Female Early Marriage and Son Preference in Pakistan

Mazhar Mughal, Rashid Javed, Thierry Lorey

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Abstract

In this study, we employ pooled data from four rounds of Pakistan Demographic and Health Survey (PDHS) to examine whether, and to what extent, does the incidence of early marriage shape the married women's perspectives on gender preference associated with reproduction. We employ a number of econometric techniques (Probit, OLS, Cox Hazard Model, IV Probit and treatment effects) and a large set of model specifications, and find significant evidence supporting the role of early marriage in perpetuating disproportionate preference for boys. 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 boy. Early-age marriage is associated with 7.7 - 12.5% higher incidence of fertility discontinuation among women without a son. This son-preferring behaviour is stronger at higher birth order and also reflects in differential spacing patterns. Women's education appears to be the strongest channel through which these effects are mediated. The divergence between early- and late-marrying women appears to have sharpened over time. The findings of this study underscore the role played by early marriage in altering the gender-specific attitudes prevalent in the society, and highlight existing gender inequality traps.

Key words: Child marriage; Age at marriage; gender bias; son preference; Pakistan
JEL codes: D13; J13; O15; C13; Z13.

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1 Introduction

39% of Pakistani women of child-bearing age are reported to get married before reaching the age of 18 (PDHS 2017-18). Though lower than 50% reported in 1990 (PDHS 1990-91), this incidence still remains high by world average. The practice of early-age marriage, also called child marriage, in part results from a higher perceived value of the young bride. In traditional societies, younger women are believed to be more fertile, sexually inexperienced and easy to 'control'. For parents, early marriage of daughters implies lower spending on education, less effort chaperoning the girl in order to protect virginity and guard 'family honour', and smaller dowry requirement (Allendorf et al., 2017; Caldwell, 2005).

Early marriage has important consequences for the health and well-being of the mother and the child. Women who marry early produce more children than who marry later (Maitra, 2004; Nasrullah et al., 2014; Raj et al., 2009). They are younger at the time of first birth and have subsequent births at shorter intervals (Jensen and Thornton, 2003; Koski et al., 2017; Raj, 2010). Early marriage is associated with greater risk of still birth and miscarriages (Kamal and Hassan, 2015). There is increasing evidence for adverse health outcomes among children born to women who married at an early age, including higher risk of premature birth, neo-natal, infant or child mortality (Adhikari, 2003; Garcia-Hombrados, 2017; Raj et al., 2010) as well as negative effects on child weight, height and general health (Chari et al., 2017; Palloni, 2017; Wachs, 2008). Women with early marriages show higher psychological distress, whereas women with late marriages tend to adjust better (Shaud & Asad, 2018). Early marriage can also limit women's economic empowerment and education outcomes of their children (Sekhri and Debnath, 2014; Yount et al., 2018).

A related area of investigation pertains to the influence of female early marriage in sustaining prevailing gender bias in general, and gender-specific reproductive outcomes in particular. Asadullah and Wahhaj (2019) find that early marriage increases agreement with statements supportive of traditional gender roles and gender bias in the allocation of resources. They hypothesize four potential pathways through which female early marriage in developing countries can affect women's beliefs and attitudes towards traditional gender norms:

1) less schooling and exposure to a school curriculum presenting alternative views; 2) fewer social networks; 3) lower likelihood of matching with more progressive men and 4) earlier experience of marital responsibilities.

The gender perspectives of early-married women get shaped by their degree of empowerment in important issues such as contraceptive use and reproductive choices (Larsson & Stanfors, 2014; Upadhyay & Karasek, 2012).

In this study, we employ pooled data from four Pakistan Demographic and Health Surveys (PDHS) to examine whether, and to what extent, does the incidence of early marriage shape the married women's perspectives on gender preference associated with reproduction. We investigate how early-age marriage influences both the reported or revealed son preference of the mother (observed in differential stopping) as well as the stated or desired preference that the interviewed women state. From a medical point of view, the likelihood of bearing sons does not depend on the age a woman marries. Any significant variation in the number of sons she bears should reflect differential fertility stopping patterns ultimately resulting from differences in the socioeconomic profile of early and late-marrying women[1].

To our knowledge, this is the first study that addresses this subject. We employ a number of econometric techniques (Probit, OLS, Cox Hazard Model, IV Probit and treatment effects) and a large set of model specifications to support our analysis. We find significant evidence supporting the role of female early marriage in perpetuating disproportionate preference for boys in Pakistan. Women who married before turning 18 not only state a greater desire for boys but are also more likely to end reproduction only after obtaining the desired number of boys. This son-preferring behaviour is stronger at higher birth order and also visible in differential spacing patterns. The divergent trend seems to be stronger in the post-2000 cohort compared to the women who married before 2000, reflecting increasing social pressures associated with demographic transition. Women's schooling appears to be the most important channel through which these gender-specific reproductive effects are mediated. We also find evidence for reported son preference among early-married men. These findings are robust to the use of alternative definitions and empirical procedures.

[1] The same outcome would result if the two groups of women differed in terms of sex-selective abortion.

Our study is organized as follows: Section 2 presents the survey data and shows relevant salient statistics. Section 3 describes the empirical model and the outcome and control variables employed in the estimations. Section 4 reports key findings followed by robustness checks and additional results in Section 5. Section 6 concludes.

2 Data

We pool data of all the four rounds (1990-91, 2006-07, 2012-13 and 2017-18) of the Pakistan Demographic and Health Survey (PDHS). The PDHS are household surveys representative at the national level, containing information about fertility, family planning, maternal and child health. A two-stage stratified sample design was adopted for the survey. The pooled sample consists of 45,260 women who married between 1951 and 2018. Out of these, 21,849 women are considered to have completed their fertility. The latter group corresponds to the women who gave the answer "want no more children" in response to the question "Do you desire more children?", those who report to be infecund or who or their husbands had undergone sterilization procedure. In our sample, 17,528 women reported to desire no more children, 1,348 reported to be infecund whereas 2,973 were sterilized. According to the dataset, 43% of the women of child-bearing age interviewed got married before the age of 18 while 24% gave birth to their first child before turning 20. The data show substantial difference between the profile of women who married before the age of 18 and those who married later (Table 1). Fewer early-marrying women and their husbands went to school than did their later-marrying counterparts. On average, early marrying women are poorer (46% of early-marrying women vs 30% of late-marrying women) and less urban (28% early-marrying women vs 39% late-marrying women). Besides, a greater proportion of them work for a living than do women who married later.

[Insert Tables 1 & 2 here]

Table 2 sheds light on divergent reproductive behaviours of the two groups of women by comparing the actual and desired number of sons born to early and late-marrying women. On average, early-marrying women are found to have more boys (3.21) than late-marrying women (2.51). The difference in the mean number of sons is clearer at higher parities. Similarly, women who marry early state greater desire for boys (2.29 boys) compared with those who marry later (2.00 boys). The spacing pattern of early-marrying women too differs from that of their late-marrying cohorts. Except for the

interval between the first and the second birth, the spacing for all intervals is higher among early-marrying women.

3 Empirical Framework

We estimate early marriage's association with son preference by regressing indicators of women's revealed and stated son preference on the early marriage indicator and controlling for individual and household socioeconomic factors. The empirical model for son preference can be given as follows:

$$SP_{ij} = \alpha_0 + \alpha_1 EM_{ij} + \alpha_2 X_{ij} + \alpha_3 Y_J + \mu_{ij} \quad (1)$$

Where SP_{ij} is an indicator of the son preference of the woman i belonging to the household j, EM_{ij} represents woman's early marriage, i.e. whether the woman i belonging to the household j married before reaching the age of 18, X_{ij} represents individual characteristics of the woman i belonging to the household j. Y_J represents the characteristics of household j, and μ_{ij} is the error term.

The variable of interest is woman's early marriage which is a binary variable that takes the value of 1 if the woman gets married before age 18, 0 otherwise. Article 1 of the Convention of the Rights of the Child (CRC) defines child or early marriage as legal or customary marriage between two people, of whom one or both spouses are below the age of 18. Later, we obtain our robustness estimates by using the count variable for women's age at marriage.

Individual and household characteristics include the respondent woman's age, education level, employment status, exposure to electronic or print media, age difference with the husband, husband's education level, household size, household wealth, area of residence (urban/rural) and access to improved water supply. The household wealth variable is constructed by generating an index of household assets such as home ownership, floor type, water source, electricity availability and durable consumer goods. The quintiles of the variable generated using Principal Component Analysis indicate the economic status of the household ranging from the poorest to the richest quintile.

Table 3 provides the definitions of the variables included and their means and proportions. About 43% of the women reported to have married before age 18 compared to 10% of the husbands. The mean age of women is 32 years. The average age

difference between husband and wife were 5.51 years. Majority of women in our sample possessed no formal education (60%) compared to 35% of the husbands. Likewise, only 8% women report having acquired tertiary level education compared to 15% husbands, respectively. Around one-fourth (22%) women in our sample participate in labour market. 41% women report either listening radio or watching television at least once a week. The average household size is 8.26. About two-thirds of the households (66%) live in the rural areas.

