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Mother's Age at Marriage and Gender-Differential in Child Schooling: Evidence from Pakistan

Sumeet Ashok[†] Mazhar Mughal[‡] Rashid Javed^{*}

Abstract

In this study, we provide empirical evidence in support of intergenerational effects of women's marriage age on girl-specific child education outcomes using a nationally representative household survey of 24,809 households from Pakistan. Our key findings are four-fold: First, we find that mother's age at marriage has no girl-specific impact on the education of children of school going age in terms of school enrolment, type of school (public/private) or education expenditure. However, there is a positive effect of delaying mother's marriage on girls in terms of relative grade progression and primary school attainment, implying that late-marrying mothers are more likely to transfer their human capital advantages/disadvantages to the daughters. Second, the impact does not depend on whether the child is firstborn or later-order, youngest child or with no siblings. Sex of the previous child does not affect the relationship either. Third, the beneficial impact of mother's marriage age on girls' education is visible only in the cohort of women who got married in 2000 or later. Fourth, father's marriage age is significantly associated with an increase in daughters' school enrolment and primary completion. The impact of smaller spousal age difference is also positive. These findings are robust to the use of empirical strategies and specifications that address potential endogeneity, collider bias, recall bias, sample selection and confounding factors. These findings suggest that delay in women's marriage is helping to narrow down gender disparities in education. The findings underscore the need to promote social and behavioural changes that encourage later marriages.

Key Words: Education Outcomes; Early Marriage; Intergenerational transmission; Pakistan.
JEL Codes: I24, J12, D64, C26.

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1. Introduction

Women in South Asia face various economic and social challenges arising from patriarchal values and socio-cultural norms that manifest in male-favouring behaviour throughout the life cycle, from birth of a child (Almond et al., 2013; Edlund, 1999; Guilmoto, 2009; Pörtner, 2021) to marriage market norms (Anderson, 2007; Caldwell et al., 1983; Makino, 2019). These features shape the general economic behavior of a society as a whole, where women have disproportionately low access to opportunities, particularly in education. Maitra et al. (2016) find evidence of significant female disadvantage in education in India which reflect variations in non-altruistic parental preferences linked to deeply held cultural norms. According to Alderman and King (1998), disparities in investment could come through differences in returns realized by parents, for example, in the probability of transfers from children to parents or in the degree of sympathy or altruism, even when market returns to the children themselves do not differ. Sahoo (2017) shows that there is an intra-household gender bias of 6 percentage points in private school enrolment among children aged 6–16 years from rural households in Uttar Pradesh, a northern state of India.

Apart from economic conditions, cultural traditions and gender norms, an important factor that hinders women's educational attainment is the practice of early marriage (Field & Ambrus, 2008; Parsons et al., 2015; Raj et al., 2010). According to article 1 of the Convention of the Rights of Child (CRC), early marriage- also known as child marriage- is formal or customary marriage that takes place before the person's 18th birthday. Existing literature has shown a strong relationship between female early marriage and the educational attainment of women and children (Behrman et al., 2006; Chari et al., 2017; Choe et al., 2005; Delprato et al., 2015; Fall et al., 2015; Field & Ambrus, 2008; Marphatia et al., 2022; Mim, 2017; Raj et al., 2014; Scott et al., 2021; Sekhri & Debnath, 2014). Bates et al. (2007), for instance, reported that 5 or more years of maternal education is associated with substantial delays in daughters' age at marriage in Bangladesh. Similarly, Scott et al. (2021) analyzed eight rounds of demographic and health surveys from South Asian countries and reported that improvements in wealth and education explained between 44% and 96% of the actual reduction in early marriage. In contrast, Raj et al., (2014) found that primary

education is likely insufficient to reduce girl child marriage in three out of four South Asian countries studied, and secondary education can be more potent in this regard.

Falling rates of child marriage and increasing age at marriage are significantly associated with improvement in education attainment among women and their children. Field and Ambrus (2008) estimated that a one year delay in women's marriage age leads to 0.22 years of additional schooling for Bangladeshi women. Mim (2017) found that child marriage keeps Bangladeshi girls from getting educated and hinders their empowerment in the society. In their analysis of data from 36 countries, Delprato et al. (2015) found that delaying early marriage by one year is associated with an increase of half a year of education in Sub-Saharan Africa and nearly one third of a year of education in South West Asia as well as a lower likelihood of dropping out from secondary school of 5.5% in South West Asia. In the same vein, studies on India (for instance, Sekhri & Debnath (2014); Chari et al. (2017)) identify the inter-generational effects of mother's age at marriage on children's educational and health. However, they do not explicitly focus on the impact of maternal age at marriage on girl-specific child wellbeing outcomes.

Evidence on the girl-specific effects of mother's marriage age on children's educational outcomes is so far limited. The issue is particularly pertinent in the context of Pakistan, where 39 percent of women get married before the age of 18 (Javed & Mughal, 2021). The country ranks second in the world for the number of out of school children, majority of whom are girls (UNICEF, 2017). Moreover, many of the country's cultural and ethnic groups display strong preference for sons (Javed & Mughal, 2020, 2022; Zaidi B, 2016). High prevalence of female early marriage combined with low level of literacy and cultural preference for sons creates profound disadvantages for girls, which may accentuate the problem of gender inequality in a country that ranks 151 out of 153 on gender parity index (World Economic Forum, 2020).

This study aims to examine the girl-specific association of mother's age at marriage with children's educational outcomes. We are interested in identifying whether it is the sons or daughters who benefit more from the transmission of social and human capital endowment advantage/disadvantage by the mothers. Our attempt in this study is not to establish the causal impact of mother's age at marriage but to provide comprehensive suggestive evidence to infer a significant or lack of significant association between mother's age at

marriage and girl-specific education outcomes. We analyse data from the latest round of Household Integrated Economic Survey (HIES) 2018-19, conducted by the Pakistan Bureau of Statistics (PBS). We employ a simple linear regression model with province-fixed effects, and include an interaction term to capture the girl-specific association of mother's marriage age with children's educational indicators. We consider three categories of indicators which take in to account allocation of parental resources in terms of time, effort and money on children's education. The first of these category reflects access to education and school choice, the second category pertains to educational progression and attainment, while the third category corresponds to parental educational investment behaviour. The indicators in the first category include the incidence of school enrolment and private schooling of children of school going age (6 – 18), those in the second category include relative grade progression of the children of school going age and primary education completion of children aged 12 - 18, while household expenditure on children's education represents the third category. These indicators account for various dimensions of women's involvement in children's education, from the decision to send them to school to their progression at school and their completing schooling, and from the money the household spends on the children's education to the extent the household wants to invest in children's education by sending them to a free government school or an expensive, private school. Together, these outcome variables cover the full spectrum of effects of women's age at marriage on children's education in terms of entry, progress and completion.

We find that the beneficial effect of a delay in a woman's marriage age is not dissimilar for male and female child's education in terms of either its educational access and schooling choice or investment in education. However, there is evidence that girls born to late marrying mothers progress further in school and are more likely to complete primary education. In addition to the baseline estimates, we examine the role of birth order (firstborn, later born child, youngest child, child with no sibling, sex of previous child). We compare the women in the pre- and post-2000 marriage cohorts to examine whether the impact of mother's marriage age on children's education has evolved over time. During the time period examined (1981 – 2019), Pakistan underwent demographic transition, as fertility rates fell, average age at marriage grew, and enrolment and attainment rates increased. We also compare the impact of mother's marriage with that of father's marriage

age and their age difference. We conduct a number of sensitivity analyses and robustness checks by including mother and mother's age-fixed effects, countering collider bias and accounting for potential problems related to girl-specific recall bias and self-selection. We also obtain estimates by employing a different definition of early marriage and using instrumental variable estimator as an alternative empirical approach. We find that the results remain in line and comparable with the baseline findings.

This paper is organized as follows. Section 2 briefly discusses relevant literature and the study's conceptual framework. Section 3 introduces the HIES dataset used in the study and provides descriptive statistics. Section 4 presents the empirical methodology employed. Section 5 reports the results and discusses key findings. Section 6 presents the results of a battery of robustness checks. Section 7 discusses the results and provides conclusions.

2. Literature Review

A large body of literature has examined the effects of women's marriage age on marital life. For example, Moore & Waite (1981) found that teenage parenthood did not appear to increase the risk of divorce or separation among young wives in the US, whereas teenage marriage significantly increased the probability of disruption. In the same vein, Heaton et al. (2001) found that there is a lower chance of separation among late-married couples in Indonesia. In contrast, Garcia-Hombrados and Özcan (2024) reported that early marriage among Chinese couples within the 20-25-year-old age does not increase their risk of divorce.

