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Age at marriage, social norms, and female education in Nepal

Saqib Jafarey[1] | **Ram Mainali**[2] | **Gabriel Montes-Rojas**[3]

[1]Department of Economics, City University of London, London, UK

[2]Economic Policy Analysis Division, Ministry of Finance, Kathmandu, Nepal

[3]Instituto Interdisciplinario de Economía Política de Buenos Aires (IIEP-BAIRES-UBA), Facultad de Ciencias Económicas, Universidad de Buenos Aires, Buenos Aires, Argentina

Correspondence
Gabriel Montes-Rojas, Instituto Interdisciplinario de Economía Política de Buenos Aires (IIEP-BAIRES-UBA), Facultad de Ciencias Económicas, Universidad de Buenos Aires, Av. Córdoba 2122 2do piso, C1120AAQ, Ciudad Autónoma de Buenos Aires, Argentina.
Email: gabriel.montes@fce.uba.ar

Abstract

We study the impact of age at marriage on female education. We hypothesize that in cultures where women marry young, parents discount the pecuniary benefits of educating girls; the earlier the anticipated age at marriage the greater this discount. We empirically test this effect using household data from Nepal. We control for potential endogeneity of age at marriage by exploiting variations in cultural norms regarding dowry and differences in the average age of female marriage among ethnicities and regions as instrumental variables. The econometric results support the hypothesis that female education is negatively affected by cultural norms that favor early marriage.

KEYWORDS

education, gender, marriage, Nepal

JEL CLASSIFICATION

I20; J12; J16

1 | INTRODUCTION

The millennium development goals sponsored by the United Nations (in particular, Sustainable Development Goal Five, SDG5, United Nations General Assembly, 2015) call on member countries to promote gender equality, an important dimension of which is related to education. While most countries have succeeded in narrowing the educational gender gap at primary and lower secondary levels, it continues to affect higher levels, particularly in South Asia. In this paper, we study the impact of age at marriage on female education, instrumenting the former via variations in cultural influences on female marriage age across ethnic groups in Nepal.

Demographers and ethnographers recognize that the age at which a typical man or woman will marry is influenced by prevailing social norms.[1] Neugarten, Moore, and Lowe (1965) and Billari,

Prskawetz, and Furnkranz (2003) argue that social norms directly determine the acceptable age range for individuals to enter marriage. The main hypothesis of this paper is that the earlier the culturally determined age at which a woman is expected to marry, the less education she will receive, even in the years prior to her marriage. Our paper empirically tests this effect using data from a Nepalese survey that identified married women by the age at which they married, their educational attainment, and their ethnicity, along with other characteristics of their marital and parental households.

Nepal is a relevant country for studying this issue. It has a high incidence of child marriage (defined by the United Nations Children's Fund [UNICEF] as marriage before reaching age 18). As Table 1 shows, 40% of women in the age group 20–24 years were married before age 18, a rate that is second only to Bangladesh in South Asia. At the same time, Nepal's gender gap in education has been practically eliminated at primary level, greatly narrowed at lower secondary level but remains fairly high at the upper secondary level, exceeding that of Bangladesh, India, and Pakistan. This raises the question as to whether the phenomenon of early marriage and the customs driving it are undermining female education beyond the basic levels.[2]

Nepal has considerable variation in age at first marriage across ethnic groups and regions, a feature that we exploit in implementing an instrumental variable (IV) strategy. Our first instrument indicates membership to the Maithili-speaking community. Maithili is one of Nepal's three main languages; its speakers traditionally belong to a region called Mithila that straddles the Indo-Nepalese border, stretching from northern Bihar in India to Janakpur in southeastern Nepal. Maithili speakers inhabit both sides of the border.

Although Nepali Maithili speakers are not counted as a distinct ethnic group within Nepal, mainly because they are themselves divided into castes and religions, they share cultural traits with their neighbors in Bihar. One of these is the tradition of dowry. According to widespread popular perception, dowry-giving is more widely practiced by the Maithili community than by other communities of Nepal. Although less so in the case of Nepal, academic studies on India have identified Bihar, along with neighboring Uttar Pradesh, as two states in which dowry is implemented more strictly than in other parts of India (Ashraf, 1997; Dyson & Moore, 1983; Srinivasan & Lee, 2004). The Maithili custom of *Tilak Pratha,* which links the value of the dowry to the grooms' economic status, encourages parents to marry their daughters young.

TABLE 1 Comparisons of female education and marriage age across South Asia

	School completion rates[a]						Female marriage		
	Primary		Lower secondary		Upper secondary			Percentage married on or before	
Country	Male	Female	Male	Female	Male	Female	Average age at first marriage[a]	15[a]	18[a]
Afghanistan	67.2	40.2	49.3	25.6	32.3	14.4	21.2	8.8	34.8
Bangladesh	76.3	89.1	59.2	70.5	31.5	27.3	19.2	22.4	58.6
India	91.5	91.3	82.4	79.3	46.5	39.7	20.7	6.8	27.3
Nepal	83.9	82.3	71.4	67.9	51.9	38.5	20.7	7	39.5
Pakistan	64	55.4	54.7	44.6	23.6	23.3	23.1	2.8	21

[a]https://data.unicef.org (Demographic and Health Survey). Year of data: Afghanistan 2015; India, Nepal 2016; Bangladesh 2019 (education), 2014 (marriage age); Pakistan 2018 (education), 2013 (marriage age).

[b]https://databank.worldbank.org (Gender Statistics Database). Year of data: Afghanistan, Bangladesh, Pakistan 2013; India 2011; Nepal 2014.

The impact of dowry traditions on the age of marriage has been a matter of some discussion in the empirical literature, albeit in contexts outside Nepal. Ashraf, Bau, Nunn, and Voena (2020) study the impact of school construction policies in Indonesia and Zambia and how the policy interacts with marriage customs. They find that girls' education increased only as a result of this policy in places where it is common for the brides' family to receive a payment when their daughter gets married (i.e., families invest in their daughters' education only if they can monetize it). Corno, Hildebrandt, and Voena (2020) look at the impact of weather shocks on child marriage in Africa and India and find that the sign of the impacts depends on whether the prevalent marriage payments are dowry or bride price.

In Section 3.2, we justify the use of this instrument in greater detail, and in Section 2.2, we discuss other identification strategies implemented to study similar effects. However, we acknowledge the possibility of two sources of bias arising from this variable: first, there may be an inherent cultural bias in the Maithili community that disfavors girls' schooling on its own account; second, the practice of dowry might influence girls' education because of income effects that might be especially significant for poor families.

We attempt to control for these potential biases by (1) including mother's education as a control for household attitudes to female education and (2) rerunning our IV regressions using only the upper two quartiles of households in terms of wealth distribution. Our results remain robust to both checks. Nonetheless, we go on to employ a second instrument, namely, the average age at marriage within a respondent's peer group, which we define as the ethno regional group into which she was born and conduct the aforementioned robustness checks on this instrument as well. Our results continue to hold.

While the IV estimates have large confidence intervals, so that we cannot say that they are significantly different from the ordinary least squares (OLS) estimates, they are positive and significant in the majority of cases. We can infer that the effect is between 0.2 and 0.5 years of schooling per 1-year increase in age-at-marriage.

The rest of the paper is organized as follows. Section 2 compares female education and age at marriage across the countries of South Asia and reviews the literature on gender gaps in education, female age at marriage, and the interaction of the two. Section 3 explains the econometric model and discusses the identification assumptions. Section 4 describes the data and presents summary statistics. Section 5 reports the empirical results. Section 6 concludes.

2 | FEMALE EDUCATION AND EARLY MARRIAGE IN SOUTH ASIA: STATISTICS AND LITERATURE

In this section, we shall first provide some background details, based on recent statistics and information taken from secondary sources, concerning marriage age and school completion rates in Nepal and other South Asian countries. We shall then review the broader literature on girls' schooling, age at marriage, and their mutual relationship.

2.1 | The South Asian background

We acknowledge that since the survey from which our data are taken, Nepal has made steady progress in both female educational attainment and the incidence of child marriage. Yet in Nepal and throughout South Asia, policymakers and academics remain concerned about both issues and believe that further progress needs to be made.

Table 1 provides an update on female education and age at marriage in five South Asian countries: Afghanistan, Bangladesh, India, Nepal, and Pakistan. Columns 2–7 report school completion rates by gender for primary, lower secondary, and upper secondary levels, respectively; column 8 reports average age at first marriage for women, and columns 9 and 10 report cumulative percentages of 20–24-year-old women who entered child marriage on or before two different age thresholds: 15 and 18 years. Note that these age thresholds roughly coincide with the ages of completion for lower secondary and upper secondary schooling levels, respectively.

Starting from similarly low levels in the early 1990s, India, Bangladesh, and Nepal have forged ahead of Pakistan and Afghanistan in promoting female education and narrowing gender gaps in school completion. While India has the highest completion rates overall, Bangladesh has had the most success in reversing gender gaps; these now go the other way at primary and lower secondary levels. Nepal is somewhere in between these two countries in both dimensions.

At the same time, in all countries, women continue to lag behind men at the upper secondary level.[3] This echoes the finding of Grant and Behrman (2010) that South Asia has lagged behind other parts of the developing world in eliminating gender inequality at post-primary levels.

Turning to age at marriage, Table 1 prima facie contradicts the widely hypothesized positive relationship between education and age at marriage. Pakistan, which lags substantially behind India, Nepal, and Bangladesh in school attainment, has the highest average age at female marriage and the lowest percentage of young women who married during childhood. Afghanistan, which has the widest gender gaps in education, has proportionately fewer child marriages than Nepal or Bangladesh. At the other end, Bangladesh, which has had the most success in furthering female education, remains the country with the highest incidence of child and early female marriage. Nepal comes next.

National-level statistics, however, mask the diversity within each South Asian country, most of which have significant heterogeneity in ethnic, linguistic, and religious composition, as well as in regional patterns of development. These differences are associated with considerable variation in issues related to gender equality along ethnic and regional lines. Sathar, Kiani, and Farooqui (1986) used labor force survey data from Pakistan, along with census figures for 1980, to study average age at first marriage for women, by province and rural/urban areas. They found considerable variation in this statistic, from 21.6 years in urban North-West Frontier Province (now known as Khyber Pakhtunkhwa) to 17.6 in rural Baluchistan.[4]

Similarly, Islam, Haque, and Hossain (2016) used the 2011 Demographic and Health Survey (DHS) for Bangladesh to study variations in the incidence of child marriage across its seven districts. Controlling for household wealth, spousal education, employment status, and religion, they found that child marriage was between two and four times more prevalent in the other six districts than in the district of Sylhet. They attributed these differences to two factors: poverty incidence and exposure to natural disasters. The poorest and most vulnerable district, Rangpur, had the highest propensity for female child marriage, while Sylhet's high rate of overseas emigration meant both that poverty rates were comparatively low and that income security was comparatively less dependent on climatic events. They also cite dowry traditions as one of the factors motivating female child marriage in the poorer districts: demands from the groom's family, which typically increase with the bride's age (see also Amin & Das, 2014), also become more salient under the pressure of poverty and insecurity.[5]

In the case of Nepal, two studies, Thapa (1989) and Aryal (2007), have used fertility surveys from 1976 and 2000, respectively, to estimate ethnic variation in age at first marriage. Comparing their findings is complicated by the fact that they do not cover the same ethnic groups, partly because they differ in the scope of regional coverage and partly because, with over 100 officially recognized groups, the ethnic map of Nepal is unusually complex: while some ethnic groups are further divided into different linguistic and religious subgroups, others are so similar to one another that social scientists often lump

them together. While both studies treat Gurung and Magar ethnicities as one, Thapa (1989) conflates Tharus with Satar and Mosar, while Aryal (2007) links them to Choudharys.[6] In addition, many of the smaller ethnicities end up being lumped into a single category called "Other," despite significant differences between them.