[Insert Table 3 here]

Outcome variables

1. Revealed son preference:

We employ three indicators to represent different dimensions of revealed son preference. Following Javed & Mughal (2022), we define the baseline indicator of differential birth stopping for revealed or reported son preference as a binary variable which takes the value of 1 if a woman has no son at a given birth order and does not pursue further child birth, 0 otherwise. The second variable modifies this definition to focus only on the sex of the latest child. For example, the variable takes the value of 1 if a woman who has four children, out of which the fourth is a girl, does not proceed to subsequent child birth. The third indicator of revealed son preference is a count variable that pertains to succeeding birth spacing. It is defined as the succeeding birth space in months at a given parity if a woman has no son. Estimation results of these three outcomes are reported for the first four birth orders.

2. Stated son preference:

We employ two indicators to measure stated or desired son preference: First, following Behrman and Duvisac (2017), we define the baseline indicator for stated or desired son preference as a binary variable which takes the value of 1 if the woman's desire number of sons exceeds the desired number of daughters. Following Gaudin (2011), we also use a ratio to denote desired son preference. The alternative measure is defined as the ratio of the difference between Ideal number of boys and girls to the Ideal number of children.

In our sample, 14%, 16%, 18% and 20% woman without at least one son stop their childbearing at the first, second, third and fourth birth order, respectively. The mean succeeding birth space of women without at least one son ranges from 27.31 to 28.63

months at the first four birth orders. The average spacing is the shortest at the fourth birth order. 37% women reported desiring more boys than girls.

[Insert Figure 1 here]

Figure 1 represents the gender-specific progression to subsequent birth. Almost all (98%) of the women moved on to second parity regardless of whether the firstborn was a boy or a girl (Figure 1). At higher parities however, the reproductive patterns of girls-only women diverge from those of women with one or more sons: 96% of women with no boys proceed to third birth compared to 91% of women with one or two sons, while 93% of girls-only women move on to fourth birth compared to 83% of women with three sons.

Methodology

Given the binary nature of the first two revealed preference outcomes and the first stated preference outcome, the corresponding models are initially estimated using the Probit estimator, while the stated preference ratio is estimated using OLS. Later, these estimations are carried out using instrumental-variable and matching estimators. The spacing outcome is regressed using the Cox Hazard Model. All estimations are carried out first without, and then with the full set of controls and region- and time-fixed effects.

4 Findings

4.1 Revealed Son Preference

In son preferring societies, discriminatory reproductive patterns manifest themselves, either in the form of sex-selective abortions, or differential birth stopping. Even though preferential attitudes towards boys are widespread in the Indian Subcontinent, the practice does not usually enjoy good press (Robitaille, 2013). Islam, Pakistan's dominant religion, does not promote sex-selective reproductive practices (Aydede & Robitaille, 2019). There is little evidence supporting widespread practice of sex-selective abortion in Pakistan (see for instance Zaidi & Morgan, (2016)). However, differential stopping is reported to be widely practised (Hussain et al., 2000; Javed & Mughal, 2022). In the presence of disproportionate preference for male offspring, early-marrying women continue childbearing as long as the desired number of sons is not attained. Table 4 reports partial results for the association between women's early

marriage and their child-stopping behaviour in the situation where all the existing children are girls. We report both the estimates and the marginal effects (ME). Columns 1 to 8 alternately show results of Probit estimations, with and without controls, and region- and time-fixed effects, for the likelihood of childbearing after the first, second, third and fourth birth respectively. The results are negative and statistically significant at all the birth orders. At the first birth order, an early-marrying woman with a girl child is 7.7% to 10.5% less likely to stop child bearing, in contrast to the late-marrying women. The impact is found to be stronger at higher birth orders. At the second birth order, the presence of no son is associated with 9.2% (without controls) and 12.4% (with controls) lower probability of stopping childbearing. In other words, early-marrying women, both of whose first two children are girls, are 9.2-12.4% less likely to discontinue fertility compared with late-marrying women. The corresponding results for probit estimates for birth order 3 and 4 show 8.3% to 12.5% lower likelihood of stopping childbearing among early-marrying women without at least one son.

This differential birth stopping effect is similar for both rural and urban women (Table 5), except for the fourth birth on which the effect is much stronger among urban women (17.2% less likelihood) compared to the rural women (9% less likelihood). The proportion of early-marrying women living in the urban areas (0.28) is much lower than that of the late-marrying women (0.39). This, combined with the fact that early-marrying women have on average more children and a greater stated desire for sons, makes the revealed son preference effect of early marriage stronger in the cities.

[Insert Table 4 & 5 here]

These results could be challenged on the grounds that the fertility preferences of early-marrying women might be over-represented in the sample. At a given time, women who marry early are more likely to achieve their desired fertility than women who married late and thereby began their reproductive phase later[2]. In Table 6, we show results of estimations, first without, and then with the set of controls and the fixed effects, carried out on the sub-sample of women whose fertility could be considered complete, i.e. women who gave the answer “want no more children” in response to the question “Do you desire more children?”, those who report to be infecund or who or their husbands had undergone sterilization procedure. The association between early marriage and

[2] In Pakistan, child-birth generally occurs only in matrimony.

reported preference remains negative and statistically significant as before. However, the marginal effects are much lower (1.3 – 6.7%) compared to those observed in the full sample.

[Insert Tables 6 & 7 here]

The definition of 'completed fertility' used in our above estimations for the subsample with complete fertility is based on the interviewed women's self-reported state of infecundity. In Table 7, we employ an alternative definition of complete fertility by restricting our sample to women age 40 or above. One can assume that by that age, most women have completed their fertility, and many of those who have not, are nearing menopause and are facing difficulty conceiving. As before, the association between early marriage and revealed son preference remains negative and significant. The marginal effects range between 1.2% and 6.0%.

Table 8 presents the estimates of childbearing behaviour with respect to the sex of the last child. Compared to late-marrying women, early-marrying women are more likely to continue childbearing if the last child happens to be a girl with the marginal effects ranging from 7.7% to 13%.

[Insert Tables 8 & 9 here]

Another dimension of fertility, but for which we do not find much evidence, is the differential child-spacing practised by early-married Pakistani women. Javed and Mughal (2020) report strong evidence for differential behaviour at early parities. They find that women whose first or second child is a son have significantly longer subsequent birth intervals compared with women with no sons. In this study, our interest lies not in the spacing patterns of women with one or more sons per se, but rather in their interaction with early marriage. Table 9 reports partial results for Cox Hazard Model estimations for the first four parities. We observe significant difference between early- and late-marrying women at the first two birth orders. Early-marrying women without a son have 6.7-8.4% shorter subsequent birth interval in contrast to late marrying woman. The effect is not visible at higher birth orders.

All in all, these findings show a clear difference between women who married early and those who married later in terms of their revealed son preference reflected in greater incidence of differential birth stopping and spacing.

4.2 Stated Son Preference

Next, we examine if the divergence in preference for male child found between women who married early and those who married later is also reflected in their stated desire. Stated preference, to some extent, reflects the woman's perception of gender equality, and should plausibly decrease with growing maturity and autonomy that accompanies later marriage. Partial results of Probit estimations for stated son preference reported in Table 10 support this argument. The results shown in Columns 1 and 2 point to a positive and mostly significant relationship between desired son preference and early marriage. The marginal effects are similar to those observed for revealed preference, and range from 1.8% to 6.3%.

[Insert Table 10 here]

Here, the survey questions on which the stated preference variable used in the above set of estimations is based merit scrutiny. Women who already given birth to a child were asked the following questions to find out their desired fertility preferences:

"If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?", "How many of these children would you like to be boys?" and "How many would you like to be girls, and for how many would it not matter if it's a boy or a girl?"

Responses to such questions, constituting direct measures of son preference, are criticized in the literature for being subject to Rationalization bias. A woman's perception of ideal number of sons and daughters may be driven by the number of sons she has already borne (Dasgupta, 2016; Pritchett, 1994). In our data however, we do not find support for this assertion. The correlation between the indicators of stated and revealed preference is low (correlation coefficient = -0.0382 for parity 1, -0.06 for parity 2, -0.04 for parity 3 and -0.08 for parity 4). Furthermore, the results of the stated son preference model are not much affected if the sex of existing children is controlled for. For this, we include the son ratio variable, defined as the ratio of sons as a proportion of the total number of children born to the woman. The coefficient of the variable is found to be significant, and its inclusion, if anything, improves the statistical significance of the models. An early-marrying woman with completed fertility is 1.8% to 6.3% more likely

to declare greater desire for sons than daughters than a later-marrying woman does (Columns 3 - 4).

Next, we employ another definition of stated son preference, defined as the ratio of the difference between Ideal number of boys and girls to the Ideal number of Children born to the woman. Partial results for OLS estimations carried out with this alternative measure (shown in columns 5-8) again point to a positive and statistically significant association between female early marriage and stated son preference. The coefficients of the early-marriage variable for the models with or without controls or fixed effects, or with or without the inclusion of the sex of existing children, are all significant and lie in the 1 – 3.5% range.

The results for women residing in rural and urban areas (shown in Table 11) are quite similar, and suggest that the differences between the early- and late-marrying women's stated preference effects do not substantially differ by their place of residence.

[Insert Table 11 here]

4.3 Husband's Early Marriage

Next, we compare the gender-specific fertility effects of female early marriage examined thus far with those associated with men's early marriage. Early marriage is much less common among Pakistani men. Only 10% men in our sample got married before age 18 compared to 43% women. This notwithstanding, male early marriage's association with revealed son preference does not appear much different from that observed in the case of female early marriage (Table 12). The marginal effects range from 3.4% to 7.6%. This finding is in line with the observation that historically, son preference and the demand for additional children has been strong both among Pakistani men and women (Khan & Sirageldin, 1977).

