Waiting Your Turn: Sibling Rivalry, Birth Order, and Dowry in Rural India *

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Abstract

In societies with strong birth-order marriage norms and marital payments, same-sex siblings create queue pressure, and additional daughters can split a family's dowry-paying capacity, limiting the matches it can finance. We estimate how sibling gender composition and birth order affect household formation in rural India using the 1999 Rural Economic and Demographic Survey, which records age at marriage, own education, spouse education, and dowry transfers for *all* siblings in sampled households. Women with a next-younger sister marry husbands with 0.32 fewer years of education and pay Rs. 13,034 less in dowry; among closely spaced sisters, they marry 0.35 years earlier. We document a novel parallel pattern for men: those with a next-younger brother have 0.26 fewer years of education, marry earlier, and match with a less-educated spouse, while their dowry receipts remain unchanged. Family fixed-effects estimates show a later-born advantage in marriage timing, education, spouse quality, and transfers. The results show that the effects of sibling composition are not confined to daughters: they also shape sons' human capital and matches, while marital transfers respond asymmetrically by gender.

Keywords: Marriage markets; Siblings; Human capital; Birth order; Dowry; Gender; India

JEL codes: J12, J13, J16, J24, D13, O15

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1 Introduction

In much of the developing world, marriage is one of the most consequential economic transitions of early adulthood: it ends schooling, determines lifetime living standards through the match, and triggers some of the largest financial transfers a household will ever make. In India, where over 95% of marriages are still arranged (Rubio, 2014), these decisions are made by parents subject to a long-standing social norm: same-sex siblings must marry in their order of birth. This sequencing rule makes siblings' marriages interdependent—one child's place in the family "marriage queue" shapes when they marry, how long they stay in school, whom they match with, and what their family pays or receives in dowry. Vogl (2013) documents one side of this interdependence: teenage girls with a closely spaced younger sister leave the natal home earlier and match with lower-quality husbands than girls with a younger brother. However, because existing data sources rarely record completed marital histories for *all* siblings in a family, three first-order questions remain open: whether marriage-queue pressure also constrains sons' human capital and matches, how it shapes marital transfers, and whether birth order itself generates a gradient in marriage market outcomes.

This paper answers these questions using the 1999 wave of the Rural Economic and Demographic Survey of India (REDS), which records exact age at marriage, own and spousal education, and dowry transfers for *all* siblings of the household head and of the head's spouse—27,198 individuals across 6,093 families with completed fertility and completed marital decisions. Three features of these data are essential. First, we observe *actual* age at marriage for both genders, rather than the age at home-leaving used as a proxy in prior work—a proxy that is reasonable for women in patrilocal societies but invalid for men, who often remain in the parental household after marriage (Khalil and Mookerjee, 2019). Second, because fertility is complete for every family, we can control directly for family size, separating the sibling-composition channel from the family-size channel that son-stopping fertility behavior would otherwise confound (Anukriti et al., 2022a). Third, we observe dowry payments for all married siblings, allowing us to analyze how queue pressure shapes marital transfers.

Our empirical strategy follows Vogl (2013) in comparing individuals whose next-younger sibling differs by sex, conditional on older-sibling sex composition, birth order, birth cohort, state, family size, and family characteristics. Under this conditioning set, we treat the sex of the next-younger sibling as good as randomly assigned. This assumption is plausible because most sample cohorts were born before widespread prenatal sex determination (Anukriti et al., 2022a) and because the comparison is made at fixed parity and completed family size. The birth-order analysis uses within-family variation and absorbs all time-invariant household heterogeneity. Two further considerations matter for interpretation. First, the queuing norm entails sharp predictions about where effects should be stronger, particularly for age at marriage: among same-sex siblings with close age gaps, and not elsewhere. Confounding family-level unobservables would have to mimic this precise interaction pattern to generate our results spuriously. Second, we assess sensitivity to selection on unobservables using the approach of Oster (2019), reported alongside the main estimates in Section 6. We therefore interpret the estimates as plausibly causal effects of marriage-queue pressure, while acknowledging that, absent experimental variation in sibling composition, some caution is warranted.

We begin with documenting novel descriptive evidence on the marriage queue itself. More than 80% of women and men alike marry in their order of birth among same-sex siblings, and compliance is strikingly uniform across religion, caste, and wealth—the norm is a structural feature of the marriage market, not a custom of particular groups. However, how families deviate from the queue differs sharply by gender. When men marry out of turn, they marry *late*: 22% of men marry after their position in the overall birth order, and this share rises to 41% among men whose next-younger sibling is a sister—consistent with sons stepping aside so that a sister can marry first. When women marry out of turn, they marry *early*: 34% of women marry ahead of their birth order, irrespective of the gender of the sibling behind them—consistent with the marriage window being more binding for daughters (Field and Ambrus, 2008; Andrew and Adams, 2025).

We then estimate how the gender of the next-younger sibling—the sibling whose approach to marriageable age most directly tightens the queue—shapes marital and educational outcomes.[1] For women, the results confirm and sharpen the sibling rivalry mechanism using direct marriage-age data. Women with a next-younger sister complete 0.13 fewer years of education, marry husbands with 0.32 fewer years of education, and their families pay Rs. 13,034 ($283 in 2010 dollars) less in dowry than women with a next-younger brother. Marriage timing responds exactly where the queue binds: among sisters spaced less than two years apart—the median gap—a next-younger sister accelerates marriage by 0.35 years. In terms of quantifying the magnitude, the timing effect

[1]In Appendix A we develop a conceptual framework that extends the marriage-search model in Vogl (2013) to incorporate the family's dowry-paying capacity. Because dowry is the price of a groom, the sex of a younger sibling moves outcomes along two margins: a birth-order queue that governs marriage *timing*, and a dowry budget that governs the *quality of matches a family can finance*.

is roughly half the size of the effect of a one-year delay in menarche on girls' age at marriage estimated by Field and Ambrus (2008).

Our key finding is that the marriage queue is not a constraint on daughters alone: it shapes the human capital, marriage timing, and match quality of sons with comparable magnitude. Men with a next-younger brother complete 0.26 fewer years of schooling, marry 0.21 years earlier on average—0.37 years earlier when the brothers are closely spaced—and match with wives who have 0.25 fewer years of education than men with a next-younger sister. However, the gender of the next-younger sibling does not impact the dowry a man receives, even as his schooling, timing, and match deteriorate.

Finally, we exploit complete fertility to estimate birth-order gradients in marriage outcomes within families, using family fixed effects in the spirit of Coffey and Spears (2021); Spears et al. (2022). Later-born children of both genders enjoy a systematic marriage market advantage: relative to the eldest same-sex sibling, third-or-later-born daughters marry 0.56 years later, complete 0.17 more years of education, marry husbands with 0.27 more years of education, and pay Rs. 10,693 more in dowry; third-or-later-born sons marry 1.16 years later, complete 0.27 more years of schooling, marry wives with 0.28 more years of education, and receive Rs. 7,461 ($162 in 2010 dollars) more in dowry.

This paper contributes to three strands of literature. First, we extend the literature on sibling spillovers in marriage and family formation. Vogl (2013) establishes the sibling rivalry mechanism for girls in South Asia using home-leaving as a proxy for marriage; Parish and Willis (1993) document related burdens on eldest daughters in Taiwan; and Ahsan and Jain (2026) show that a higher brothers-to-siblings ratio improves spousal quality for Hindu women in India, with dowry as a key mechanism. Close to our work, Péter et al. (2018) use Swedish register and twin data to show that same-sex siblings raise men's earnings, marriage rates, and fertility, with effects strengthening when siblings are closely spaced. In Sweden, where marriages are self-arranged and unsequenced, a same-sex sibling operates through socialization and sibling spillovers that benefit men; in rural India, where parents arrange marriages under a binding birth-order norm, a same-sex sibling is competition in a queue, and we find he costs the elder brother schooling, search time, and match quality. The same family structure thus produces opposite outcomes depending on the marriage market institution it interacts with. The finding that sibling sex composition shapes men's human capital accumulation connects to broader evidence that gender norms transmitted within families affect educational attainment (Huber and Paule-Paludkiewicz, 2024) and that marriage and labor markets are interlinked (Bonilla et al., 2022).

Second, we contribute to the literature on dowry, a transfer that often amounts to one to two times annual household income and shapes savings behavior, daughters' welfare, and post-marital outcomes (Rao, 1993; Anderson, 2007; Anukriti et al., 2022b; Bhalotra et al., 2020; Calvi and Keskar, 2021; Chiplunkar and Weaver, 2023). We provide evidence that dowry payments respond to the marriage queue: the gender of the next-younger sibling, an individual's birth order, and the overall gender composition of the sibling group all systematically shift the size of marital transfers, and they do so asymmetrically for brides' and grooms' families.

Third, we extend the birth-order literature. A large body of work documents birth-order effects on health, education, and labor market outcomes in both developed and developing countries (Black et al., 2005, 2018; Jayachandran and Kuziemko, 2011; Jayachandran and Pande, 2017; Coffey and Spears, 2021; Spears et al., 2022), but the data requirements for studying *marriage* outcomes—completed fertility (Blake, 1989) and completed marital histories for all siblings — have left the marriage market largely unexplored. We document a later-born advantage in age at marriage, education, spousal quality, and transfers for both genders.

Beyond these literatures, the outcomes we study are policy-relevant margins of human capital formation. The mean age at marriage in our sample is 18.1 years for women and 21.5 for men, and the marriage queue compresses both schooling and marital search precisely for individuals with closely spaced same-sex siblings.[2] A large literature documents the human capital and welfare costs of early marriage for girls (Field and Ambrus, 2008; Andrew and Adams, 2025); recent work shows that early marriage also reduces educational attainment, labor market outcomes, and match quality for boys (Chauhan and Sekher, 2024; Mukherjee and Sekher, 2017). Because men remain the primary earners in most rural Indian households, queue-induced losses in sons' schooling carry long-run consequences for household welfare. The mechanism we study is also an instance of the broader interaction between social norms and economic behavior (La Ferrara and Yanagizawa-Drott, 2026): the birth-order rule raises the social cost of leaving an older sibling unmarried, while dowry obligations attach material stakes to the timing and terms of each match.

[2] According to the National Family Health Survey (NFHS-5, 2019–21), the median age at first marriage among women aged 20–49 increased from 17.2 years in 2005–06 (NFHS-3) to 19.2 years in 2019–21. For men aged 25–29, the median rose from 22.6 to 24.9 years over the same period.

The rest of the paper proceeds as follows: Section 2 describes the institutional setting, Section 3 describes the data, and Section 4 presents descriptive evidence on the marriage queue. Section 5 outlines the empirical strategy. Section 6 presents the results, and Section 7 concludes. We develop the conceptual framework in Appendix A.

