bureau of Economic Research. [6]

BEAUCHAMP, A., R. CALVI, AND S. FULFORD (2021): "Terms of engagement: Migration, dowry, and love in Indian marriages," . [5]

BENFORD, F. (1938): "The law of anomalous numbers," *Proceedings of the American philosophical society*, 551–572. [9]

BHALOTRA, S., A. CHAKRAVARTY, AND S. GULESCI (2020): "The price of gold: Dowry and death in India," *Journal of Development Economics*, 143, 102413. [6]

BLACK, S. E., P. J. DEVEREUX, AND K. G. SALVANES (2005): "The more the merrier? The effect of family size and birth order on children's education," *The Quarterly Journal of Economics*, 120, 669–700. [1], [7], [21]

BLACK, S. E., E. GRÖNQVIST, AND B. ÖCKERT (2018): "Born to lead? The effect of birth order on noncognitive abilities," *Review of Economics and Statistics*, 100, 274–286. [1], [7]

BLAKE, J. (1989): "Number of siblings and educational attainment," *Science*, 245, 32–36. [1], [9] BLOCH, F. AND V. RAO (2002): “Terror as a bargaining instrument: A case study of dowry violence in rural India,” *American Economic Review*, 92, 1029–1043. [6]

BOTTICINI, M. AND A. SIOW (2003): “Why dowries?” *American Economic Review*, 93, 1385–1398. [6]

BROWN, P. H. (2009): “Dowry and intrahousehold bargaining: Evidence from China,” *Journal of Human Resources*, 44, 25–46. [6]

CALVI, R., A. BEAUCHAMP, AND S. FULFORD (2022): “Terms of Engagement: Migration, Dowry, and Love in Indian Marriages,” Tech. rep., CEPR Discussion Papers. [6]

CALVI, R. AND A. KESKAR (2021): “Dowries, resource allocation, and poverty,” *Journal of Economic Behavior & Organization*, 192, 268–303. [6]

——— (2023): “’Til Dowry Do Us Part: Bargaining and Violence in Indian Families,” *Review of Economics and Statistics*, 1–45. [6], [9], [18]

CHAUHAN, S. AND T. SEKHER (2024): “Why do boys marry early? An enquiry into early marriages of young men in rural Uttar Pradesh, India,” *Journal of Social and Economic Development*, 1–24. [4]

CHIPLUNKAR, G. AND J. WEAVER (2023): “Marriage markets and the rise of dowry in India,” *Journal of Development Economics*, 164, 103115. [1], [6], [18], [20], [33]

COFFEY, D. AND D. SPEARS (2021): “Neonatal death in India: birth order in a context of maternal undernutrition,” *The Economic Journal*, 131, 2478–2507. [1], [3], [4], [7], [9], [14], [21]

FIELD, E. AND A. AMBRUS (2008): “Early marriage, age of menarche, and female schooling attainment in Bangladesh,” *Journal of political Economy*, 116, 881–930. [4], [5], [11], [17]

JACOB, S. AND S. CHATTOPADHYAY (2016): “Marriage dissolution in India: Evidence from census 2011,” *Economic and Political Weekly*, 51, 25–27. [5]

JAYACHANDRAN, S. (2017): “Fertility decline and missing women,” *American Economic Journal: Applied Economics*, 9, 118–139. [12]

——— (2023): “Ten facts about son preference in India,” Tech. rep., National Bureau of Economic Research. [12]

JAYACHANDRAN, S. AND I. KUZIEMKO (2011): “Why Do Mothers Breastfeed Girls Less Than Boys? Evidence and Implications for Child Health in India,” *The Quarterly Journal of Economics*, 126, 1485–1538. [7]

JAYACHANDRAN, S. AND R. PANDE (2017): “Why Are Indian Children So Short? The Role of Birth Order and Son Preference,” *American Economic Review*, 107, 2600–2629. [1], [4], [7]

KHALIL, U., S. MOOKERJEE, AND A. RAY (2024): “Post-marital residence and female wellbeing,” *Journal of Population Economics*, 37, 49. [4]

MAKINO, M. (2019): “Marriage, dowry, and women’s status in rural Punjab, Pakistan,” *Journal of population economics*, 32, 769–797. [6]

MUKHERJEE, A. AND T. SEKHER (2017): “‘Do Only Girls Suffer? We Too!’: Early Marriage Repercussions on Boys in Rural India,” *Economic and Political Weekly*, 75–82. [4]

OSTER, E. (2019): “Unobservable selection and coefficient stability: Theory and evidence,” *Journal of Business & Economic Statistics*, 37, 187–204. [2], [3], [13], [16], [18], [19], [20]

PARISH, W. L. AND R. J. WILLIS (1993): “Daughters, education, and family budgets Taiwan experiences,” *Journal of Human Resources*, 863–898. [5]

RAO, V. (1993): “The rising price of husbands: A hedonic analysis of dowry increases in rural India,” *Journal of political Economy*, 101, 666–677. [6]