These differences notwithstanding, the two studies found remarkably consistent results. Using Brahmins as the reference group, they found that belonging to the Tharu ethnicity lowers marriage age although, for Aryal (2007), this result was insignificant. They both found that belonging to Newar and Gurung-Magar ethnicities delays marriage; similar effects were found by Aryal (2007) for the Kami-Damain ethnicity and by Thapa (1989) for Kirate and Tamang.

Thapa (1989) explains the ethnic differences in his study by way of an ethnographic profile of each group. The picture he paints is one of the highly diverse attitudes on issues related to youth, gender, and sexuality. At one end, the high-caste Brahmins and Chhetris (Kshatriyas in Sanskrit), along with Muslims, are socially conservative; Brahmins, in particular, consider it a source of *punya* ("merit") for girls to marry as young as possible to preserve their purity. At the other end, Tamangs and Kirates have fairly relaxed attitudes about the social mingling of boys and girls, even tolerating premarital sex, as well as divorce and female-headed households. Gurungs, Magars, and the indigenous Newars fall somewhere in between.[7] Religion and race are also factors: while Brahmins and Chhetris are Indo-Aryan in origin and mainly practice Hinduism, Tamang, Kirate, Gurung, and others are Sino-Tibetan and are either Buddhist, or divided between Hindus and Buddhists or practicing syncretic forms of both religions. The exception in this account are the Tharus who Thapa (1989) describes only in terms of their low socioeconomic status, implying that early female marriage might be a response to poverty in their case.

2.2 | Literature review

As our goal is not to do a comprehensive analysis of either the gender gap in education or the determinants of marriage age, but to study the potential causal effect of the latter on the former, we shall concentrate on the literature that, to our understanding, helps shed light on this question.

Empirical studies on the gender gap in education can be divided into two strands. The first focuses on household characteristics, such as economic status and parental education, and how these influence gender preferences in schooling. In general, these studies find that poverty, lack of social security, credit markets, and low levels of parental education all contribute to gender biases in education (see, e.g., Cameron & Worswick, 2001; Jacoby & Skoufias, 1997; Sawada, 1997).

The second strand takes into account gender differences in labor market outcomes, especially with respect to returns to education (see, e.g., Rosenzweig & Schultz, 1982). This literature has produced mixed results on the pure returns to female education. While, for example, Kingdom (1998) found on the basis of data from Uttar Pradesh in India that girls face lower economic rate of returns to education, Aslam (2009), Behrman and Deolalikar (1995), and Asadullah (2006) found the opposite for, respectively, Pakistan, Indonesia, and Bangladesh. Moreover, Munshi and Rosenzweig (2006) found that traditional caste restrictions on occupational mobility can restrict boys' occupational choices and therefore the quality of their education more than that of girls. Thus, labor market outcomes do not present an unambiguous explanation for the gender gaps in female education in South Asian countries.

From a theoretical perspective, Lahiri and Self (2007) analyze the impact of patrilocal arrangements on female education. Patrilocality, which is especially widespread in South Asia, leads to the anticipation that a daughter's future earnings will accrue to her spousal, rather than her parental, household and this discourages investment in her education. Jafarey and Maiti (2015) argue that

gender wage inequality leads directly to a discount on girls' schooling and indirectly via a marital division of labor in which women shoulder a disproportionate amount of responsibility for housework, to a further discount on girls' education. Child or early marriage may also operate by curtailing a girl's emotional and cognitive readiness to negotiate on her own behalf (Dixon-Mueller, 2008), including in family economic decisions and in market work after marriage.

Wahhaj (2018) endogenizes age at marriage in an overlapping generations model with multi-period lived men and women. Multi-period lifespans provide women two periods over which to participate in the marriage market, while men participate in it only at the later of the two ages. Imperfect information about a prospective mate's "quality" can make men discount older women by raising the conditional probability that an older woman seeking marriage is of low quality. In equilibrium, older brides must make dowry-like transfers to men. A higher proportion of women marrying young increases this conditional probability, which in turn (1) increases the size of the transfer and (2) incentivizes the next cohort of women to also marry early, thus creating intergenerational persistence of early marriage. Increased outside options for women, such as through enhanced employment opportunities, can help dis-incentivize early marriage.

In their study of how early marriage contributes to a wider transmission of traditional attitudes toward gender, Asadullah and Wahhaj (2019) outline a theoretical framework that determines age at marriage while accounting for its effect on female education, groom characteristics, the nature of the adult female's social network, and her own social attitudes, both directly and through interaction with the other effects. The main theoretical implication is that early marriage can incline a woman toward supporting traditional gender roles both directly, by plunging her into household responsibilities while still a girl, and indirectly by lowering her educational attainment, shaping the nature of her social peer group and making it more likely that she marries someone with traditional views.

We now turn to the empirical literature. Following Becker's seminal work (Becker, 1973), an empirical literature study developed in which marital decisions are treated as endogenous and their determinants studied. In recent years, this literature has turned increasingly to studying the interaction between marriage and female education. This is especially true in the context of South Asian countries, where parents consider a daughter's marriage to be one of the family's main milestones and start planning for it years in advance. Because of the potential two-way causality between age at marriage and female education, both the effect of age at marriage on female education and its reverse, the impact of education on postponing marriage, are important questions that have attracted attention in the literature. However, most papers concentrate on child marriage, that is, marriage on or before the age of 18, while some, for reasons to do with identification strategy, concentrate on marriage soon after puberty. The present paper differs in asking how social norms regarding age at marriage affect female education, even after the age of majority.

Starting with the effect of education on age at marriage, Sathar, Kiani, and Farooqui (1986), Islam, Haque, and Hossain (2016), Thapa (1989), and Aryal (2007) all found that higher levels of schooling were associated with higher age at marriage in Pakistan, Bangladesh, and Nepal. These papers do not specifically study the causal impact of education on age at marriage. Among papers that do, Brien and Lillard (1994) used empirical evidence from Malaysia to study the role of education and enrolment in delaying marriage and first conception and the role of marriage in delaying first conception and dropping out of school. They found that changes in education and enrolment account for a substantial portion of the cohort trend toward later marriage in Malaysia. Mensch, Singh, and Casterline (2006) evaluate the effect of schooling on age at first marriage. Looking at evidence from 73 developing countries, they found that the expansion of schooling has led to a proportional increase in the age at first marriage for women but did not find a similar result for men.

Evidence from such studies has led many policymakers to support the provision of incentives for parents to increase their daughters' school attainment as an important weapon in the fight against child marriage. Amin, Asadullah, Hossain, and Wahhaj (2017), however, challenge this in a recent policy brief. They point out that despite significant gains in increasing female schooling via targeted incentives, Bangladesh has not substantially reduced child marriage. An important observation is that incentives to educate girls work only to the point where they do not conflict with marriage prospects. If a suitably attractive proposal turns up, or soon after the girl completes secondary schooling, marriage takes over in determining her future life trajectory. Even in regions where conditional incentives have succeeded in raising the age at marriage, such as Haryana state in India, it did not change the lack of agency that young girls have on marital choices. They advocate interventions that specifically target norms.

Investigating the reverse effect, of early marriage on education, is complicated by the possible endogeneity of age at marriage. This has been a major concern in the literature. Field and Ambrus (2008) look at the effect of early marriage on female schooling and other adult outcomes in Bangladesh, using menarche as an instrument for age at marriage. The age of menarche imposes a constraint on how early girls can be married. They find that early marriage significantly lowers female schooling and that each year's delay in marriage would increase female schooling by 0.22 years, an estimate that is within the same ballpark as the one we derive using our own IV strategy. Chari, Heath, Maertens, and Fatima (2017) study the impact of child marriage on education and fertility in India, using the same instrument. They find that increasing the age at marriage by 1 year increases the number of years of education of the woman's children by 0.11 years.

Age at menarche has also been used as an instrument for age at marriage by Dhamija and Roychowdhury (2020) to study female labor market outcomes in India. The authors find that delaying marriage does not significantly affect labor market participation, hourly wages, annual earnings, or hours of work even though it increases education and reduces fertility, channels that one would normally associate with better labor market outcomes for women. They explain that older and more educated brides face a backlash from their male partners that counteracts the positive stimulus to labor market participation from the channels normally associated with delayed marriage.

More recently, Asadullah and Wahhaj (2019) provide a detailed discussion of age at menarche as an IV. On the basis of medical literature, they point out that age at menarche can itself be affected by acute physical and psychological stress, which, in turn, could depend on environmental factors affecting a woman's parental household. For this reason, in their first stage regression, they use sister fixed effects along with age at menarche to control for environmental triggers, and birth year fixed effects for transitory shocks to household income, that could accelerate menarche. The main focus of their second stage, however, is not schooling levels, but the reinforcement effect of early marriage on the girl's adherence to traditional gender norms.

Using a combination of attitudinal and living standard surveys from Bangladesh, they find strong evidence of this effect and go on to study the possible channels through which it arises: less school attainment, access to narrower and more traditional social networks, marriage into more conservative households, and a direct reinforcement effect arising from shouldering marital responsibilities from an early age. One by one, they rule out all but the direct channel. They do find that postponing marriage by 1 year increases schooling by 0.422 years, which is twice the size of the effect reported by Field and Ambrus (2008), but when they use only a subsample of women who had no schooling, they find that the effect of marriage age on adherence to norms is no different. Asadullah and Wahhaj (2019) also raise the issue that measurement errors in reporting age at marriage can lead to biased estimates of the effect of age at marriage on education, thus motivating the need of using IV to solve the bias.

While age at menarche is certainly an econometrically valid instrument, its external validity is restricted to societies in which prevailing norms favor marriage as soon as a girl reaches puberty. While this remains comparatively true of Bangladesh, it has become less true of other South Asian countries, including Nepal, save for a few ethnic groups.[8] Indeed, even for Bangladesh, Asadullah and Wahhaj (2019) state that the possible reason for why their estimated effect of age at menarche on age at marriage is lower than that of Field and Ambrus (2008) is that age at menarche is less of a binding constraint on age at marriage now (in 2014) than it was 20 years earlier.

Another limitation of focusing on marriage soon after puberty is that while it *directly* hinders female schooling by imposing household duties at a young age, schooling levels at those ages have already increased substantially for women, at least for countries such as Nepal. The concern remains, however, with schooling at upper secondary and tertiary levels, which happens some years past puberty. In addition, we are concerned with the indirect disincentive to female education that marriage exerts at any age, via its implications for the returns to schooling of married women. In other words, even if a woman gets married after the normal age for a particular level of schooling, the sooner she plans to marry after reaching that age, the less likely that she will attain that level in the first place.