2 Institutional Setting

Three institutional features distinguish the rural Indian marriage market and motivate our empirical design. First, marriage is nearly universal and effectively irreversible. 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 by their early thirties, while only 0.29% of the population reports being separated (Jacob and Chattopadhyay, 2016). Second, arranged marriage remains the dominant form of spousal selection in India, as in much of Asia, Africa, and the Middle East (Anukriti and Dasgupta, 2017). Parents and extended kin typically determine matches, with young adults having limited influence over partner choice (Banerjee et al., 2013; Beauchamp et al., 2021): in the IHDS, 72% of women report that their spouse was chosen by their parents or other relatives. Because the marriage decision rests with parents who must marry off several children from a common budget, one child's match is linked to the prospects of the others.

Third, marriages typically involve a dowry—a transfer from the bride's family to the groom or his family at the time of the wedding. Dowry payments are nearly universal and economically significant: since 1975, more than 80% of Indian marriages have involved a dowry, and payments often amount to one to two times annual household income (Rao, 1993; Anderson, 2007; Chiplunkar and Weaver, 2023).[3] Dowry obligations shape behavior well beyond the wedding itself, affecting girls' pre-marital welfare (Alfano, 2017; Bhalotra et al., 2020), parental savings (Anukriti et al., 2022b), women's post-marital outcomes (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., 2026).

Within this institutional environment, a long-standing norm requires that same-sex siblings marry in their order of birth. The practice is rooted in religious and historical tradition—ancient

[3] A large theoretical literature interprets dowry as a pre-mortem bequest to daughters and/or a market-clearing transfer in the marriage market (Srinivas, 1984; Botticini and Siow, 2003; Anderson, 2007; Anderson and Bidner, 2015); see Beauchamp et al. (2021) for a review.

texts such as the Manusmriti prescribe it—and is sustained by practical considerations: sequential marriages spread the financial burden of dowries over time, a strong match for the eldest improves younger siblings' prospects, and an unmarried elder sibling can stigmatize the family in the marriage market. The central economic implication, formalized in the marriage-search model in Vogl (2013), is that a younger same-sex sibling approaching marriageable age imposes a "queuing cost" on the parents of the older sibling: to clear the queue, parents lower their reservation match quality and accept an earlier, and on average worse, offer. Appendix A extends this logic to a setting with dowry affordability constraints.

3 Data and Measurement

3.1 The 1999 REDS sibling data

We use the 1999 wave of the Rural Economic and Demographic Survey of India (REDS), a nationally representative survey of rural households first fielded in 1969, with subsequent rounds in 1970, 1971, 1982, 1999, and 2006. The 1999 wave is uniquely suited to our questions for two reasons. First, it records detailed information on marital payments, spousal characteristics, and socioeconomic indicators not only for the household head and spouse but for *all* of their siblings and parents, allowing us to construct sibling-level data with complete marriage histories. Second, unlike the 2006 wave—which records only gift exchanges at marriage and lacks complete sibling marriage histories—the 1999 wave asks direct and explicit questions about dowry payments. Crucially, the data record *actual* age at marriage for every sibling, rather than the age at home-leaving that Vogl (2013) uses as a proxy for women's marriage timing. While home-leaving is a reasonable proxy in patrilocal contexts where brides join the groom's household, it is invalid for men, who typically remain in the parental household after marriage. Observed marriage ages for both genders, therefore allowing us to measure sibling effects on marriage timing directly, and for men for the first time.

3.2 Sample construction

We build two sibling-level datasets: (i) the household head and all his siblings, and (ii) the household head's spouse and all her siblings. To each, we apply the following criteria. First, we retain families with a male household head in a monogamous marriage in which all siblings are married, so that fertility and marital decisions are complete. Second, we exclude families in which any sibling's birth year is missing, implausible, or not distinct across siblings, since birth order requires a strict ranking.[4] Third, we drop families with missing or inconsistent years of marriage, which we need to compute marriage order and age at marriage.[5] Fourth, we restrict to families with at least two and at most ten siblings. Fifth, we convert all dowry values to 2010 Rupees and recode amounts below the 1st or above the 99th percentile as missing, separately for dowries received by men and paid by women. Finally, we drop families with implausible age gaps between siblings or between siblings and parents.[6] These criteria yield a final analysis dataset of 27,198 siblings across 6,093 families.

3.3 Summary statistics

Table 1: REDS Sibling-level Data: Summary Statistics

	Observations	Mean	St.Dev.	Median	Minimum	Maximum
$\mathbb{1}$ [Women]	27198	0.45	0.50	0.00	0.00	1.00
Total number of Siblings	27198	5.16	1.82	5.00	2.00	10.00
Age (Women)	12332	43.61	11.17	43.00	20.00	79.00
Age (Men)	14866	46.08	11.44	45.00	20.00	82.00
Age at Marriage (Women)	12332	18.15	3.58	18.00	7.00	50.00
Age at Marriage (Men)	14866	21.46	4.58	21.00	7.00	50.00
Years of Education (Women)	12223	2.63	3.64	0.00	0.00	19.00
Years of Education (Men)	14799	5.05	4.75	5.00	0.00	20.00
Dowry Given ($\times 10^3$) [2010 Rupee]	9033	77.96	128.69	28.49	0.00	1,073.83
Dowry Received ($\times 10^3$) [2010 Rupee]	10818	71.44	121.43	23.52	0.00	1,045.30
Father's Education (Years)	27195	1.47	2.83	0.00	0.00	20.00
Mother's Education (Years)	27189	0.49	1.53	0.00	0.00	12.00
$\mathbb{1}$ [Hindu]	27198	0.89	0.32	1.00	0.00	1.00
$\mathbb{1}$ [SC,ST,OBC]	27198	0.54	0.50	1.00	0.00	1.00
Family Land	26853	4.88	2.85	5.99	0.00	8.70
Observations	27198					

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

Table 1 presents summary statistics. Women constitute 45% of the sample, and families have 5.2 siblings on average. The sample skews older—mean ages are 46 for men and 44 for women—reflecting the restriction to families in which all siblings are married. Approximately 89% of households are Hindu, and 54% belong to a Scheduled Caste, Scheduled Tribe, or Other Backward Caste.

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

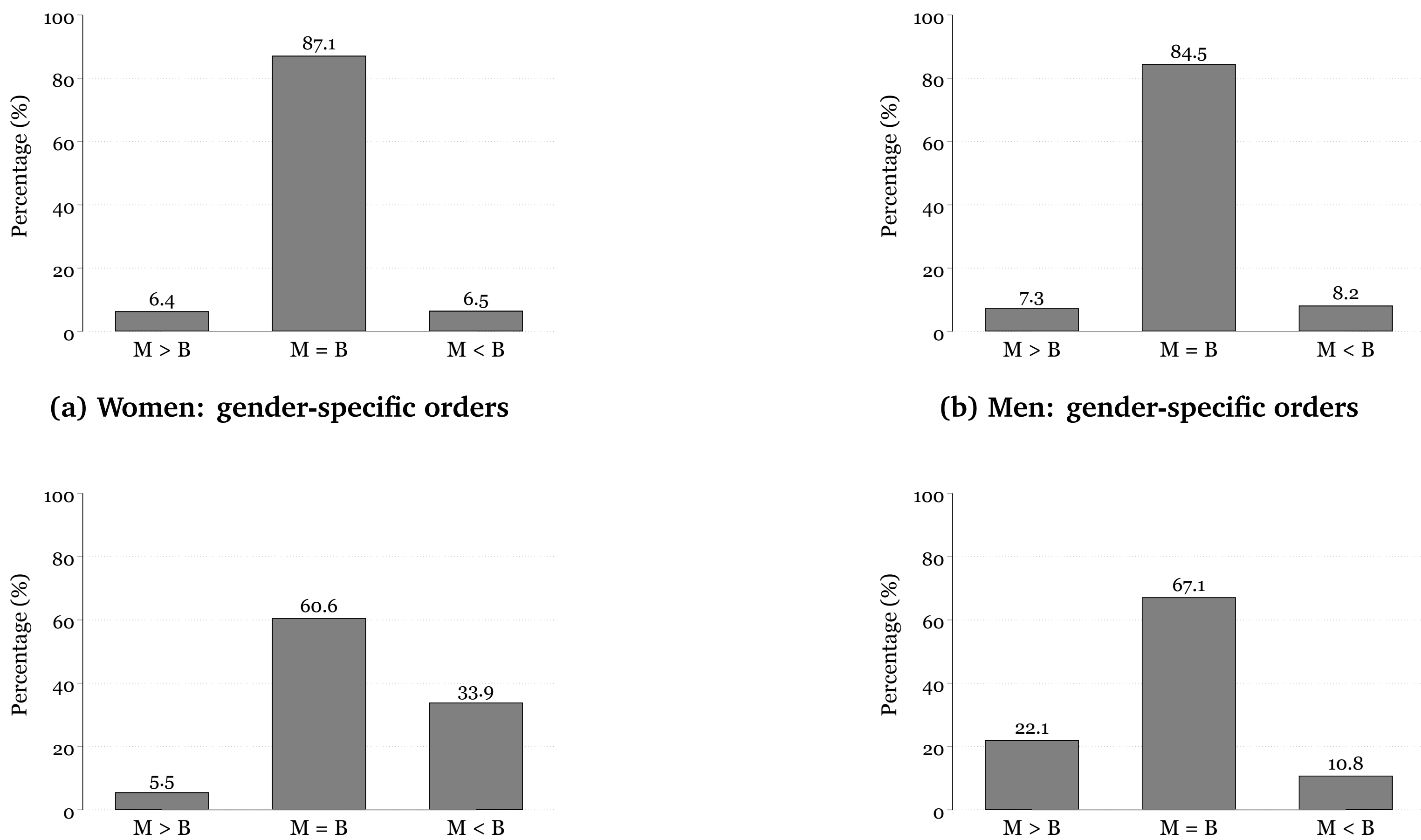
[5] We exclude families where any sibling married before 1940.

[6] Specifically, we exclude families whose sibling age gap falls below the 1st or above the 99th percentile of the sibling age gap distribution, and families where the father–child age gap is implausibly narrow (below 11 years) or wide (above 64 years).

Parental education is low: 1.5 years for fathers and 0.5 years for mothers, on average. The median age at marriage is 18 for women and 21 for men, and women average 2.6 years of education compared to 5.1 for men. Dowry payments are substantial: men receive an average of Rs. 71,440 and women's families pay an average of Rs. 77,960, in 2010 Rupees. The distribution is highly right-skewed, with median dowries of Rs. 23,523 received and Rs. 28,494 paid.

4 Descriptive evidence on the queuing norm

Figure 1: Marriage Order and Birth Order: Gender-Specific and Overall Queuing Norms



(a) Women: gender-specific orders **(b) Men: gender-specific orders**

(c) Women: overall orders **(d) Men: overall orders**

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). Panels (a)–(b) compare gender-specific marriage and birth orders; sample restricted to at least two sisters for women and at least two brothers for men. Panels (c)–(d) compare overall marriage and birth orders. M denotes marriage order; B denotes birth order.