SPEARS, D., D. COFFEY, AND J. R. BEHRMAN (2022): “Endogenous inclusion in the Demographic and Health Survey anthropometric sample: Implications for studying height within households,” *Journal of Development Economics*, 155, 102783. [1]

SRINIVAS, M. N. ET AL. (1984): “Some reflections on dowry,” *(No Title)*. [6]

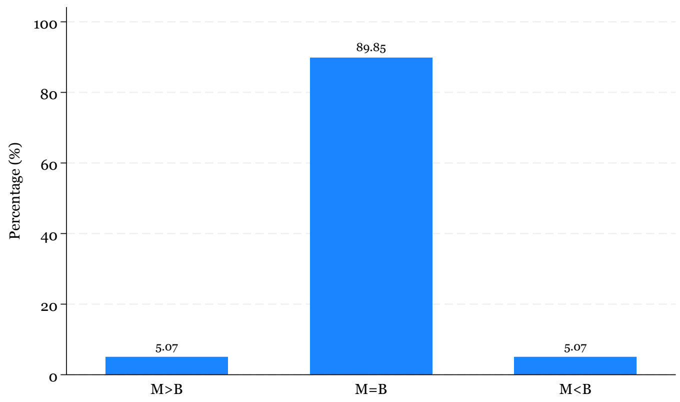
SRINIVASAN, S. AND A. S. BEDI (2007): “Domestic violence and dowry: Evidence from a South Indian village,” *World Development*, 35, 857–880. [6]

VOGL, T. S. (2013): “Marriage institutions and sibling competition: Evidence from South Asia,” *The Quarterly journal of economics*, 128, 1017–1072. [1], [2], [3], [5], [6], [8], [10], [12], [13], [17], [23], [24]

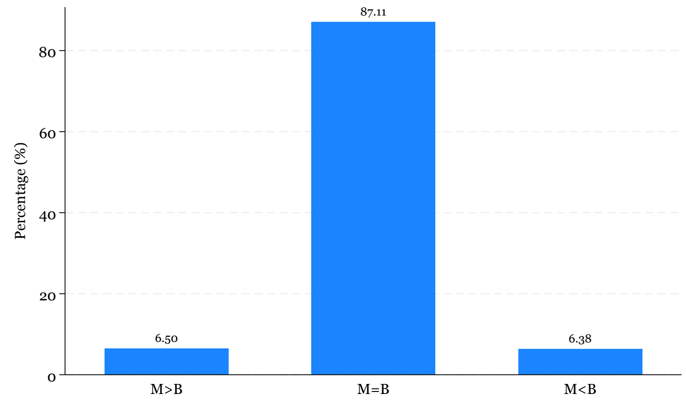
ZHANG, J. AND W. CHAN (1999): “Dowry and wife’s welfare: A theotrical and empirical analysis,” *Journal of Political Economy*, 107, 786–808. [6]

A Additional Tables and Figures

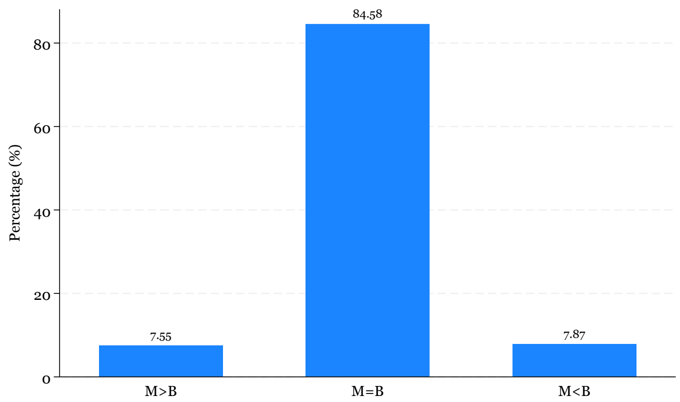
Figure A1: Gender-Specific Marriage Order-Birth Order: Queuing Norm by Number of Girls