Dahl (2010) does predict age at marriage beyond the context of very early marriages using an IV that exploits variation in the legal minimum age at which individuals can marry across the different states of the United States. However, this IV relies not only on variation in the law but also on the ability of institutions to enforce these laws, something that many developing countries lack. In the case of Nepal, such regional variation in law does not exist in the first place. Therefore, we use variations in cultural norms across Nepal's rich variety of ethnolinguistic communities for similar purposes, as described here.

3 | ECONOMETRIC MODEL AND INSTRUMENTAL VARIABLES

In this section, we shall first describe our econometric strategy and instruments, then we shall defend the choice of instruments.

3.1 | Empirical strategy

The main hypothesis of this paper is that the earlier the age at marriage of a woman the less education she receives. An OLS estimate of the effect of age at marriage on education will be potentially biased for at least three reasons. The first reason is that, as already mentioned, reverse causality can certainly arise. Second, there may be measurement errors arising from recall bias, which applies to our case of retrospective information. Third, girls' schooling in Nepal is likely to be affected by remoteness, poverty, son preference, and learning environments at school not conducive for girls. Our data set contains imperfect information about these issues. Thus, we consider an IV identification strategy.

The potential endogeneity of age at marriage can come from several sources, both economic and cultural. The first possibility arises from a girl's own unobserved ability to convert education into labor market productivity. A girl with low ability is not expected to earn much even as a single woman, and this discounts any pecuniary benefits from delaying her marriage. Second, there is the possibility that in traditional South Asian societies parents are influenced by cultural norms that jointly favor early marriage and disfavor female schooling. Both of these possibilities could induce a positive relationship between the two variables.

Then there are possibilities of an opposite bias. A girl might have traits that both enhance her position within her natal household and make her more marriageable. Physical appearance, personality, and social skills would be examples of such traits. These would lead to a reduction in the age at marriage along with a higher level of education. This is especially true if we consider that education is a good in itself.[9] Another possibility is that a girl's education increases the chances of marrying a groom of higher socioeconomic status. These factors would generate the opposite effect from that of educational ability.

Moreover, as discussed in the literature review, there may be measurement errors in age at marriage (see Asadullah & Wahhaj, 2019); thus, the effect may be biased for this reason as well. Finally, there may be unobservables that affect both age at marriage and education that we may not be able to control for given data limitations, such as remoteness, poverty, son preference, and learning environment for girls.

Longitudinal data that span enough years could enable us to control for some of these biases, but are unfortunately not available; we only observe ex post and retrospective decisions regarding education and the age at marriage. For all these reasons, an attempt to establish causality between these two variables requires the use of IV identification strategy. We use two IVs, both of which reflect community norms to predict female age at marriage. In Section 3.2, we justify the validity of these instruments.

The first instrument is a dummy for membership of the Maithili community. Their particular dowry practice, known as *Tilak Pratha,* is effectively a groom price that increases with the educational qualification and social standing of the groom. The result of *Tilak Pratha* is that parents try to get their daughters married as soon as possible because older girls are more likely to match with more mature and well-educated boys, putting upward pressure on the amount of dowry. The second instrument is the average age of marriage for the respondent's reference peer group, which in turn is defined as the intersection of the ethnic and regional community into which the respondent was born. The assumption here is that peer group effects are important in determining an ideal age at which a woman marries.

We use three different IV models: (1) IV1: a binary variable denoting membership of the Maithili-community, (2) IV2: the average age of women within the ethnic-regional grouping to which the respondent belongs, and (3) Two IVs: both instruments are used together. In the first stage of each regression, age at marriage is regressed on the appropriate IV (and other control variables), and in the second stage, educational attainment is regressed on the predicted age at marriage and other control variables.

The two-stage regression model can be written as.

$$Educ_{i=}\beta_0 + \beta_1 Mage_i + \beta_2 X_i + u_{i,} \tag{1}$$

$$Mage_i = \delta_{0+}\delta_1 Z_i + \delta_2 X_i + v_i, \tag{2}$$

where *Educ* is years of schooling and *Mage* is the age at marriage associated with woman *i*. *X* comprises a set of exogenous covariates, representing individual as well as household characteristics such as age dummies, mother's and father's education, urban dummy, ethnic dummies, and regional dummies. These two sets of dummies correspond to the woman's parental house. *Z* is the IV set (IV1, IV2, or Two IVs). *u* and *v* are the idiosyncratic error terms associated with woman *i*.

3.2 | Justification of the IVs

With respect to the first IV, as we have already pointed out in Section 1, the Maithili dowry tradition does not appear to have attracted much academic attention on the Nepali side of the Maithili region.[10]

This could be because Maithili speakers are not counted as a distinct ethnicity but as members of other ethnic groups.[11] It has, however, been a focus of community activism in regions where the Maithili are present and has attracted the attention of national media and Kathmandu-based non-governmental organizations (NGOs), such as Fight Violence against Women (FVAW) and Resource Centre for Primary Healthcare (RECPHEC), a public health NGO.[12] At the international level UN-ESCAP (2012) has stated: "The Maithili speaking people in the *Terai* have the highest rate of child marriage, with 95.6% girls getting married before the age of 16. The main reason behind this is the widely prevalent dowry system." The report goes on to link *Tilak Pratha* with early marriage: "a younger girl, on the other hand, can get a groom who will be comparatively younger and less qualified, thus demanding less Tilak money."

Our own data show that 63% of Maithili girls were married by the age of 16, compared to 41% of non-Maithili girls (see Table 5). These differences are significant at the 1% level and provide *prime facie* evidence that *Tilak Pratha* influences marital behavior in Nepal within the Maithili community. Empirical evidence from our survey on household expenditures (see Table 2) shows that, in fact, the dowry and wedding expenses represent a higher burden on the Maithili households than on non-Maithili households (as a proportion of landholding value and household income).

While we are not aware of any evidence, whether anecdotal or academic, that Maithilis are against female education in its own right, from the point of statistical inference we cannot rule out the possibility that this is the case. In addition, the Maithili instrument could suffer from an additional bias, that is, Maithilis marry their daughters young because of the income effects of large dowries. By contrast, Dalmia and Lawrence (2005) argue that dowry size is a function of differences in individual and household characteristics between grooms and brides. This suggests that the lower the gap in such characteristics the smaller will be the dowry payment. This would actually encourage investment in daughters' education.

These possibilities have received some attention in the empirical literature, and the results are mixed. Employing household survey data from the Indian states of Uttar Pradesh and Karnataka, Dalmia and Lawrence (2005) found that, contrary to their own argument, brides' human capital was positively correlated with the amount of dowry. The authors themselves pointed to two types of possible confounding biases in their data. First, in a polygamous marriage market, a relatively large number of women might have been competing for a limited number of eligible men, and both the educational level of women and the dowry might have reflected this asymmetry between men and women. Second, both variables might have been positively correlated with household wealth. In equilibrium, educated women might marry educated men and thus must pay a higher dowry because the price for marrying an educated man is high.

Another study, by Anderson (2007), estimated the effects of brides' education on dowry payments (parental characteristics and distance to school were used as IVs in the education regression). Employing data from Pakistan, this study found a positive relationship between the brides' education and dowry size. However, when the average level of education in the region was controlled for, the estimated coefficient on bride's education became statistically insignificant.

A different finding was reported by Amin and Das (2014) in the case of Bangladesh. Using a detailed, nationally representative, data set on gender norms and marital practices, they studied differences in age at first marriage and dowry payments across different cohorts of ever-married women. They find that both age at marriage and the incidence and amount of dowry payments are higher for "young" married women than they were for their "old"' counterparts, implying that progress in raising marriage age has not necessarily led to a weakening of dowry traditions; if anything they have been strengthened. Within each age cohort, however, an increase in age at first marriage by a few years led to an increase in the amount of dowry, with the increase steeper for the younger cohort than the older

TABLE 2 Wedding expenses: Current year (in thousands)

	Maithili			Non-Maithili		
	Total	**Rural**	**Urban**	**Total**	**Rural**	**Urban**
D-cost	19.39 (38.13)	20.84 (39.92)	7.04 (11.86)	5.66 (26.70)	5.55 (28.7)	5.99 (21.90)
Obs.	57	48	9	764	582	182
Wed-exp	7.62 (20.96)	7.75 (21.41)	5.38 (11.10)	8.41 (32.37)	6.43 (16.15)	19.31 (72.50)
Obs.	232	220	12	1,776	1,503	273
D-cost/landholding	0.219	0.251	0.060	0.020	0.029	0.015
D-cost/household income	0.005	0.015	0.0004	0.0005	0.0005	0.0005
Wed-exp/landholding	0.088	0.092	0.041	0.044	0.040	0.054
Wed-exp/household income Wed-exp/household income	0.004	0.004	0.003	0.001	0.001	0.0007

Note: D-cost = dowry paid, Wed-exp = marriage, birth, and other ceremonies' expenses. These figures represent aggregate household data. Standard deviations are given in parentheses.

one. The implications are that dowry culture traditionally penalizes delayed marriage in Bangladesh, in line with the prediction of Wahhaj (2018). They also find, unlike Dalmia and Lawrence (2005) and Anderson (2007), that both the likelihood of dowry payment and that of marrying before age 15 are negatively related to the bride having at least secondary education. These studies suggest that dowry size might not directly discourage girls' schooling.

In light of this and the possibility of a Maithili-specific bias against female education, we employ our second instrument, namely the average marriage age for the respondent's ethno regional peer group. Our use of this instrument is based on a long-standing literature in demography and sociology that investigates the existence of sociocultural norms regarding an ideal age at marriage. While sociologists such as Settersten and Hagestad (1996) and Neugarten et al. (1965) were interested in the broader issue of age norms for various "life-course" transitions, demographers are specifically interested in age at marriage and the length of the reproductive cycle in women (see Billari et al., 2003). Both Neugarten et al. (1965) and Billari et al. (2003) cite survey evidence on popular perceptions regarding ideal ages and/or age limits for marriage, the latter from the 1960s USA and the former from the 1990s Italy.[13]

Theoretical justification for this assumption also comes from Wahhaj (2018): the more women who marry younger, the greater the negative externality affecting older women on the marriage market. Our argument is that in countries like Nepal, marriage markets would be localized; therefore, age at marriage norms would vary by a combination of ethnicity and location, for which our best proxy is women's birth region.

We now consider whether our second instrument could be contaminated by the correlation between community norms regarding age at marriage and those regarding female education. While we cannot conclusively prove that such a correlation does not exist, we offer two arguments in defense of its independence.

First, even in the Pakistani province of Khyber Pakhtunkhwa (KP), which is considered the most socially conservative and outwardly biased against female education, survey evidence suggests that parents are generally supportive of girls going to school. Cyan, Rider, Price, and Roberts (2019) conducted an attitudinal survey of 694 rural households who had at least one high school–age daughter, either attending or having attended at least some school.[14] The survey was conducted in the Dir region, which was chosen because it is considered one of the most conservative even by KP standards and was one of the areas targeted by the Pakistani Taliban during their insurgency. They found overwhelming agreement (89%) with the principle of girls receiving more than primary schooling and 90% in the case of their own daughter's schooling.

At the same time, the authors found evidence that gender differences did appear both in how a guardian's gender determined how much they value girls' education and how guardians prioritized girls' education relative to that of boys. Female guardians were 50% more likely than male guardians to "strongly support" female education as opposed to merely "support." In addition, one of the most widely cited reasons given, especially by female guardians, for a girl to not go to school was that she was"needed at home." This suggests a bias in favor of traditional gender roles, even though 93% of the respondents disagreed with the assertion that education was important only for boys. The authors attribute this inconsistency to a lack of family resources rather than a pro-son bias; however, given the literature on gender differences in education cited earlier, pro-son bias cannot be ruled out, even if it is induced not by innate preference but by economic necessity.