We now document the prevalence of the queuing norm in our sibling-level data and examine how adherence varies across demographic groups. To our knowledge, this is the first direct, population-level description of marriage sequencing within Indian families. We first examine the relationship between *gender-specific* birth order and marriage order—the margin on which the norm is defined. Figure 1, panels (a)–(b), shows that approximately 87% of women and 85% of men marry in their gender-specific birth order. This adherence is stable across families with different numbers of same-gender siblings: even in larger sibling groups, around 80% of both women and men marry in order (Appendix Figures A1 and A2). Adherence is also strikingly uniform across socio-economic groups—similar for Hindu and non-Hindu families, across caste categories (Scheduled Caste, Scheduled Tribe, and Other Backward Caste versus others), and across wealth quartiles (Appendix Figures A7, A8, and A9). The norm is thus a structural feature of the marriage market rather than a custom of particular religious, caste, or wealth groups, and deviations from it cannot be attributed to differences in resources.

We next examine the alignment between *overall* marriage order and birth order, which reveals how the norm binds differently by gender. Figure 1, panels (c)–(d), shows that 67% of men and 61% of women marry exactly in their overall birth rank. The deviations are sharply asymmetric. Among men, 22% marry *after* their birth order and only 11% before. Among women, the pattern reverses: 34% marry *before* their birth order and only 5.5% after. This asymmetry reflects that age at marriage is a far more binding constraint for women, whose match quality in arranged-marriage settings declines rapidly with age (Field and Ambrus, 2008; Andrew and Adams, 2025). The role of sibling composition confirms this interpretation: among men with a next-younger sister, 41% marry after their birth order, compared to only 16% of men with a next-younger brother—consistent with sons delaying marriage so that a sister can marry first—whereas women rarely marry out of turn regardless of the gender of the next-younger sibling (Appendix Figure A6).

In sum, the queuing norm is widespread, stable across socio-economic groups, and gendered in its binding. That adherence varies so little with religion, caste, or wealth is consistent with the norm operating as a social-coordination equilibrium rather than a resource-driven choice: in the framework of La Ferrara and Yanagizawa-Drott (2026), behavior of this kind is sustained by the conformity payoff to matching what others in the community do, a force that is especially powerful in settings with imperfect markets, where informal rules substitute for formal contracts in organizing marriage.

These facts set up the empirical analysis: if parents face queue pressure when a same-sex sibling approaches marriageable age, the timing, schooling, match quality, and marital transfers of the older sibling should vary systematically with the gender of—and the age gap to—the next-younger sibling.

5 Empirical Strategy

We use the sibling-level data with complete marriage histories to estimate (i) how the gender of the next-younger sibling shapes an individual's marital and educational outcomes, and (ii) the birth-order gradient in marriage outcomes within families. Our outcomes throughout are age at marriage, own years of education, spousal quality, and dowry transfers.

5.1 Sibling rivalry: the gender of the next-younger sibling

Our strategy follows Vogl (2013). We compare women (men) with a next-younger sister (brother) to women (men) with a next-younger brother (sister), conditional on a rich set of fixed effects and controls. 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, the same number of siblings, and similar family background, who differ only in whether the next-younger sibling is of the same or the opposite gender. The identifying assumption is that conditional on these covariates, the gender of the next-younger sibling is as good as randomly assigned.

The completed fertility structure of our data strengthens this design in an important way. All births in our sample predate 1985, before ultrasound technology made sex-selective abortion widely available in India. In that era, families practiced son-stopping: they continued childbearing until reaching a desired number of sons (Anukriti et al., 2022a), so the gender of a child is mechanically related to completed family size. Without explicit family-size controls, the effect of a younger sister would therefore be conflated with family-size effects. Because we observe completed fertility for every family, we can control for family size directly, separating the sibling-composition channel from the family-size channel.

Our conceptual framework[7] predicts that queue pressure intensifies as the age gap to the next-younger same-sex sibling shrinks: a closely trailing sibling forces parents to lower their reservation match quality sooner, while dowry capacity shapes the set of affordable matches. We therefore estimate both a baseline specification and one that interacts the gender of the next-younger sibling

[7] We summarize it at the start of Section 6 and lay it out in detail in Appendix A.

with an indicator for a below-median age gap:

$$Y_{iobsc} = \alpha_0 + \alpha_1 Nextsamesexsibling_{iobsc} + \alpha_2 X_{iobsc} + \gamma_o + \gamma_b + \gamma_s + \gamma_c + \epsilon_{iobsc} \tag{1}$$

$$\begin{aligned} Y_{iobsc} = \beta_0 + \beta_1 Nextsamesexsibling_{iobsc} + \beta_2 Nextsamesexsibling_{iobsc} \times Agegap_{iobsc} \\ + \beta_3 X_{iobsc} + \gamma_o + \gamma_b + \gamma_s + \gamma_c + \epsilon_{iobsc} \end{aligned} \tag{2}$$

where, Y_{iobsc} is the outcome of individual i with older-sibling gender composition o, birth order b, state of residence s, and birth cohort c. $Nextsamesexsibling_{iobsc}$ equals 1 if the next-younger sibling is of the same gender (a sister if i is female, a brother if i is male) and 0 otherwise. $Agegap_{iobsc}$ equals 1 if the age gap to the next-younger sibling is below the gender-specific median—2 years for women and 3 years for men. The fixed effects are γ_o for older-sibling gender composition, γ_b for birth order, γ_c for birth cohort, and γ_s for state. The covariate vector X_{iobsc} includes the total number of siblings, an indicator for belonging to a Scheduled Caste, Scheduled Tribe, or Other Backward Caste, and parental landholdings (log acres owned). Standard errors are clustered at the family level.

The coefficient of interest in equation (1) is α_1, the effect of a next-younger same-sex sibling on the outcome. In equation (2), β_1 captures this effect when the age gap is above the median, and β_2 the additional effect when the gap is below the median; a negative β_2 for age at marriage is the signature prediction of the queuing model. To gauge sensitivity to selection on unobservables, we report bias-adjusted estimates following Oster (2019) alongside each specification. Given the conditional-independence nature of the design, we interpret the estimates as plausibly causal effects of the gender of the next-younger sibling, while acknowledging that sibling composition is not experimentally assigned.

5.2 Birth-order gradients within families

Second, we estimate birth-order effects on marriage outcomes using within-family variation. Because our data contain completed fertility and completed marital decisions for all siblings, they satisfy the requirements for identifying birth-order effects (Blake, 1989; Coffey and Spears, 2021): family fixed effects absorb time-invariant family-level unobservables, such as preferences and beliefs about marriage and human capital investment, and family size is held fixed by construction.

Since the queuing norm operates on gender-specific rank, we estimate separate regressions for women and men in which birth order is redefined as the individual's rank among same-gender siblings as follows:

$$Y_{ifcs} = \beta_0 + \beta_1 \, \textit{Second Same-Gender Child}_{ifcs} + \beta_2 \, \textit{Third Same-Gender Child}_{ifcs} \\ + \beta_3 \, \textit{Fourth+ Same-Gender Child}_{ifcs} + \gamma_f + \gamma_c + \gamma_s + \epsilon_{ifcs} \quad (3)$$

separately for women and men. The coefficients of interest, β_1–β_3, capture outcome differences for second-, third-, and fourth-or-higher-born same-gender siblings relative to the first-born same-gender sibling (the omitted category). The specification includes family (γ_f), birth cohort (γ_c), and state (γ_s) fixed effects, and standard errors are clustered at the family level.

6 Results

Our empirical analysis is guided by a marriage-search framework with dowry capacity, which we develop in Appendix A. The framework extends Vogl (2013) by incorporating the family's capacity to pay dowries and human capital investments in children. Dowry is the price of a groom, so a family's resources cap the matches it can afford for its daughters, while a son's schooling both improves his own marriage-market match and helps finance his sister's dowry. The sibling sex composition operates along two margins: through the birth-order queue, it can shift marriage *timing*, and through the dowry budget, it shifts *which matches a family can finance*. This is the organizing idea behind the results that follow—a younger sister both moves an elder sibling up the marriage queue and competes for the resources that determine match quality and transfers. Appendix Section A.7 summarizes the model predictions.

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	-0.13*	-0.32***	-13034.05***
	(0.07)	(0.07)	(0.10)	(3021.81)
Observations	8,865	8,793	8,822	6,423
Control Mean	18.10	2.45	4.50	79,841.43
β^*	-0.09	-0.15	-0.35	-12736.18

	Panel B: With Age Difference			
	(1) Age at Marriage	(2) Years of Education	(3) Spouse Education (Years)	(4) Dowry Given (2010 Rupee)
Younger Sister	-0.01	-0.14*	-0.33***	-11691.98***
	(0.08)	(0.08)	(0.11)	(3254.31)
Younger Sister × Age Difference<2	-0.34*	0.03	-0.12	-9594.41
	(0.19)	(0.18)	(0.25)	(8724.09)
Observations	8,865	8,793	8,822	6,423
Control Mean	18.10	2.45	4.50	79,841.43
Younger Sister with < 2 Years Age Gap (Estimate)	-0.35	-0.11	-0.45	-21286.39
Younger Sister with < 2 Years Age Gap (p-val)	0.04	0.52	0.05	0.01
β^*: Small Age Gap	-0.29	-0.05	-0.43	-20194.44

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 Caste, 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. The Oster (2019) test adjusts the coefficient for selection on unobservables under the assumption that it is proportional to selection on the observed controls. $R_{\max}$ is the R^2 that the regression would attain if all variation, observed and unobserved, were controlled for; we set $R_{\max} = \min\{1, 1.3R^2\}$, where R^2 is from the estimated regression. δ is the strength of selection on unobservables, relative to observables, that would be required to drive the coefficient to zero, so larger values indicate greater robustness; the bias-adjusted point estimate β^* is computed at $\delta = 1$ (equal selection). In Panel B, the β^* row is computed on the below-median age-gap subsample.

6.1 Sibling rivalry: women

Table 2 reports the effect of the gender of the next-younger sibling on women's marital outcomes using regression specifications (1) (Table 2, Panel A) and (2) (Table 2, Panel B).

First, on average, women with a next-younger sister and women with a next-younger brother marry at similar ages (Table 2, Panel A, column 1). The average, however, masks the queuing model's prediction: pressure should bind only when the trailing sister is close in age. Panel B, column 1 shows this. Among women whose age gap with the next-younger sibling is below two years—the median for women in our sample— a woman with a next-younger sister is associated with marrying 0.35 years (about 4.2 months) earlier than a woman with a next-younger brother (p-value < 0.05). This result lines up with the timing prediction of the conceptual framework in Appendix A, Section A.3, which signs the effect to the close-gap case: a closely spaced sister raises the queue cost κ_S and lowers the reservation floor r_S, widening the set of acceptable grooms at the bottom and inducing parents to accept an earlier match. Because this floor-lowering force operates through the queuing cost, which rises as the age gap shrinks, the effect concentrates among the most closely spaced sisters—as shown in Panel B. To benchmark the magnitude of this effect, Field and Ambrus (2008) estimates that each additional year of delayed puberty postpones girls' marriage by approximately 0.74 years; our close-gap estimate of 0.35 years is roughly 47% of that effect.