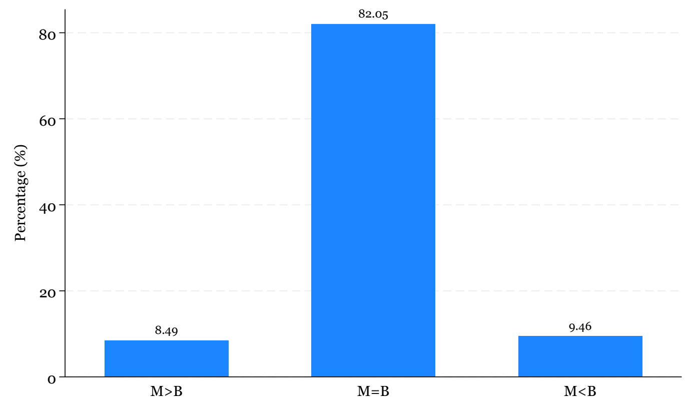
(a) Number of Girls = 2



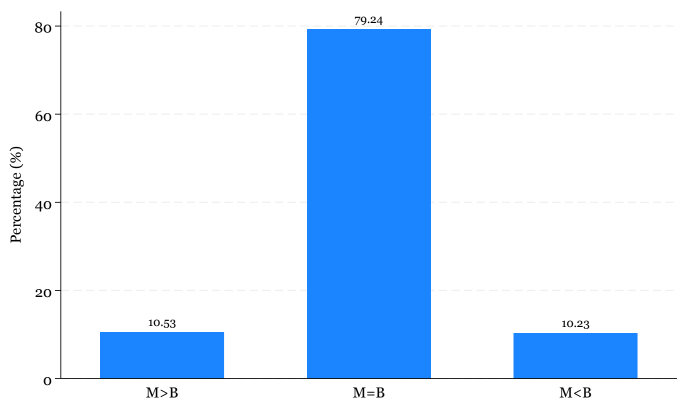
(b) Number of Girls = 3



(c) Number of Girls = 4



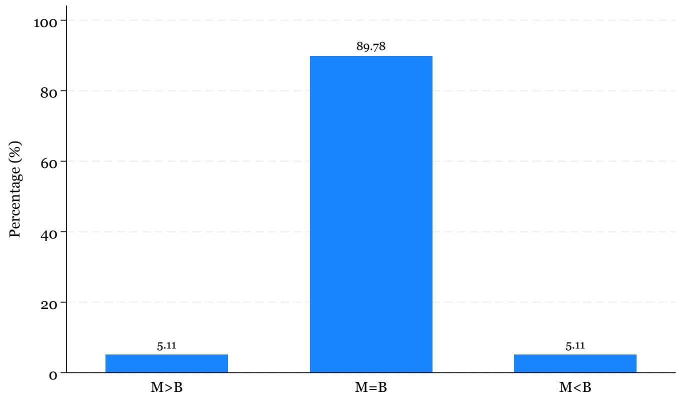
(d) Number of Girls = 5



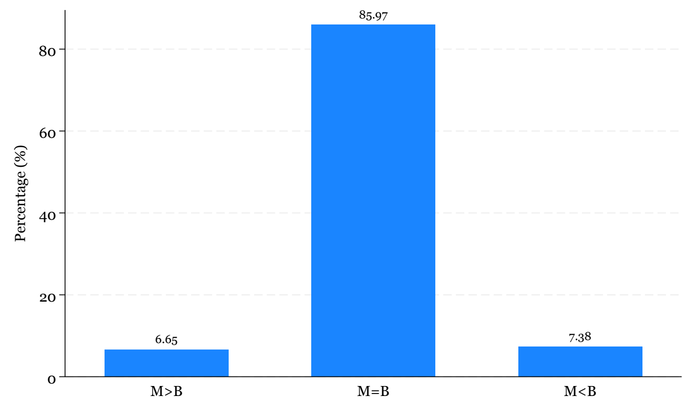
(e) Number of Girls = 6

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Sample restricted to at least two sisters for women and at least two brothers for men.

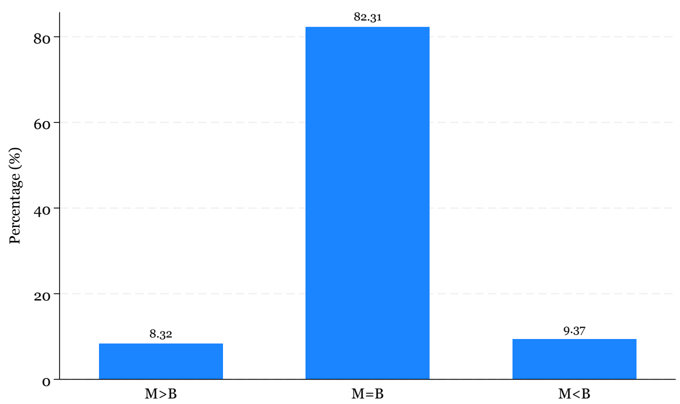
Figure A2: Gender-Specific Marriage Order-Birth Order: Queuing Norm by Number of Boys