The issue of son preference is explicitly studied by Hatlebakk (2017). Using a bespoke survey of rural households in southeast Nepal, the author studies how birth order affects the total number of births in the family, the education provided to surviving children, and other economic outcomes. One of the main findings is that a first-born girl leads to a larger number of children born (from a median

of three children if the first born is a boy to four if it is a girl), while having a first-born sister leads to more education for younger brothers (by 1.2 years). There is no direct effect from the number of children to schooling. These effects are interpreted as indicative of son preference, the first of a desire to have at least two sons and the second as enabling a boy to focus exclusively on education.

The context of son preference in Hatlebakk (2017) is similar to the one hinted at in Cyan et al. (2019) and also to the first strand of literature, reviewed earlier in Section 2, that explained anti-woman bias in resource allocation among poor, rural households: boys represent a better investment in economic security than girls. Such a bias need not itself be deeply rooted in cultural norms and could decline with economic advancement and better schooling opportunities. As we have seen in the literature on age at marriage, cultural norms around marriage are more deep-rooted and do not fade with economic betterment (Amin et al., 2017). In our own study, we have attempted to control for biases induced by poverty by considering a subsample of the wealthier half of households in terms of wealth; our results continue to hold.

At the same time, one reason why son preference might be more deep-rooted is patrilineality. den Boer and Hudson (2017) compare evidence from South Korea and Vietnam, both countries with strong patrilineal traditions, that the sex ratio at birth can *increase* with economic and educational betterment. Nonetheless, after an upward trend through the 1980s and 1990s, South Korea managed to bring the sex ratio down over the past two decades; in Vietnam, the data show an increasing trend, notwithstanding its own impressive economic growth. Through an analysis of the factors that contributed to South Korea's success, the authors argue for a multipronged approach, combining economic safety nets for the elderly with legislation and community-based action. The question arises why certain social norms do not fade away as their economic necessity wanes.

In a widely cited paper, Elster (1989) argues that for norms to be social, they must be shared by others and sustained by their collective approval or disapproval, as well as feelings of individual shame in the case of those who violate them and pride for those who uphold them even when there are no witnesses to the event. It is this combination of community and self-policing that explains why they persist even if there is no material basis for their existence. Patrilineality could be one such norm, along with other marital customs such as dowry and child marriage, essentially because they involve arrangements that are highly visible to everyone in the community.

Patrilineality is certainly widespread across South Asia. In the case of Nepal, a qualitative survey by Brunson (2010) found that as fertility rates decline, young women report an even stronger preference for sons, despite acknowledging that the economic value of daughters has been increasing over time. The main reason stated for this preference was that since daughters will become part of their spousal households, parents without a son will lose financial and moral support in old age. The author concludes that it is such insecurity, rather than religious or ideological conviction that underlies son preference.

It is not apparent, however, whether patrilineality plays a role in lowering women's age at marriage. Indeed, one might expect that at least households without any sons would actually be motivated to delay marrying off a daughter, to benefit from her contribution to household income for at least some part of her adult life. Moreover, to invalidate at least the Maithili instrument, the effect of patrilineality would have to be of a different magnitude in their culture than in others. Unfortunately, we do not have the means to test either of these hypotheses.

This takes us to our second justification for the second instrument: even if there are cultural norms that lead to both a bias against girls' schooling and a bias in favor of girls' marrying early, these norms are more likely to be based on the values and attitudes of the broader ethnic group to which the woman belongs than on localized peer-group effects. In using the average age-at-marriage for each respondent's

peer group, we are capturing variations arising from peer-group effects, which are unlikely to be driven by a broader dislike for female education among the respondent's wider ethnic community.

A final argument that our IVs do not directly affect female education is that in all specifications, mother's education is included as a direct control. The idea is that any inherent cultural bias against female education will already be captured by a mother's education when the latter is included along with other household characteristics that determine the girl's education. This is particularly true in South Asia where marriage is typically endogamous so that mother's education would be closely correlated with cultural attitudes toward female education on both sides of the marriage equation. Indeed, our results show that mother's education is only significant for the education regression and not the age at marriage one, which implies that while there are norms affecting female education these are not directly correlated with age at marriage.

Our identification approach is different from Field and Ambrus (2008) and Asadullah and Wahhaj (2019) who use the age of menarche. First, as discussed in Section 1, child marriage is less prevalent in Nepal, and therefore menarche is likely to pose less of a constraint. Second, we are mostly concerned with the anticipatory effect of age at marriage on a girl's education, rather than the direct disruption that would arise if a school-age girl gets married and must start attending to spousal duties. Finally, the age of menarche is not available in our data set. It should be noted that our proposed approach of considering community norms that are specifically correlated with age at marriage allows the estimation of the effect of interest in more general setups than when the age of menarche is used.

4 | DATA

This paper employs data from the 2003 National Living Standard Survey of Nepal, carried out by its Central Bureau of Statistics with the technical support of the World Bank and UK Department of International Development. The survey follows the World Bank's Living Standard Measurement Survey and applies a two-step stratified sampling scheme. It took place over 269 primary sampling units, covering 73 out of a total of 75 districts in Nepal and comprises information related to demography, education and literacy, health and maternity, and other information at the household and individual levels. The data cover the five administrative regions of Nepal: Eastern, Central, Western, Midwestern, and Far Western, and an additional category of Abroad for those who were not residing in Nepal at the time of the survey (they were mostly in India).

The survey has a total of 5,240 households and 28,110 individuals. This is a unique survey where we can identify the Maithili community from a specific question on language. We restrict the sample to ever-married women (still married, divorced, separated, or widowed), which results in 5,028 women. This may lead to potential sample selection bias because unmarried women would be systematically excluded. Table 3 reports women's marital status for different age groups. The table shows that the likelihood of marriage increases monotonically until the age of 30 years, after which less than 2.5% women remain unmarried. We thus consider two subsamples, *Sample2549* (3,760 observations) and *Sample3049* (2,818 observations), representing married women in the age ranges of 25–49 and 30–49, respectively, to minimize this potential selection bias. The upper limit of 49 is imposed to exclude potential selection bias because of respondent mortality.

The survey contains two types of educational information on individuals: (1) the highest level of completed schooling and (2) a categorical question about whether the individual (i) never attended school, (ii) attended in the past, and (iii) is currently attending school. Only 28% (from the *Sample2549* subsample) answered question (1). For those respondents who did not answer question (1) but answered question (2-i), we imputed their educational level as zero. This increased the sample

TABLE 3 Women's marital status by age group (in %)

Age group	Married	Divorced	Separated	Widow	Unmarried
≤15	2.76	0.10	–	0.05	97.09
16–20	42.98	0.19	0.51	0.13	56.20
21–24	76.08	0.10	0.52	0.21	23.09
25–29	90.76	–	0.84	0.65	7.74
30–34	93.74	–	1.76	2.09	2.41
35–39	93.35	0.18	0.72	3.60	2.16
40–44	89.49	0.26	2.37	5.78	2.10
45–49	83.22	0.34	2.37	12.37	1.69
Total[a]	59.51	0.14	1.15	8.91	30.29

[a]All ages, including age >49.

size considerably from 1,079 to 3,760 for *Sample2549* and from 684 to 2,818 for *Sample3049*. We define the measure of educational achievement derived from question (1) as *Educ1* and the measure derived by including the imputed values for those who answered question (2-i) as *Educ2*. See Table 7 for the summary statistics in our sample.

The average school attainment for married women was 7.51 years using *Educ1* and fell dramatically to 2.16 years when *Educ2* is used. Geographically, the distribution of married women was 22%, 34%, 25%, 7%, 4%, and 8% from the Eastern, Central, Western, Midwestern, Far Western regions, and Abroad, respectively, and 80% live in rural areas. They belong to 14 different ethnicities.[15]

Table 4 presents average years of education, average age at first marriage, and incidence of very early (≤15 years old) marriage by ethnicity for women aged 25–49 years in our data set; education figures are presented for both *Educ1* and *Educ2*.[16] For each group, average years of education fall considerably once women who reported never attending school are included.

Looking across ethnicities, women belonging to Brahmin, Chhetri, Newar, and Gurung have the highest educational attainment, while Tharu, Kami, Muslim, Yadav, and Sarki have the lowest, especially when women with no schooling are factored in. In the case of Brahmins and Chhetris, age at marriage is relatively low (approximately 17.5 years) and the proportion of very early marriages relatively high (approximately 25%). This could be the result of their high socioeconomic status combined with their conservative outlook, as outlined by Thapa (1989). Gurungs and Newars have some of the highest ages at marriage and lowest incidences of very early marriage, again in line with Thapa (1989). The contradictions to his account appear in the case of Tamangs and Magars, who have considerable proportions of girls in very early marriage. The interesting case is that of Limbu, where low school attainment coexists with a low incidence of very early marriage. This could be because Limbus are a subgroup of the Kirate group that Thapa (1989) cited for their eclectic religious traditions and comparatively relaxed cultural norms.

Table 5 presents more granular information on the distributions of marriage age and education for *Sample2549* and *Sample3049*, respectively. The upper part of Table 5 shows the distribution of marriage age: across *Sample2549*, 45% were married at or before the age of 16 years, another 39% were married between 17 and 20 years, while only 2% got married after the age of 27 years. There is also a considerably lower age at marriage within the Maithili community as compared to the non-Maithili communities. The lower part of Table 5 reports the educational background of married women. The majority of married women (71%) do not appear to have any formal schooling. Of the remainder, only 10% attained primary school, 4% secondary school, 7% high school, and 8% received higher education.

TABLE 4 Descriptive statistics

Variable	Sample2549	Sample3049
*Educ*1	7.51 (0.106)	7.37 (0.136)
*Educ*2	2.16 (0.063)	1.78 (0.068)
Feduc	2.75 (0.138)	2.75 (0.175)
Meduc	0.649 (0.070)	0.611 (0.087)
Urban	0.202 (0.012)	0.219 (0.015)
Mage	19.00 (0.107)	18.97 (0.144)
Age dummies		
25–29	0.366 (0.014)	–
30–34	0.217 (0.012)	0.342 (0.018)
35–39	0.220 (0.012)	0.346 (0.018)
40–44	0.108 (0.008)	0.178 (0.014)
45–49	0.084 (0.008)	0.133 (0.012)
Ethnic dummies		
Brahman	0.255 (0.013)	0.271 (0.017)
Chettri	0.155 (0.011)	0.160 (0.014)
Newar	0.253 (0.013)	0.276 (0.017)
Magar	0.046 (0.006)	0.042 (0.007)
Tharu	0.022 (0.004)	0.017 (0.005)
Tamang	0.021 (0.004)	0.014 (0.004)
Kami	0.012 (0.003)	0.010 (0.003)
Yadav	0.010 (0.003)	0.005 (0.002)
Muslim	0.012 (0.003)	0.010 (0.003)
Rai	0.024 (0.004)	0.016 (0.004)
Gurung	0.032 (0.005)	0.035 (0.007)
Damai	0.010 (0.003)	0.004 (0.002)
Limbu	0.012 (0.003)	0.010 (0.003)
Sarki	0.001 (0.001)	–
Others	0.142 (0.010)	0.124 (0.012)
Regional dummies		
Eastern	0.216 (0.012)	0.192 (0.015)
Central	0.335 (0.014)	0.365 (0.018)
Western	0.253 (0.013)	0.248 (0.016)
Midwestern	0.072 (0.007)	0.077 (0.010)
Far Western	0.033 (0.005)	0.030 (0.006)
Abroad	0.076 (0.008)	0.071 (0.009)

Note: Standard deviations are given in parentheses.

