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Abstract
Historically, son preference has been widely prevalent in South Asia, manifested in the form of skewed sex ratios, gender differentials in child mortality, and worse educational investments in daughters versus sons. In the present study, we show, using data from a purposefully designed nationally representative survey for Bangladesh that, among women of childbearing age, son bias in stated fertility preferences has weakened and there is an emerging preference for gender balance. We examine a number of different hypotheses for the decline in son preference, including the increasing availability of female employment in the manufacturing sector, increased female education, and the decline of joint family living. Using survival analysis, we show that, in contrast to stated fertility preferences, actual fertility decisions are still shaped by son preference.

Keywords
Fertility, gender bias, birth spacing, female employment, Bangladesh

JEL Codes
J11, J13, J16, O12

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Is Son Preference Disappearing from Bangladesh?[1]

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Abstract

Historically, son preference has been widely prevalent in South Asia, manifested in the form of skewed sex ratios, gender differentials in child mortality, and worse educational investments in daughters versus sons. In the present study, we show, using data from a purposefully designed nationally representative survey for Bangladesh that, among women of childbearing age, son bias in stated fertility preferences has weakened and there is an emerging preference for gender balance. We examine a number of different hypotheses for the decline in son preference, including the increasing availability of female employment in the manufacturing sector, increased female education, and the decline of joint family living. Using survival analysis, we show that, in contrast to stated fertility preferences, actual fertility decisions are still shaped by son preference.

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1 Introduction

The phenomenon of "son preference" has been widely documented in different parts of the world, most notably in East and South Asia, the Middle East and North Africa. We use the term to refer to any situation where parents value sons over daughters along some dimension and make choices – for example, relating to fertility or investments in children – on the basis of these preferences. These practices have potentially far-reaching economic and demographic consequences (Edlund 1998) including, for example, excess female adult and maternal mortality (Milazzo, 2018), sex-selective abortions (Bhalotra and Cochrane 2010; Jha et al. 2011), gender differences in breastfeeding (Jayachandran 2014; Hafeez and Quintana-Domeque, 2018), intra-household gender bias in food allocation (Rahman 2018), gender differentials in infant and child mortality (Rose 1999), imbalanced sex ratios and shortages of marriageable women in the population (Hudson and den Boer 2004).

In South Asia, son preference has historically manifested itself in the form of imbalanced sex ratios. In India, sex ratios were persistently (and increasingly) imbalanced during the twentieth century, and stood at 933 females per 1,000 males in 2001 (Pande and Astone 2007). In recent years, there has also been a worsening of child sex ratios in India (Jha et al. 2011). These recent trends have been attributed to a combination of a decline in desired family size, the diffusion of prenatal sex diagnostic technologies, and sex-selective abortion (see Bhalotra and Cochrane 2010; Jha et al. 2011, Jayachandran 2017).

However, these recent trends are not shared across all of South Asia: Bangladesh has experienced a decline in fertility together with an improvement in child sex ratios (Kabeer, Huq and Mahmood 2014). Data on declared preferences for sons and daughters indicate a steady decline in son preferences among women in Bangladesh and – to a lesser extent – in India and Nepal (these trends are discussed in more detail in Section 3). Whether and to what extent these declared child sex preferences are shaping actual fertility decisions remains, however, an open question.

In this paper, we use a purposefully-designed survey to assess independently whether and to what extent son preference has declined among women in Bangladesh. In addition, we address the following questions. Is son preference giving way to indifference regarding the sex composition of children or some other type of preference such as a desire for both sons and daughters? What are the drivers of the decline in son preference? Are the changes in stated child sex preferences reflected in actual fertility decisions such as birth spacing and the number of children?

The survey was conducted in 2014 with a nationally representative sample of women in Bangladesh of childbearing age and contains information on the respondents' fertility history, their desire for future sons and daughters and other socio-economic characteristics. We use a regression framework to investigate how the birth of a son versus a daughter affects respondents' stated desires for future sons and daughters. This approach allows us to infer whether the population, on average, exhibits son preference, a 'balance' between sons and

daughters or indifference between sons and daughters. Furthermore, we use survival/duration analysis to investigate how the birth of a son or daughter affects the decision to have another child and the associated birth-spacing. This analysis addresses the question whether women's stated preferences regarding sons and daughters are reflected in their actual fertility decisions.

Our analysis indicates a strong desire among women in Bangladesh for children of both sexes. Among respondents who have not yet had a child, the proportions indicating a desire for sons and daughters are almost identical. Among respondents with one or two children, the presence of a son has a strong negative effect on the desire for additional sons, and the presence of a daughter has a strong negative effect on the desire for additional daughters.