Second, women with a next-younger sister complete 0.13 fewer years of education than women with a next-younger brother (Panel A, column 2; p-value < 0.1). This follows from the schooling channel of the conceptual framework in Appendix A, Section A.4, in which a girl's education is a function of her marriage timing, so an earlier age at marriage feeds through into fewer completed years. The mechanism is consistent with parents treating marriage timing and schooling as joint decisions for teenage girls: Andrew and Adams (2025) shows that parents attach little intrinsic value to a daughter's education once her marriage is secured and believe its marriage-market return falls quickly with her age, so earlier marriage brings forward the point at which they stop investing in the elder daughter's schooling.

Third, women with a next-younger sister marry husbands with 0.32 fewer years of education (Panel A, column 3; p-value < 0.01), and the penalty is larger when the queue is tight: the combined close-gap estimate is 0.45 fewer years of spousal education (Panel B, column 3; p-value $= 0.05$). Taking spousal education as a measure of groom quality gives the model's central prediction (Appendix A, Section A.4), and it is the one place where its two channels reinforce each other. A younger sister lowers the reservation floor through the queue, so parents under pressure accept an earlier, worse offer, and lowers the affordability ceiling through the divided dowry budget, so the best grooms move out of reach; both shift the accepted match downward, and expected groom quality falls unambiguously.

Lastly, families of women with a next-younger sister pay Rs. 13,034 ($\approx$ USD 283) less in dowry than families of women with a next-younger brother (Panel A, column 4; p-value < 0.01). In terms of quantifying the magnitude of the effect in Panel A, it is approximately 47% of the dowry effect associated with amendments to the Dowry Prohibition Act (Alfano, 2017; Calvi and Keskar, 2023). In the model, dowry is the price of a groom (Anderson and Bidner, 2015), so a lower payment follows from the lower match quality that the queue and budget produce. From Appendix A, Section A.5, two channels drive this result: First, a younger sister also marries with less schooling, and a less educated bride could require a larger transfer for a given groom, so a fall in observed dowry means the drop in groom quality outweighs the bride-education offset—the family pays less because its daughter marries a lower quality husband. Second, parents facing multiple dowry obligations may hold down the elder daughter's dowry to smooth the burden across marriages, consistent with the savings behavior documented by Anukriti et al. (2022b).

6.2 Sibling rivalry: men

Table 3: Sibling Rivalry Effects: Men

	Panel A: Without Age Difference			
	(1) Age at Marriage	(2) Years of Education	(3) Spouse Education (Years)	(4) Dowry Received (2010 Rupee)
Younger Brother	-0.21***	-0.26***	-0.25***	3601.30
	(0.07)	(0.08)	(0.06)	(2428.62)
Observations	11,949	11,898	11,862	8,696
Control Mean	21.49	4.94	2.42	73,510.84
β^*	-0.19	-0.17	-0.18	2,786.31

	Panel B: With Age Difference			
	(1) Age at Marriage	(2) Years of Education	(3) Spouse Education (Years)	(4) Dowry Received (2010 Rupee)
Younger Brother	-0.10	-0.30***	-0.31***	6015.95*
	(0.10)	(0.11)	(0.08)	(3082.19)
Younger Brother × Age Difference<3	-0.27*	0.10	0.12	-5197.32
	(0.14)	(0.16)	(0.12)	(4517.36)
Observations	11,949	11,898	11,862	8,696
Control Mean	21.49	4.94	2.42	73,510.84
Younger Brother with < 3 Years Age Gap (Estimate)	-0.37	-0.21	-0.19	818.64
Younger Brother with < 3 Years Age Gap (p-val)	0.00	0.09	0.04	0.82
β^*: Small Age Gap	-0.30	-0.16	-0.16	105.01

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 Caste, 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. The Oster (2019) test adjusts the coefficient for selection on unobservables under the assumption that it is proportional to selection on the observed controls. $R_{\max}$ is the R^2 that the regression would attain if all variation, observed and unobserved, were controlled for; we set $R_{\max} = \min\{1, 1.3R^2\}$, where R^2 is from the estimated regression. δ is the strength of selection on unobservables, relative to observables, that would be required to drive the coefficient to zero, so larger values indicate greater robustness; the bias-adjusted point estimate β^* is computed at $\delta = 1$ (equal selection). In Panel B, the β^* row is computed on the below-median age-gap subsample.

Table 3 reports the corresponding estimates for men.

First, men with a next-younger brother marry 0.21 years earlier than men with a next-younger sister (Panel A, column 1; p-value < 0.01), and the effect is concentrated where the queue binds: among men whose age gap to the next-younger sibling is below three years—the median for men—a next-younger brother is associated with marrying 0.37 years earlier (Table 3, Panel B, column 1; p-value < 0.01). This is the timing prediction applied to the male side. The birth-order norm operates within sex, so a younger brother is the son's analog of a younger sister for the daughter: he raises the queue cost of continued search, lowers the son's reservation, and brings his marriage forward. As on the female side, this queue cost rises as the age gap narrows, so the effect concentrates among the most closely spaced brothers—as shown in Panel B. The close-gap magnitude is strikingly similar to the corresponding estimate for women, as the model implies: the queue is a single same-sex mechanism, and a tightly spaced same-sex sibling exerts the same timing pressure whether the pair is two brothers or two sisters.

Second, men with a next-younger brother complete 0.26 fewer years of education than men with a next-younger sister (p-value < 0.01), with no significant variation by age gap (Panel A, column 2; Panel B). In the son's schooling problem (see Appendix A, Section A.6), a younger sister's dowry obligation adds an additional return to the son's education—schooling can raise the resources available to finance her marriage—so a son with a younger sister is schooled more. A son with a younger brother carries no such obligation, so this extra return is absent, and his schooling is correspondingly lower. The comparison, therefore, is based on the dowry-financing incentive that a sister provides and a brother does not. Consistent with this, the penalty shows no age-gap gradient: the financing motive depends on whether there is a sister's dowry to fund, not on how closely the siblings are spaced, which is what governs the queue.

Third, a younger brother also lowers the quality of a son's own match. Men with a next-younger brother marry wives with 0.25 fewer years of education than men with a next-younger sister (Panel A, column 3; p-value < 0.01). From Appendix A, Section A.6, taking spousal education as a measure of match quality, this combines two channels on the son's side. First, the queue acts directly on his search: a younger brother raises the cost of continued search and lowers his reservation, so he accepts an earlier and lower-quality match, exactly as a younger sister lowers an elder daughter's groom quality through the reservation floor. Second, the financing motive acts indirectly, through his own schooling: a younger sister would raise his education and hence his own quality as a groom, allowing him to attract a better-educated bride, so a younger brother—who supplies no such incentive—leaves him both less schooled and therefore matched to a lower-quality wife. The two channels push in the same direction on the level of spousal education, but they differ in how they vary with spacing: the queue effect should sharpen at close age gaps, whereas the financing effect, which depends on whether a sister's dowry exists rather than on spacing, should be flat. Empirically, the penalty is flat to slightly attenuated at close gaps rather than sharpened—the interaction with the age gap is small and statistically insignificant (Panel B, column 3)—which points to the financing channel, operating through the son's own schooling, as the dominant force behind the lower quality of his match.

Lastly, in contrast to the results for women, we find no evidence that sibling composition affects the dowries men receive. The point estimate for a next-younger brother is Rs. 3,601 and statistically insignificant in Panel A. In Panel B, the close-gap estimate is Rs. 819 (p-value $= 0.82$), again showing no economically or statistically meaningful transfer response. Appendix A, Section A.6, predicts an ambiguous effect of the gender of the next sibling on the dowry received for men. A younger sister raises a son's groom quality through the financing motive, which raises the dowry his family can command, but a higher-quality groom need not be compensated through a larger transfer—a better-educated or younger bride can substitute for it. The groom-quality and bride-characteristic terms pull in opposite directions, so the net effect is ambiguous.

We assess the sensitivity of the women's and men's results to omitted-variable bias using the method of Oster (2019), which adjusts each coefficient for selection on unobservables under the assumption that it is proportional to selection on the observed controls. We report the bias-adjusted estimate β^* at equal selection ($\delta = 1$), with $R_{\max} = \min\{1, 1.3R^2\}$ taken from the controlled regression; in Panel B, the adjustments are computed within the below-median age-gap subsample and pertain to the close-gap comparison alone. Under this adjustment, the estimates retain their sign and economic magnitude in both samples. For women, the younger-sister coefficient moves from −0.05 to −0.09 for age at marriage, from −0.13 to −0.15 for own schooling, from −0.32 to −0.35 for spousal schooling, and from Rs. $-13,034$ to Rs. $-12,736$ for dowry given. For men, the younger-brother coefficient moves from −0.21 to −0.19 for age at marriage, from −0.26 to −0.17 for own schooling, and from −0.25 to −0.18 for spousal schooling; these schooling adjustments are larger than for women but leave both effects clearly negative, while the effect on dowry received remains small and statistically insignificant. The close-gap estimates in Panel B are similarly stable:

for women, -0.29 years for age at marriage, -0.43 years for spousal schooling, and Rs. $-20,194$ for dowry; for men, -0.30 years for age at marriage and -0.16 years for spousal schooling. For women's dowry given, selection on unobservables would have to be more than twenty times as strong as selection on observables to drive the estimate to zero (Oster $\delta = 22.5$). The marital-timing, schooling, spousal-quality, and dowry results are therefore robust to plausible selection on unobserved determinants of marriage.

Lastly, Chiplunkar and Weaver (2023) document measurement problems in the 1999 REDS dowry data for Karnataka, Gujarat, Orissa, Tamil Nadu, and Maharashtra. Appendix Table A1 shows that our dowry results are robust to excluding these states: the reduction in dowry paid for women with a next-younger sister persists, and the dowry received by men remains unaffected by the gender of the next-younger sibling.

6.3 Birth-order gradients in marriage outcomes

Building on these findings illustrating the interdependence between siblings' marital outcomes, we now specifically examine whether there is a birth-order gradient in the marriage market by estimating equation (3) with family fixed effects. Since the queuing norm operates on gender-specific rank, our preferred specifications redefine birth order among same-gender siblings.

First, Table 4 reports the results for women. Second-born daughters marry 0.22 years later than eldest daughters (p-value < 0.01), and third-or-later-born daughters marry 0.56 years later (p-value < 0.01). Later-born daughters also attain 0.17 more years of education (p-value < 0.1), marry husbands with 0.27 more years of education (p-value < 0.05), and pay Rs. 10,693 ($\approx$ USD 232) more in dowry (p-value < 0.05) than their eldest sister.

Second, Table 5 shows a parallel pattern for men. Second-born sons marry 0.59 years later than eldest sons (p-value < 0.01), and third-or-later-born sons 1.16 years later (p-value < 0.01). Third-or-later-born sons also attain 0.27 more years of schooling (p-value < 0.05), marry wives with 0.28 more years of education (p-value < 0.01), and receive Rs. 7,461 ($\approx$ USD 162) more in dowry (p-value < 0.05).