Extant literature also underscores the role of mother's age at marriage in determining fertility and reproductive outcomes. For example, Kamal and Ulas (2021) examined the association of child marriage with fertility and fertility-related outcomes of married women age 20 – 49 in six countries of South Asia. They found that early-marrying women have lower likelihood of early and repeated childhood and higher likelihood of high fertility, unintended pregnancy, lifetime pregnancy termination and use of modern contraceptive method, compared to late-marrying women. In contrast, Nahar et al. (2013) showed that Bangladeshi women who marry later produce fewer children than those who marry early.

Kiani (1998) and Nasrullah et al (2014) found that early marriage in Pakistan is significantly associated with high fertility. Raj et al. (2009) found evidence for higher contraceptive use among late-married mothers in India. Onagoruwa and Wodon (2018) analyze data on women aged 35 – 49 from 15 countries, and estimate that the reduction in total fertility from ending child marriage ranges from 0.24 to 1.06 children per woman, with countries with high prevalence of child marriage witnessing a greater decrease.

Existing literature also shows a link between mothers' marriage age and son preference. For example, in a recent study, Mughal et al (2023) found that women who married before turning 18 not only state a greater desire for boys but are also less likely to stop reproduction as long as they do not have a son. Mother's age at marriage is also important in terms of adverse medical outcomes. For example, Nour (2006) pointed out that early married females have high risk of catching sexually transmitted diseases, cervical cancer, malaria, death during childbirth and obstetric fistulas. In addition, there is also a high probability of premature birth and infant or child mortality.

Marphatia et al. (2017) provide a comprehensive synthesis of the physiological, bio-demographic, and socio-environmental drivers of variable marriage age. They describe the adverse health consequences to mothers and to their offspring of an early age at marriage and of childbearing, which include malnutrition and high rates of morbidity and mortality. Similarly, Garcia-Hombrados (2022) found a causal effect of mother early marriage on child mortality in Ethiopia. Fall et al. (2015) analysed maternal and child development data from five developing countries and found that younger maternal age is associated with low birthweight, preterm birth and 2-year stunting of children born.

Field & Ambrus (2008) demonstrated the causal effect of women's age at marriage on their educational outcomes and their children's health and educational trajectory. Cameron et al. (2023) reported that child marriage among Indonesian women is associated with lesser educational attainment, lower earnings and less say in household decision-making, and that early-marrying women are less likely to have a medically-supervised birth and their children are more likely to die, be stunted and perform worse on cognitive tests. Chari et al. (2017) showed that delayed marriage among Indian women results in significantly better

child health and educational outcomes. They found that a one-year delay in mother's age at marriage in India increases by 4.6 percent the probability that the child will get vaccinated, and by 3.1 percent the probability that the child will get enrolled in school. Sekhri & Debnath (2014) found a strong relationship between women's age at marriage and their children's learning outcomes in India. A one-year delay in mother's marriage age increases the probability that the child can solve challenging arithmetic problem and perform reading task by 3.5 percentage points. Similarly, Perez-Alvarez & Favara (2023) found that children born to very young mothers perform worse in math in India.

3. Data

We employ data from the Household Integrated Economic Survey (HIES) 2018-19, conducted by Pakistan Bureau of Statistics (PBS)¹. HIES is conducted under the Pakistan Social and Living measurement Survey (PSLM) project since 2004. The current round covered 24,809 household from all the four provinces² based on 1802 urban and rural Primary sampling units (PSUs). The HIES is a comprehensive, nationally representative survey that collects information on various aspects of Pakistani households, including education, employment, income, health, demographic characteristics, water, and sanitation. The survey allots unique identification codes to fathers and mothers, which helps identify couples' biological children. This attribute of the data helps us to establish mother's characteristics and their effects on child schooling in the respective household. The unit of analysis is the children of school going age (age 6 – 18).

To identify the effect of mother's marriage on child schooling, we consider three categories of educational indicators of the children of school-going age. The first category comprises two variables of outcomes representing the educational access and schooling choice: The first variable, current enrolment of the children of school-going age (6 – 18), is a dichotomous variable which takes the value 1 if a child is currently attending school, otherwise 0. The second variable pertains to whether the child of school going age is currently enrolled in a private or a public school. It takes the value 1 if a child is currently

¹ downloaded from www.pbs.gov.pk

² Federally Administered Tribal Areas (FATA) and Gilgit Baltistan were not included in survey.

attending a private school, otherwise 0. The second category consist of two outcomes pertaining to educational progression and attainment: The first variable is the relative grade progression ratio of the children of school going age, defined as the ratio of completed years of schooling over potential years of schooling. It can be given by the following formula:

$$\text{Relative grade progression} = \frac{\text{COMPLETED YEARS OF EDUCATION}}{\text{AGE}-6},$$

Where six years is the mandatory age for school enrolment in Pakistan. The second indicator, primary school completion, is calculated for children aged 12 to 18, and therefore one year after the official age for completing primary school.

The third category captures the parental preferences and investment behaviour in terms of children's education, measured as the log of the child's educational expenditure.

We restrict our sample to the children for whom mother's characteristics including age at marriage, sequence of birth, number of births, health, and education status are available in the dataset. Our useable sample contains observations for 30,563 children for the first education indicator, 24,219 children for the second indicator, 15,143 children for the third indicator, 8,418 children for the fourth indicator, and 28,343 children for the last indicator.

[Insert Table 1]

Table 1 shows summary statistics of children's educational indicators, overall and by mother's marriage age. In our sample, 67% of school going age children (aged 6-18) are currently enrolled. The enrolment rates of children born to mothers who married after 18 are significantly higher compared to those born to early-marrying mothers. For instance, 69.22% of the children born to women who married after turning 18 are currently enrolled compared to 63.88% of the children of early marrying-women. Enrolment in private school is likewise higher among the children of late-marrying women (34.58%) compared to those born to early-marrying women (30.73%). In the similar vein, once the child get to school, their performance in terms of grade progression and primary education completion is stronger among children born to mothers who got married after the age of 18. The educational expenditure on children of late-marrying women is likewise higher.

Overall, school enrolment, enrolment in private school, relative grade progression, primary

completion, and educational expenditure all increase with mother's marriage age (Two-way t test values = 9.02, 5.59, 11.75, 6.90, and 7.38, respectively).

[Insert Figure 1 and 2]

Figures 1 and 2 illustrate the relationship between mothers age at marriage and child education outcomes by child gender. Figure 1 plots the distribution of children's school enrolment, private schooling, relative grade progression and primary completion while figure 2 plots the log educational expenditure by mother's marriage age for boys and girls, respectively. The proportion of children currently enrolled and the proportion of children enrolled in private schools are higher, both for boys and girls born to mothers who got married after the age of 18. Similarly, relative grade progression and primary completion are higher both for boys and girls born to late married mothers, but the beneficial effect of delaying mothers' marriage age is more evident for girls. A similar pattern can be observed in figure 2. The log education expenditure number of years of schooling for girls whose mothers got married before 18 is lower compared to those born to late-married mothers.

4. Empirical Methodology

4.1 Model

The baseline model specification can be given as follows.

$$Y_{CMH} = \beta_0 + \beta_1 \text{Marriage Age}_{MH} + \beta_2 \text{Female}_{CMH} + \beta_3 (\text{Marriage Age}_{MH} * \text{Female}_{CMH}) + \beta_4 X_{CMH} + \alpha_p + u_{CMH} \dots (1)$$

Here, Y_{CMH} represents the set of educational indicators for the child 'C' born to the mother 'M' in the household 'H'. Marriage Age_{MH} is an indicator for marriage age of mother M in the household H. Female_{CMH} is an indicator for the child's gender. Our variable of interest is the interaction between mother's marriage age and child gender dummy, β_3 is the coefficient of the variable of interest which represents the association between mother's marriage age and girl-specific child educational outcomes. X is the vector of covariates at the child, parent, and household level. Child controls include age, birth order, and sibling size. Parental controls include mother's education, mother's autonomy and father's education, and household covariates include income and region of residence. Mother's autonomy, defined as the ability of women to make decisions within the household, is measured through the female autonomy index generated using a unique survey design that

collects information on domestic decision making. The HIES interviews women in the household independently about who makes the decision- herself, her spouse or both on a wide range of household activities such as decisions pertaining to children's education, marriage, food, clothing, use of birth control and whether or not to continue childbearing. The index is created through principal component analysis (PCA). Finally, α_p Corresponds to province fixed effects, and u_{CMH} is the error term.

Table 2 presents summary statistics for the indicators of child, parental, and household characteristics. The average age of school going children is 10.5 years, 41.1% of them are girls, and each child has on average 2.1 siblings. The average age at marriage for mothers is 19.56 years. Mothers have 2.3 years of education on average compared to 5.2 years among fathers. 67% of children belong to rural households.