We use the same approach to explore heterogeneity in preferences within the population. We find some evidence that the desire for gender balance in child composition is stronger among women who have completed secondary school and those who live in areas with more opportunities for female paid work, specifically in the ready-made garments sector. The desire for gender balance in the sex composition of children is, surprisingly, *stronger* among women who are co-resident with their mothers-in-law.

The survival analysis indicates that actual fertility decisions are still shaped by son preference. The model estimates indicate that respondents who have no sons among their first two children are significantly more likely to have another child in any subsequent time period relative to those who do not. The absence of a *daughter* among the first two children, on the other hand, has no corresponding effect on the decision to have another child. We uncover some evidence that the effect of son preference on fertility decisions is weakening over time. Among older cohorts in the sample (born between 1975 and 1986), a female firstborn accelerates a second birth (relative to a male firstborn) but there is no corresponding effect among younger cohorts (born between 1987 and 1994).

Thus, our analysis reveals a discrepancy between the child sex preferences of women in Bangladesh and their fertility behaviour: while they *express* a desire for both sons and daughters, it is only the desire for sons that shape actual fertility decisions.

The question as to whether son preference is weakening in Bangladesh has previously been raised in the literature. Kabeer, Huq and Mahmud (2014) document the phenomenon in Bangladesh using qualitative interviews and a quantitative survey conducted in 2008 in 8 districts in Bangladesh. Based on their quantitative measures, they report son preference among 40% of respondents, daughter preference among 7%, and indifference among the rest. We contribute to the existing work with evidence from a more recent, nationally representative survey and show that (i) son preference has, on average, given way to a desire for gender balance in child sex composition and (ii) actual fertility decisions are lagging behind the evolution in women's child sex preferences.

Our contribution is also distinctive from a large number of existing studies that measure child sex preferences using questions on the *ideal* number of daughters and sons, or the desire for sons versus daughters in a hypothetical situation (see, for example, Clark 2000; Pande and Astone 2007; Kabeer, Huq and Mahmud 2014). In contrast to this approach, our methodological approach allows a focus on women who are physically able to bear children and their desire for *future* sons and daughters.[6]

Our survival/duration analysis using the fertility history of respondents follows previous work in the literature that have used this approach to show that the sex composition of existing children affects subsequent fertility decisions for Shanxi province in China (Tu 1991), Bangladesh (Rahman and DaVanzo 1993), India (Arnold, Choe and Roy 1998), Vietnam (Haughton and Haughton, 1998), China (Poston 2002) and Pakistan (Javed and Mughal 2019). While the previous literature has found a strong influence of child sex composition on birth spacing in South Asia, we find evidence, for the most recent cohorts of women in Bangladesh, that the relationship between the sex of the firstborn and the birth spacing to the next child is weakening.

2 Literature Review

2.1 Consequences of Son Preference

In recent decades, there has been much progress around the world in terms of increasing female schooling, and promoting economic opportunities and legal rights of women. But, in spite of various pro-women developments, son preference remains strong in many Asian countries. The consequences of sex preference have been wide ranging, resulting in excess female adult and maternal mortality (Milazzo, 2018), gender differences in breastfeeding (Jayachandran 2014; Hafeez and Quintana-Domeque, 2018), gender differentials in health (Jayachandran and Pande 2017; Barcellos 2010; Schlosser 2015; Muhuri and Menken, 1997), gender differences in the number of siblings and family size (Jensen 2005), domestic violence (Solotaro and Pande 2014), intra-household gender bias in food allocation (Rahman 2018) and childcare time (Barcellos, Carvalho, and Lleras-Muney, 2014), shortage of marriageable women (Hudson and den Boer 2004), gender difference in illiteracy and schooling (Jensen 2005; Sahoo 2015; Mu and Zhang 2011) and contraceptive prevalence rate (Rajaretnam and Deshpande 1994). There is also evidence of heterogeneous effects. Research suggests gender differentiated effect of the presence of older female children (Bairagi and Langsten, 1986; Clark 2000; Amin 1990). Economic crises in presence of son preference is found to lower the count of girls in the population (Lee and Orsini, 2018).

[6] An exception in the existing literature on detecting son preference is Khan and Sirageldin (1977) who, similar to the approach taken in this paper, investigate how the sex composition of existing children affect the desire for additional children among men and women in Pakistan.