TABLE 5 Education and age at marriage by ethnic group

	Years of education							
	*Educ*1		*Educ*2		Age at marriage		Married at ≤ 15 years	
Ethnic group	**Average**	***SD***	**Average**	***SD***	**Average**	***SD***	**Proportion**	***SD***
Brahmin	7.87	3.45	4.03	4.65	17.37	3.55	0.260	0.439
Chhetri	7.09	3.46	2.07	3.70	17.70	3.38	0.219	0.414
Newar	8.99	3.58	5.59	5.20	19.69	3,68	0.086	0.281
Magar	6.58	2.90	1.68	3.23	17.87	3.12	0.223	0.417
Tharu	6.20	3.04	0.65	2.13	16.19	2.87	0.389	0.489
Tamang	6.08	3.35	0.83	2.42	17.79	3.28	0.318	0.467
Kami	6.29	3.64	0.69	2.30	16.95	3.44	0.318	0.467
Yadav	5.33	1.92	0.55	1.73	14.89	2.63	0.529	0.501
Muslim	5.54	2.30	0.40	1.55	15.28	2.69	0.530	0.500
Rai	5.83	3.36	1.74	3.24	20.06	4.14	0.066	0.249
Gurung	7.20	3.41	2.53	3.99	19.31	4.35	0.144	0.353
Damai	6.86	3.01	1.25	2.94	17.34	3.98	0.308	0.465
Limbu	5.82	3.30	1.57	3.10	21.4	5.28	0.079	0.272
Sarki	N/A	N/A	0.18	1.19	15.62	3.08	0.500	0.506
Others	7.13	3.46	1.26	3.08	16.47	3.20	0.367	0.482

Note: Sample of 25-49-year-old women; *SD* = standard deviation.

5 | RESULTS

Table 8 presents the first-stage (Equation 2) and Table 9 second-stage (Equation 1) baseline regressions for *Sample2549* and *Sample3049* subsamples, respectively. White robust standard errors are reported. Regional and ethnicity dummy variables are included, but their coefficients are not reported. Education is measured, as explained in Section 4, by both *Educ1* and *Educ2*. In the following discussions, the results following from each of these two different measures are analogously identified as the *Educ1* and *Educ2* samples, respectively. To save space, coefficients are not reported for all the explanatory variables that were used in the regressions, but they are available upon request.

The first column in Table 9 shows the OLS coefficients. Taken at face value, they imply that increasing age at marriage by 1 year is likely to increase women's educational level by 0.314 years using *Educ1* and 0.195 years using *Educ2* for the sample of age 25–49 years and 0.270 years using *Educ1* and 0.162 years using *Educ2* for the sample of age 30–49 years.

We next consider the IV estimates. In IV1, membership to the Maithili community has the expected negative and significant relationship with age at marriage (see Table 8). The estimated coefficient for the *Educ1* sample is − 1.72 for 25–49 years old and − 1.64 for 30–49 years old (see Table 9). Analogous coefficients of − 0.89 and − 1.14 are estimated for the *Educ2* sample, for 25–49 and 30–49 years old, respectively. The first-stage IV2 model shows positive and statistically significant coefficients for *Avemage*. When both IVs are used together, the Maithili coefficients are slightly reduced but retain their statistical significance. The calculated *F*-statistics (reported in Table 9) are no less than 10 for the largest 25–49 years old sample indicating strong joint significance of the estimated coefficients, but this statistic falls in magnitude when the smaller subsample of 30–49 years old

TABLE 6 Comparison of age at marriage and educational distribution

	Sample2549			*Sample3049*		
Variable	**All**	**Non-Maithili**	**Maithili**	**All**	**Non-Maithili**	**Maithili**
Age at marriage						
Average	17.44 (0.059)	17.71 (0.064)	15.78 (0.127)	17.34 (0.078)	17.61 (0.077)	15.48 (0.157)
Married ≤ 16	0.45 (0.008)	0.42 (0.008)	0.65 (0.021)	0.47 (0.009)	0.44 (0.009)	0.69 (0.024)
Married 17–18	0.25 (0.007)	0.25 (0.007)	0.22 (0.018)	0.24 (0.008)	0.25 (0.008)	0.20 (0.021)
Married 19–20	0.14 (0.005)	0.15 (0.006)	0.09 (0.012)	0.14 (0.006)	0.15 (0.007)	0.08 (0.014)
Married 21–22	0.07 (0.004)	0.08 (0.004)	0.02 (0.006)	0.07 (0.004)	0.07 (0.005)	0.02 (0.006)
Married 23–24	0.04 (0.003)	0.04 (0.003)	0.01 (0.0050	0.03 (0.003)	0.03 (0.003)	0.005 (0.002)
Married 25–26	0.03 (0.002)	0.03 (0.003)	0.005 (0.002)	0.03 (0.003)	0.03 (0.003)	0.005 (0.002)
Married ≥ 27	0.02 (0.002)	0.02 (0.002)	0.005 (0.002)	0.02 (0.002)	0.03 (0.003)	0.005 (0.002)
Education						
No formal schooling	0.71 (0.007)	0.69 (0.008)	0.87 (0.014)	0.76 (0.008)	0.73 (0.008)	0.92 (0.014)
Primary [1–5]	0.10 (0.004)	0.11 (0.005)	0.06 (0.010)	0.09 (0.005)	0.10 (0.005)	0.04 (0.009)
Secondary [6–7]	0.04 (0.003)	0.03 (0.003)	0.03 (0.007)	0.03 (0.003)	0.03 (0.003)	0.01 (0.006)
High school [8–10]	0.07 (0.004)	0.08 (0.004)	0.02 (0.006)	0.06 (0.004)	0.07 (0.005)	0.01 (0.005)
Higher education [≥11]	0.08 (0.004)	0.09 (0.004)	0.02 (0.006)	0.06 (0.004)	0.07 (0.007)	0.02 (0.007)
Obs.	3,760	3,244	516	2,818	2,460	358

Note: Grades corresponding to each educational level from variable *Educ*2 are presented in brackets. Standard deviations are given in parentheses.

is used. In the Two IV model, the *p*-values for the Sargan overidentifying restriction test (reported in Table 9) cannot reject the null hypothesis of the validity of the IV.

Turning to the second-stage results, each of the IV models shows a positive impact of delaying the age at marriage (*Mage*) on education although the level of significance varies across models and samples. For the 25–49-year-old sample, *Educ1* IV1 model shows a coefficient of age at marriage on education of 0.334 (not significant), IV2 0.453 (significant at the 5% level), and Two IV model 0.410 (significant at the 1% level). For *Educ2*, *Mage* also has a positive (statistically significant at 1% level) effect in all models: 0.565, 0.327, and 0.363 for IV1, IV2, and Two IV models, respectively.[17]

For the 30–49-year-old subsample, *Educ1* model, the coefficients of *Mage* are not statistically significant except for OLS. However, for *Educ2*, *Mage* has a positive effect in all models: 0.350 (at 5%), 0.180 (at 10%), and 0.216 (at 5%) for IV1, IV2, and Two IV models, respectively.

These estimates are roughly in line with but slightly higher than the one found by Field and Ambrus (2008) for Bangladesh where increasing age at marriage by 1 year increases education by 0.22 years. They are somewhat lower than the one by Asadullah and Wahhaj (2019), who found the effect to be 0.422. Apart from country-specific effects, the differences could be a result of the time gap between the survey data that we used and the ones used by the latter two papers.

Note, however, that compared to OLS, standard errors are considerably higher, which makes the point estimate less precise. If, however, the point estimates are taken at face value, the IV estimates

TABLE 7 Distribution of the Maithili community

Ethnicity	Sample2549	Sample3049
Ethnic distribution		
Bramhin	0.02 (0.005)	0.02 (0.007)
Yadav	0.16 (0.016)	0.17 (0.019)
Muslim	0.14 (0.014)	0.13 (0.017)
Sarki	0.03 (0.007)	0.02 (0.007)
Tharu	0.04 (0.008)	0.03 (0.009)
Other	0.61 (0.018)	0.63 (0.025)
Regional distribution		
Eastern	0.38 (0.021)	0.38 (0.025)
Central	0.36 (0.021)	0.36 (0.025)
Western	0.01 (0.003)	0.01 (0.004)
Midwestern	–	–
Far Western	–	–
Abroad (India)	0.25 (0.018)	0.25 (0.015)
Obs.	516	358

Note: Standard deviations are given in parentheses.

suggest that unobservables were biasing down OLS. That is, there should be girl's traits that favor both more education and early marriage, and this effect is potentially of a higher-order effect than labor productivity unobserved ability and culture biases against education.

5.1 | Robustness and validity of the estimated results

In this section, we consider potential sources of bias in our estimates and outline our attempts to address them. We present results only for the subsample of 25–49-year-old women.

One of the main concerns with our instruments, both of which reflect cultural norms and practices regarding woman age at marriage, has been the possibility of a correlation between these norms and those that underlie female education. The insignificance of the results on mother's education in the first-stage regressions suggests that such norms are independent of one another. Nonetheless, other biases might still arise.

First, there is the possibility that poverty drives parents both to keep their daughters out of school and to marry them young so that the burden of maintenance falls on their husbands and in-laws. Moreover, poor parents could be more susceptible to trading off girls' education for the sake of accumulating a sufficient dowry, even in communities that do not practice dowry culture as strictly as Maithilis do.

Second, a potential detrimental effect of early marriage on female education may arise because a significant proportion of women were getting married during childhood and were therefore obliged to abandon schooling and take up household duties. While this would be a valid effect in its own right, our main concern is with the *anticipatory* disincentive to female education that early marriage induces and not just its disruptive effect once the marriage has taken place.