[Insert Tables 12 & 13 here]

Interestingly, the association of men's early marriage with stated son preference is mostly insignificant (Table 13), suggesting that unlike women, men's stated desire for boys does not significantly differ by age at marriage. In other words, while early-marrying women state a desire for boys that is significantly greater than that expressed by late-marrying women, early- and late-marrying men exhibit no such difference in

their stated gender preference. Compared to men, women in patriarchal societies face more pressure to produce sons (Javed & Mughal, 2019), which is expressed in their greater stated desire for boys.

4.4 Demographic Transition

Women in our sample got married between 1951 and 2018. During this time period, Pakistan went through demographic transition, with fertility rates falling from over 6 in the 1950s to less than 4 in 2018 (World Bank, 2020). Contraceptive prevalence increased from 12% in 1991 to 34% in 2018 (PDHS, 2018). In the presence of son preferring norms, smaller family requirements can aggravate gender-specific fertility stopping. The change can be expected to affect early-marrying women disproportionately, leading to increasing difference with late-marrying women. We find evidence for this argument by comparing the pre- and post-2000 marriage cohorts. Table 14 reports the partial results of probit estimations for these two cohorts, without and with the set of controls and fixed effects. The association between early marriage and reported son preference remains negative and statistically significant. The effect is substantially stronger in post-2000 marriages. The likelihood of stopping childbearing without a son among the more recent (post-2000) early-marrying women is lower by as much as 21% (parity 2/3) compared to their later-marrying counterparts.

[Insert Table 14 here]

4.5 Mediating Channels

We examine the role of the four mediating channels suggested by Asadullah and Wahhaj (2019) through which early marriage can affect women's beliefs and attitudes towards traditional gender norms.

1) Women's schooling: we compare women with no schooling to those with at least some education. 2) Social network: We compare women who, in response to the question: "Who usually decides on visits to family or relatives?", answer: "respondent alone" or "Respondent and husband/partner jointly", with those who answer: "family elders", "husband/partner alone" or "others". 3) Progressive spousal matching: We compare women whose husbands have acquired at least five years more education from them with those who do not. 4) Earlier experience of marital responsibilities: We

compare women who gave birth to their first child within twelve months of marriage with those who did not.

Out of the four channels, women's education appears to be the strongest, especially considering the women's revealed son preference. The education profiles of the early- and late-marrying women are substantially different. Only 26% of early-marrying women have ever been to school compared to 47% of late-marrying women. Early-marrying women, on average, hold 1.68 years of schooling compared to 4.2 years for late-marrying women. The differences in gender-specific birth stopping effects between the early- and late-marrying women are stronger among educated women, particularly at higher birth orders (Table 15). For example, at the third birth order, illiterate early-marrying women without a son are 8.6% less likely to stop fertility compared to late-marrying women, while their educated counterparts are 18.2% less likely to stop childbearing compared to corresponding late-marrying women. The difference is much less important in case of stated preference (Table 16).

[Insert Tables 15 & 16 here]

The difference in gender-specific birth stopping behaviour of early- and late-marrying women is weaker for the other three mediation channels examined. The difference among women with weak social network ranges between 12.8 and 13.9% at the four birth orders, and 7.6 and 13.6% among women with stronger social network (Table 17). Both the revealed and stated preference effects are somewhat stronger among women with weak network (Table 18). Likewise, the effects are stronger among women who take up marital responsibilities soon after marriage (Tables 21-22). In contrast, the differential child stopping impact of early marriage is similar across women with and without progressive spousal matches (Table 19-20).

[Insert Tables 17 - 22 here]

5 Robustness Measures and Additional Results

In this section, we show that the main results are robust to a wide range of robustness checks.

5.1 Instrumental Variable Estimations

The estimations reported in the previous section may be subject to endogeneity concerns. Personal and family values, local traditions and cultural norms prevalent in the society influence the age at which girls get married and the importance the birth of boys enjoys. Age at which a woman marries, therefore, cannot be treated as a random event, and may plausibly be correlated with unobserved factors which also affect the woman's reproductive preferences. We employ an instrumental strategy to tackle potential endogeneity present in our estimated models. We construct a community-level instrument for this purpose. The instrument is defined as the percentage of incidence of early marriage observed in the Primary Sampling Unit (PSU) among the women who married before the respondent. This instrument takes its inspiration from Delprato et al. (2017), who analyze the inter-generational of education effects of early marriage in Sub-Saharan Africa. The logic for this instrument goes as follows: In traditional societies, marriage is an institution meant to maintain and promote social ties and within-group connections (UNFPA, 2006). Early-age marriage, in this context, serves as a means to preserve community values related to gender and sexuality. The community is expected to adhere to the practice, and failure to conform could be socially costly (Bayisenge, 2010; Bicchieri & Mercier, 2014; Srinivas, 2000). The proportion of early-married women in the community could therefore act as a useful community-level predictor of female age at marriage, while not being directly related to individual reproductive outcomes. Table A1 presents the first-stage regressions of the instrumental-variable estimation, which confirm this plausible association. The community-incidence variable is strongly associated with the female age at marriage variable, with all coefficients significant at the 1% level. The F-statistics is above 10 across all specifications, implying that instrument is strong.

Table 23 shows results of the IV Probit estimations for fertility stopping, without and with the full set of controls and fixed effects. The impact of female early marriage on fertility stopping among women without a son at a given birth order is negative and significant as before, with coefficients ranging between -1.06 and -1.78 (Columns 1-8). The impact of female early marriage on the stated desire for sons is likewise negative and statistically significant, with coefficients ranging between 0.15 and 0.15 (Table 24).

[Insert Tables 23 & 24 here]

We compute the proportion of early-marrying women among all the women in the PSU who got married prior to the surveyed woman. The trends and norms prevalent at the time of the surveyed woman's marriage might closely relate to those present at the time of marriages that took place in the near past. The instrument may in such a case not be considered exogenous. We consider this possibility by limiting the marriages in the PSU to five and ten years prior to the respondent's marriage respectively. The results of IV Probit estimations for revealed and stated son preference carried out with these two instruments is presented in Tables 25 and 26 (IV2) and Tables 27 and 28 (IV3). The female early marriage and son preference relationship obtained using these instruments is similar to the one found previously, and again points to a lower likelihood of birth stopping among early-marrying women without a son.

[Insert Tables 25 & 28 here]

5.2 Treatment Effects

It is possible that women who marry early self-select based on their individual and household characteristics. As previously shown in Table 1, early and late-marrying women differ substantially on a number of observables including schooling, employment, wealth status and place of residence. Women marrying early may therefore differ from those marrying later in ways that could be considered non-random. We account for this possibility of selection bias by estimating the baseline model using different treatment effect estimations including Propensity Score Matching (PSM), Regression Adjustment (RA), Inverse probability weights (IPW) and Augmented IPW (AIPW). The PSM is a matching technique which matches the treated group individuals (those who married early) to the non-treated counterparts (women who married later) based on a propensity score for participation given observable characteristics of the individual. RA estimates the average treatment effect (ATE) and the potential-outcome means (POMs) from observational data. RA estimators use contrasts of averages of treatment-specific predicted outcomes to estimate the treatment effects. IPW estimates the average treatment effect (ATE) and the potential-outcome means (POMs) from observational data by obtaining probability weights to correct for missing data pertaining to the potential outcomes. Finally, AIPW estimators

have the double-robust property as they combine aspects of regression-adjustment and inverse-probability-weighted methods.

The results of treatment effect estimations for revealed son preference are given in Table 29. The corresponding Average Treatment Effects (ATE) obtained for the all four birth orders are negative and significant. The ATE of early marriage on fertility stopping at given parity for the four treatment effect estimators range between 9.6% and 13.8% (PSM), 10.5% and 12.4% (RA), 9.2% and 12.3% (IPW), and 9.2% and 12.3% (AIPW), respectively. These findings are highly similar, both in sign and significance, to the baseline estimates, and give strong evidence in favour of higher revealed son preference among early marrying women in Pakistan. Likewise, the results of treatment effects estimated for stated son preference (Table 30) are similar to the baseline estimates.

[Insert Tables 29 & 30 here]

After the treatment effect estimations, the balancing of the treatment groups is checked using Kernel density plots. The covariates of the two groups are found to be well balanced.

5.3 Alternative Female Early Marriage Indicator

We further check the robustness of our estimates by employing an alternative indicator of female early marriage. We use woman's age at marriage as a count variable rather than a binary indicator. We again come up with significant impact of women's marriage age on the revealed and stated preference for boys. A one-year increase in women's age at marriage is associated with 1 – 2% higher likelihood of stopping childbearing without a son (Tables 31). Likewise, a one-year delay in women's marriage in 0.4 (outcome 2) - 0.7% (outcome 1) lower stated preference for boys when estimated without controls (Table 32). The significance of the impact on stated preference disappears, however, when the full set of controls is included.

[Insert Tables 31 & 32 here]

5.4 Alternative Definition of Female Early Marriage

Pakistani law sets the female marriageable age at 16 years as against 18 years for men. About 19% of the women interviewed in our survey got married before turning 16. These women are on average less educated and come from poorer households, and can be expected to show a greater preference for boys than late-marrying women. Table 33

(Columns 1-8) gives the results of the revealed son preference model. The coefficients of the early marriage variable are highly significant and retain the negative sign. The marginal effects for the first four birth order vary from 7% to 10.2%.