[Insert Table 2]

4.2 Methodology

The empirical analysis proceeds as follows: In the first step, we study the association between mother's age at marriage and gender differential in the above mentioned three sets of child educational outcomes. The estimations are carried out, first without, and then with the full set of controls and province fixed effects. Robust standard errors are clustered at the household level. In the second step, we focus on the role of children's birth order, first by separately estimating the mother's age at marriage – children's education relationship for the subsamples of firstborn and later-born children, secondly by restricting the sample to the youngest child and single child groups, and thirdly by controlling for the sex of the previous child. In the third step, we consider the role of demographic transition on the relationship between mother's age at marriage and gender differentials in children's educational outcomes by comparing the pre- and post-2000 marriage cohorts. In the fourth step, we explore the association between the father's age at marriage and gender differential in children's educational outcomes. We also compare the impact of mother's marriage age for the subsample in which the mother is less than five years younger than the father with that in which the age difference is at least five years.

In the final step, we carry out a number of robustness estimations to check the quality of our baseline estimations: First, we include mother fixed effects to hold constant the observed and unobserved factors that are fixed within a mother and that might also affect the child outcomes of interest. Second, we include mother's age fixed effects in our base line model to disentangle the lifecycle trends associated with child age. Third, we overcome the potential issue of collider bias (or intermediate variable bias) which can occur due to the inclusion of post-treatment controls correlated with the outcome. For that, we exclude post-treatment controls from our baseline specifications. Fourth, we estimate our baseline model by using the incidence of early marriage as an alternate indicator of mother's age at marriage. Fifth, we address the problem of recall bias or measurement error in marriage age or children's outcomes of interest by restricting the sample to younger mothers. Sixth, we account for potential bias in our estimations that may arise due to selection bias by alternately limiting the sample to households with below-median wealth and those without access to clean water. Seventh, we check the robustness of our baseline estimates by including an alternate control related to mother's agency in children's education decisions. Finally, we carry out a set of instrumental-variable estimations using two instruments to take into account potential endogeneity.

5. Results

5.1 Baseline Findings

Table 3 reports estimations for the five indicators of children educational outcomes representing the three categories. Each estimation includes the interaction of child gender with mother's marriage age, first without and then with the full set of controls and province fixed effects. Mother's marriage age is significantly and positively associated with four out of five child education outcomes, indicating that the likelihood of children's enrolment and school completion increases with mother's age at marriage. Likewise, the association of most indicators with the child's gender is significantly and negatively related, suggesting lower enrolment and attainment among girls of school going age.

In this analysis, we are mainly interested in the sign and significance of the interaction term $Marriage\ Age_{MH} * Female_{CMH}$. A positive sign would suggest a beneficial role of mother's late marriage on girls' education. Columns 1-4 show the results of the first category of

educational indicators including school enrolment and private schooling. The coefficients of the interaction term in all the four estimations are found to be insignificant, implying that mother's age at marriage has no significant girl-specific association with the first set of children's educational outcomes (the p-values of the four estimates range from 0.665 to 0.939). The association of mother's late marriage with girl's educational progression and primary school completion (Columns 5-8) is significant however. The coefficient of the interaction term is positive and significant at 1 to 5% level of significance, implying that a woman's association with girls' educational progression and attainment outcomes increases with her marriage age. A one-year increase in mother's age at marriage is associated with an increase of 0.003 in relative progression ratio and 0.011 in the proportion of primary school completion among girls of school going age. In contrast, the association with middle school completion (eight years of schooling) among children aged 15 - 18 lacks significance (p-value = 0.107 without controls, 0.431 with controls)³. This may owe to the fact that there are fewer middle and high schools in Pakistan, especially for girls, and supply side constraints (e.g. lack of water and sanitation facilities at school, distance from school) and transportation and other costs may prove more binding. However, these results are based on a much smaller number of observations, and may not be reliable.

[Insert Table 3]

Table 3 columns 9-10 report the results for the log educational expenditure variable that captures parental investment behaviour. We find a significant relationship between mother's age at marriage and gender differentials in educational expenditures, without controls and province fixed effects (P-value 0.025). However, the association loses any significance after adding controls and including province fixed effects (P-value 0.647).

To sum up, these findings show partial evidence for an association between mother's age at marriage and girl-specific child educational outcomes. The beneficial effect of delaying mother's marriage is more pronounced among girls in terms of progress at school and primary school completion, implying that late-marrying mothers transfer their human capital advantages more to the daughters. However, the effect of delay in woman's marriage

³ The results are shown in Table A1 in the appendix.

age for male and female child's education in terms of parental financial commitment is not dissimilar.

5.2 Role of Birth Order

Existing studies have shown that children's birth order can affect their developmental and welfare outcomes (Booth & Kee, 2009; Price, 2008; Sawada & Lokshin, 2009). Jayachandran & Kuziemko (2011) showed that parents' girl-specific behaviour relative to child outcomes increases with children's birth order. In the same vein, Mitra & Sengupta (2023) showed that in India, the eldest sibling is found to be more susceptible to drop out of school, and that the dropout rate is lower for younger siblings in the same household. Firstborn girls drop out more than their male counterparts. This bias may arise because first-born girls are often required to take up household chores and responsibilities to care for other siblings. Therefore we can expect sex- differential treatment of children to vary by birth order, and the impact on the firstborn girls could be higher than that on later-order girls.

[Insert Table 4]

Table 4 presents the results for the subsamples of first-born and later-born children. Columns 1-5 report results for the first born subsample while columns 6-10 represent the results for the later order children subsample. As seen in the preceding estimates, we do not find any girl-specific effect of mother's marriage on children's school enrolment, private school choice, grade progression and educational expenditure. These effects remain insignificant regardless of whether the child is firstborn or later-order, suggesting that the girl-specific association of mother age at marriage with children's educational outcomes does not differ by birth order. However, we find some evidence of girl-specific association with children's primary education completion (columns 4 and 9). A one-year increase in mother's marriage age is associated in an increase in the proportion of primary school completion by 0.019 among the firstborn girls and a smaller 0.01 among the later-order girls.

[Insert Table 5]

These findings can be challenged on the grounds that birth order is related to family size. The firstborn child may well be part of a smaller household compared to later order

children. In the presence of girl-specific birth stopping practices, parental investments may vary if girls disproportionately end up in larger households (Barcellos et al., 2014). In the same vein, the resources and attention that a child receives in a son-preferring society such as Pakistan may depend on the sex of the previous child.

To overcome this issue, we first restrict our sample to groups of youngest children and single children with no siblings. Table 5 report the results for the youngest child subsample (panel A) and the single child with no siblings subsample (Panel B). The girl-specific association between mother's age at marriage and children's educational outcomes remains insignificant for majority of indicators, with one and two out of five coefficients in the two subsamples significant at least at the 10% level, respectively. The signs for the significant results are invariably positive, suggesting mother's marriage age's positive association with girl child's education. Second, we control for the sex of the previous child (Table 6). As before, the results remain insignificant for most of the estimations, with the interaction term significant only for relative grade progression ratio and primary schooling attainment.

To sum up, the girl-specific association between mother's age at marriage and children's education does not seem to vary by birth order.

[Insert Table 6]

5.3 Role of Demographic Transition

In our estimated sample, women got married between 1981 and 2018, and children were born between 1981 and 2019. During this time period, Pakistan went through demographic transition, as fertility rate dropped from 6.7 to 3.6 (World Bank, 2022). Similarly, the contraceptive prevalence rate increased from 12% in 1990 to 34% in 2017 (PDHS, 2018).

This, coupled with the fact that the average age at marriage too has increased significantly over time, implies that the girl-specific association of mothers' marriage age with children's educational outcomes too may have evolved. We seek evidence to support this argument by dividing our sample into two cohorts of women: those who were married before 2000 and those who were married since the year 2000.

Table 7 reports partial results for these two cohorts, with the full set of controls and province fixed effects. In our first cohort (Pre-2000 marriage), the coefficient of interest for the interaction terms is invariably insignificant for all the three set of child education outcomes (p-values range from 0.196 to 0.977). However, we find significant evidence of girl-specific effect on children's grade progression and primary education completion for the second cohort (Post-2000 marriage). The coefficient of the interaction term is positive and significant at 1 to 5% level of significance, indicating that for women who married in 2000 or later, girls' relative grade progression and primary completion outcomes significantly increase with mother's marriage age, with the two coefficients being 0.003 and 0.015, respectively. These results suggest significant role of mother's age at marriage in driving girl-specific child educational progression and attainment outcomes, and that this role has changed over time.

[Insert Table 7]

5.4 Role of Father's Age at Marriage

Thus far we have examined the association between mother's age at marriage and gender differentials in three set of children's educational outcomes. It is possible that mothers' and fathers' gender preference, and subsequent bias in children's educational outcomes, may be interlinked, and may as well show in relation to the fathers' age at marriage. Robitaille and Ishita (2020) investigated the mutual interaction between husband and wife's desired gender preference in India, and found that having a husband who desires only boys is associated with an increase in wife's desired preference for boys. In the same vein, Mughal et al. (2023) examined whether parents age at marriage is associate with gender preference in Pakistan. Their findings are similar for both the father and mothers samples, revealing a shared preference for sons.