TABLE 8 First-stage regression results: Dependent variable *Mage*

	IV1	IV2	Two IV	IV1	IV2	Two IV
	Subsample age 25–49 years			**Subsample age 30–49 years**		
	Subsample for Educ1					
Maithali	−1.724***		−1.595***	−1.640**		−1.338*
	(0.527)		(0.522)	(0.798)		(0.789)
Avemage		0.746***	0.714***		0.834***	0.796***
		(0.172)	(0.176)		(0.201)	(0.205)
Age 30–34	−0.185	−0.0978	−0.179			
	(0.272)	(0.270)	(0.271)			
Age 35–39	−0.318	−0.281	−0.327	−0.130	−0.171	−0.142
	(0.272)	(0.272)	(0.269)	(0.328)	(0.323)	(0.324)
Age 40–44	−0.141	−0.121	−0.151	0.0358	−0.0358	0.0147
	(0.354)	(0.356)	(0.353)	(0.395)	(0.392)	(0.396)
Age 45–49	−0.713*	−0.673*	−0.738*	−0.473	−0.513	−0.499
	(0.396)	(0.375)	(0.380)	(0.427)	(0.414)	(0.417)
Feduc	0.0968***	0.0930***	0.0971***	0.115***	0.113***	0.115***
	(0.0248)	(0.0247)	(0.0246)	(0.0323)	(0.0318)	(0.0319)
Meduc	−0.0408	−0.0293	−0.0337	−0.0685	−0.0497	−0.0529
	(0.0488)	(0.0493)	(0.0486)	(0.0662)	(0.0648)	(0.0644)
Urban	1.301***	1.171***	1.131***	1.580***	1.454***	1.433***
	(0.330)	(0.331)	(0.334)	(0.446)	(0.443)	(0.448)
Obs.	1,079	1,079	1,079	684	684	684
R-squared	0.182	0.188	0.196	0.192	0.205	0.209
	Subsample for Educ2					
Maithali	−0.892***		−0.791***	−1.145***		−1.024***
	(0.183)		(0.181)	(0.222)		(0.219)
Avemage		1.001***	0.981***		1.008***	0.979***
		(0.0952)	(0.0953)		(0.112)	(0.112)
Age 30–34	−0.0912	−0.116	−0.136			
	(0.153)	(0.150)	(0.150)			
Age 35–39	−0.245*	−0.264*	−0.288**	−0.139	−0.130	−0.138
	(0.143)	(0.142)	(0.141)	(0.163)	(0.161)	(0.161)
Age 40–44	−0.442***	−0.449***	−0.481***	−0.361**	−0.337*	−0.354*
	(0.167)	(0.164)	(0.164)	(0.183)	(0.181)	(0.181)
Age 45–49	−0.815***	−0.844***	−0.858***	−0.725***	−0.727***	−0.723***
	(0.194)	(0.192)	(0.191)	(0.210)	(0.208)	(0.207)
Feduc	0.118***	0.117***	0.118***	0.120***	0.120***	0.121***
	(0.0213)	(0.0212)	(0.0211)	(0.0272)	(0.0269)	(0.0269)
Meduc	0.000417	0.00987	0.00373	−0.0271	−0.0140	−0.0206

(Continues)

TABLE 8 (Continued)

	IV1	IV2	Two IV	IV1	IV2	Two IV
	Subsample age 25–49 years			**Subsample age 30–49 years**		
	(0.0470)	(0.0472)	(0.0471)	(0.0612)	(0.0603)	(0.0605)
Urban	1.724***	1.520***	1.493***	2.037***	1.852***	1.819***
	(0.276)	(0.279)	(0.279)	(0.351)	(0.355)	(0.355)
Obs.	3,760	3,760	3,760	2,818	2,818	2,818
R-squared	0.190	0.207	0.211	0.193	0.208	0.213

Note: White robust standard errors are given in parentheses. ***Significant at 1% level, **significant at 5% level, *significant at 10% level. IV1: Maithili. IV2: *Avemage*. Age:25–29 years as a base category for subsample 25–49 and Age: 30–34 years as a base category for subsample 30–49. Regional and ethnicity dummies are included but not reported.

Third, a possible bias affecting only the Maithili instrument is that this might reflect regional variations in marriage practice, especially regarding age at marriage, rather than an effect of dowry culture specific to Maithilis. This possibility arises because Maithilis are concentrated in certain regions of Nepal that border India—to be precise in four of the six regions of our survey data: Eastern, Central, Western, and Abroad. Since cultural practices in Nepal do vary by region and the concomitant degree of urbanization, this could arise as a source of bias.

The results for this robustness analysis are summarized in Table 10, in which we include only the main variables of interest.

We start by looking at the possibility that poverty underlies the observed relationship between female education and age at marriage. We run regressions on a restricted subsample of households that belong to the upper half of the wealth distribution proxied by landholding. This information is only available for the marital household, and there is no such variable for the married women parental household. The underlying assumption is that marriages are more likely to occur among families of similar wealth status. We shall discuss separately the cases of *Educ1* and *Educ2*.

For *Educ1*, the first-stage coefficients of the instruments increase in value and remain significant at the 1% level across all IV models. In the second-stage regression, the coefficient of age at marriage increased for IV1 and dropped in value and/or significance for IV2 and Two IV models, possibly due to the reduced sample size. For *Educ2,* while a marginal decrease is observed in the second-stage regression across the three IV models, they remain statistically significant. The *p*-value of the Sargan tests and the *F*-statistics support the validity of the instruments in this subsample. The important point is that, by and large, our qualitative results continue to hold at similar levels of significance, especially in the larger *Educ2* subsample.

Second, we look at the possibility that the detrimental effect of early marriage on female education arises because of very early marriage. To filter out this effect, we run regressions on the subsample of women who married above the age of 15 years. Fifteen is the age set by the International Labor Organization convention as the minimum age of employment and is also an age by which most children will have completed secondary school. If child marriage is the main driving force behind low female education, we would expect insignificant effects of age at marriage on education in these subsamples. Overall, the results are similar in magnitude and significance to the corresponding baseline regression models, showing a positive effect of age of marriage on education. However, the Sargan test rejects the exogeneity of IV in the *Educ2* case.

TABLE 9 Second-stage regression results: Dependent variable *Educ1* or *Educ2*

	OLS	IV1	IV2	Two IV	OLS	IV1	IV2	Two IV
	Subsample age 25–49 years				**Subsample age 30–49 years**			
	Dependent variable Educ1							
Mage	0.314***	0.334	0.453**	0.410***	0.270***	−0.0484	0.175	0.130
	(0.0286)	(0.239)	(0.213)	(0.157)	(0.0340)	(0.435)	(0.167)	(0.158)
Age 30–34	−0.355	−0.353	−0.342	−0.346				
	(0.236)	(0.234)	(0.236)	(0.234)				
Age 35–39	−0.435*	−0.429*	−0.398	−0.409*	−0.115	−0.168	−0.131	−0.138
	(0.233)	(0.236)	(0.243)	(0.236)	(0.267)	(0.290)	(0.267)	(0.268)
Age 40–44	−0.561*	−0.559*	−0.546*	−0.551*	−0.274	−0.282	−0.277	−0.278
	(0.299)	(0.297)	(0.304)	(0.300)	(0.327)	(0.346)	(0.324)	(0.326)
Age 45–49	−1.199***	−1.186***	−1.110***	−1.137***	−0.965**	−1.121**	−1.011**	−1.033***
	(0.372)	(0.400)	(0.399)	(0.384)	(0.389)	(0.462)	(0.395)	(0.397)
Feduc	0.185***	0.183***	0.172***	0.176***	0.204***	0.240***	0.214***	0.220***
	(0.0206)	(0.0300)	(0.0281)	(0.0246)	(0.0259)	(0.0579)	(0.0320)	(0.0319)
Meduc	0.0922***	0.0930***	0.0973***	0.0957***	0.107***	0.0860*	0.101**	0.0977**
	(0.0314)	(0.0321)	(0.0337)	(0.0325)	(0.0402)	(0.0485)	(0.0397)	(0.0393)
Urban	1.858***	1.830***	1.669***	1.728***	1.810***	2.324***	1.964***	2.036***
	(0.278)	(0.426)	(0.400)	(0.350)	(0.371)	(0.803)	(0.449)	(0.446)
Obs.	1,079	1,079	1,079	1,079	684	684	684	684
R-squared	0.362	0.361	0.345	0.354	0.365	0.273	0.357	0.348
F-test		10.7	18.8	13.8		4.2	17.3	9.9
Sargan test				0.70				0.59
	Dependent variable Educ2							
Mage	0.195***	0.565***	0.327***	0.363***	0.162***	0.350**	0.180*	0.216***

(Continues)

TABLE 9 (Continued)

	OLS	IV1	IV2	Two IV	OLS	IV1	IV2	Two IV
	Subsample age 25–49 years				**Subsample age 30–49 years**			
	(0.0172)	(0.189)	(0.0886)	(0.0816)	(0.0184)	(0.148)	(0.0978)	(0.0837)
Age 30–34	−0.655***	−0.630***	−0.646***	−0.644***				
	(0.156)	(0.163)	(0.156)	(0.156)				
Age 35–39	−1.156***	−1.076***	−1.128***	−1.120***	−0.496***	−0.472***	−0.494***	−0.489***
	(0.142)	(0.153)	(0.142)	(0.143)	(0.150)	(0.153)	(0.150)	(0.150)
Age 40–44	−1.615***	−1.466***	−1.562***	−1.547***	−0.956***	−0.891***	−0.950***	−0.937***
	(0.146)	(0.174)	(0.150)	(0.150)	(0.153)	(0.163)	(0.156)	(0.155)
Age 45–49	−1.642***	−1.347***	−1.537***	−1.508***	−0.981***	−0.844***	−0.968***	−0.942***
	(0.157)	(0.232)	(0.171)	(0.171)	(0.163)	(0.201)	(0.178)	(0.174)
Feduc	0.388***	0.345***	0.373***	0.368***	0.396***	0.373***	0.394***	0.389***
	(0.0238)	(0.0313)	(0.0256)	(0.0250)	(0.0297)	(0.0336)	(0.0322)	(0.0313)
Meduc	0.217***	0.214***	0.216***	0.216***	0.231***	0.235***	0.232***	0.232***
	(0.0414)	(0.0413)	(0.0404)	(0.0403)	(0.0531)	(0.0526)	(0.0528)	(0.0526)
Urban	2.699***	2.049***	2.467***	2.403***	2.698***	2.305***	2.660***	2.585***
	(0.290)	(0.444)	(0.322)	(0.317)	(0.352)	(0.468)	(0.394)	(0.383)
Obs.	3,760	3,760	3,760	3,760	2,818	2,818	2,818	2,818
R-squared	0.447	0.349	0.435	0.427	0.423	0.391	0.423	0.421
F-test		23.8	110.6	65.2		26.7	81.1	52.2
Sargan test				0.21				0.31

Note: White robust standard errors are given in parentheses. ***Significant at 1% level, **significant at 5% level, *significant at 10% level. *Mage* is treated as endogenous. IV1: Maithili. IV2: *Avemage*. Age: 25–29 years as a base category for subsample 25–49 and Age: 30–34 years as a base category for subsample 30–49. Regional and ethnicity dummies are included but not reported.