Similarly, the marginal effects for the stated son preference models given in Table 34 range between 1.2% to 7.5%, respectively

[Insert Tables 33 & 34 here]

5.5 Sex-selective Abortion

A possible threat to our estimation could be from sex-selective abortion. As discussed in Section 4.1, there is little evidence suggesting widespread practice of sex-selective abortion in Pakistan. Reliable data are scarce, as women are reluctant to report abortions given the social stigma attached to the practice. We explore this possibility through two strategies:

First, in our pooled sample, mothers reported the deaths of 16,198 children. Out of these, 7,930 (4,540 boys and 3,390 girls) were reported to have died at zero month. This number may presumably include abortions in addition to still-births and neo-natal deaths. A significant association between death at birth of a female child and mother's early-age marriage may suggest the presence of a discriminatory practice. We fail to find any such association. Table 35 shows the coefficients of the early-marriage variable, first for the estimation without and then with various mother- and household-level factors and including time, region and mother-specific effects. The coefficients are invariably insignificant, with p-values in excess of 0.5.

Second, we limit our sample to the women who do not report any child death, thereby precluding any cases of gender-specific abortion misreported as miscarriage or still birth. We again obtain results similar to our baseline estimations (Table 36).

[Insert Tables 35 & 36 here]

6 Conclusion

The fifth Sustainable Development Goal (SDG) of the United Nations 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 (UN,

2015). A prerequisite to achieving the goal of women's economic empowerment is to eliminate harmful practices such as marriage before age 18. In this study, we compared the reproductive behaviour and fertility preferences of early- and late-married women using data on married women from four PDHS surveys. The findings of this study underscore the role played by early marriage in altering the gender-specific attitudes prevalent in the society. There is substantial evidence for disproportionate son preference prevalent among early-married women. This evidence points in the direction of gender-inequality traps. Previous research from Pakistan has shown an association between women's say in household decision making and son preference (Javed and Mughal, 2019). Likewise, early-marrying women, who are themselves victims of existing patriarchal customs, help perpetuate gender bias through son-preferring reproductive practices.

These son-preferring norms have non-negligible social and demographic consequences. The desired sex ratio is increasing, sex ratio at last birth is worsening, and son preference's association with modern contraceptive use has become stronger. This can aggravate existing gender gaps in children's anthropometric, health and development outcomes. Tackling these traps requires policy interventions aimed at empowering women. Raising the female marriage age to 18 years could be one option. However, merely passing laws against child marriage is not sufficient to end the practice in the developing countries (Wodon et al., 2017). It is equally important to provide the parents better incentive structures that lead to greater school enrolment and higher labour participation of their daughters. The incidence of female early marriage in Pakistan has decreased over time and the age at first marriage has risen. This demographic transition owes less to any sustained policy initiative or public awareness campaign and more to socioeconomic pressures related to urbanization, improved girls' education and increased female participation in the labour market (Javed & Mughal, 2021). Investing in girls' education can help reduce gender disparities while at the same time delaying marriages, thereby contributing to further reducing the incidence of early-age marriage (Qureshi, 2018).

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Tables and Figures:

Table 1: Individual and household characteristics by Age of Marriage

	Early Marriage	Late Marriage	Two sample t-test
Overall	0.43	0.56	
Education			
Schooling	0.26	0.47	-34.13
Years of Schooling	1.68	4.20	-45.34
Spouse Education			
Schooling	0.56	0.70	-21.62
Women Employed			
Yes	0.26	0.19	11.17
Place of Residence			
Urban	0.28	0.39	-17.97
Economic Status			
Poor	0.46	0.30	23.82

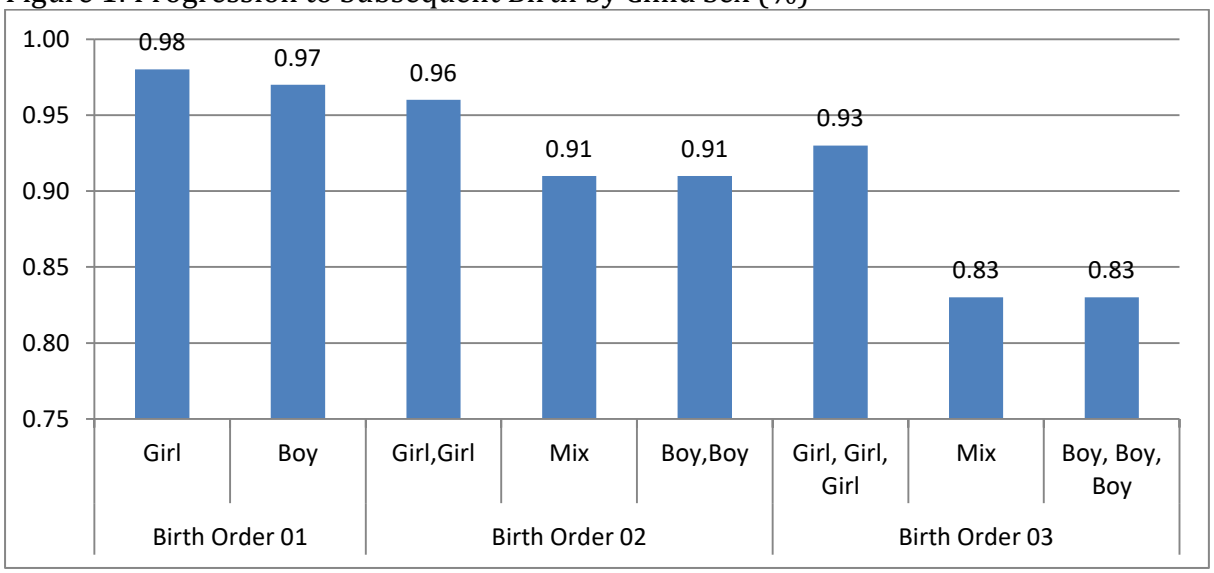
Source: Authors' calculations using pooled data from the four rounds of PDHS. The means are reported in columns 1 and 2. Columns 3 report the t-statistic for the early Marriage- late marriage mean comparison test.

Table 2: Number of Boys and Spacing by Women's Age at Marriage

	Early Marriage	Late Marriage	Two sample t-test
Overall	3.21	2.51	9.22
Total number of living children			
1	0.59	0.60	-0.29
2	1.25	1.27	-0.48
3	1.77	1.77	0.18
4	2.27	2.19	1.97
5	2.72	2.63	1.93
More than 5	3.98	3.68	6.75
Birth Spacing			
1-2	27.42	26.61	2.73
2-3	28.64	29.50	-2.57
3-4	29.25	30.18	-2.42
4-5	29.20	30.57	-3.10
Mean ideal number of boys	2.29	2.00	11.33

Source: Authors' calculations using pooled data from the four rounds of PDHS. The means are reported in columns 1 and 2. Columns 3 report the t-statistic for the early Marriage- late marriage mean comparison test.

Figure 1: Progression to Subsequent Birth by Child Sex (%)



Source: Authors' calculations using pooled data from the four rounds of PDHS.

Table 3: Data description

Variables	Description	Proportion/Mean
Revealed Son Preference		
Birth Stopping		
1	Dummy variable, takes the value of 1 if the woman whose first child is a girl and stops child birth, 0 otherwise	0.14 0.85
2	Dummy variable, takes the value of 1 if the woman whose first two children are girls and stops child birth, 0 otherwise	0.16 0.83
3	Dummy variable, takes the value of 1 if the woman whose first three children are girls and stops child birth, 0 otherwise	0.18 0.81
4	Dummy variable, takes the value of 1 if the woman whose first four children are girls and stops child birth, 0 otherwise	0.20 0.79
Birth Spacing		
1	Succeeding birth space in months at parity 1 if first child is a girl	27.53
2	Succeeding birth space in months at parity 2 if first two children are girls	28.30
3	Succeeding birth space in months at parity 3 if first three children are girls	28.63
4	Succeeding birth space in months at parity 4 if first four children ate girls	27.31
Stated Son Preference	Dummy variable, takes the value of 1 Ideal number of boys greater than ideal number of girls, 0 otherwise	0.37 0.62
Stated Son Preference: alternate proxy	The ratio of the difference between Ideal number of boys and girls to the Ideal number of children	0.14
Early Marriage	Dummy variable, takes the value of 1 if female age at marriage below 18, 0 otherwise	0.43 0.56
Early Marriage - Alternative Measure	Dummy variable, takes the value of 1 if female age at marriage below 16, 0 otherwise	0.19 0.80
Husband Early Marriage	Dummy variable, takes the value of 1 if husband age at marriage below 18, 0 otherwise	0.10 0.89
Age	Woman's current age in completed years	32.20
Age Difference	Age difference between husband and wife in years	5.51
Education	Categorical variable, takes the value of 0 if the woman has no education, 1 if the woman possesses primary education, 2 if the woman possesses secondary education, 3 if the woman possesses higher education	0.60 0.14 0.16 0.08
Spouse Education	Categorical variable, takes the value of 0 if the husband possesses no education, 1 if the husband possesses primary education, 2 if the husband possesses secondary education, 3 if the husband possesses higher education	0.35 0.16 0.33 0.15
Women Employed	Dummy variable, takes the value of 1 if the woman is employed, 0 otherwise	0.22 0.77
Media Exposure	Dummy variable. takes the value of 1 if the woman read newspaper or listens radio or watches television once a week, 0 otherwise	0.41 0.58
Household Size	Total number of family members in the household	8.36
Place of Residence	Dummy variable, takes the value of 1 if the household resides in urban area, 0 otherwise	0.33 0.66
Wealth Status	Categorical variable, takes the value of 1-5 for households belonging to poorest, poorer, middle, rich and richest household wealth groups.	0.18 0.19 0.19 0.21 0.21

Source: Authors' calculations using pooled data from the four rounds of PDHS.