[Insert Table 8]

In Pakistan, early marriage is less common among Pakistani men. In our sample, mean age at marriage for women is 19.65 years compared to 24.52 for men. Table 8 reports partial results of estimates for the fathers subsample including controls and province fixed effects. A significant association is visible for two out of five educational outcomes, implying a small but significant role of father's age at marriage in driving the girl-specific child education

outcomes. Father's marriage age is positively and significantly associated with girl's school enrolment (coefficient = 0.0025) and primary school completion (coefficient = 0.0042).

A second way in which husbands and wives' preferences could interact is through their age difference. A woman's decision making power may be limited if she is much younger than her husband. We examine this possibility by comparing the impact of mother's marriage age for two subsamples of women, those who are less than five years younger than their husbands and those who are at least five years younger. We find that the results of the two subsamples widely differ (Table 9). Among women at least five years younger than their husbands, the impact of marriage age on none of the five outcomes is significant, with p-values for the five ranging between 0.165 and 0.597. In contrast, the impact is significant for three outcomes in case of the women who are less than five years younger than their husbands, the three outcomes being school enrolment, relative progression and primary completion. This clearly indicates that mother's marriage age affects children's education more in the households in which age difference between the parents is low.

[Insert Table 9]

6. Robustness Checks

In this section, we show that the baseline estimates are robust to a wide range of robustness checks. All results are presented in the appendix.

6.1 Additional Fixed Effects

In our estimates, mothers with two or more children appear multiple times in the regression. For example, a woman with five sample children will make up 5 observations in the analysis. Therefore, women with more children get higher weightage than those with fewer children. As our estimations are carried out at the child level, it should be possible to include mother fixed effects in a regression framework. This could more credibly estimate the effect of early maternal marriage age on gender discrimination than the current regression estimates because it holds constant any observed and unobserved factors that are fixed for mother and that might also affect the child outcomes of interest. Results with mother fixed effects reported in table 10 are similar to the baseline estimates. The coefficients of the interaction term for the children's relative grade progression ratio and

primary school completion are positive and significant at the 1% level of significance (columns 3 and 4).

[Insert Table 10]

It is also possible that child age is correlated with maternal age at marriage. As children grow, the opportunity cost of remaining in school increases, and the probability that they drop out of school increases. Their grade progression is also more likely to slow down. There tends to be much wider variation in the education outcomes of adolescents than of younger children. Women who marry younger are also more likely to have children at a younger age. Their children should therefore be older. For example, if two mothers are of similar age and one has their child at younger age, then that child will, by construction, be older than the child of the woman who has her child at an older age. Therefore, if delaying marriage also delays childbirth, the fact that the children of earlier marrying mothers have worse education outcomes may in part be due to the fact that their children are older. This problem is likely to be bigger in the first-born subsample (section 5.2), since the firstborn children of early-marrying mothers are almost certainly older than those of late-marrying mothers, and are thus more likely to have more siblings. In our baseline specification, we control for child age, however, this may not be enough to account for this possibility. This could be handled by including mother age fixed effects and a child age control⁴. This would help disentangle the lifecycle trends associated with child age. Results with mother age fixed effects reported in table 11 are highly similar to the baseline estimates.

[Insert Table 11]

6.2 Collider Bias

In our baseline specification, we include both pre- and post-treatment controls. Including post-treatment controls can introduce bias into the main estimate of interest, even if the main treatment variable is exogenous and the controls are not correlated with the treatment variable. Therefore, including post-treatment controls correlated with the outcome variable can introduce collider bias. We can account for this possibility by dropping post-treatment controls from our baseline model and relying only on pre-

⁴ We are thankful to the anonymous reviewer for this suggestion.

treatment controls⁵. Results are reported in Table 12. Again, we do not observe any difference relative to the baseline results.

[Insert Table 12]

6.3 Alternative Mother's Marriage Age Indicator

In the empirical framework, our variable of interest is the interaction between mother's age at marriage and child sex. Mother's age at marriage is a count variable. We further check the robustness of our baseline estimates by employing an alternative indicator of mother's age at marriage. For this purpose, we replace mother's age at marriage with mother's early marriage, a binary variable that takes the value of 1 if the mother gets married before age 18, 0 otherwise. Thus, our coefficient of interest is the interaction between mother's early marriage and child sex. Results are reported in table 13. We again come up with results comparable to the baseline estimates.

[Insert Table 13]

6.4 Recall Bias

A possible threat to our estimates could arise from recall bias. In gender preferring societies, parents are less likely to give similar attention to girls' welfare measurement as they do to boys, potentially leading to girl-specific misreporting (Milazzo, 2014). Recall bias is thought to be more common among older mother (Coughlin, 1990; Ready et al., 2007; Van De Mheen et al., 1998). This possibility could be handled by focusing on the subsample of younger mothers. Consequently, we restrict our sample to women under 40 at the time of the survey. Results of the younger mothers subsample reported in table 14 are found to be comparable to the baseline estimates.

[Insert Table 14]

6.5 Selection by Household Wealth and Access to Water

The heterogeneity among mother's socioeconomic profile can yet affect our findings in other ways. For instance, mothers can self-select by household wealth status and access to water. First, the gender differential in children welfare outcomes may vary by household wealth as discriminatory behaviours are more visible in the presence of resource

⁵ We are thankful to the anonymous reviewer for this suggestion.

limitations (Le & Nguyen, 2022). We account for this possibility by limiting the sample to the households with below-median wealth. Second, lack of access to water in developing countries can have significant impacts on various health and education indicators of the children (Javed & Mughal, 2024). Children, particularly girls, are often tasked with fetching water before heading to school. This responsibility can lead to their absence from school and potential learning losses. Rauniyar et al. (2011) examined the impact of a water supply project implemented in a rural area of Pakistan on various child welfare outcomes. Their findings show that the project improved households' access to water supply and school attendance of high school-age girls. In our data, we have information about whether households have access to water at home or they need to travel to collect water. The girl-specific child education outcomes could be more visible among households with no access to water. We account for this possibility by limiting the sample to the households without access to water (i.e. those who need to travel to collect water). The results are presented in tables 15 and 16. In both cases, i.e. below-median wealth households and households without access to water, the estimates are similar to baseline estimates.

[Insert Table 15]

[Insert Table 16]

6.6 Alternate Mother's Agency Control

Mother's autonomy, defined as the ability of women to make decisions within the household, is measured by creating the autonomy index and decision-making pertaining to children's education, marriage, food, clothing, use of birth control and whether or not to continue childbearing. We control for mother's autonomy in our baseline model through an autonomy index. As a robustness check, we replace the index with a variable for mother's decision-making power in the matter of children's education. This is a binary variable, equal to 1 if the mother alone makes decisions about their children's education and 0 otherwise. In our sample, 31.31% of women participate in the educational decisions of their children. Corresponding results reported in Table 17 are not dissimilar from the baseline estimates.

[Insert Table 17]

6.7 Instrumental Variable Estimation

Our baseline estimates may suffer from endogeneity. Family values, local traditions and cultural norms prevalent in society shape the age at which girls marry. Hence, mother's age at marriage is not a random event and may plausibly be associated with unobserved factors related to their gender perspective on child education outcomes. As a final robustness check, we employ an instrumental variable strategy to tackle potential endogeneity present in the baseline specification. For this purpose, we construct two community-level instruments, namely the prevalence (in %) of early marriage observed in the Primary Sampling Unit (PSU) among the women who married at least five and ten years prior to the respondent's marriage respectively. These instruments take their inspiration from Mughal et al. (2023) who analyze whether mothers age at marriage shapes their perspectives on gender preference associated with reproduction. The logic for the instruments goes as follows: In traditional societies, marriage is an institution meant to maintain and promote social ties and within-group connections. Age at marriage, in this context, serves as a means of preserving community values related to gender and sexuality. Thus, the proportion of early-married women in the community could act as a useful community-level predictor of female age at marriage while not directly related to individual girl-specific children's educational outcomes. The interaction between mother's age at marriage and child sex is instrumented by the interaction between the proportion of early-marrying women among all the women in the PSU who got married prior to the surveyed woman and child sex.

Results of the second-stage estimates are reported in Table 18. The results remain comparable to the baseline estimates. The p-values of under-identification test are shown at the bottom of the table. The instrument validity test revealed that the model is exactly identified. For all the outcomes, the under-identification tests reject the null hypothesis that the model is under-identified.