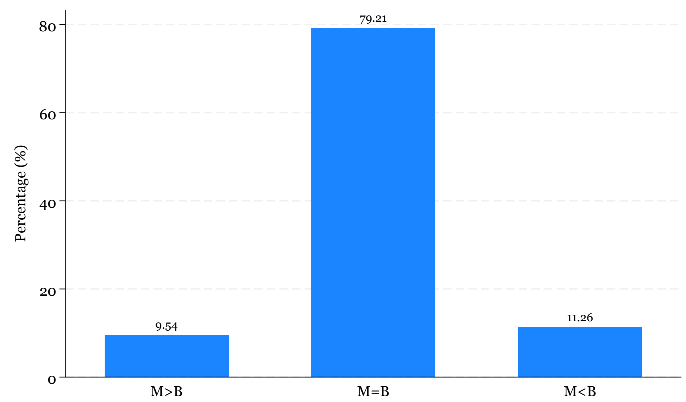
(a) Number of Boys = 2



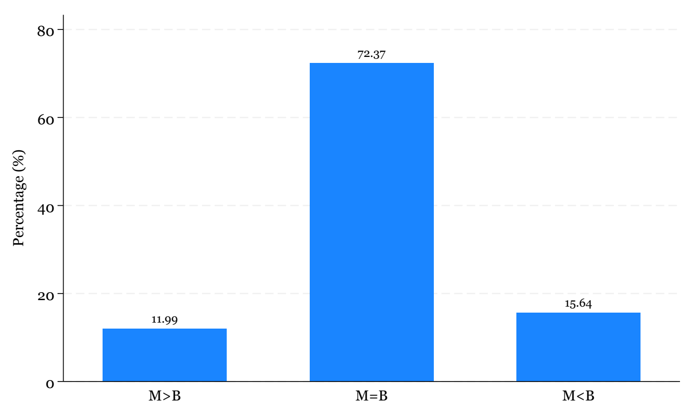
(b) Number of Boys = 3



(c) Number of Boys = 4



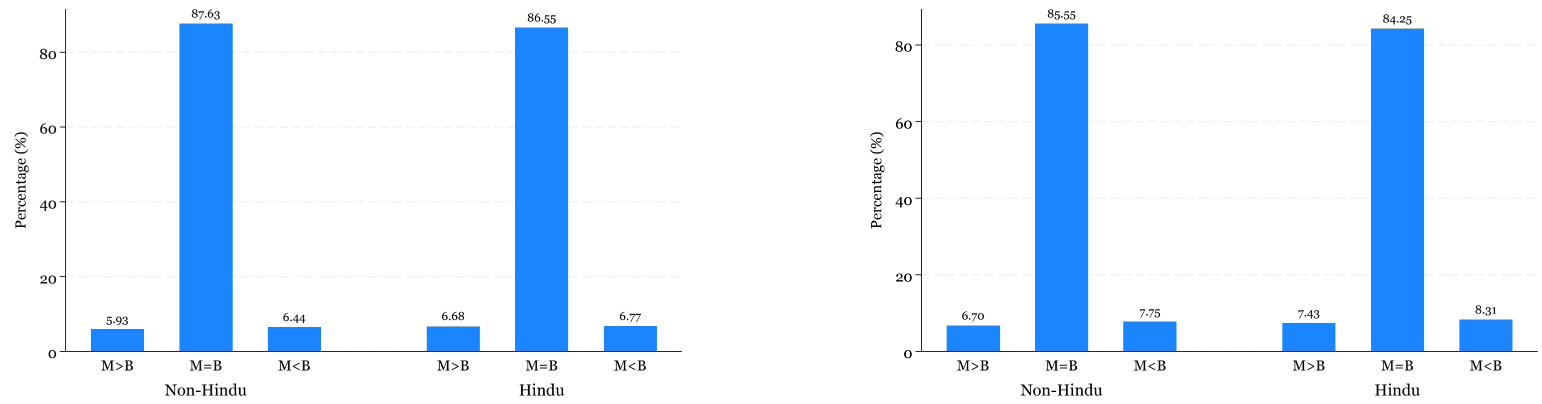
(d) Number of Boys = 5



(e) Number of Boys = 6

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Sample restricted to at least two sisters for women and at least two brothers for men.

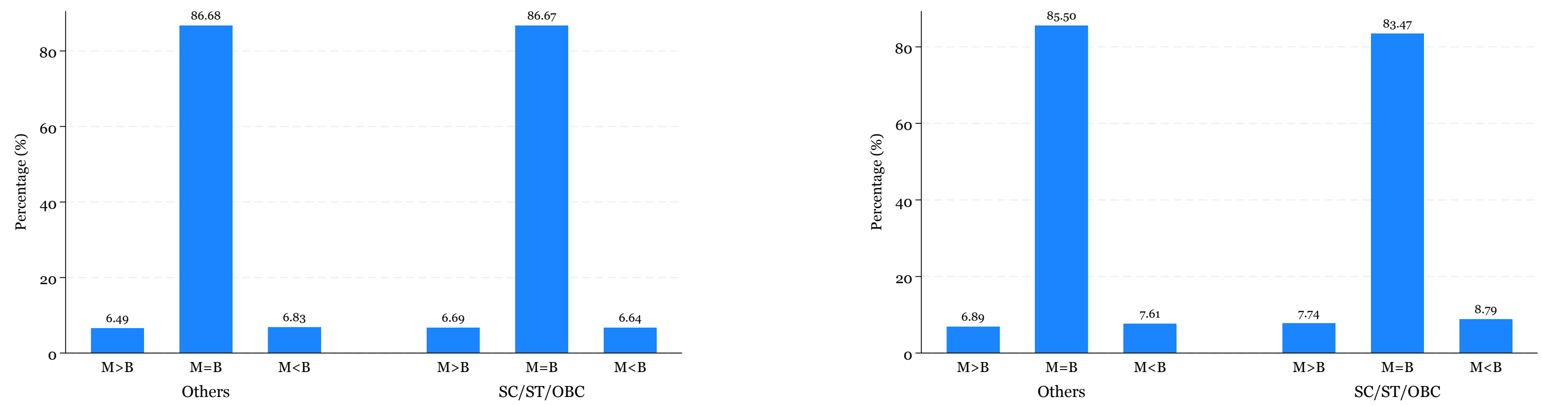
Figure A3: Gender-Specific Marriage Order-Birth Order: Queuing Norm by Religion