TABLE 10 Robustness checks (I)

	Upper wealth households				Adult marriage (*Mage* ≥ 15)				Four regions			
	OLS	**IV1**	**IV2**	**Two IV**	**OLS**	**IV1**	**IV2**	**Two IV**	**OLS**	**IV1**	**IV2**	**Two IV**
	Subsample for Educ1											
	First stage: dep. var. Mage											
Maithali		−1.976***		−1.820***		−0.916*		−0.845		−1.554***		−1.540***
		(0.578)		(0.586)		(0.521)		(0.522)		(0.532)		(0.526)
Avemage			0.974***	0.949***			0.727***	0.719***			0.680***	0.676***
			(0.180)	(0.184)			(0.170)	(0.172)			(0.200)	(0.200)
Obs.		530	530	530		1,003	1,003	1,003		965	965	965
R-squared		0.242	0.264	0.274		0.150	0.165	0.167		0.184	0.188	0.196
	Second stage: dep. var. Educ1											
Mage	0.306***	0.447*	0.335**	0.362***	0.294***	0.358	0.415*	0.407**	0.315***	0.420	0.489*	0.462**
	(0.045)	(0.256)	(0.155)	(0.138)	(0.031)	(0.476)	(0.214)	(0.196)	(0.029)	(0.266)	(0.266)	(0.186)
Obs.	530	530	530	530	1,003	1,003	1,003	1,003	965	965	965	965
R-squared	0.365	0.350	0.364	0.363	0.347	0.344	0.336	0.338	0.367	0.357	0.341	0.349
F-test		11.7	29.1	17.8		3.1	18.3	10.4		8.5	11.6	10.2
Sargan test				0.71				0.91		.		0.85
	Subsample for Educ2											
	First stage: dep. var. Mage											
Maithali		−1.231***		−1.095***		−0.755***		−0.658***		−0.729***		−0.824***
		(0.261)		(0.258)		(0.166)		(0.165)		(0.189)		(0.187)
Avemage			0.968***	0.936***			0.774***	0.755***			0.945***	0.974***
			(0.118)	(0.119)			(0.095)	(0.096)			(0.110)	(0.110)
Obs.		1,877	1,877	1,877		3,128	3,128	3,128		3,076	3,076	3,076
R-squared		0.195	0.210	0.215		0.157	0.170	0.173		0.205	0.216	0.220

(Continues)

TABLE 10 (Continued)

	Upper wealth households				Adult marriage (*Mage* ≥ 15)				Four regions			
	OLS	**IV1**	**IV2**	**Two IV**	**OLS**	**IV1**	**IV2**	**Two IV**	**OLS**	**IV1**	**IV2**	**Two IV**
	Second stage: dep. var. Educ2											
mean) mage	0.186***	0.386**	0.323***	0.338***	0.201***	1.016***	0.370***	0.471***	0.196***	0.579**	0.313**	0.364***
Obs.	1,877	1,877	1,877	1,877	3,128	3,128	3,128	3,128	3,076	3,076	3,076	3,076
R-squared	0.375	0.343	0.360	0.356	0.445	0.099	0.430	0.407	0.455	0.353	0.445	0.435
F-test		22.3	67.5	41.3		20.6	65.0	39.4		14.9	74.0	47.5
Sargan test				0.76				0.02				0.30

Note: White robust standard errors are given in parentheses. ***Significant at 1% level, **significant at 5% level, *significant at 10% level. Mage is treated as endogenous. IV1: Maithili. IV2: Avmage. Sample of 25–49 years old. Upper wealth households correspond to top 50% households in terms of landholding. Adult marriage: *Mage* ≥ 15. Four regions: Eastern, Central, Western, and Abroad. The regression models also contain the covariates in Tables 8 and 9.

TABLE 11 Robustness checks (II)

	OLS	IV1	IV2	Two IV	OLS	IV1	IV2	Two IV
	Subsample for 25–35 years old				**Subsample for 30–35 years old**			
	Subsample for Educ1							
	First stage: dep. var. Mage							
Maithali		−1.873***		−1.803***		−2.539*		−2.315*
		(0.630)		(0.623)		(1.326)		(1.314)
Avemage			0.627**	0.592**			0.670	0.578
			(0.249)	(0.246)			(0.421)	(0.412)
Obs.		734	734	734		339	339	339
R-squared		0.206	0.202	0.213		0.236	0.232	0.241
	Second stage: dep. var. Educ1							
Mage	0.321***	0.411	0.875**	0.596***	0.229***	0.0630	0.347	0.174
	(0.0356)	(0.277)	(0.435)	(0.229)	(0.0473)	(0.480)	(0.477)	(0.349)
Obs.	734	734	734	734	339	339	339	339
R-squared	0.372	0.365	0.119	0.309	0.374	0.348	0.361	0.371
F-test	,	8.9	6.3	7.2		3.7	2.5	2.84
Sargan test				0.32				0.65
	Subsample for Educ2							
	First stage: dep. var. Mage							
Maithali		−0.581**		−0.519**		−0.894***		−0.805**
		(0.234)		(0.230)		(0.344)		(0.342)
Avemage			0.949***	0.939***			0.995***	0.974***
			(0.151)	(0.150)			(0.237)	(0.238)
Obs.		2,035	2,035	2,035		1,093	1,093	1,093
R-squared		0.225	0.242	0.244		0.224	0.239	0.243

(Continues)

TABLE 11 (Continued)

	OLS	IV1	IV2	Two IV	OLS	IV1	IV2	Two IV
	Subsample for 25–35 years old				**Subsample for 30–35 years old**			
	Second stage: dep. var. Educ2							
Mage	0.189***	0.983**	0.484***	0.531***	0.189***	0.663*	0.145	0.238
	(0.0315)	(0.488)	(0.169)	(0.163)	(0.0315)	(0.384)	(0.194)	(0.175)
Obs.	1,093	2,035	2,035	2,035	1,093	1,093	1,093	1,093
R-squared	0.464	0.218	0.458	0.446	0.464	0.323	0.463	0.463
F-test		6.18	39.7	22.6		6.7	17.6	11.9
Sargan test				0.24				0.17

Note: White robust standard errors are given in parentheses. ***Significant at 1% level, **significant at 5% level, *significant at 10% level. Mage is treated as endogenous. IV1: Maithili. IV2: Avmage. The regression models also contain the covariates in Tables 8 and 9, except that it includes a full set of dummy variables for each age.

The third potential source of bias is that the Maithili instrument might reflect regional variations in marriage practice rather than the effect of Maithili dowry culture. We estimated our models on a subsample that comes from regions in which the Maithili community is concentrated. This subsample includes the Eastern, Central, Western, and Abroad regions but excludes the Midwestern and Far Western regions. The estimates reported are similar to the corresponding baseline models.

An anonymous referee pointed out that since there is gender parity in primary schooling in Nepal and school facilities would have been very different for someone aged 25 and 49 years old, the results could be specific to the completion of secondary grade. To explore this issue, we include the regression results for a restricted sample of 25–35 years old in Table 11. The rationale is that if the effects were driven by differences in birth cohort effects, these should be different when using the restricted sample. The results are still positive and in line with the baseline results. There are some difference in magnitude, but they are, however, within a 95% confidence interval of each other.

6 | CONCLUSIONS

We investigated the impact of age at marriage on female education using survey data from Nepal. We instrumented age at marriage via variables that reflect cultural norms and peer group effects around the socially acceptable age at which women should marry. While the results differed across our different IVs and samples, the estimates indicate that each year's delay in marriage increases female education from 0.2 to 0.5 years. These figures are roughly in line with the estimates found by Field and Ambrus (2008) of 0.22 and those reported by Asadullah and Wahhaj (2019) of 0.42.

These findings support the attempts by social reformers and governments to curtail the practice of early marriage in countries where it is encouraged by tradition, particularly across the South Asian subcontinent. Policies that increase marriage age might increase parent's incentives to spend on girls' education. In particular, our findings suggest that an important channel for policy intervention would be addressing cultural norms regarding female marriage. In line with this, policymakers should work closely with and support community-based organizations that try to lift women out their traditional roles as wives and mothers. In Nepal, organizations such as Nepal Lending Hands and Janakpur Women's Development Centre have been established precisely for this purpose.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author on request.

ORCID

Gabriel Montes-Rojas https://orcid.org/0000-0002-8447-4929

ENDNOTES

[1] See Wahhaj (2018) and Yount, Crandall, and Cheong (2018) for extensive literature reviews on this link. In particular, Wahhaj (2018) carries out a wide-ranging review of both economic and sociological explanations for early marriage and gender gaps in marriage age.

[2] It is also noteworthy that, at 82.8%, Nepal has one of the highest rates of female labor force participation anywhere. The corresponding figures for its neighbors are: Afghanistan (21.6%), Bangladesh (36.3%), Pakistan (21.9%), and India (20.5%) although 20 years ago India was closer to where Bangladesh is now (see https://databank.worldbank.org [World Development Indicators 2019]). These figures suggest that Nepal's gender gap in upper secondary education is not necessarily related to norms that oppose female work outside the home.

[3] Two caveats about the data. First, although the most recent in terms of availability, some of the data are from as early as 2011. It is likely that further progress has been made across the region. Second, the data on school completion in Table 1 were taken from the UNICEF website. The World Bank WDI website tends to report higher completion rates. This is for two reasons. First, the UNICEF data are based on standardized DHS surveys that are conducted on a 5-year rotating basis across partner countries, while WDI uses a variety of sources, including administrative data, which can vary from one country to another in frequency and reliability. Second, the two measure completion rates differently: UNICEF measures it as the ratio of pupils completing a given level, whose age ranges from the normal age for completing that level to 5 years above that age to the total population of children in that age range, while WDI defines it as the ratio of pupils *entering* the last year of the given stage, whose age is exactly at the normal age for that year of schooling, to the total population of children of the same age. These differences tend to make the WDI estimate higher than the UNICEF one.

[4] These figures represent singulate mean age at marriage, which includes never-married individuals in each age cohort. This normally results in a higher value of average age at marriage than would be the case if the sample included only ever-married individuals.

[5] Amin and Das (2014) corroborate these interpretations: using district-level survey data on marriage practices, they found that Sylhet had the lowest incidence of dowry payment as well as the lowest rate of female child marriage for all age cohorts of ever-married women.

[6] The full list of differences between the two studies is as follows: the 1976 survey was based on a nationally representative sample, while the 2000 survey drew upon only two adjoining districts in Western Nepal; Thapa (1989) identified nine groups: Brahmins, Chhetri-Thakuri, Newar, Muslim, Tharu-Satar-Mosar, Kirate, Gurung-Magar, Tamang, and Other, while Aryal (2007) used six: Brahmin, Chhetri, Gurung-Magar, Tharu-Choudhary, Kami-Damain, Newar; Aryal (2007) included age at menarche, while Thapa (1989) used detailed information on female employment.

[7] Both authors, however, caution that the permissive traditions of ethnic groups such as Gurung are being eroded under the influence of the more dominant Chhetri-Brahmin culture, a process they call *Sanskritization*.

[8] Refer to Table 1, which is based on UNICEF data: in Bangladesh, 22% of women marry by age 15, while in Nepal, the corresponding percentage is 7 and even lower in India and Pakistan; however, from Table 4, which we have calculated using our own, admittedly earlier, data set we can see that, given the diversity of age at marriage across ethnic groups in Nepal, for some ethnicities the figure might still be quite high.

[9] The possibility that education is a consumption good in addition to an investment in human capital has its precedents in the education and health literature. See, for example, early attempts to empirically disentangle these two effects by Schaafsma (1976) and Lazear (1977). Cutler and Lleras-Muney (2006) summarize a large body of evidence that establishes a positive relationship between health and education, even after accounting for the effects of education on income. Their argument is that education leads to better decision-making and information-seeking and thus helps individuals maintain good health.

[10] Ashraf (1997), Srinivasan and Lee (2004), and Dyson and Moore (1983), however, identify Bihar state in India, with which the Maithili community is culturally and linguistically related, as one of two states in which dowry-giving traditions are deeply rooted and cut across religious and caste lines. Empirical findings from India also suggest a positive correlation between the size of the dowry and the socioeconomic standing of the prospective husband (Jejeebhoy & Halli, 2006).

[11] In our data set, Maithili speakers are themselves classified as Brahmin, Muslim, Tharu, Yadav, and others (see Table 6); the reason we can identify them is because of a unique question that asked respondents to identify their native language.