[Insert Table 18]

7. Discussion and Conclusion

In this study, we examined an issue that lies at the intersection of two important development objectives as defined in the United Nations' Sustainable Development Goals (SDGs). SDG4 asks for gender equality in education by ensuring that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant

and effective learning outcomes. SDG5, which deals with gender inequality, calls for entailing women and girls equal rights to economic resources and ensuring their full participation at all levels in economic decisions. Women's age at marriage strongly relates to the human capital they acquired, the labour market and earning opportunities they possess, and the degree of autonomy and decision making power they enjoy at home, including their say in children's education. In this study, we examined whether women's marriage age plays any role in determining the differences in educational opportunities provided to their sons and daughters, and whether greater economic resources available to later-marrying women translate into better educational outcomes of their daughters. Using a nationally representative household survey from Pakistan, we examined the impact of mother's marriage age on child education indicators grouped in three categories: the first one, educational access and schooling choice, includes variables for the child's school enrolment and type of school (private/public), the second category pertains to educational progression and attainment, and includes variables for relative grade progression and primary education completion. The third category corresponds to parental investment on education, and includes variable for education expenditure. We include province fixed effects to account for unobserved geographical characteristics and use robust standard errors clustered at the household level. We come up with the following main findings:

First, mother's age at marriage has no girl-specific impact on educational access and school choice and parental investment behaviour, be it in terms of children's school enrolment, choice of school (public vs private) or the amount of expenditure allocated by the household. The lack of impact on the two indicators that directly involve allocation of financial resources (i.e. education expenditure and school choice) could be understood in light of women's limited decision making power in money matters. According to Javed and Mughal (2019), 6% of Pakistani women can make decisions on household consumption and financial matters compared to 7% on social and 9% on health issues. However, the effect of delaying mother's marriage is beneficial to daughters in terms of progress at school and primary school completion, implying that late-marrying mothers are more likely to transfer their human capital advantages to the daughters thanks to their higher education and autonomy and better access to household resources.

Second, children's birth order does not appear to play any significant role, as there is no evidence that the girl-specific impact of mother's marriage at varies by birth order. The differential impact on most of the children's educational outcomes is insignificant regardless of whether the child is the firstborn or later-order, youngest or with no siblings. This points to the possibility that while early--marrying women may well exhibit son preference in their reproductive outcomes (see for instance, Mughal et al., 2023), their behaviour with respect to children's education does not substantially vary from that of late-marrying women.

Third, the girl-specific impact of women's marriage age seems to have changed over time. There is significant evidence of a role of mother age at marriage in deriving girl-specific child educational progression and attainment outcomes among women who got married in the year 2000 or later. In contrast, there is no evidence of a significant role in any of the five educational outcomes in the pre-2000 women cohort. This difference may owe to improvements in Pakistani women's developmental statistics over time. Women's educational attainment and say in household matters has increased. For example, 29.98% of women in the pre-2000 cohort can make decisions about their children's education as compared to 31.97% in the post-2000 cohort.

Fourth, there is some evidence of the father's age at marriage playing a significant role in determining girl-specific child education outcomes pertaining to enrolment and primary school attainment. Later marriage of men, just like that of women, is associated with improvement in two out of five educational outcomes of their daughters, possibly owing to better education and awareness among late-marrying men. The impact is likewise positive for children of parents whose ages differ by less than five years. Smaller age difference may imply better balance of power and greater decision making power for women.

Our findings are robust to the use of different strategies, techniques and empirical specifications that address the issues of endogeneity, collider bias, recall bias, sample selection bias and confounding factors.

The study has two important limits. First, the question of continuing a girl child's education may gain importance with the onset of puberty and attaining the age of menarche, making the role of mother in household decision making crucial. However, detailed data on children's school enrolment, progression and attainment are available only up to age 18.

This precludes the analysis of the impact of mother's marriage age on children's completion of secondary education (i.e. 12 years of schooling). The impact on university or college education is likewise not possible. Second, while we were able to examine the role of women's marriage age in their children's school enrolment and completion, we could not observe the impact on children's performance at school in indicators such as grades, learning outcomes and attendance due to lack of data on these aspects.

To sum up, these findings suggest that delay in women's marriage is helping to a certain extent in narrowing down gender inequalities in education across the current generation. The findings of this study underscore the need to promote social and behavioural changes which lead to lower incidence of early marriage and incentivise girls' education. Delay in women's marriage is not only helpful for their own socioeconomic uplift through higher education, but is also a catalyst to better educational outcomes and lower gender differentials in the next generation.

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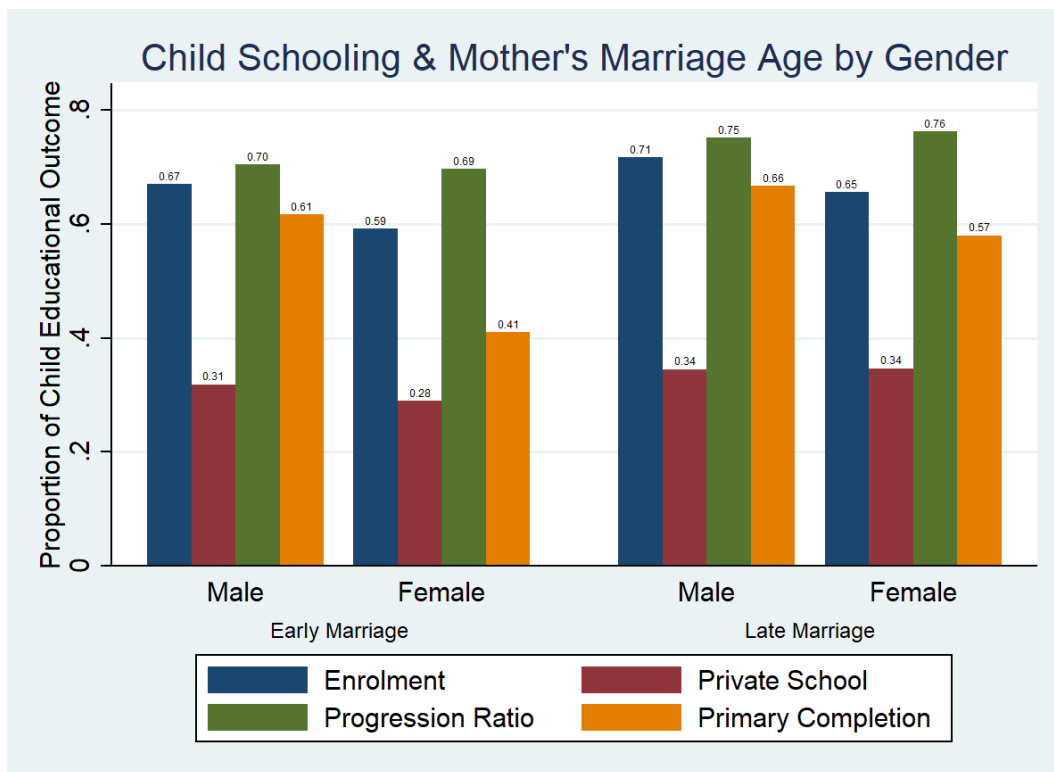
Tables and Figures

Table 1: Children's education outcomes by mother's early/late marriage

Variables	Full-Sample		Early Marriage (age < 18)		Late Marriage (age >= 18)		Two sample t-test
	Frequency (N)	Percent/Mean	Frequency (N)	Percent/Mean	Frequency (N)	Percent/Mean	
Enrolment (%)	30563	67.72%	8538	63.84%	22025	69.22%	9.02
Private Schooling (%)	24219	33.56%	6439	30.73%	17780	34.58%	5.59
Relative Progression	15143	0.74	3910	0.70	11233	0.75	11.75
Primary Completion (%)	8418	61.88%	2424	56.15%	5994	64.20%	6.90
Education expenditure (log)	28343	8.70	7277	8.61	21066	8.74	7.38

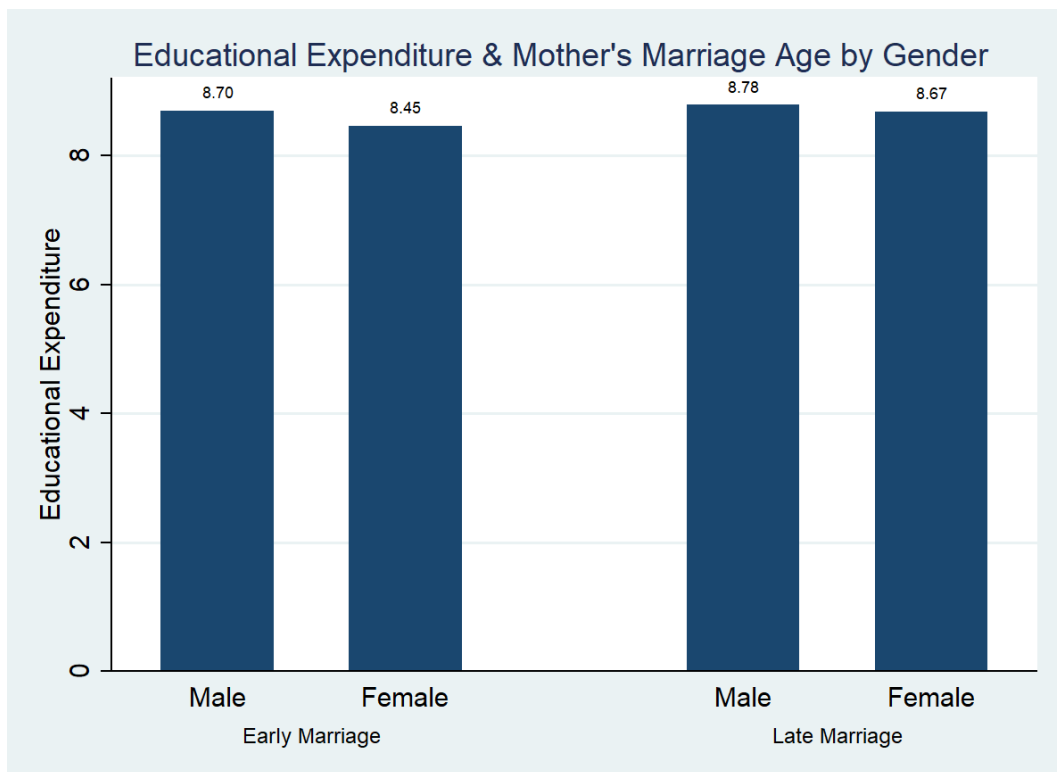
Source: Authors' calculations using HIES 2018-19. The table presents the number of observations and percent/means of the outcome variables. Columns 1 and 2 present the observations and percent/means for the overall sample while columns 3-6 present the observations and percent/means for the early and late marriage sample. Dichotomous variables are shown in percentages while means are provided for continuous variables. Column 7 report the t-statistic for the mean comparison test