(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Sample restricted to at least two sisters for women and at least two brothers for men.

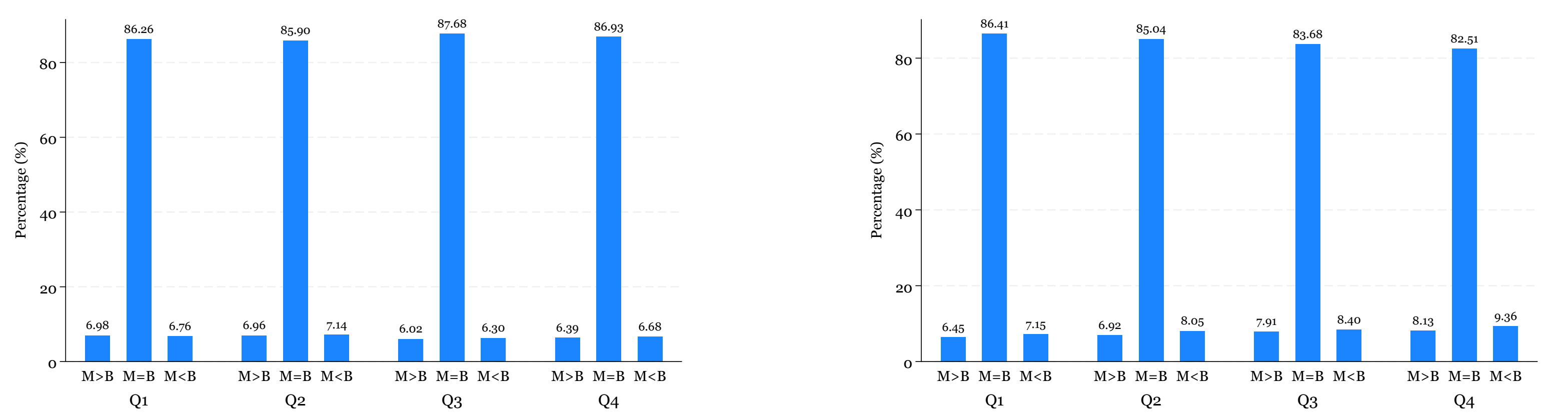
Figure A4: Gender-Specific Marriage Order-Birth Order: Queuing Norm by Caste



(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Sample restricted to at least two sisters for women and at least two brothers for men.

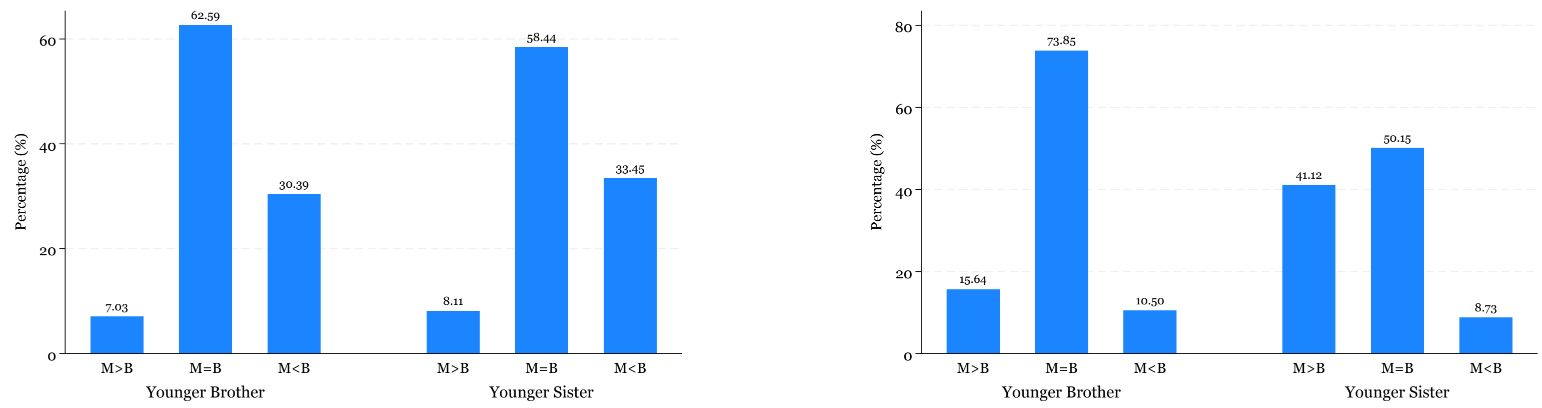
Figure A5: Gender-Specific Marriage Order-Birth Order: Queuing Norm by Wealth



(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Sample restricted to at least two sisters for women and at least two brothers for men.