Taken together, the birth-order results mirror the queuing logic from the opposite direction: whereas a trailing same-sex sibling pressures earlier-borns into faster, worse matches, later-borns—for whom the queue has already cleared—marry later, accumulate more schooling, match with

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	0.22***	-0.00	-0.00	1244.44
	(0.08)	(0.06)	(0.08)	(2580.77)
Third and Above	0.56***	0.17*	0.27**	10693.32**
	(0.12)	(0.09)	(0.13)	(4166.81)
Observations	10,699	10,585	10,631	7,463
First Born Girl	18.05	2.32	4.39	84,045.44

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 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	0.59***	-0.06	0.04	1638.08
	(0.08)	(0.07)	(0.06)	(2228.83)
Third and Above	1.16***	0.27**	0.28***	7461.29**
	(0.13)	(0.12)	(0.10)	(3427.47)
Observations	13,549	13,466	13,391	9,488
First Born Boy	21.45	4.63	2.10	76,806.64

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%.

better-educated spouses, and command more favorable transfers.

7 Conclusion

In marriage markets governed by birth-order sequencing norms, siblings stand in a queue—and their place in it carries economic consequences. Using sibling-level data with complete marital histories from rural India, this paper documents three sets of facts. First, closely spaced same-sex siblings accelerate marriage timing and reduce match quality for *both* women and men: the queuing cost previously documented for daughters constrains the schooling, search, and matches of sons by comparable magnitudes. Second, marital transfers respond asymmetrically by gender: a younger sister reduces the dowry paid for a woman's marriage, while a younger brother leaves the dowry a man receives unchanged. This asymmetry carries welfare consequences, as dowry in India has been linked to several dimensions of female well-being (Bloch and Rao, 2002; Roy, 2015; Bhalotra et al., 2020). Third, family fixed-effects estimates reveal a later-born advantage in the marriage market: later-born daughters and sons marry later, accumulate more schooling, match with better-educated spouses, and command more favorable transfers than their eldest same-sex siblings.

The findings carry implications for gender inequality and human-capital policy. Because son-biased fertility stopping leaves women with more siblings on average and more likely to have a sister, elder daughters face a disproportionate risk of queue pressure—pressure that pushes parents to lower their reservation match quality and accept worse matches at earlier ages, in a setting where the marriage window already binds more tightly for women. These losses are not confined to daughters. Queue-induced reductions in sons' schooling matter for long-run household welfare in an economy where men remain the primary earners, and the marital transfers men receive can themselves facilitate rural-urban migration (Bau et al., 2026). Policies that reduce son preference and the economic stakes of daughters' marriage may, over time, relax the queue pressure we document and improve marital and educational outcomes for both daughters and sons.

A natural question is whether the patterns documented here still persist. Our data span cohorts whose marriages were largely complete by the late twentieth century, and answering questions of this kind requires exactly what these data provide and what is otherwise rare: complete birth and marriage histories for all siblings in a family. Over the intervening decades, son preference has weakened along some margins, even as other dimensions of gender inequality have proven stubborn (Jayachandran, 2023) and age at marriage has risen for both sexes. Recent work likewise emphasizes that social norms in developing countries can be persistent yet malleable, changing in response to information, social interactions, material incentives, and institutional reforms (La Ferrara and Yanagizawa-Drott, 2026). Whether the marriage queue still binds as tightly, and whether its costs to sons and daughters have narrowed in step with these broader changes, remain open questions. Bringing comparably detailed sibling histories to recent cohorts is a promising path to answering these questions.

Declaration of Generative AI and AI-Assisted Technologies

During the preparation of this work, the authors used ChatGPT (OpenAI) and Claude (Anthropic) for writing assistance and code development. The authors reviewed the output and take full responsibility for the article's content.

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A Conceptual Framework

We extend the marriage-search model of Vogl (2013) by adding dowry capacity. A family searches for a spouse for its child and accepts an offer whose quality clears a reservation threshold. In Vogl (2013), birth-order norms create a same-sex siblings queue—an elder child marries before a younger same-sex sibling—so a younger same-sex sibling raises the cost of waiting and can hasten marriage. We add that the bride's household must pay a dowry that rises with the groom's quality, so the family's resources cap the groom's quality that it can afford. Therefore, in our simple extension, sibling sex composition moves outcomes along *two* margins: the queue governs *timing*, and the dowry budget governs *which matches can be financed*. When the budget never binds, the model reduces to the optimal stopping problem in Vogl (2013).

A.1 Search, dowry, and the reservation rule

A daughter of age a draws offers in discrete time: a groom of quality $q \sim F$ on $[q_L, q_H]$ arrives with probability λ, and the groom's side accepts a bride of age a with probability $\pi(a)$, declining in age (Andrew and Adams, 2025). Dowry is the price of a groom (Anderson and Bidner, 2015),

$$D = \mathscr{D}(q, e, a), \qquad \mathscr{D}_q > 0, \quad \mathscr{D}_e \leq 0, \quad \mathscr{D}_a \geq 0,$$

rising in groom quality, falling in the bride's education, and rising in her age; higher-quality grooms command larger dowries in rural India (Chiplunkar and Weaver, 2023). With dowry capacity w the family can afford grooms up to a cap $\hat{q}(w, e, a)$. Indexing the child by the sex of the next-younger sibling, $j \in \{B, S\}$, a groom is accepted when $r_j(a) \leq q \leq \hat{q}_j(a)$: the floor $r_j(a)$ is set by search and the queue, the ceiling $\hat{q}_j(a)$ by the budget.

The queue enters as a cost κ_j of continued search, because delay holds a younger same-sex sibling back: $\kappa_B = 0$ for a younger brother, and $\kappa_S > 0$ for a younger sister, which is larger when the siblings are closely spaced. Let $V_j(a)$ be the value of an unmarried daughter at age a. The household accepts an affordable groom whose quality clears the continuation value $C_j(a) =$

$V_j(a+1) - \kappa_j(a, \Delta)$, so the reservation is $r_j(a) = C_j(a)$ and

$$V_j(a) = r_j(a) + \lambda\pi(a) \int_{r_j(a)}^{\hat{q}_j(a)} [q - r_j(a)] \, dF(q).$$

Writing this one period forward gives the reservation recursion the model rests on:

$$r_j(a) - r_j(a+1) = \lambda\pi(a+1) \int_{r_j(a+1)}^{\hat{q}_j(a+1)} [q - r_j(a+1)] \, dF(q) - \kappa_j(a, \Delta). \tag{A1}$$

The reservation declines with age, as offers grow scarcer when π falls, and declines further when a younger sister raises κ_S. The budget enters only through the upper limit of the integral; when it never binds, $\hat{q}_j(a) = q_H$ and (A1) is exactly the recursive equation in Vogl (2013).

A.2 What a younger sibling does

A younger sister moves *both* endpoints of the accepted interval. She lowers the floor through the queue ($\kappa_S > 0$), and she lowers the ceiling because she competes for the dowry budget:

$$w_B = W_0 + s_b, \qquad w_S = \alpha W_0, \qquad \Delta w \equiv w_S - w_B = -(1-\alpha)W_0 - s_b < 0.$$

A younger sister lowers capacity twice over: baseline resources are split across two daughters, and the household forgoes the brother's contribution s_b. Here, a brother can pledge anticipated labor-market resources $s_b \geq 0$ toward a sibling's dowry, while we set a sister's pledgeable contribution to zero, reflecting that men participate in the labor market far more than women in India (Fletcher et al., 2017).

A.3 Timing

A younger sister lowers the floor (more low grooms acceptable) but also lowers the ceiling (fewer high grooms affordable), so the two channels push timing in opposite directions. She hastens marriage exactly when the mass gained at the bottom exceeds the mass lost at the top:

$$\underbrace{F(r_B(a)) - F(r_S(a))}_{\text{queue opens the bottom}} > \underbrace{F(\hat{q}_B(a)) - F(\hat{q}_S(a))}_{\text{budget closes the top}}. \tag{A2}$$

It is useful to see why these two channels pull against each other. The marriage hazard is the probability mass inside the accepted interval, $\lambda\pi(a)[F(\hat{q}_j)-F(r_j)]$—the share of grooms who are at once acceptable, above the floor r_j, and affordable, below the ceiling $\hat{q}_j$. A younger sister moves each endpoint inward, but from opposite ends. Through the queue, she lowers the floor, which adds grooms at the bottom of the distribution and widens the window, pushing toward earlier marriage; this is the channel at work in Vogl (2013). Through the budget, she lowers the ceiling, which removes affordable grooms at the top and narrows the window, pushing toward later marriage; this channel is absent when dowry plays no role. Whether she marries earlier or later, therefore, depends on which movement covers more probability mass—the grooms gained at the bottom against those lost at the top—which is exactly the comparison in (A2). The age gap enters through the floor and not the ceiling. A smaller gap raises the queue cost $\kappa_S(a,\Delta)$—a closely spaced sister is nearer her own marriageable window, so delay forecloses more of her opportunities—which lowers r_S further and enlarges the left-hand side of (A2), while the right-hand side, set by the capacity split, is unaffected by spacing. There is therefore a critical gap below which the floor gain dominates, and a younger sister hastens marriage, and above which the budget loss dominates, and she delays it; the effect is strongest for the most closely spaced sisters and fades as the gap widens. In the limiting case where the budget never binds, the ceiling does not move; only the floor-lowering channel remains, and a younger sister unambiguously hastens marriage, as in Vogl (2013).

A.4 Schooling and match quality

Girls' schooling is not a separate decision but a by-product of marriage timing: a girl leaves school when she marries, so her completed schooling is $e_f = g(a^*)$ with $g' > 0$, where a^* is her age at marriage. Differencing across the sex of the next-younger sibling,

$$\Delta e_f \;\approx\; \underbrace{g'(a^*)}_{\text{schooling–age slope }(>0)} \cdot \underbrace{\Delta a^*}_{\text{earlier marriage }(<0\text{ under (A2))}} \;<\; 0. \tag{A3}$$

The change in schooling is the sensitivity of schooling to marriage age, g', times the change in marriage age. The first factor is positive—a later marriage buys more completed years—and the second is negative whenever the queue hastens marriage, so the product is negative: a younger sister lowers her sister's schooling entirely through the timing margin.

Match quality moves through the same two endpoints, but now they reinforce rather than offset. The expected accepted groom quality is the average groom inside the window,

$$\mu(r_j, \hat{q}_j) = \mathbb{E}\big[q \mid r_j \le q \le \hat{q}_j\big],$$

and it rises with each endpoint: $\partial\mu/\partial r > 0$, since raising the floor discards the worst grooms, and $\partial\mu/\partial\hat{q} > 0$, since raising the ceiling admits better ones. A younger sister lowers both—the floor through the queue and the ceiling through the budget—so

$$\Delta\mu \;\approx\; \underbrace{\frac{\partial\mu}{\partial r}\Delta r}_{\text{lower floor }(<0)} \;+\; \underbrace{\frac{\partial\mu}{\partial\hat{q}}\Delta\hat{q}}_{\text{lower ceiling }(<0)} \;<\; 0. \tag{A4}$$

This is the mirror image of the timing comparison. There, the two movements pull against each other, because a lower floor *adds* acceptable grooms while a lower ceiling *removes* affordable ones; here they pull together, because a lower floor means she settles for worse grooms at the bottom and a lower ceiling means she can no longer reach the best grooms at the top, and both drag the average down. The queue lowers quality on its own—this is the Vogl (2013) channel, present even when dowry plays no role—and the budget deepens it by stripping the top off the affordable set. So, due to a younger sister, whether an older sister marries *earlier* is ambiguous, but that she marries a *worse* groom is not, and the decline is sharpest when the budget binds, and both endpoints fall together.