Figure 1: Child schooling and mother's marriage age by child gender



Source: Authors' calculations using HIES 2018.

Figure 2: Expenditure on child education and mother's marriage age by child gender



Source: Authors' calculations using HIES 2018

Table 2: Summary statistics by mother's marriage age

Variables	Overall		Early Marriage (age < 18)		Late Marriage (age >= 18)		Two sample t-test
	Frequency (N)	Percent/Mean	Frequency (N)	Percent/Mean	Frequency (N)	Percent/Mean	
Children's Characteristics							
Female (%)	35155	41.43%	9878	40.49%	25277	41.52%	1.74
Age (years)	35155	10.55	9878	10.77	25277	10.47	-7.74
Birth order	35155	2.45	9878	2.55	25277	2.41	-8.05
Sibling size	35155	2.18	9878	2.26	25277	2.15	-6.00
Parental Characteristics							
Mother's marriage age (years)	35155	19.56	9878	16.08	25277	20.91	166.25
Mother's Education (years)	35155	2.38	9878	1.54	25277	2.71	24.05
Father's education (years)	30563	5.20	8538	4.72	22025	5.39	10.48
Household Characteristics							
Income (log)	35152	12.72	9876	12.72	25276	12.72	-0.65
Women autonomy	35155	0.07	9878	-0.01	25277	0.10	5.90
Rural (%)	35155	67.44%	9878	69.48%	25277	66.64%	-5.10

Source: Authors' calculations using HIES 2018-19. The table presents the number of observations and mean of selected individual, parental, and household-related variables. Columns 1 and 2 present the observations and percent/means for the overall sample while columns 3-6 present the observations and percent/means for the early and late marriage sample. Dichotomous variables are shown in percentages while means are provided for continuous variables. . Column 7 report the t-statistic for the mean comparison test.

Table 3: Mother's marriage age and gender differentials in child education

VARIABLES	(1) School Enrolment	(2) School Enrolment	(3) Private School Enrolment	(4) Private School Enrolment	(5) Grade Progression	(6) Grade Progression	(7) Primary Completion	(8) Primary Completion	(9) Education Expenditure	(10) Education Expenditure
Mother's Marriage Age	0.0112*** (0.0013)	0.0020* (0.0012)	0.0098*** (0.0017)	-0.0008 (0.0015)	0.0061*** (0.0009)	0.0033*** (0.0009)	0.0066*** (0.0022)	0.0058*** (0.0020)	0.0231*** (0.0043)	0.0061* (0.0036)
Female Child	-0.0275 (0.0373)	-0.0831** (0.0341)	-0.0143 (0.0447)	-0.0447 (0.0410)	-0.0458* (0.0277)	-0.0643** (0.0269)	-0.4208*** (0.0781)	-0.1486* (0.0766)	-0.3722*** (0.1073)	-0.0797 (0.0953)
Mother's Marriage Age* Female Child	-0.0008 (0.0019)	0.0001 (0.0017)	0.0006 (0.0022)	0.0005 (0.0020)	0.0029** (0.0014)	0.0030** (0.0013)	0.0160*** (0.0039)	0.0115*** (0.0038)	0.0119** (0.0053)	0.0021 (0.0047)
Constant	0.5202*** (0.0258)	0.2464*** (0.0833)	0.1628*** (0.0332)	-1.8977*** (0.1116)	0.6258*** (0.0178)	0.4479*** (0.0632)	0.5391*** (0.0424)	-2.0555*** (0.1435)	8.3727*** (0.0853)	-1.0911*** (0.2876)
Observations	30,563	30,561	24,219	20,624	15,143	15,143	8,418	7,144	28,343	20,645
Controls	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Province Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-10 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations are presented, first without and then with the set of controls and province fixed effects. Controls include individual (sex, age, birth order, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Mother's marriage age and gender differentials in child education- Firstborn and later order children subsamples

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure	(6) School Enrolment	(7) Private School Enrolment	(8) Grade Progression	(9) Primary Completion	(10) Education Expenditure
	Birth order 1					Birth order >1				
Mother's Marriage Age	0.0022 (0.0014)	0.0003 (0.0019)	0.0026** (0.0011)	0.0058** (0.0026)	0.0081* (0.0044)	0.0023 (0.0015)	-0.0017 (0.0019)	0.0041*** (0.0012)	0.0065** (0.0031)	0.0047 (0.0045)
Female Child	-0.0869 (0.0548)	-0.0854 (0.0710)	-0.0639 (0.0458)	-0.3411** (0.1570)	-0.0983 (0.1683)	-0.0885** (0.0412)	-0.0612 (0.0479)	-0.0437 (0.0335)	-0.1100 (0.0939)	-0.1433 (0.1128)
Mother's Marriage Age* Female Child	-0.0003 (0.0026)	0.0017 (0.0034)	0.0032 (0.0022)	0.0190** (0.0076)	-0.0003 (0.0081)	0.0003 (0.0021)	0.0015 (0.0024)	0.0022 (0.0017)	0.0096** (0.0047)	0.0066 (0.0056)
Constant	0.2828*** (0.1015)	-1.8491*** (0.1366)	0.3180*** (0.0844)	-1.8114*** (0.1986)	-1.0765*** (0.3448)	0.2720*** (0.1044)	-1.9187*** (0.1314)	0.5181*** (0.0791)	-2.2561*** (0.1999)	-1.1127*** (0.3460)
Observations	10,236	7,181	5,775	3,009	7,216	20,325	13,443	9,368	4,135	13,429
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Panel A shows the results for the subsample of first-born and panel B for the subsample of later order children. Columns 1-10 present the girl-specific effects of mother's marriage age on child education indicators, including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-related characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Mother's marriage age and gender differentials in child education- Youngest and single child subsamples

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure	(6) School Enrolment	(7) Private School Enrolment	(8) Grade Progression	(9) Primary Completion	(10) Education Expenditure
	Youngest Child					Child with no sibling				
Mother's Marriage Age	0.0055** (0.0022)	0.0045* (0.0027)	0.0007 (0.0021)	0.0037 (0.0051)	0.0248*** (0.0061)	0.0047 (0.0045)	0.0078 (0.0058)	0.0025 (0.0034)	0.0035 (0.0079)	0.0261** (0.0130)
Female Child	0.0334 (0.0672)	-0.0361 (0.0845)	-0.1345** (0.0616)	0.0323 (0.1734)	0.0858 (0.1956)	0.1247 (0.1851)	-0.3834 (0.2427)	-0.1239 (0.1838)	-0.8724* (0.4697)	-0.1260 (0.5158)
Mother's Marriage Age* Female Child	-0.0044 (0.0033)	0.0008 (0.0042)	0.0070** (0.0030)	0.0039 (0.0086)	-0.0053 (0.0096)	-0.0104 (0.0089)	0.0188* (0.0113)	0.0047 (0.0087)	0.0431** (0.0205)	0.0038 (0.0238)
Constant	-0.0078 (0.1389)	-1.9698*** (0.1786)	0.6090*** (0.1319)	-2.4344*** (0.3271)	-1.0811** (0.4645)	-0.2508 (0.3335)	-2.1445*** (0.4001)	-0.0587 (0.2349)	-2.6709*** (0.5711)	-1.7510* (0.8932)
Observations	5,292	3,756	2,399	1,173	3,762	912	647	454	281	653
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Panel A shows the results for the subsample of youngest and panel B for the subsample of single children. Columns 1-10 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Mother's marriage age and gender differentials in child education- Sex of previous child