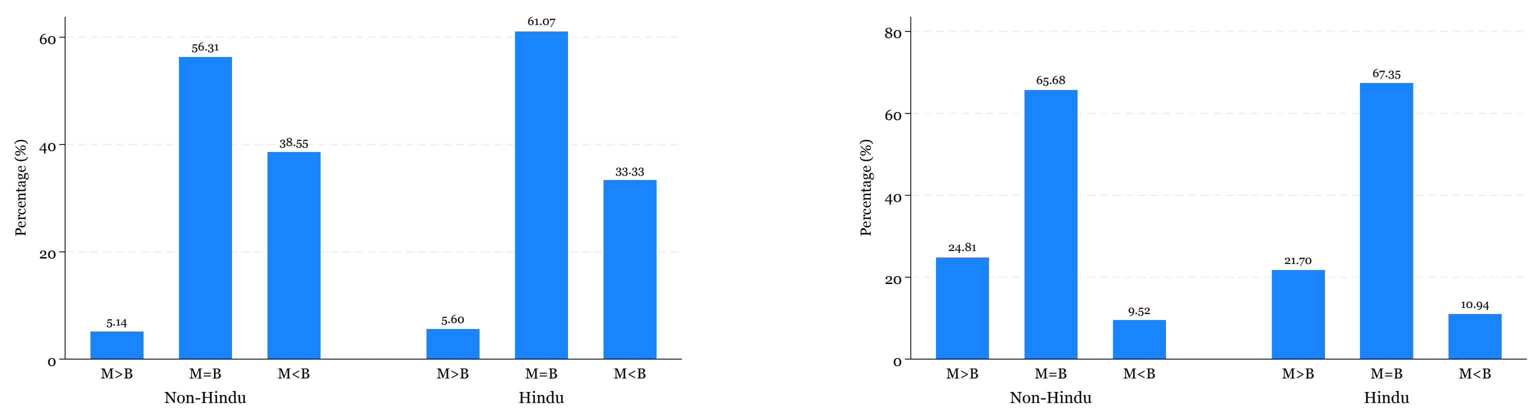
Figure A6: Overall Marriage Order-Birth Order: Queuing Norm by Gender and Next-Youngest Sibling



(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS).

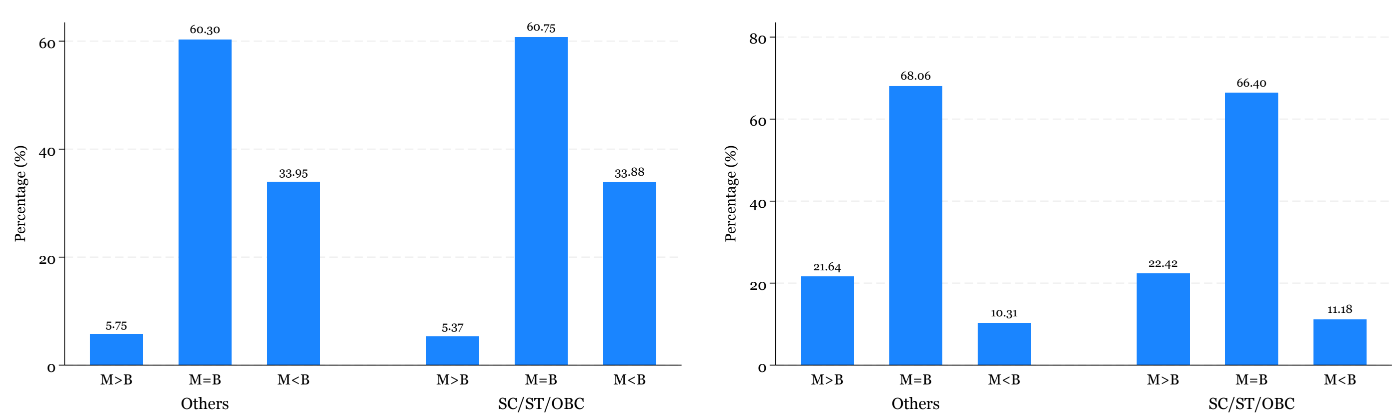
Figure A7: Overall Marriage Order-Birth Order: Queuing Norm by Religion



(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS).