A.5 Dowry paid

The dowry the bride's family pays is $D^P = \mathscr{D}(q^*, e^*, a^*)$, evaluated at the realized match. Comparing a girl with a younger sister to one with a younger brother, a first-order expansion gives

$$\Delta D^P \simeq \underbrace{\mathscr{D}^B_q\,\Delta q^*}_{\text{groom quality }(<0)} \;+\; \underbrace{\mathscr{D}^B_e\,\Delta e^*}_{\text{bride education }(\ge 0)} \;+\; \underbrace{\mathscr{D}^B_a\,\Delta a^*}_{\text{bride age }(\le 0)}\;, \tag{A5}$$

where $\mathscr{D}^B_x$ is the derivative of $\mathscr{D}$ at the younger-brother match. Two of the three channels lower the dowry unambiguously: a worse groom ($\mathscr{D}^B_q > 0$, $\Delta q^* < 0$) and a younger marriage age ($\mathscr{D}^B_a \ge 0$,

$\Delta a^* < 0$). The education channel runs the other way. Its size depends on whether bride education can substitute for dowry. If it does, $\mathscr{D}_e^B < 0$, and since the younger sister is also less educated ($\Delta e^* < 0$), the term $\mathscr{D}_e^B \Delta e^*$ is strictly positive: a less educated bride must be compensated with a larger transfer for a given groom, partly offsetting the decline. If bride education does not enter the price, $\mathscr{D}_e^B = 0$, the offset vanishes and dowry paid falls with groom quality and age alone. The education channel can therefore only *weaken*, the decline—and the more bride education substitutes for dowry, the larger the offset. Dowry paid falls whenever the groom-quality and age effects dominate it,

$$\mathscr{D}_q^B |\Delta q^*| + \mathscr{D}_a^B |\Delta a^*| > |\mathscr{D}_e^B| \, |\Delta e^*|.$$

This is what makes a lower dowry informative rather than mechanical. Where bride education substitutes for cash, less schooling on its own would *raise* the price, so observing the dowry fall means the match itself became cheaper: the family pays less because its daughter marries a worse groom.

A.6 Sons

For a son, the household chooses schooling directly, so schooling and marriage timing are separate margins rather than a single pass-through. Education e_m raises a son's quality as a groom, $q_m = v(e_m)$ with $v' > 0$, at convex cost $c(e_m)$. When he has a sister, schooling does double duty: it also raises the resources available for her dowry, $s(e_m) = \chi \rho e_m$. Let $\psi(W)$ be the shadow value of the daughter-side budget—the marginal gain from relaxing the affordability cap, positive whenever the cap binds. The household then chooses the son's schooling to satisfy

$$v'(e_m) + \mathbf{1}\{\text{sister}\} \, \psi(W_0 + \chi \rho e_m) \chi \rho = c'(e_m). \tag{A6}$$

The second term is the financing motive, present only when a sister's dowry binds. It raises the marginal return to the son's schooling, because an extra year of school now relaxes the sister's dowry constraint as well as improving his own match. This channel reflects the labor-market asymmetry between sons and daughters: men participate in market work at far higher rates than women, so a son's schooling translates into earnings the household can direct toward a sister's marriage, whereas a daughter's schooling does not generate a comparable, pledgeable income stream (Fletcher et al., 2017). A son with a younger sister is therefore schooled more than one with a younger brother, $e^G_m > e^B_m$, and through $v(\cdot)$ reaches a better match, $q^G_m > q^B_m$.

Timing. The same-sex queue still governs a son's marriage timing: a younger brother raises the queue cost and hastens his marriage, exactly as a younger sister does for a daughter. The difference from the daughter side is that male schooling is not truncated by marriage, so an earlier marriage does not mechanically lower a son's education. Timing and schooling, therefore, move independently for him—the queue sets when he marries, the financing motive sets how much he is schooled.

Dowry received. The dowry the son's family receives is priced by the same schedule, $D^R = \mathscr{D}(q_m, e_{\text{br}}, a_{\text{br}})$, where $(e_{\text{br}}, a_{\text{br}})$ are the bride's characteristics. Comparing across the sex of the next-younger sibling,

$$\Delta D^R \simeq \underbrace{\mathscr{D}^B_q \, \Delta q_m}_{\text{groom quality }(>0)} + \underbrace{\mathscr{D}^B_e \, \Delta e_{\text{br}} + \mathscr{D}^B_a \, \Delta a_{\text{br}}}_{\text{bride characteristics, unsigned}} . \tag{A7}$$

The first term is positive—a son with a younger sister is a better groom—but the second is unsigned: a higher-quality groom may be compensated with a larger cash transfer, or instead matched to a better-educated or younger bride, since bride characteristics substitute for dowry. The effect of the younger sibling's sex on dowry received can be positive, negative, or zero.

A.7 Predictions

The model delivers four key predictions as follows:

1. **Timing.** A younger sister hastens a girl's marriage when the mass gained at the floor exceeds the mass lost at the ceiling, (A2); a younger brother hastens a son's through the same-sex queue. Timing effects are strongest when same-sex siblings are closely spaced.

2. **Schooling.** A younger sister lowers a girl's completed schooling through earlier marriage, and raises a son's through the dowry-financing motive. Since schooling raises a son's groom quality, a younger sister also raises his marriage-market quality.

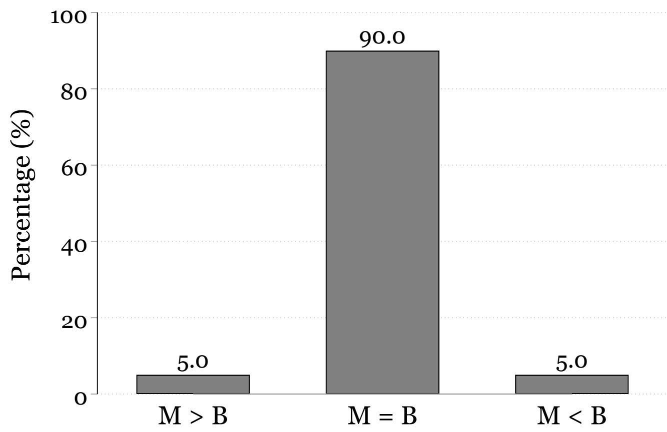
3. **Match quality.** A younger sister lowers a girl's groom quality, because the queue lowers the reservation floor and the budget lowers the affordability ceiling, and raises a son's groom

quality through his schooling.

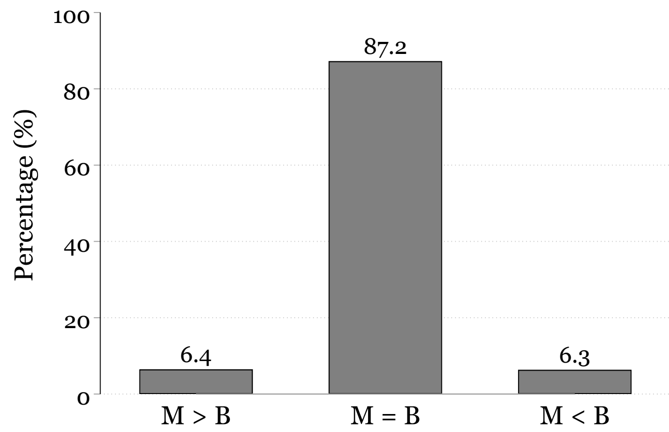
4. **Dowry.** A younger sister lowers the dowry a girl's family pays when the groom-quality and age effects dominate the bride-education offset; the effect on the dowry a son receives is ambiguous, since bride characteristics may substitute for dowry.

B Additional Tables and Figures

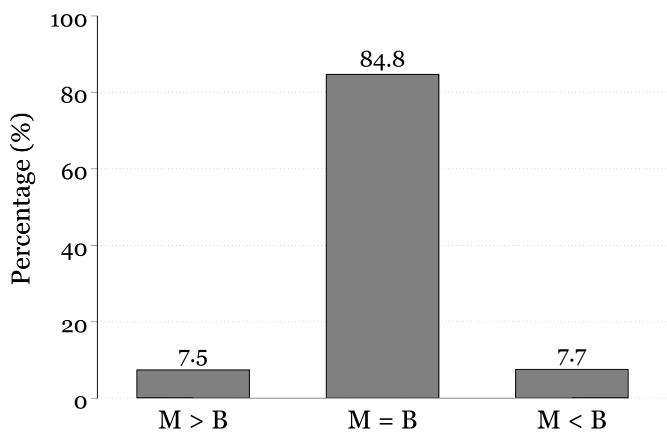
Figure A1: Gender-Specific Marriage Order-Birth Order: Queuing Norm by Number of Daughters