VARIABLES	(1) School Enrolment	(2) School Enrolment	(3) Private School Enrolment	(4) Private School Enrolment	(5) Grade Progression	(6) Grade Progression	(7) Primary Completion	(8) Primary Completion	(9) Education Expenditure	(10) Education Expenditure
Mother's Marriage Age	0.0109*** (0.0014)	0.0020 (0.0013)	0.0084*** (0.0018)	-0.0014 (0.0016)	0.0063*** (0.0010)	0.0038*** (0.0009)	0.0060*** (0.0022)	0.0062*** (0.0020)	0.0189*** (0.0047)	0.0057 (0.0039)
Female Child	-0.0262 (0.0393)	-0.1049*** (0.0361)	-0.0041 (0.0472)	-0.0762* (0.0439)	-0.0467 (0.0307)	-0.0587** (0.0299)	-0.3181*** (0.0819)	-0.1049 (0.0792)	-0.2603** (0.1164)	-0.1409 (0.1053)
Mother's Marriage Age* Female Child	-0.0002 (0.0019)	0.0006 (0.0018)	0.0021 (0.0023)	0.0024 (0.0022)	0.0034** (0.0015)	0.0032** (0.0015)	0.0135*** (0.0041)	0.0099** (0.0039)	0.0106* (0.0058)	0.0065 (0.0052)
Constant	0.5335*** (0.0283)	0.2712*** (0.0883)	0.2300*** (0.0359)	-1.8400*** (0.1127)	0.6178*** (0.0195)	0.4206*** (0.0715)	0.5627*** (0.0433)	-2.0401*** (0.1484)	8.6303*** (0.0945)	-1.0942*** (0.2957)
Observations	23,672	23,670	18,708	15,895	11,885	11,885	8,112	6,883	21,618	15,927
Controls	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Province Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-10 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary school completion, and education expenditure. The estimations are presented, first without and then with the set of controls and province fixed effects. Controls include individual (sex, age, birth order, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Mother's marriage age and gender differentials in child education- Pre- and Post-2000 marriage cohorts

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	School Enrolment	School Enrolment	Private School Enrolment	Private School Enrolment	Grade Progression	Grade Progression	Primary Completion	Primary Completion	Education Expenditure	Education Expenditure
	Pre- 2000	Post-2000	Pre- 2000	Post-2000	Pre- 2000	Post-2000	Pre- 2000	Post-2000	Pre- 2000	Post-2000
Mother's Marriage Age	0.0032 (0.0022)	0.0002 (0.0014)	-0.0020 (0.0026)	-0.0008 (0.0019)	0.0051*** (0.0015)	0.0028*** (0.0010)	0.0088*** (0.0025)	0.0044 (0.0031)	0.0072 (0.0064)	0.0049 (0.0044)
Female Child	-0.0527 (0.0659)	-0.1225*** (0.0411)	-0.1264 (0.0795)	-0.0337 (0.0497)	0.0057 (0.0515)	-0.0657** (0.0321)	-0.0185 (0.1167)	-0.2122** (0.1055)	0.0424 (0.1821)	-0.1500 (0.1149)
Mother's Marriage Age* Female Child	-0.0026 (0.0034)	0.0021 (0.0020)	0.0054 (0.0041)	-0.0004 (0.0024)	-0.0010 (0.0026)	0.0033** (0.0015)	0.0047 (0.0060)	0.0156*** (0.0051)	0.0003 (0.0093)	0.0042 (0.0055)
Constant	0.0546 (0.1495)	0.2390** (0.1001)	-1.9568*** (0.1824)	-1.8925*** (0.1429)	0.2980*** (0.1101)	0.5205*** (0.0753)	-1.9161*** (0.1811)	-2.5837*** (0.2402)	-1.9469*** (0.4806)	-0.6252* (0.3522)
Observations	12,889	17,672	7,827	12,797	5,231	9,912	4,320	2,824	7,866	12,779
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression of Pre- and Post-2000 marriage cohorts. Columns 1-10 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Father's marriage age and gender differentials in child education

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Father's Marriage Age	-0.0000 (0.0007)	0.0019** (0.0009)	0.0020*** (0.0005)	0.0033*** (0.0011)	0.0052** (0.0021)
Female Child	-0.1404*** (0.0252)	-0.0048 (0.0301)	-0.0210 (0.0201)	-0.0258 (0.0567)	-0.1207* (0.0725)
Father's Marriage Age* Female Child	0.0025** (0.0010)	-0.0012 (0.0012)	0.0006 (0.0008)	0.0042* (0.0022)	0.0034 (0.0028)
Constant	0.2951*** (0.0810)	-1.9594*** (0.1089)	0.4762*** (0.0617)	-2.0030*** (0.1393)	-1.0766*** (0.2800)
Observations	30,515	20,595	15,126	7,137	20,616
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of father's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Mother's marriage age and gender differentials in child education- Spousal Age Difference

VARIABLES	(1) School Enrolment	(2) School Enrolment	(3) Private School Enrolment	(4) Private School Enrolment	(5) Grade Progression	(6) Grade Progression	(7) Primary Completion	(8) Primary Completion	(9) Education Expenditure	(10) Education Expenditure
	difference < 5	difference >= 5	difference < 5	difference >= 5	difference < 5	difference >= 5	difference < 5	difference >= 5	difference < 5	difference >= 5
Mother's Marriage Age	-0.0009 (0.0017)	0.0053*** (0.0017)	0.0028 (0.0022)	-0.0053** (0.0023)	0.0030** (0.0013)	0.0047*** (0.0013)	0.0051* (0.0028)	0.0066** (0.0030)	0.0164*** (0.0052)	-0.0050 (0.0056)
Female Child	-0.1861*** (0.0507)	-0.0196 (0.0501)	-0.0103 (0.0615)	-0.0696 (0.0615)	-0.0958** (0.0393)	-0.0350 (0.0407)	-0.2485** (0.1062)	-0.1016 (0.1173)	-0.0480 (0.1427)	-0.1517 (0.1428)
Mother's Marriage Age* Female Child	0.0045* (0.0025)	-0.0021 (0.0025)	-0.0007 (0.0030)	0.0016 (0.0031)	0.0045** (0.0019)	0.0016 (0.0020)	0.0176*** (0.0052)	0.0082 (0.0059)	-0.0002 (0.0069)	0.0074 (0.0072)
Constant	0.3196*** (0.1239)	0.2354* (0.1209)	-1.8833*** (0.1616)	-1.7679*** (0.1628)	0.3528*** (0.0897)	0.5325*** (0.0910)	-2.3029*** (0.2033)	-1.7155*** (0.2126)	-1.2617*** (0.3861)	-0.9198** (0.4276)
Observations	14,392	14,308	9,455	9,815	6,910	7,241	3,194	3,581	9,466	9,829
Controls	0.2080	0.2144	0.2703	0.2868	0.0687	0.0605	0.3316	0.2828	0.3863	0.3947
Province Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-10 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary school completion, and education expenditure. The estimations are presented, first without and then with the set of controls and province fixed effects. Controls include individual (sex, age, birth order, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Mother's marriage age and gender differentials in child education- Mother-fixed effects

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Mother's Marriage Age	0.0019 (0.0012)	-0.0013 (0.0015)	0.0033*** (0.0009)	0.0057*** (0.0020)	0.0043 (0.0036)
Female Child	-0.0779** (0.0340)	-0.0392 (0.0410)	-0.0634** (0.0270)	-0.1411* (0.0768)	-0.0511 (0.0950)
Mother's Marriage Age* Female Child	-0.0000 (0.0017)	0.0004 (0.0020)	0.0029** (0.0013)	0.0112*** (0.0038)	0.0014 (0.0047)
Constant	0.1077 (0.0878)	-2.1430*** (0.1157)	0.4074*** (0.0638)	-2.1101*** (0.1471)	-2.0834*** (0.2919)
Observations	30,561	20,624	15,143	7,144	20,645
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province and mother fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 11: Mother's marriage age and gender differentials in child education- Mother's age-fixed effects

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Mother's Marriage Age	0.0026** (0.0013)	-0.0002 (0.0017)	0.0012 (0.0009)	0.0011 (0.0022)	0.0014 (0.0041)
Female Child	-0.1424*** (0.0341)	-0.0504 (0.0410)	-0.0296 (0.0243)	-0.1123 (0.0742)	-0.0215 (0.0957)
Mother's Marriage Age* Female Child	0.0017 (0.0017)	0.0005 (0.0020)	0.0021* (0.0012)	0.0098*** (0.0037)	0.0000 (0.0047)
Constant	0.1001 (0.0933)	-2.1783*** (0.1255)	0.6183*** (0.0662)	-2.1658*** (0.1538)	-1.2832*** (0.3255)
Observations	30,561	20,624	15,143	7,144	20,645
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province and mother age fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 12: Mother's marriage age and gender differentials in child education- Collider Bias