[12] On its website, http://fightvaw.org/news/view/519, FVAW highlights a demonstration held in June 2014 in Rajbiraj, a town in Satpari District, by Maithili women, in protest against the high incidence of child marriages in their

community and the dowry culture that they blamed for this evil. The protesters were demanding implementation of a law passed in 1976 outlawing *Tilak Pratha*.

[13] According to the data cited by Billari et al. (2003), older women perceived age limits for marriage more frequently than younger ones, and all age groups believed more strongly in a minimum age than a maximum. For example, 11% of women born between 1945 and 1947 believed in an upper age limit, but only 5% of women born in 1973 did so. These are results from modern Europe. Casual evidence suggests that such culturally influenced age limits are far stronger in traditional South Asian ones than in modern European ones. Unfortunately, we are not aware of similar survey evidence from Asia, but even in the 1960s, from the survey data from the USA, Neugarten, Moore, and Lowe (1965) reported that 80% of male and 90% of female respondents believed that men should marry between the ages of 20 and 25, and 85% of men and 90% of women set the analogous age range for women between 19 and 24 years.

[14] The sample of households was drawn using registry records of current and former pupils at local schools; therefore, it was inevitable that all households had at least one daughter with positive schooling. The authors acknowledge the bias that this creates but attempt to control for it by asking respondents about the overall attitudes of their fellow villagers and comparing the responses for consistency.

[15] Brahmin, Chhetri, Newar, Magar, Tharu, Tamang, Kami, Yadav, Muslim, Rai, Gurung, Limbu, Sarki, and others.

[16] Only one of 46 women of the Sarki ethnic group reported having attended school, and therefore we have excluded this group from *Educ1* for the purposes of this table.

[17] We would expect marital age to have a stronger effect on years of schooling than on the decision between "some" and "no" schooling. This is reflected to some extent in the coefficients of Mage being larger in most regressions for *Educ1*, in which comparatively fewer women reported no schooling, than in *Educ2*, which has a large proportion of such women. Referring to Table 9, the exceptional case is that of IV1, proxying Maithili membership, for which the magnitudes are reversed. One explanation for this could be that compositional effects arise with respect to the IV1 dummy: as we see in Table 5, 87% of Maithili women have no formal schooling, and Maithilis would thus be underrepresented in *Educ1*, relative to their proportion in *Educ2*. This could also explain why the coefficient of Mage tends to be insignificant in many IV1 regressions that use *Educ1*. Finally, we should note that the standard errors of all regressions using *Educ1* are larger than for those that use *Educ2*, making simple comparisons of point estimates problematic even when the Maithili dummy is not being used.

REFERENCES

Amin, S., Asadullah, M. N., Hossain, S., & Wahhaj, Z. (2017). Eradicating child marriage in the commonwealth: Is investment in girls' education sufficient? *The Commonwealth Journal of International Affairs, Round Table*, *106*(2), 221–223.

Amin, S., & Das, M. B. (2014). Marriage continuity and change in Bangladesh. In R. Kaur & R. Palriwala (Eds.), *Marrying in South Asia: Shifting concepts, changing practices in a globalising world* (chap. 6, pp. 172–199). Hyderabad, India: Orient Blackswan.

Anderson, S. (2007). The economics of dowry and brideprice. *Journal of Economic Perspectives*, *21*(4), 151–174.

Aryal, T. R. (2007). Age at first marriage in Nepal: Differentials and determinants. *Journal of Biological Sciences*, *39*, 693–706.

Asadullah, M. N. (2006). Returns to education in Bangladesh. *Education Economics*, *14*(4), 453–468.

Asadullah, M. N., & Wahhaj, Z. (2019). Early marriage, social networks and the transmission of norms. *Economica*, *86*, 801–831.

Ashraf, N. (1997). Dowry among Muslims in Bihar. *Economic and Political Weekly*, *32*(52), 3310–3311.

Ashraf, N., Bau, N., Nunn, N., & Voena, A. (2020). Bride price and female education. *Journal of Political Economy*, *128*(2), 591–641.

Aslam, M. (2009). Education gender gaps in Pakistan: Is the labor market to blame? *Economic Development and Cultural Change*, *57*(4), 747–784.

Becker, G. S. (1973). A theory of marriage: Part I. *Journal of Political Economy*, *81*(4), 813–846.

Behrman, J. R., & Deolalikar, A. B. (1995). Are there differential returns to schooling by gender? The case of Indonesian labour markets. *Oxford Bulletin of Economics and Statistics*, *57*(1), 97–117.

Billari, F. C., Prskawetz, A., & Furnkranz, J. (2003). On the cultural evolution of age-at-marriage norms. In F. Billari, & A. Prskawetz (Eds.), *Agent-based computational demography. Contributions to economics*, (139–157). Heidelberg: Physica.

Brien, M. J., & Lillard, L. A. (1994). Education, marriage and first conception in Malaysia. *Journal of Human Resources*, *29*(4), 1167–1204.

Brunson, J. (2010). Son preference in the context of fertility decline: Limits to new constructions to gender and kinship in Nepal. *Studies in Family Planning*, *41*(2), 89–98.

Cameron, L. A., & Worswick, C. (2001). Education expenditure responses to crop loss in Indonesia: A gender bias. *Economic Development and Cultural Change*, *49*(2), 351–363.

Chari, A., Heath, R., Maertens, A., & Fatima, F. (2017). The causal effect of maternal age at marriage on child wellbeing: Evidence from India. *Journal of Development Economics*, *127*, 42–55.

Corno, L., Hildebrandt, N., & Voena, A. (2020). Age of marriage, weather shocks and the direction of marriage payments. *Econometrica*. *88*(3), 879–915.

Cutler, D., & Lleras-Muney, A. (2006). *Education and health: Evaluating theories and evidence* (NBER Working Paper No. W12352). http://www.nber.org/papers/w12352

Cyan, M., Rider, M., Price, M., & Roberts, S. J. (2019). *What accounts for the education gender in Pakistan's Khyber Pakhtunkhwa Province?* (Working Paper 19–06, April 2019). International Center for Public Policy, Georgia State University.

Dahl, G. B. (2010). Early teen marriage and future poverty. *Demography*, *47*(3), 689–718.

Dalmia, S., & Lawrence, P. G. (2005). The institution of dowry in India: Why it continues to prevail. *Journal of Developing Areas*, *38*(2), 71–94.

den Boer, A., & Hudson, V. (2017). Son preference, and sex selection in South Korea and Vietnam. *Population and Development Review*, *43*(1), 119–147.

Dhamija, G., & Roychowdhury, P. (2020). Age at marriage and women's labour market outcomes in India. *Journal of International Development*, *32*(3), 342–374.

Dixon-Mueller, R. (2008). How young is too young? Comparative perspectives on adolescent sexual, marital, and reproductive transitions. *Studies in Family Planning*, *39*(4), 247–262.

Dyson, T., & Moore, M. (1983). On kinship structure, female autonomy and demographic behavior in India. *Population and Development Review*, *9*(1), 35–60.

Elster, J. (1989). Social norms and economic theory. *Journal of Economic Perspectives*, *3*(4), 99–117.

Field, E., & Ambrus, A. (2008). Early marriage, age of menarche and female schooling attainment in Bangladesh. *Journal of Political Economy*, *116*(5), 881–930.

Grant, M. J., & Behrman, J. R. (2010). Gender gaps in educational attainment in less developed countries. *Population and Development Review*, *36*(1), 71–89.

Hatlebakk, M. (2017). Son preference, number of children, education and occupational choice in rural Nepal. *Review of Development Economics*, *21*(1), 1–20.

Islam, M. K., Haque, M. R., & Hossain, M. B. (2016). Regional variations in child marriage in Bangladesh. *Journal of Biological Sciences*, *18*, 694–708.

Jacoby, H. G., & Skoufias, E. (1997). Risk, financial markets, and human capital in a developing country. *Review of Economic Studies*, *64*(3), 311–335.

Jafarey, S., & Maiti, D. (2015). Glass slippers and glass ceilings: An analysis of marital anticipation and female education. *Journal of Development Economics*, *115*, 45–61.

Jejeebhoy, S. J., & Halli, S. S. (2006). Marriage patterns in rural India: Influence of sociocultural context. In C. B. Lloyd, J. R. Behrman, N. P. Stromquist, & B. Cohen (Eds.), *The changing transitions to adulthood in developing countries: Selected studies* (chap. 6, pp. 172–199). Washington, DC: The National Academies Press.

Kingdom, G. G. (1998). Does the labour market explain lower female schooling in India? *Journal of Development Studies*, *35*(1), 39–65.

Lahiri, S., & Self, S. (2007). Gender bias in education: The role of inter-household externality, dowry and other social institutions. *Review of Development Economics*, *11*(4), 591–606.

Lazear, E. (1977). Education: Consumption or production? *Journal of Political Economy*, *85*, 569–597.

Mensch, S., Singh, S., & Casterline, J. B. (2006). Trends in the timing of first marriage among men and women in the developing world. In C. B. Lloyd, J. R. Behrman, N. P. Stromquist, & B. Cohen (Eds.), *The changing transitions*

to adulthood in developing countries: Selected studies (chap. 5, pp. 118–171). Washington, DC: The National Academies Press.

Munshi, K., & Rosenzweig, M. (2006). Traditional institutions meet the modern world: Caste, gender and schooling choice in a globalizing economy. *American Economic Review*, *96*(4), 1225–1252.

Neugarten, B. L., Moore, J. W., & Lowe, J. C. (1965). Age norms, age constraints, and adult socialization. *American Journal of Sociology*, *70*(6), 710–717.

Rosenzweig, M. R., & Schultz, T. P. (1982). Market opportunities, genetic endowments, and intrafamily resource distribution: Child survival in rural India. *American Economic Review*, *72*(4), 803–815.

Sathar, Z., Kiani, M., & Farooqui, M. (1986). Delayed marriages in Pakistan. *Pakistan Development Review*, *25*(4), 535–552.

Sawada, Y. (1997). Human capital investments in Pakistan: Implications of micro evidence from rural households. *Pakistan Development Review*, *36*(4), 695–712.

Schaafsma, J. (1976). The consumption and investment aspects of the demand for education. *Journal of Human Resources*, *11*, 233–242.

Settersten, R., & Hagestad, G. (1996). What's the latest? Cultural age deadlines for family transitions. *The Gerontologist*, *36*(2), 178–188.

Srinivasan, P., & Lee, G. R. (2004). The dowry system in northern India: Women's attitude and social change. *Journal of Marriage and Family*, *66*(5), 1108–1117.

Thapa, S. (1989). The ethnic factor in the timing of family formation in Nepal. *Asia Pacific Population Journal*, *4*(1), 3–34.

UN-ESCAP (2012). Harmful traditional practices in three countries of South Asia: Culture, human rights and violence against women (Gender and Development Series Discussion Paper No., 21). http://www.unescapsdd.org/files/documents/SDD_pub_2530.pdf

United Nations General Assembly (2015). *Transforming our world: The 2030 agenda for sustainable development (A/RES/70/1)*. New York: Author.

Wahhaj, Z. (2018). An economic model of early marriage. *Journal of Economic Behavior and Organization*, *152*, 147–176.

Yount, K. M., Crandall, A., & Cheong, Y. F. (2018). Women's age at first marriage and long-term economic empowerment in Egypt. *World Development*, *102*, 124–134.

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