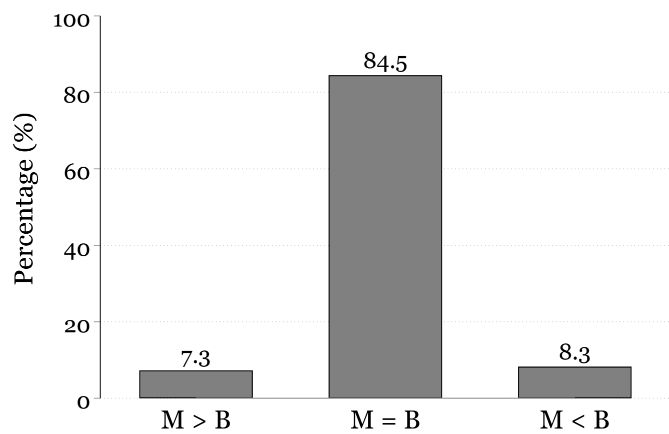
(a) Number of Daughters = 2



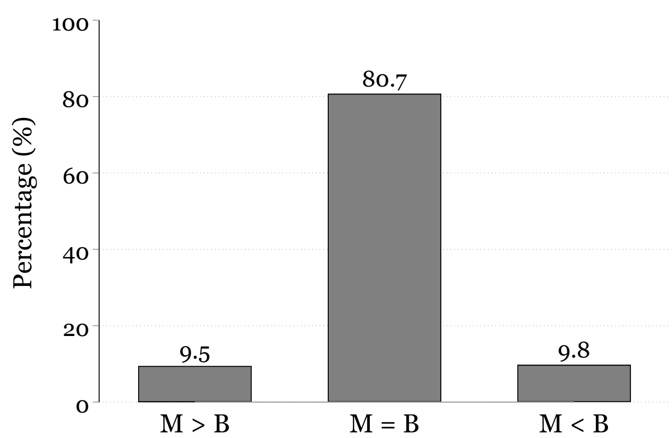
(b) Number of Daughters = 3



(c) Number of Daughters = 4



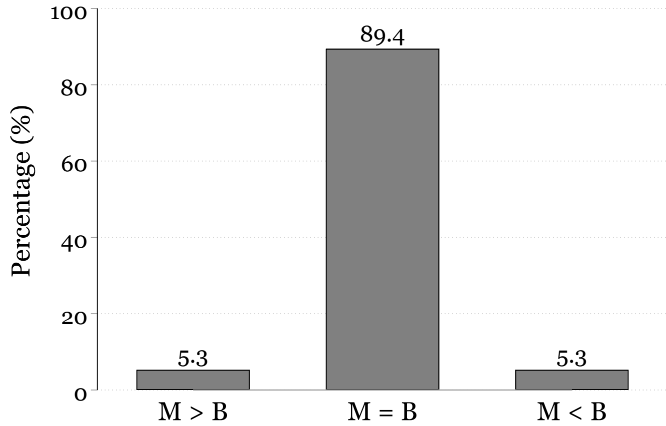
(d) Number of Daughters = 5



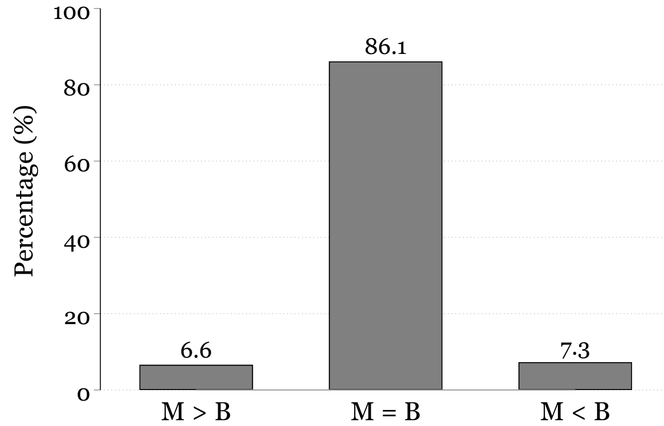
(e) Number of Daughters = 6

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. M denotes marriage order; B denotes birth order.

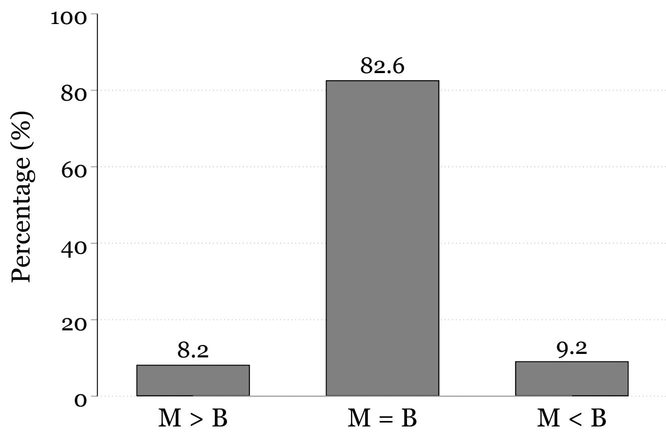
Figure A2: Gender-Specific Marriage Order-Birth Order: Queuing Norm by Number of Sons



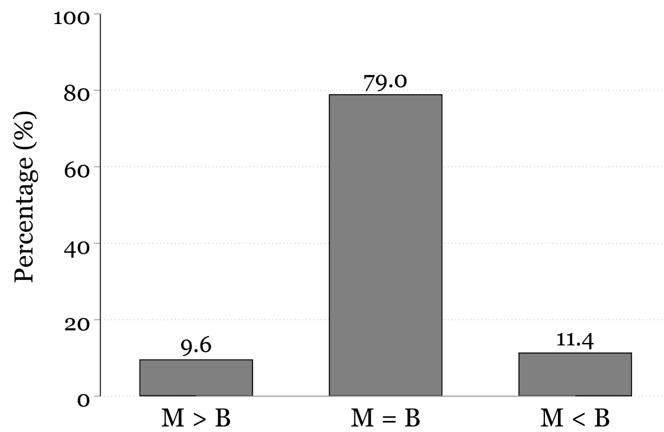
(a) Number of Sons = 2



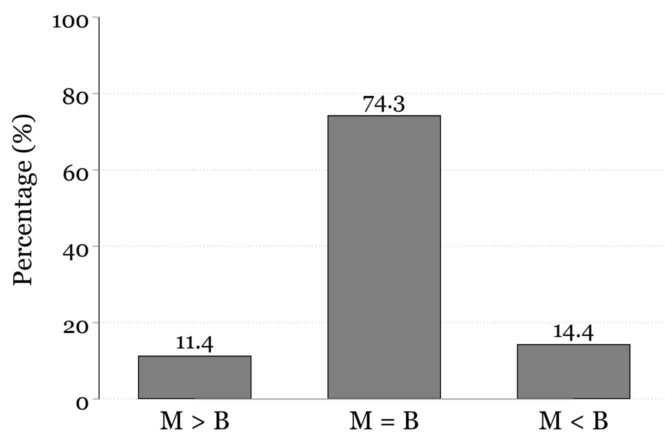
(b) Number of Sons = 3



(c) Number of Sons = 4



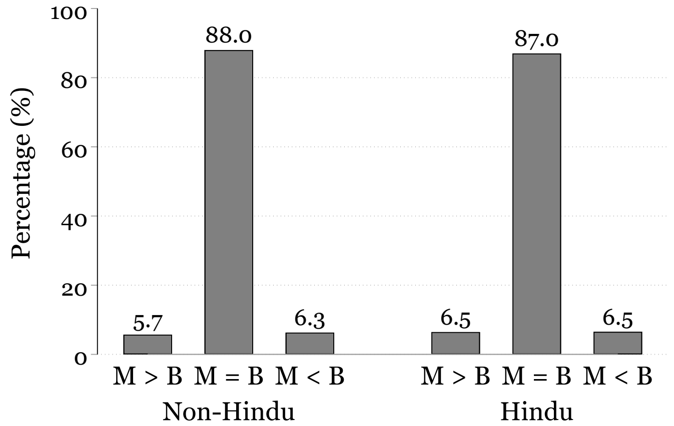
(d) Number of Sons = 5



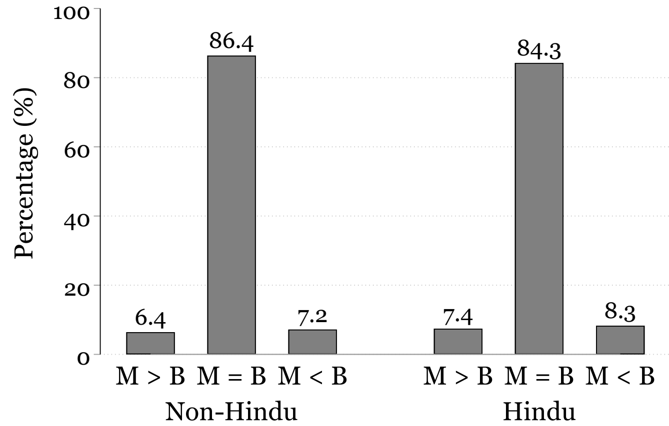
(e) Number of Sons = 6

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. M denotes marriage order; B denotes birth order.

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



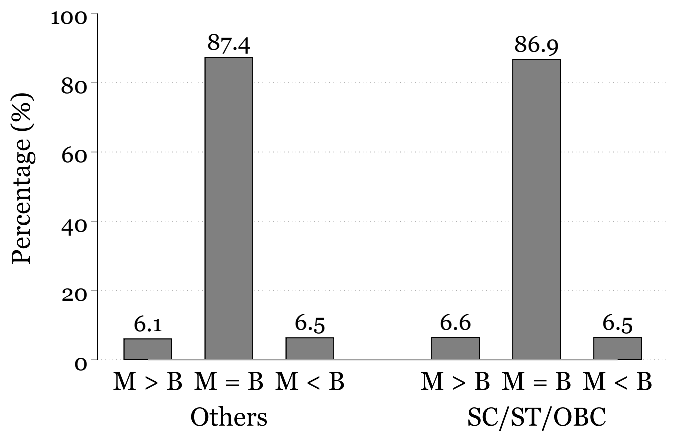
(a) Women



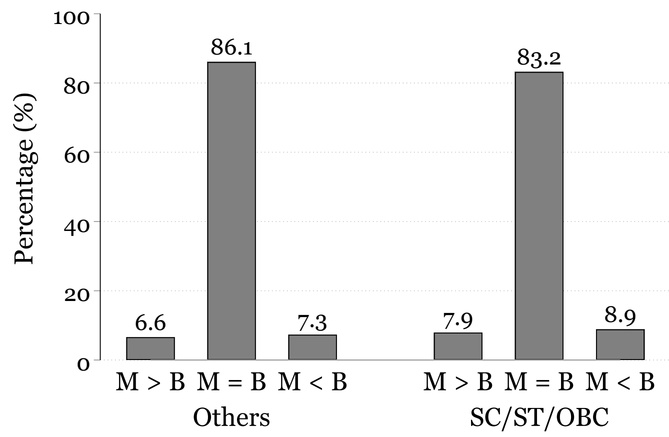
(b) Men

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. M denotes marriage order; B denotes birth order.

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



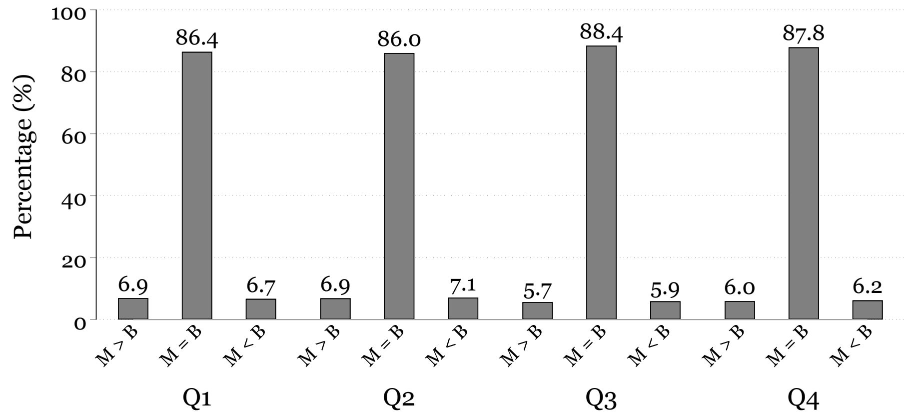
(a) Women



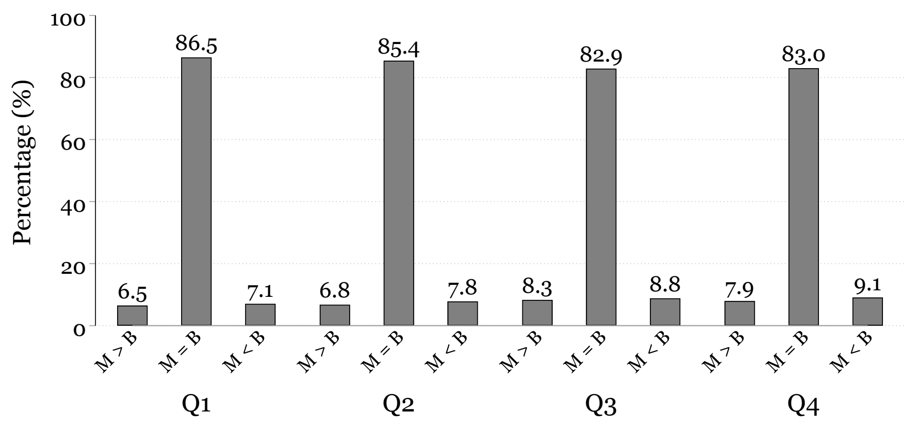
(b) Men

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. M denotes marriage order; B denotes birth order. SC/ST/OBC stands for Scheduled Caste, Scheduled Tribe, or Other Backward Caste.