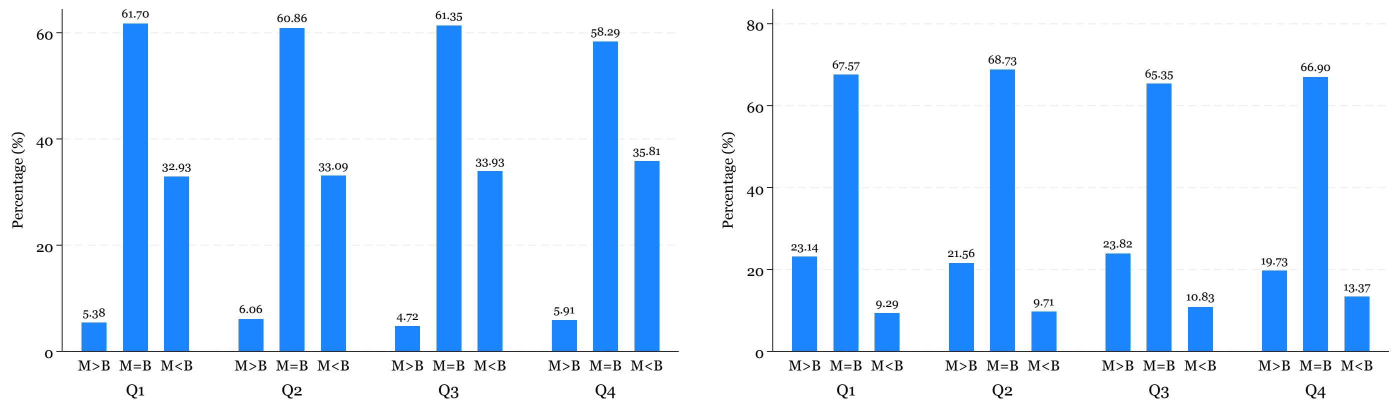
Figure A8: Overall Marriage Order-Birth Order: Queuing Norm by Caste



(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). SC/ST/OBC stands for Scheduled Caste, Scheduled Tribe, or Other Backward Caste.

Figure A9: Overall Marriage Order-Birth Order: Queuing Norm by Wealth Quintiles



(a) Women (b) Men

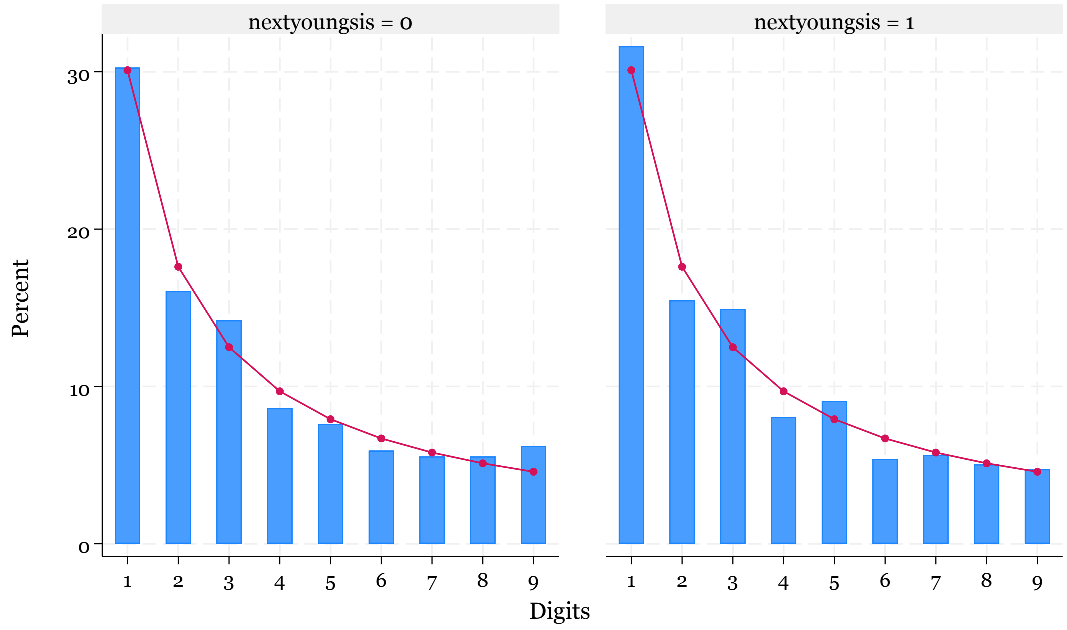
Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Q1 to Q4 are wealth quintiles, where wealth is defined by land ownership (in acres).