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Mother's Marriage Age	0.0041*** (0.0012)	0.0005 (0.0016)	0.0037*** (0.0009)	0.0021 (0.0023)	-0.0020 (0.0041)
Female Child	-0.0248 (0.0346)	-0.0278 (0.0439)	-0.0509* (0.0270)	-0.4311*** (0.0837)	-0.2914*** (0.1067)
Mother's Marriage Age* Female Child	-0.0014 (0.0017)	0.0001 (0.0022)	0.0027** (0.0013)	0.0154*** (0.0042)	0.0069 (0.0052)
Constant	0.5590*** (0.0248)	0.1718*** (0.0339)	0.6084*** (0.0181)	0.4726*** (0.0476)	8.3515*** (0.0854)
Observations	30,563	20,626	15,143	7,145	20,647
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include mother's marriage age, mother's education, and father's education. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 13: Mother's marriage age and gender differentials in child education- Alternative marriage age indicator

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Early Marriage (ref: Late Marriage)	-0.0088 (0.0090)	0.0143 (0.0116)	-0.0302*** (0.0068)	-0.0326** (0.0140)	-0.0301 (0.0278)
Female Child	-0.0787*** (0.0063)	-0.0437*** (0.0079)	0.0028 (0.0051)	0.0985*** (0.0150)	-0.0577*** (0.0188)
Early Marriage* Female Child	-0.0167 (0.0129)	-0.0086 (0.0160)	-0.0183* (0.0106)	-0.1254*** (0.0272)	-0.0161 (0.0378)
Constant	0.3015*** (0.0791)	-1.8725*** (0.1062)	0.5141*** (0.0601)	-1.9017*** (0.1351)	-0.8651*** (0.2731)
Observations	30,561	20,624	15,143	7,144	20,645
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's early marriage, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 14: Mother's marriage age and gender differentials in child education- Recall bias

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Mother's Marriage Age	0.0018 (0.0015)	-0.0010 (0.0021)	0.0036*** (0.0011)	0.0072** (0.0035)	0.0035 (0.0050)
Female Child	-0.0979** (0.0412)	-0.0374 (0.0518)	-0.0738** (0.0330)	-0.1807 (0.1127)	-0.0511 (0.1213)
Mother's Marriage Age* Female Child	0.0012 (0.0021)	-0.0005 (0.0026)	0.0036** (0.0017)	0.0148** (0.0059)	-0.0010 (0.0061)
Constant	0.3180*** (0.0992)	-2.0685*** (0.1378)	0.4390*** (0.0728)	-2.3029*** (0.2067)	-1.2917*** (0.3512)
Observations	21,930	15,274	11,868	4,165	15,256
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 15: Mother's marriage age and gender differentials in child education- Selection by household wealth

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Mother's Marriage Age	-0.0009 (0.0021)	0.0018 (0.0027)	0.0029* (0.0016)	0.0007 (0.0037)	0.0084 (0.0066)
Female Child	-0.1099* (0.0567)	0.0017 (0.0760)	-0.1620*** (0.0482)	-0.2829** (0.1284)	0.0361 (0.1823)
Mother's Marriage Age* Female Child	0.0015 (0.0028)	-0.0010 (0.0037)	0.0080*** (0.0023)	0.0184*** (0.0062)	-0.0024 (0.0089)
Constant	0.2427 (0.1497)	-2.0366*** (0.2086)	0.3643*** (0.1260)	-1.8185*** (0.2924)	-1.9954*** (0.5415)
Observations	9,259	5,670	4,164	1,959	5,666
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary completion, and education expenditure. The results estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 16: Mother's marriage age and gender differentials in child education- Selection by access to water

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Mother's Marriage Age	0.0045*** (0.0017)	-0.0002 (0.0019)	0.0027** (0.0012)	0.0058* (0.0032)	0.0077 (0.0047)
Female Child	-0.0244 (0.0484)	-0.0356 (0.0522)	-0.0884** (0.0388)	-0.1727 (0.1204)	-0.0976 (0.1286)
Mother's Marriage Age* Female Child	-0.0039 (0.0024)	0.0004 (0.0026)	0.0038* (0.0019)	0.0112* (0.0061)	0.0047 (0.0062)
Constant	-1.2167*** (0.2081)	-2.8891*** (0.2733)	0.0728 (0.1568)	-2.9446*** (0.4203)	-4.7548*** (0.7329)
Observations	16,859	10,194	7,668	3,130	10,181
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary school completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 17: Mother's marriage age and gender differentials in child education- Alternative indicator for mother's agency

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure
Mother's Marriage Age	0.0021* (0.0012)	-0.0006 (0.0015)	0.0033*** (0.0009)	0.0058*** (0.0020)	0.0062* (0.0036)
Female Child	-0.0815** (0.0341)	-0.0425 (0.0411)	-0.0641** (0.0269)	-0.1474* (0.0766)	-0.0778 (0.0954)
Mother's Marriage Age* Female Child	0.0001 (0.0017)	0.0004 (0.0020)	0.0030** (0.0013)	0.0115*** (0.0038)	0.0021 (0.0047)
Constant	0.2769*** (0.0827)	-1.8396*** (0.1110)	0.4541*** (0.0629)	-2.0393*** (0.1433)	-1.0950*** (0.2851)
Observations	30,561	20,624	15,143	7,144	20,645
Controls	YES	YES	YES	YES	YES
Province Fixed Effects	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate regression. Columns 1-5 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary school completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, mother participation in child education decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 18: Mother's marriage age and gender differentials in child education- IV Estimations

VARIABLES	(1) School Enrolment	(2) Private School Enrolment	(3) Grade Progression	(4) Primary Completion	(5) Education Expenditure	(6) School Enrolment	(7) Private School Enrolment	(8) Grade Progression	(9) Primary Completion	(10) Education Expenditure
			IV1					IV2		
Mother's Marriage Age	-0.0043 (0.0072)	0.0169* (0.0096)	0.0056 (0.0060)	0.0212 (0.0164)	-0.0078 (0.0220)	-0.0016 (0.0066)	0.0194** (0.0085)	0.0091* (0.0053)	0.0215 (0.0148)	0.0069 (0.0206)
Female Child	-0.4372** (0.2172)	-0.2405 (0.3143)	-0.1704 (0.1916)	-1.6408** (0.8162)	-1.4957** (0.7492)		-0.4268 (0.2771)	-0.1940 (0.1712)	-1.1007* (0.6428)	-1.3237* (0.6812)
Mother's Marriage Age* Female Child	0.0176 (0.0109)	0.0097 (0.0157)	0.0082 (0.0096)	0.0857** (0.0411)	0.0711* (0.0375)	0.0203** (0.0096)	0.0194 (0.0139)	0.0093 (0.0086)	0.0590* (0.0324)	0.0634* (0.0340)
Constant	0.3606** (0.1674)	-2.2911*** (0.2223)	0.3848*** (0.1401)	-2.2552*** (0.3805)	-0.7041 (0.5153)	0.3169** (0.1509)	-2.3718*** (0.1978)	0.3060** (0.1229)	-2.4116*** (0.3444)	-1.1550** (0.4745)
Observations	23,458	15,850	12,907	4,989	15,853	26,451	18,001	14,671	5,672	18,001
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
underidentification testtest										
Province Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using HIES 2018-19. Each coefficient provided in the table corresponds to a separate IV regression. Columns 1-10 present the girl-specific effects of mother's marriage age on child education indicators including school enrolment, private school enrolment, relative grade progression ratio, primary school completion, and education expenditure. The estimations include the set of controls and province fixed effects. Controls include individual (sex, age, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Age at marriage is instrumented by the proportion of early marriages in the PSU to five years and ten years prior to the respondent's marriage respectively, and the interaction between age at marriage and gender is instrumented by the interaction between the proportion of early marriages in the PSU to five years and ten years prior to the respondent's marriage. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Appendix

Table A1: Mother's marriage age and gender differentials in child education- Middle school completion

VARIABLES	(1) Secondary Completion	(2) Secondary Completion
Mother's Marriage Age	0.0048 ** (0.0025)	0.0037 (0.0031)
Female Child	0.1600*** (0.0668)	0.0905 (0.0899)
Mother's Marriage Age* Female Child	-0.0055 (0.0034)	-0.0034 (0.0044)
Constant	0.7665*** (0.0499)	-1.2489*** (0.1925)
Observations	5,381	3,949
Controls	NO	YES
Province Fixed Effects	NO	YES

Source: Authors' calculations using HIES 2018-19. Columns 1-2 present the girl-specific effects of mother's marriage age on child education indicators including secondary school completion. The estimations are presented, first without and then with the set of controls and province fixed effects. Controls include individual (sex, age, birth order, Sibling size), parental (mother's marriage age, mother's education, father's education), and household-level characteristics (income, autonomy in decision-making, place of residence). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.