Table 4: Early Female Marriage and Differential Birth Stopping

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.360***	-0.650***	-0.382***	-0.682***	-0.319***	-0.558***	-0.363***	-0.552***
	(0.024)	(0.032)	(0.035)	(0.047)	(0.051)	(0.068)	(0.079)	(0.099)
Marginal effect	-0.077***	-0.105***	-0.092***	-0.124***	-0.083***	-0.113***	-0.104***	-0.125***
	(0.004)	(0.004)	(0.008)	(0.007)	(0.013)	(0.013)	(0.022)	(0.022)
Constant	-0.933***	2.765***	-0.813***	3.268***	-0.752***	3.171***	-0.629***	3.001***
	(0.014)	(0.101)	(0.022)	(0.157)	(0.034)	(0.236)	(0.054)	(0.373)
Observations	18,798	17,942	7,941	7,596	3,299	3,148	1,318	1,255
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Early Female Marriage and Differential Birth Stopping- Place of Residence

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 2	(3) Subsequent birth at birth order 3	(4) Subsequent birth at birth order 4	(5) Subsequent birth at birth order 1	(6) Subsequent birth at birth order 2	(7) Subsequent birth at birth order 3	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.691***	-0.622***	-0.665***	-0.430***	-0.608***	-0.782***	-0.478***	-0.741***
	(0.043)	(0.061)	(0.096)	(0.140)	(0.048)	(0.073)	(0.099)	(0.147)
Marginal effect	-0.111***	-0.114***	-0.125***	-0.090***	-0.098***	-0.137***	-0.103***	-0.172***
	(0.006)	(0.108)	(0.017)	(0.029)	(0.007)	(0.011)	(0.020)	(0.032)
Constant	2.893***	3.159***	3.757***	3.151***	2.710***	3.280***	2.664***	2.933***
	(0.141)	(0.214)	(0.339)	(0.513)	(0.160)	(0.254)	(0.360)	(0.604)
Observations	9,467	4,073	1,691	669	8,475	3,523	1,457	586
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table presents results for the subsequent birth at the nth birth order. Columns 1-4 show results for women living in rural areas while Columns 5-8 show results for women living in urban areas. All estimations include the full set of controls and fixed effects. Controls include woman's birth order, with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical feature (region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Early Female Marriage and Differential Stopping – Complete Fertility Sample

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.282***	-0.383***	-0.417***	-0.511***	-0.508***	-0.531***	-0.256**	-0.201
	(0.061)	(0.079)	(0.073)	(0.095)	(0.090)	(0.114)	(0.123)	(0.159)
Marginal effect	-0.013***	-0.014***	-0.034***	-0.034***	-0.067***	-0.059***	-0.044**	-0.027
	(0.002)	(0.002)	(0.005)	(0.006)	(0.011)	(0.0124)	(0.021)	(0.021)
Constant	-1.929***	0.279	-1.582***	1.364***	-1.235***	1.243***	-1.170***	1.147*
	(0.036)	(0.286)	(0.042)	(0.357)	(0.053)	(0.422)	(0.084)	(0.652)
Observations	9,842	9,472	4,406	4,244	1,938	1,890	801	770
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Early Female Marriage and Differential Birth Stopping – Subsample of women age 40 and above

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.289***	-0.258**	-0.406***	-0.391***	-0.468***	-0.418**	-0.352**	-0.320
	(0.077)	(0.103)	(0.109)	(0.135)	(0.132)	(0.172)	(0.155)	(0.215)
Marginal effect	-0.018***	-0.012**	-0.029***	-0.025***	-0.053***	-0.039**	-0.060**	-0.043
	(0.004)	(0.004)	(0.007)	(0.008)	(0.014)	(0.015)	(0.262)	(0.028)
Constant	-1.772***	0.638	-1.646***	0.346	-1.357***	2.862**	-1.120***	-0.299
	(0.044)	(0.733)	(0.059)	(0.937)	(0.072)	(1.303)	(0.096)	(1.669)
Observations	4,883	4,409	2,299	2,075	1,078	933	515	444
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Early Female Marriage, Sex of Last Child and Differential Stopping

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.360***	-0.650***	-0.406***	-0.673***	-0.362***	-0.492***	-0.314***	-0.421***
	(0.024)	(0.032)	(0.024)	(0.031)	(0.024)	(0.030)	(0.027)	(0.032)
Marginal effect	-0.077***	-0.105***	-0.103***	-0.130***	-0.104***	-0.117***	-0.100***	-0.112***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.007)	(0.007)	(0.008)	(0.008)
Constant	-0.933***	2.765***	-0.746***	3.099***	-0.615***	2.481***	-0.502***	2.617***
	(0.014)	(0.101)	(0.015)	(0.104)	(0.016)	(0.105)	(0.019)	(0.119)
Observations	18,798	17,942	16,347	15,647	13,594	12,979	10,300	9,816
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women with female child at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Early Female Marriage and Differential Birth Spacing - Cox Estimates

VARIABLES	(1) Duration 1 to 2	(2) Duration 2 to 3	(3) Duration 3 to 4	(4) Duration 4 to 5
Early Marriage (ref: Late Marriage)	-0.084***	-0.067**	-0.042	0.060
	(0.017)	(0.027)	(0.042)	(0.067)
Observations	15,414	6,316	2,567	986
Controls	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-4 present results for the subsequent birth space at the nth birth order with the set of controls. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

Table 10: Early Female Marriage and Stated Son Preference

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 01	(4) Son Preference 01	(5) Son Preference 02	(6) Son Preference 02	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.163***	0.050***	0.167***	0.052***	0.035***	0.010***	0.035***	0.011***
	(0.015)	(0.017)	(0.015)	(0.017)	(0.003)	(0.004)	(0.003)	(0.004)
Marginal effect	0.063***	0.018***	0.063***	0.018***	0.035***	0.010***	0.035***	0.011***
	(0.005)	(0.006)	(0.005)	(0.006)	(0.003)	(0.004)	(0.003)	(0.004)
Son ratio			0.716***	0.751***			0.183***	0.179***
			(0.024)	(0.028)			(0.005)	(0.006)
Constant	-0.306***	-0.117*	-0.686***	-0.526***	0.144***	0.191***	0.049***	0.096***
	(0.010)	(0.063)	(0.016)	(0.066)	(0.002)	(0.013)	(0.003)	(0.013)
Observations	30,418	29,156	30,147	28,895	30,418	29,156	30,147	28,895
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the stated son preference, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Early Female Marriage and Stated Son Preference- Place of Residence

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 02	(4) Son Preference 02	(5) Son Preference 01	(6) Son Preference 01	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.041*	0.041*	0.010**	0.010**	0.055**	0.059**	0.010**	0.010**
	(0.022)	(0.022)	(0.005)	(0.004)	(0.025)	(0.025)	(0.005)	(0.005)
Marginal effect	0.015*	0.015*	0.010**	0.010**	0.019**	0.020**	0.010**	0.010**
	(0.008)	(0.008)	(0.005)	(0.004)	(0.008)	(0.008)	(0.005)	(0.005)
Son ratio		0.717***		0.179***		0.797***		0.178***
		(0.035)		(0.007)		(0.037)		(0.007)
Constant	0.095	-0.273***	0.238***	0.142***	-0.450***	-0.912***	0.131***	0.037**
	(0.074)	(0.080)	(0.015)	(0.016)	(0.088)	(0.093)	(0.017)	(0.018)
Observations	15,397	15,281	15,397	15,281	13,759	13,614	13,759	13,614
R-squared			0.073	0.111			0.048	0.093
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table presents results for stated son preference. Columns 1-4 show results for women living in rural areas while Columns 5-8 show results for women living in urban areas. All estimations include the full set of controls and fixed effects. Controls include woman's birth order, with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical feature (region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Husband's Early Marriage and Differential Birth Stopping

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.298***	-0.530***	-0.147***	-0.323***	-0.330***	-0.407***	-0.151	-0.336**
	(0.043)	(0.054)	(0.057)	(0.072)	(0.090)	(0.108)	(0.124)	(0.151)
Marginal effect	-0.057***	-0.076***	-0.034***	-0.056***	-0.076***	-0.076***	-0.041	-0.071**
	(0.007)	(0.006)	(0.012)	(0.011)	(0.018)	(0.017)	(0.032)	(0.029)
Constant	-1.058***	2.298***	-0.954***	2.604***	-0.873***	2.689***	-0.788***	2.490***
	(0.012)	(0.095)	(0.018)	(0.145)	(0.027)	(0.222)	(0.042)	(0.352)
Observations	17,991	17,942	7,619	7,596	3,159	3,148	1,257	1,255
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The unit of analysis is husband. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include husband's characteristics (age, age difference with wife, education, employment status, media exposure), wife education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to those without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 13: Husband's Early Marriage and Stated Son Preference