Table A1: Results: Impact of Younger Siblings on Dowry Payments (Robustness to States with Data Concerns (Chiplunkar and Weaver, 2023)

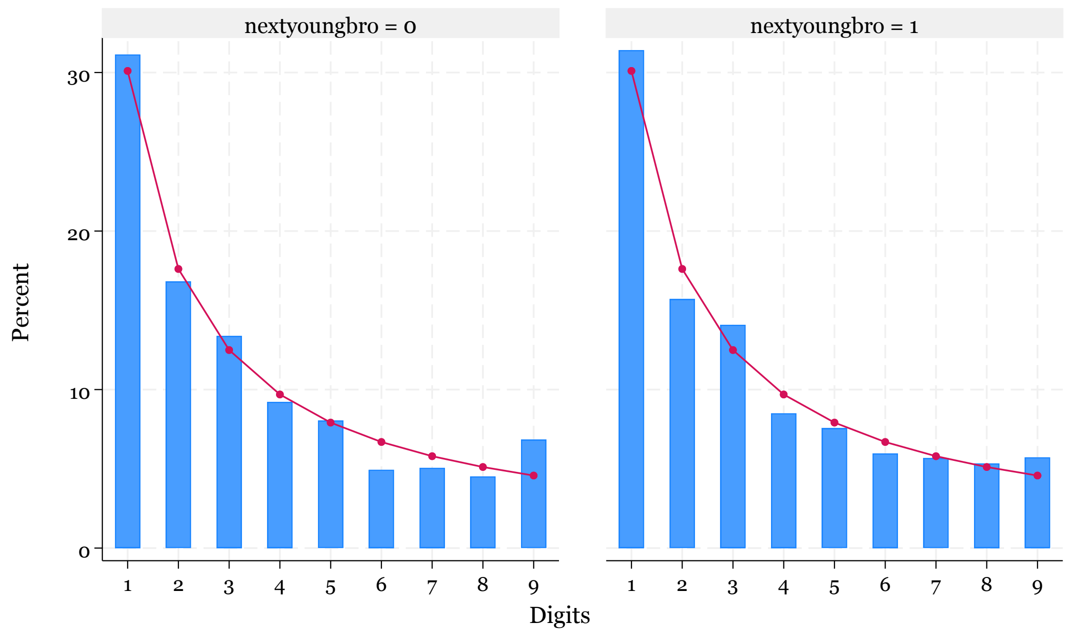
	(1) Dowry Given (2010 Rupee)	(2) Dowry Received (2010 Rupee)	(3) Dowry Given (2010 Rupee)	(4) Dowry Received (2010 Rupee)
Younger Sister	-8480.96***		-7117.91**	
	(3099.60)		(3340.52)	
Younger Brother		-1756.59		-512.46
		(2507.29)		(3137.10)
Younger Sister × Age Difference<2			-10350.39	
			(8592.68)	
Younger Brother × Age Difference<3				-2287.86
				(4560.15)
Observations	4,818	6,451	4,818	6,451
Control Mean	77786.20	71392.61	77786.20	71392.61
Younger Sibling with < median Years Age Gap (Estimate)			-17468.30	-2800.32
Younger Sibling with < median Years Age Gap (p-val)			0.03	0.45

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). All regressions include fixed effects for birth cohort (year of birth), birth order, older sibling gender composition, and state of residence. Covariates include indicators for belonging to a Scheduled Caste, Scheduled Tribe, or Other Backward Class, parental landholdings (measured as the natural logarithm of acres of land owned), the total number of siblings, and age gap with respect to the next younger sibling. * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure A10: Dowry Leading Digit Distribution by Gender of Next-Youngest Sibling



(a) Dowry Given



(b) Dowry Received

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS).

Table A2: Birth Order Effects on Education and Age at Marriage

	(1) Age at Marriage	(2) Years of Education
Female	-3.23***	-2.61***
	(0.05)	(0.05)
Second border	0.18***	-0.07
	(0.07)	(0.05)
Third Border	0.35***	0.08
	(0.08)	(0.07)
Fourth+ Border	0.79***	0.21**
	(0.11)	(0.09)
Observations	26,745	26,742
First Born	21.74	4.34

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). All regressions include family fixed effects and fixed effects for birth cohort (year of birth), and state of residence. Standard errors are clustered at the family-level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A3: Birth Order effects on Age at Marriage: By Family Size

	(1) Two Children	(2) Three Children	(3) Four Children	(4) Five Children	(5) Six Children	(6) Seven Children	(7) Eight Children
Female	-3.800***	-3.503***	-3.238***	-3.137***	-3.134***	-3.250***	-2.965***
	(0.263)	(0.156)	(0.121)	(0.112)	(0.133)	(0.176)	(0.196)
Second border	-0.104	0.211	0.231	0.369**	0.285	0.176	0.083
	(0.304)	(0.174)	(0.154)	(0.146)	(0.195)	(0.224)	(0.320)
Third Border		0.777***	0.593***	0.370**	0.232	1.167***	-0.041
		(0.266)	(0.209)	(0.182)	(0.199)	(0.274)	(0.315)
Fourth+ Border			0.755***	1.153***	0.740***	1.171***	0.144
			(0.281)	(0.245)	(0.249)	(0.305)	(0.400)
Observations	1602	3588	5040	5663	4789	3101	1731

Notes: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). All regressions include family fixed effects and fixed effects for birth cohort (year of birth), and state of residence. Standard errors are clustered at the family-level. * significant at 10%; ** significant at 5%; *** significant at 1%.