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



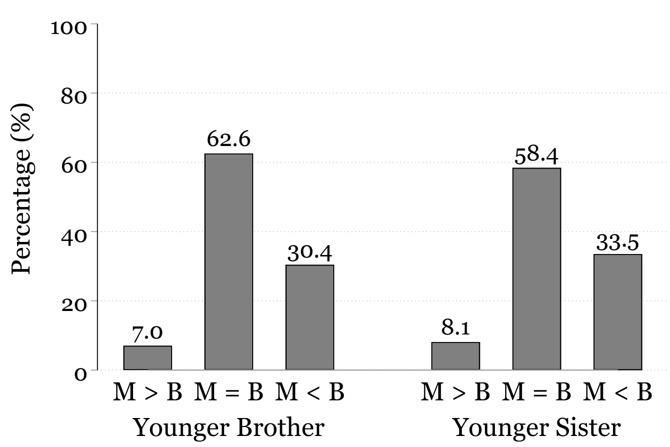
(a) Women



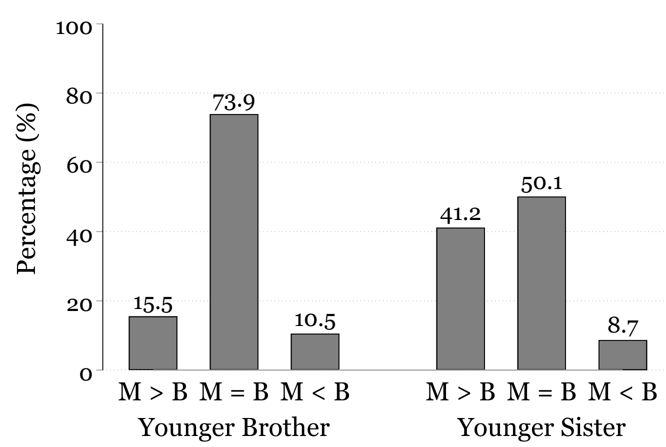
(b) Men

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. M denotes marriage order; B denotes birth order. Q1 to Q4 represent quartiles of the natural logarithm of parental landholdings (in acres), with Q1 indicating the lowest and Q4 the highest landholding group.

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



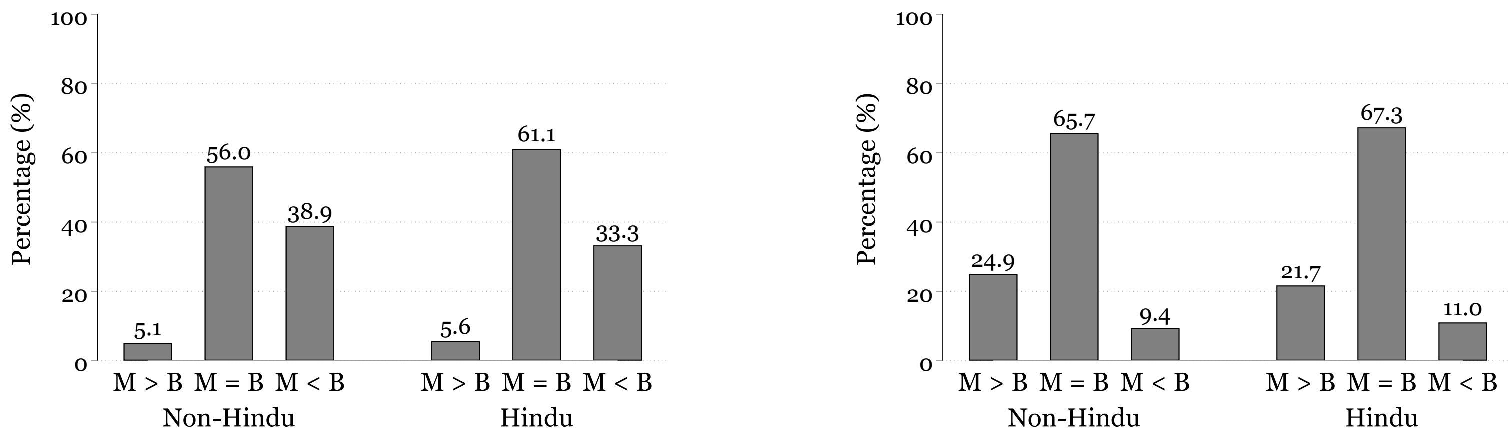
(a) Women



(b) Men

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

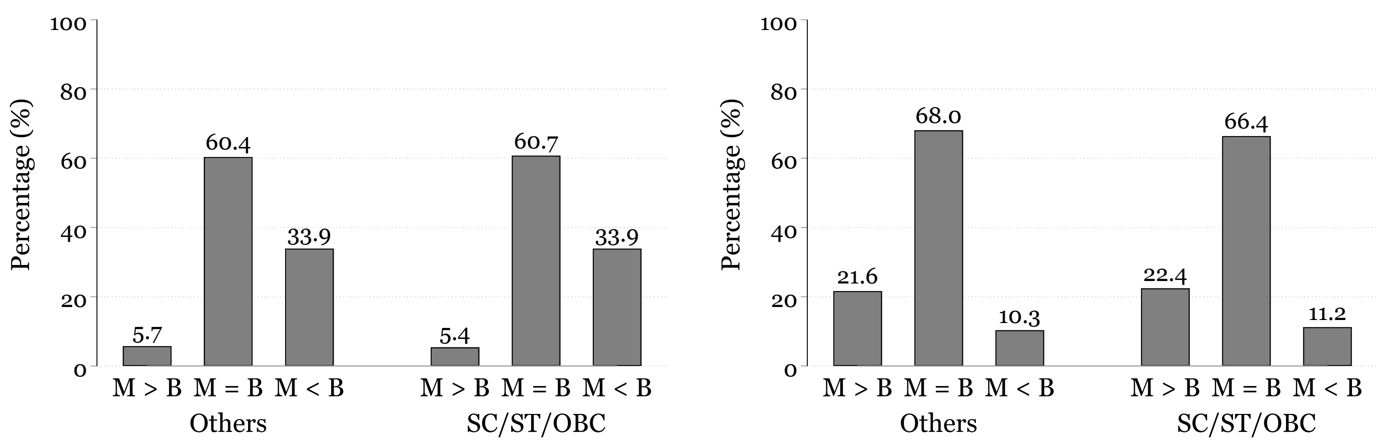
Figure A7: Overall Marriage Order-Birth Order: Queuing Norm by Religion



(a) Women (b) Men

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

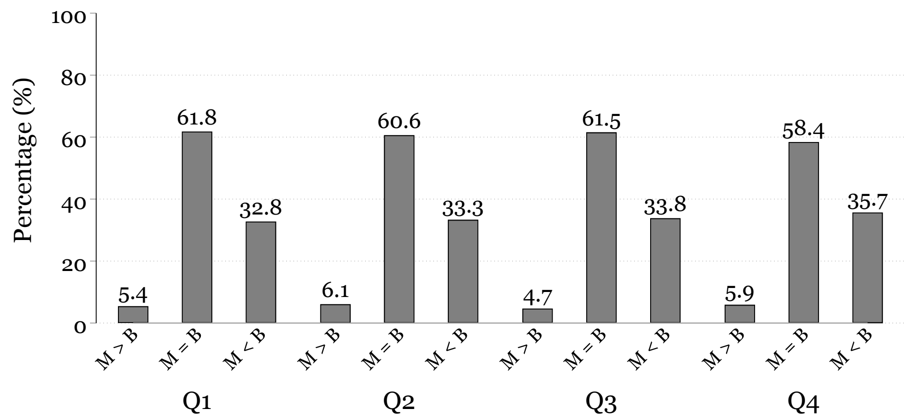
Figure A8: Overall Marriage Order-Birth Order: Queuing Norm by Caste



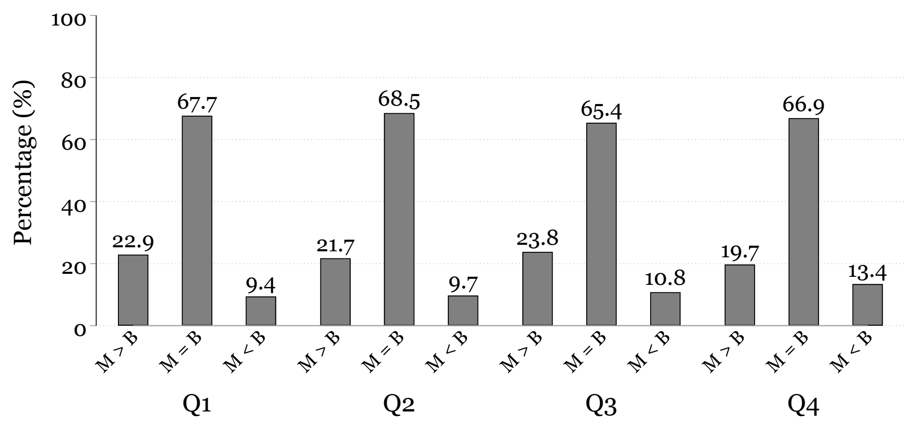
(a) Women (b) Men

Note: Data source: 1999 wave of the Rural Economic and Demographic Survey of India (REDS). M denotes marriage order; B denotes birth order. 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). M denotes marriage order; B denotes birth order. Q1 to Q4 represent quartiles of the natural logarithm of parental landholdings (in acres), with Q1 indicating the lowest and Q4 the highest landholding group.

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	-8594.37***		-7379.93**	
	(3111.45)		(3349.23)	
Younger Brother		-2110.91		-106.07
		(2495.92)		(3091.82)
Younger Sister × Age Difference<2			-9747.84	
			(8492.16)	
Younger Brother × Age Difference<3				-3948.48
				(4596.76)
Observations	4,897	6,564	4,897	6,564
Control Mean	65457.59	57698.50	65457.59	57698.50
Younger Sibling with < median Years Age Gap (Estimate)			-17127.77	-4054.55
Younger Sibling with < median Years Age Gap (p-val)			0.03	0.28

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 Caste, 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%.