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 01	(4) Son Preference 01	(5) Son Preference 02	(6) Son Preference 02	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.132**	0.062	0.144**	0.076	0.012	-0.004	0.007	-0.005
	(0.055)	(0.058)	(0.060)	(0.066)	(0.012)	(0.013)	(0.012)	(0.012)
Marginal effect	0.052**	0.023	0.057**	0.023	0.012	-0.004	0.007	-0.005
	(0.021)	(0.022)	(0.023)	(0.022)	(0.012)	(0.013)	(0.012)	(0.012)
Son ratio			0.427***	0.457***			0.096***	0.086***
			(0.059)	(0.066)			(0.011)	(0.014)
Constant	-0.041**	0.268**	-0.267	-0.120	0.160***	0.284***	0.101***	0.138***
	(0.017)	(0.128)	(0.036)	(0.140)	(0.004)	(0.026)	(0.007)	(0.027)
Observations	6,026	5,570	4,764	4,376	6,496	6,007	5,142	4,726
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the three rounds of PDHS. The unit of analysis is husband. Columns 1-8 present results for stated son preference, first without and then with the set of controls and fixed effects. Controls include husband's characteristics (age, age difference with wife, education, employment status, media exposure), wife education, household size, wealth status, and geographical features (place of residence, region). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 14: Early Female Marriage and Differential Birth Stopping – Pre- and Post-2000 Cohorts

VARIABLES	(1) Subsequent birth at birth order 1(Pre 2000)	(2) Subsequent birth at birth order 1(Post 2000)	(3) Subsequent birth at birth order 2 (Pre 2000)	(4) Subsequent birth at birth order 2 (Post 2000)	(5) Subsequent birth at birth order 3 (Pre 2000)	(6) Subsequent birth at birth order 3 (Post 2000)	(7) Subsequent birth at birth order 4 (Pre 2000)	(8) Subsequent birth at birth order 4 (Post 2000)
Early Marriage (ref: Late Marriage)	-0.467***	-0.772***	-0.453***	-0.790***	-0.422***	-0.746***	-0.488***	-0.562**
	(0.051)	(0.045)	(0.068)	(0.073)	(0.090)	(0.123)	(0.119)	(0.230)
Marginal effect	-0.042***	-0.187***	-0.053***	-0.212***	-0.066***	-0.211***	-0.096***	-0.168**
	(0.004)	(0.009)	(0.008)	(0.017)	(0.0142)	(0.031)	(0.023)	(0.064)
Constant	1.724***	3.841***	2.056***	4.888***	2.412***	5.303***	2.085***	4.953***
	(0.167)	(0.147)	(0.231)	(0.257)	(0.322)	(0.538)	(0.461)	(0.983)
Observations	10,607	7,335	4,864	2,667	2,273	875	997	255
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 15: Early Female Marriage and Differential Birth Stopping- Role of Women's Education

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 2	(3) Subsequent birth at birth order 3	(4) Subsequent birth at birth order 4	(5) Subsequent birth at birth order 1	(6) Subsequent birth at birth order 2	(7) Subsequent birth at birth order 3	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.680***	-0.688***	-0.490***	-0.506***	-0.657***	-0.731***	-0.756***	-0.679***
	(0.042)	(0.060)	(0.086)	(0.119)	(0.050)	(0.075)	(0.113)	(0.190)
Marginal effect	-0.097***	-0.111***	-0.086***	-0.104***	-0.123***	-0.155***	-0.182***	-0.184***
	(0.005)	(0.009)	(0.015)	(0.024)	(0.008)	(0.014)	(0.023)	(0.047)
Constant	2.731***	3.082***	3.058***	3.016***	2.822***	3.601***	3.510***	3.083***
	(0.129)	(0.196)	(0.295)	(0.438)	(0.189)	(0.298)	(0.476)	(0.862)
Observations	10,666	4,725	2,052	888	7,276	2,871	1,096	366
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table shows results for subsequent birth at the nth birth order. Columns 1-4 show results for women with no education while Columns 5-8 show results for women with at least some schooling. All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 16: Early Female Marriage and Stated Son Preference- Role of Women's Education

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 02	(4) Son Preference 02	(5) Son Preference 01	(6) Son Preference 01	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.057***	0.059***	0.014***	0.014***	0.056**	0.057**	0.008	0.008
	(0.020)	(0.021)	(0.004)	(0.004)	(0.027)	(0.028)	(0.005)	(0.005)
Marginal effect	0.021***	0.022***	0.014***	0.014***	0.019**	0.019**	0.008	0.008
	(0.007)	(0.007)	(0.004)	(0.004)	(0.009)	(0.009)	(0.005)	(0.005)
Son ratio		0.678***		0.176***		0.830***		0.181***
		(0.035)		(0.007)		(0.037)		(0.007)
Constant	-0.103	-0.479***	0.201***	0.103***	-0.494***	-0.926***	0.104***	0.018
	(0.065)	(0.070)	(0.014)	(0.014)	(0.111)	(0.117)	(0.021)	(0.021)
Observations	16,626	16,469	16,626	16,469	12,530	12,426	12,530	12,426
R-squared			0.073	0.105			0.024	0.081
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table shows results for states son preference. Columns 1-4 show results for women with no education while Columns 5-8 show results for women with at least some schooling. . All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 17: Early Female Marriage and Differential Birth Stopping- Role of Social Networks

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 2	(3) Subsequent birth at birth order 3	(4) Subsequent birth at birth order 4	(5) Subsequent birth at birth order 1	(6) Subsequent birth at birth order 2	(7) Subsequent birth at birth order 3	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.679***	-0.685***	-0.605***	-0.607***	-0.562***	-0.774***	-0.523***	-0.632***
	(0.053)	(0.082)	(0.121)	(0.196)	(0.062)	(0.092)	(0.120)	(0.181)
Marginal effect	-0.128***	-0.132***	-0.128***	-0.139***	-0.076***	-0.119***	-0.104***	-0.136***
	(0.009)	(0.014)	(0.024)	(0.043)	(0.007)	(0.012)	(0.022)	(0.036)
Constant	3.116***	4.147***	3.166***	4.299***	2.299***	3.274***	3.708***	3.107***
	(0.162)	(0.274)	(0.412)	(0.696)	(0.195)	(0.303)	(0.430)	(0.856)
Observations	5,708	2,305	904	357	5,590	2,436	1,028	399
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table presents results for subsequent birth at the nth birth order. Columns 1-4 show results for women without any role in decisions involving social networks while Columns 5-8 show results for women with some role in decisions involving social networks. All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 18: Early Female Marriage and Stated Son Preference- Social Network

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 02	(4) Son Preference 02	(5) Son Preference 01	(6) Son Preference 01	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.066**	0.068**	0.021***	0.021***	0.051*	0.055*	0.010*	0.010*
	(0.028)	(0.028)	(0.006)	(0.006)	(0.030)	(0.030)	(0.006)	(0.005)
Marginal effect	0.024**	0.024**	0.021***	0.021***	0.018*	0.018*	0.010*	0.010*
	(0.010)	(0.010)	(0.006)	(0.006)	(0.010)	(0.010)	(0.006)	(0.005)
Son ratio		0.555***		0.135***		0.920***		0.200***
		(0.041)		(0.008)		(0.047)		(0.008)
Constant	-0.203**	-0.499***	0.164***	0.095***	-0.655***	-1.201***	0.088***	-0.022
	(0.080)	(0.084)	(0.016)	(0.017)	(0.096)	(0.101)	(0.018)	(0.018)
Observations	9,955	9,955	9,955	9,955	9,737	9,737	9,737	9,737
R-squared			0.116	0.140			0.042	0.096
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table shows results for states son preference. Columns 1-4 show results for women without any role in decisions involving social networks while Columns 5-8 show results for women with some role in decisions involving social networks. All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 19: Early Female Marriage and Differential Birth Stopping- Progressive Spousal Matching

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 2	(3) Subsequent birth at birth order 3	(4) Subsequent birth at birth order 4	(5) Subsequent birth at birth order 1	(6) Subsequent birth at birth order 2	(7) Subsequent birth at birth order 3	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.646***	-0.684***	-0.551***	-0.634***	-0.698***	-0.717***	-0.601***	-0.488***
	(0.040)	(0.058)	(0.085)	(0.131)	(0.053)	(0.079)	(0.112)	(0.162)
Marginal effect	-0.107***	-0.130***	-0.117***	-0.138***	-0.107***	-0.116***	-0.112***	-0.108***
	(0.006)	(0.010)	(0.017)	(0.027)	(0.007)	(0.012)	(0.020)	(0.035)
Constant	2.838***	3.213***	3.287***	3.467***	2.578***	3.398***	2.986***	2.595***
	(0.125)	(0.191)	(0.295)	(0.495)	(0.177)	(0.287)	(0.416)	(0.638)
Observations	11,705	4,923	2,003	797	6,235	2,673	1,145	458
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table presents results for subsequent birth at the nth birth order. Columns 1-4 show results for women whose husbands do not hold at least five more years of schooling while Columns 5-8 show results for women whose husbands have at least five more years of schooling. All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 20: Early Female Marriage and Stated Son Preference- Progressive Matches

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 02	(4) Son Preference 02	(5) Son Preference 01	(6) Son Preference 01	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.054***	0.058***	0.011***	0.012***	0.045*	0.044	0.010*	0.009*
	(0.021)	(0.021)	(0.004)	(0.004)	(0.026)	(0.027)	(0.005)	(0.005)
Marginal effect	0.019***	0.020***	0.011***	0.012***	0.016***	0.016***	0.010*	0.009*
	(0.007)	(0.007)	(0.004)	(0.004)	(0.009)	(0.009)	(0.005)	(0.005)
Son ratio		0.751***		0.178***		0.756***		0.180***
		(0.031)		(0.006)		(0.044)		(0.009)
Constant	-0.146**	-0.541***	0.179***	0.084***	-0.078	-0.518***	0.200***	0.102***
	(0.067)	(0.072)	(0.014)	(0.014)	(0.092)	(0.099)	(0.019)	(0.020)
Observations	18,954	18,792	18,954	18,792	10,200	10,101	10,200	10,101
R-squared			0.069	0.112			0.066	0.104
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table shows results for states son preference. Columns 1-4 show results for women whose husbands do not hold at least five more years of schooling while Columns 5-8 show results for women whose husbands have at least five more years of schooling. All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 21: Early Female Marriage and Differential Birth Stopping- Early Assumption of Marital Responsibilities

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 2	(3) Subsequent birth at birth order 3	(4) Subsequent birth at birth order 4	(5) Subsequent birth at birth order 1	(6) Subsequent birth at birth order 2	(7) Subsequent birth at birth order 3	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-1.078***	-0.813***	-0.450***	-0.775***	-0.610***	-0.724***	-0.696***	-0.516***
	(0.071)	(0.095)	(0.132)	(0.190)	(0.036)	(0.054)	(0.080)	(0.119)
Marginal effect	-0.139***	-0.133***	-0.086***	-0.180***	-0.103***	-0.135***	-0.144***	-0.115***
	(0.007)	(0.013)	(0.024)	(0.041)	(0.005)	(0.009)	(0.015)	(0.026)
Constant	3.381***	3.238***	3.074***	3.651***	2.711***	3.379***	3.325***	2.760***
	(0.215)	(0.314)	(0.446)	(0.678)	(0.117)	(0.184)	(0.285)	(0.458)
Observations	5,475	2,285	954	383	12,467	5,311	2,194	872
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table presents results for subsequent birth at the nth birth order. Columns 1-4 show results for women who gave birth to a child within twelve months of marriage while Columns 5-8 show results for women who gave birth to a child at least twelve months after marriage. All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 22: Early Female Marriage and Stated Son Preference- Early assumption of marital responsibilities

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 02	(4) Son Preference 02	(5) Son Preference 01	(6) Son Preference 01	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.066**	0.068**	0.013**	0.013**	0.040**	0.042**	0.009**	0.009**
	(0.031)	(0.031)	(0.006)	(0.006)	(0.019)	(0.020)	(0.004)	(0.004)
Marginal effect	0.023**	0.024**	0.013**	0.013**	0.014**	0.015**	0.009**	0.009**
	(0.011)	(0.011)	(0.006)	(0.006)	(0.007)	(0.020)	(0.004)	(0.004)
Son ratio		0.729***		0.168***		0.761***		0.183***
		(0.046)		(0.009)		(0.030)		(0.006)
Constant	-0.185*	-0.591***	0.172***	0.082***	-0.091	-0.500***	0.199***	0.102***
	(0.102)	(0.106)	(0.020)	(0.020)	(0.063)	(0.069)	(0.013)	(0.014)
Observations	8,972	8,972	8,972	8,972	20,184	19,923	20,184	19,923
R-squared			0.056	0.094			0.070	0.113
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. The table shows results for states son preference. Columns 1-4 show results for women who gave birth to a child within twelve months of marriage while Columns 5-8 show results for women who gave birth to a child at least twelve months after marriage. All estimations include the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 23: Community Prevalence of Early Marriage and Son Preference – IV Probit Estimates

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-1.511***	-1.067***	-1.656***	-1.781***	-1.476***	-1.326***	-1.287***	-0.136
	(0.057)	(0.204)	(0.068)	(0.159)	(0.139)	(0.339)	(0.279)	(0.625)
Constant	-0.186***	3.081***	0.063***	3.775***	0.025	3.717***	-0.026	2.613**
	(0.051)	(0.146)	(0.067)	(0.142)	(0.021)	(0.267)	(0.213)	(0.896)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Region Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Time Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	18,301	17,492	7,699	7,377	3,172	3,033	1,256	1,199

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Early marriage is instrumented by the proportion of early-marrying women among all the women in the PSU who got married prior to the surveyed woman. The sample is restricted to women without a son at nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 24: Community Prevalence of Early Marriage and Stated Son Preference – IV Probit Estimates

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 01	(4) Son Preference 01	(5) Son Preference 02	(6) Son Preference 02	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.608***	0.156***	0.635***	0.159*	0.104***	0.016	0.105***	0.016
	(0.063)	(0.096)	(0.063)	(0.097)	(0.014)	(0.017)	(0.014)	(0.017)
Son ratio			0.659***	0.744***			0.180***	0.177***
			(0.024)	(0.025)			(0.005)	(0.005)
Constant	-0.497***	-0.272**	-0.872***	-0.696***	0.113***	0.194***	0.018**	0.098***
	(0.026)	(0.080)	(0.027)	(0.081)	(0.006)	(0.015)	(0.006)	(0.013)
Observations	29,792	28,598	29,521	28,337	28,792	28,598	29,521	28,337
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for stated son preference, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Early marriage is instrumented by the proportion of early-marrying women among all the women in the PSU who got married prior to the surveyed woman. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 25: Community Prevalence of Early Marriage and Son Preference – IV2 Probit Estimates

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-1.647***	-1.529***	-1.729***	-1.761***	-1.374***	-0.895***	-1.119***	-0.277
	(0.045)	(0.140)	(0.061)	(0.171)	(0.151)	(0.389)	(0.320)	(0.617)
Constant	-0.051***	3.254***	0.135***	3.783***	0.054	3.512***	-0.144	2.740**
	(0.045)	(0.098)	(0.064)	(0.144)	(0.123)	(0.379)	(0.225)	(0.845)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Region Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Time Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	17,809	17,020	7,464	7,153	3,080	2,945	1,215	1,161

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Early marriage is instrumented by proportion of early marriages in the PSU to five years prior to the respondent's marriage respectively. The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 26: Early Female Marriage and Stated Son Preference – IV2 Probit Estimates

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 01	(4) Son Preference 01	(5) Son Preference 02	(6) Son Preference 02	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.783***	0.358***	0.799***	0.347***	0.160***	0.089***	0.157***	0.083***
	(0.063)	(0.103)	(0.063)	(0.103)	(0.016)	(0.020)	(0.015)	(0.019)
Son ratio			0.671***	0.798***			0.180***	0.177***
			(0.025)	(0.025)			(0.005)	(0.005)
Constant	-0.567***	-0.408***	-0.928***	-0.820***	0.089***	0.083***	-0.003	-0.008
	(0.025)	(0.083)	(0.025)	(0.083)	(0.007)	(0.016)	(0.007)	(0.016)
Observations	29,094	27,922	28,827	27,665	29,094	27,922	28,827	27,665
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for stated son preference, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Early marriage is instrumented by the proportion of early marriages in the PSU to five years prior to the respondent's marriage respectively. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 27: Community Prevalence of Early Marriage and Son Preference – IV3 Probit Estimates

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-1.631***	-1.271***	-1.770***	-1.846***	-1.551***	-1.240***	-1.305***	-0.257
	(0.042)	(0.146)	(0.049)	(0.125)	(0.110)	(0.289)	(0.262)	(0.552)
Constant	-0.067***	3.178***	0.186***	3.773***	0.097	3.674***	-0.014	2.762**
	(0.041)	(0.113)	(0.055)	(0.142)	(0.102)	(0.268)	(0.202)	(0.784)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Region Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Time Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	18,242	17,435	7,667	7,347	3,162	3,025	1,253	1,197

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Early marriage is instrumented by the proportion of early marriages in the PSU to ten years prior to the respondent's marriage respectively. The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 28: Early Female Marriage and Stated Son Preference – IV3 Estimates

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 01	(4) Son Preference 01	(5) Son Preference 02	(6) Son Preference 02	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.704***	0.224***	0.721***	0.216***	0.104***	0.051***	0.138***	0.047***
	(0.058)	(0.090)	(0.058)	(0.090)	(0.014)	(0.017)	(0.013)	(0.016)
Son ratio			0.679***	0.741***			0.180***	0.177***
			(0.024)	(0.025)			(0.005)	(0.005)
Constant	-0.535***	-0.320**	-0.901***	-0.735***	0.097***	0.111***	0.004	0.018
	(0.024)	(0.076)	(0.024)	(0.077)	(0.006)	(0.014)	(0.006)	(0.014)
Observations	29,695	28,505	29,425	28,245	29,695	28,505	29,425	28,245
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for stated son preference, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Early marriage is instrumented by the proportion of early marriages in the PSU to ten years prior to the respondent's marriage. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 29: Early Female Marriage and Differential Birth Stopping – Treatment Effects

	Propensity score matching	Regression adjustment		Inverse-Probability weights		Augmented IPW	
	Subsequent birth	Subsequent birth	POmean	Subsequent birth	POmean	Subsequent birth	POmean
Birth order 01							
ATE (Early Marriage vs Late Marriage)	-0.096***	-0.105***	0.186***	-0.092***	0.179***	-0.092***	0.179***
	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	17,942	17,942	17,942	17,942	17,942	17,942	17,942
Birth order 02							
ATE (Early Marriage vs Late Marriage)	-0.114***	-0.124***	0.223***	-0.111***	0.214***	-0.110***	0.214***
	(0.010)	(0.007)	(0.006)	(0.008)	(0.006)	(0.008)	(0.006)
Observations	7,596	7,596	7,596	7,596	7,596	7,596	7,596
Birth order 03							
ATE (Early Marriage vs Late Marriage)	-0.101***	-0.114***	0.234***	-0.104***	0.227***	-0.104***	0.227***
	(0.015)	(0.012)	(0.010)	(0.013)	(0.011)	(0.013)	(0.011)
Observations	3,148	3,148	3,148	3,148	3,148	3,148	3,148
Birth order 04							
ATE (Early Marriage vs Late Marriage)	-0.138***	-0.122***	0.276***	-0.123***	0.274***	-0.123***	0.274***
	(0.029)	(0.022)	(0.018)	(0.022)	(0.018)	(0.022)	(0.018)
Observations	1,255	1,255	1,255	1,255	1,255	1,255	1,255

Source: Authors' calculations using pooled data from the four rounds of PDHS. Robust standard errors in parentheses. *** p<0.01, ** p<0.05,

Table 30: Early Female Marriage and Stated Son Preference – Treatment Effects

VARIABLES	Propensity score matching	Regression adjustment		Inverse-Probability weights		Augmented IPW	
	(1)	(2)	POmean	(3)	POmean	(4)	POmean
ATE (Early Marriage vs Late Marriage)	0.020***	0.025***	0.394***	0.027***	0.397***	0.027***	0.398***
	(0.007)	(0.006)	(0.003)	(0.006)	(0.004)	(0.006)	(0.004)
Observations	29,156	29,156	29,156	29,156	29,156	29,156	29,156

Source: Authors' calculations using pooled data from the four rounds of PDHS. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 31: Early Female Marriage and Differential Birth Stopping- Alternate Definition of Early Marriage

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Age at Marriage	0.058***	0.145***	0.061***	0.152***	0.053***	0.123***	0.050***	0.091***
	(0.003)	(0.004)	(0.004)	(0.007)	(0.007)	(0.010)	(0.011)	(0.015)
Marginal effect	0.012***	0.023***	0.014***	0.027***	0.013***	0.024***	0.014***	0.020***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)
Constant	-2.182***	0.429***	-2.122***	0.866***	-1.865***	1.171***	-1.705***	1.245***
	(0.055)	(0.108)	(0.084)	(0.162)	(0.129)	(0.246)	(0.201)	(0.389)
Observations	18,798	17,942	7,941	7,596	3,299	3,148	1,318	1,255
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for subsequent birth at the nth birth order, first without and then with the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 32: Early Female Marriage and Stated Son Preference- Alternate Definition of Early Marriage

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 01	(4) Son Preference 01	(5) Son Preference 02	(6) Son Preference 02	(7) Son Preference 02	(8) Son Preference 02
Age at Marriage	-0.021***	-0.003	-0.021***	-0.003	-0.004***	-0.000	-0.004***	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
Marginal effect	-0.007***	-0.001	-0.007***	-0.001	-0.004***	-0.000	-0.004***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Son ratio			0.716***	0.751***			0.183***	0.179***
			(0.024)	(0.025)			(0.005)	(0.005)
Constant	0.147***	-0.032	-0.223***	-0.437***	0.233***	0.201***	0.137***	0.106***
	(0.035)	(0.064)	(0.038)	(0.067)	(0.008)	(0.013)	(0.008)	(0.013)
Observations	30,418	29,156	30,147	28,895	30,418	29,156	30,147	28,895
R-squared					0.003	0.066	0.046	0.108
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for stated son preference, first without and then with the full set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 33: Early Female Marriage and Differential Birth Stopping – Legal marriage age

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.420***	-0.592***	-0.398***	-0.611***	-0.334***	-0.508***	-0.259***	-0.351***
	(0.031)	(0.040)	(0.043)	(0.056)	(0.062)	(0.077)	(0.090)	(0.111)
Marginal effect	-0.080***	-0.087***	-0.087***	-0.102***	-0.081***	-0.096***	-0.070***	-0.076***
	(0.005)	(0.004)	(0.008)	(0.007)	(0.013)	(0.013)	(0.023)	(0.022)
Constant	-1.002***	2.426***	-0.896***	2.875***	-0.823***	2.928***	-0.737***	2.608***
	(0.012)	(0.096)	(0.019)	(0.149)	(0.029)	(0.229)	(0.045)	(0.353)
Observations	18,939	18,073	8,003	7,653	3,326	3,172	1,329	1,266
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 34: Early Female Marriage and Stated Son Preference – Legal marriage age

VARIABLES	(1) Son Preference 01	(2) Son Preference 01	(3) Son Preference 01	(4) Son Preference 01	(5) Son Preference 02	(6) Son Preference 02	(7) Son Preference 02	(8) Son Preference 02
Early Marriage (ref: Late Marriage)	0.192***	0.070***	0.177***	0.061***	0.037***	0.012***	0.035***	0.011***
	(0.017)	(0.020)	(0.018)	(0.020)	(0.004)	(0.004)	(0.004)	(0.004)
Marginal effect	0.075***	0.025***	0.067***	0.022***	0.037***	0.012***	0.035***	0.011***
	(0.006)	(0.007)	(0.006)	(0.007)	(0.004)	(0.004)	(0.004)	(0.004)
Son ratio			0.715***	0.752***			0.182***	0.179***
			(0.024)	(0.028)			(0.005)	(0.006)
Constant	-0.286***	-0.130**	-0.649***	-0.514***	0.151***	0.189***	0.057***	0.098***
	(0.008)	(0.059)	(0.015)	(0.066)	(0.002)	(0.012)	(0.003)	(0.013)
Observations	34,522	33,097	30,405	29,132	34,522	33,097	30,405	29,132
R-squared					0.003	0.066	0.045	0.108
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for stated son preference, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 35: Early Female Marriage and Differential Birth Stopping - No child death subsample

VARIABLES	(1) Subsequent birth at birth order 1	(2) Subsequent birth at birth order 1	(3) Subsequent birth at birth order 2	(4) Subsequent birth at birth order 2	(5) Subsequent birth at birth order 3	(6) Subsequent birth at birth order 3	(7) Subsequent birth at birth order 4	(8) Subsequent birth at birth order 4
Early Marriage (ref: Late Marriage)	-0.362***	-0.647***	-0.390***	-0.709***	-0.337***	-0.580***	-0.350***	-0.533***
	(0.024)	(0.033)	(0.036)	(0.049)	(0.054)	(0.072)	(0.082)	(0.104)
Marginal effect	-0.078***	-0.105***	-0.093***	-0.127***	-0.088***	-0.117***	-0.100***	-0.120***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.013)	(0.014)	(0.023)	(0.023)
Constant	-0.930***	2.775***	-0.818***	3.311***	-0.744***	3.310***	-0.634***	3.292***
	(0.015)	(0.104)	(0.023)	(0.166)	(0.035)	(0.252)	(0.057)	(0.395)
Observations	17,764	16,981	7,351	7,037	3,019	2,879	1,197	1,139
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Region Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES
Time Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the subsequent birth at the nth birth order, first without and then with the set of controls and fixed effects. Controls include woman's characteristics (age, age difference with husband, education, employment status, media exposure), spouse education, household size, wealth status, and geographical features (place of residence, region). The sample is restricted to women without a son at the nth birth order and who do not report any child death. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 36: Death of Female Child at Birth and Female Early Marriage

VARIABLES	(1)	(2)
Early Marriage (ref: Late Marriage)	-0.002	0.021
	(0.028)	(0.031)
Constant	0.184***	0.098
	(0.219)	(0.077)
Controls	No	Yes
Region Fixed Effects	No	Yes
Time Fixed Effects	No	Yes
Mother Fixed Effects	No	Yes
Observations	7,842	7,472

Source: Authors' calculations using pooled data from the four rounds of PDHS. The unit of analysis is child. Columns 1 and 2 present results for the female child death, first without and then with the set of controls and fixed effects. Controls include mother's characteristics (age, age difference with husband, education, employment status, media exposure), father education, household size, wealth status, household sanitation facility, household clean water facility, geographical features (place of residence, region), and child's BMI. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix

Table A1: First Stage Estimates - Community Prevalence of Early Marriage and Son Preference

VARIABLES	Outcome: Early Marriage							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Birth Order 01	Birth Order 01	Birth Order 02	Birth Order 02	Birth Order 03	Birth Order 03	Birth Order 04	Birth Order 04
Percentage of Early Marriages in a given PSU prior to Marriage of a respondent	0.517***	0.404***	0.495***	0.385***	0.462***	0.396***	0.463***	0.436***
	(0.018)	(0.019)	(0.028)	(0.029)	(0.043)	(0.044)	(0.067)	(0.072)
Constant	-0.151***	0.535***	0.180***	0.684***	0.218***	0.749***	0.244***	0.867***
	(0.010)	(0.024)	(0.016)	(0.039)	(0.026)	(0.063)	(0.042)	(0.106)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Region Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Time Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	18,301	17,492	7,699	7,377	3,172	3,033	1,256	1,199

Source: Authors' calculations using pooled data from the four rounds of PDHS. Columns 1-8 present results for the first stage estimates. Our instrument corresponding to the proportion of early-marrying women among all the women in the PSU who got married prior to the surveyed woman. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.