Gender differentiated impact on mortality rate is one of the widely examined consequences. In developing Asian countries such as India, China, and Pakistan, there is a deficit of women in the population. According to Sen (1990), approximately 100 million women were missing in Southeast Asia[7] which is shown to have increased further in absolute terms (Klasen & Wink 2003). This demographic imbalance is particularly acute in case of female infants and children. Sex selective abortion and female infanticide have arguably contributed to skewed sex ratios at birth as well as child sex ratios. The proximate causes for this deficit include the gender differentiated allocation of resources within the household which also alters household characteristics across gender[8] because of male-biased stopping rules of fertility.

Moreover, in a number of countries, child sex ratios have even increased in the past two decades (Hudson and den Boer 2015).[9] Within Asia, there is also considerable cross-country variation in patterns of and trends in sex ratios. Son preference is arguably strong in China, Taiwan, India, and Pakistan despite rapid fertility decline. On the other hand, fertility declined in Indonesia, Sri Lanka, and Thailand without any history of son preference. Only South Korea succeeded in transitioning to a declining sex ratio at birth by reversing a decade-long trend of high and rising sex ratio (den Boer and Hudson 2017).

2.2 Causes of Son Preference

What causes son preference in fertility is therefore an important question. A number of studies have examined the factors responsible for son preference, or the lack thereof, in Asian countries. Son preference is driven by low economic value of women. Higher relative female employment in agriculture is reportedly associated with lower ratios of female to male children in Indian districts (Carranza 2014). For India, evidence indicates a negative wealth effect on son preference (Gaudin 2011). Some (e.g. Bourne and Walker, 1991) have therefore argued that socio-economic development (e.g. better economic opportunities for women and female empowerment) would reduce the desire for sons. In countries with high female literacy (e.g. Sri Lanka), son preference is weak. In economically poor countries, there may be additional individual-specific incentives for son preference (Li and Wu 2011; Zimmermann 2018).[10] The other explanation is cultural traditions. Patrilocal and patrilineal social structures, often reinforced by religious institutions, increases the demand for male members

[7] Skewed sex ratio can also result from a combination of mortality selection and son preference (e.g. see Mu and Zhang (2011) and/or environmental factors such as historical ecological endowments (e.g. ancestral plough use) (Hazarika, Jha & Sarangi 2019).

[8] For this reason, estimate of the effect of gender on intra-household allocations is biased.

[9] For historical evidence of son preference in South Asia, see Hudson and den Boer (2004).

[10] While Li and Wu (2011) report a positive impact of having a first-born son on women's household decision-making and mother's nutritional well-being, Zimmermann (2018) finds no adverse effect of son preference on maternal empowerment.

in the family (Kabeer, Huq & Mahmud 2014).[11] Reforms that affect social attitude therefore can be affective independent of economic development. For instance, the arrival of cable television in the village decreased the preference for a son by 12 percentage points (Jensen and Oster, 2009). Similar support for the modernization hypothesis is offered by Rahman (2018) who reports weak evidence of son preference in villages with access to television.

In recent decades, son preference has persisted even in economies undergoing rapid market reforms, structural change and poverty reduction. Moreover, sex ratios at birth rose steadily in South Korea during the country's transition to high income status in spite of a decline in son preference.[12] Another fast growing Southeast Asian economy, Vietnam, saw a sharp rise in the sex ratio at birth in recent years. These trends indirectly lend support to the cultural explanation for son preference.

Klasen and Wink (2003) offer some explanation for the puzzling persistence of son preference in spite of socio-economic development. According to the authors, progress in reducing gender bias through improvement in female schooling and employment opportunities has been offset by the emergence and growing use of technology for sex-selective abortions. However, the decline in desired family size has also paradoxically adversely affected the sex ratio. At a low level of fertility, son preference increases the use of sex-selective abortion as parents want to increase the chance of having at least one son. This also explains why the enforcement of the fertility controls (e.g. One Child Policy) produced an unintended effect on sex ratio in China in spite of sustained macroeconomic growth and poverty reduction.

2.3 Trends in South Asia

There has been a clear shift in fertility preference in favor of smaller family size in South Asia. Nonetheless, in populous South Asian countries, there is a large deficit of women, as evidenced from historical data on birth sex ratio and childhood mortality. There is a consensus among scholars that gender imbalance in Asia is primarily the result of son preference.

While the overall sex ratios have improved in recent years, this trend has not been shared by sex ratios at birth which, in some instances, have increased. Following a decline in adult female mortality relative to men, there was a steady decline in fertility rates (Das Gupta et al. 2009). However, smaller family size added to the demand for sons. Jayachandran (2017) distinguishes between "son preference" and "family size preference" and offers strong causal evidence of the effect of changes in family size preferences on the desired sex ratio.[13]

[11] For instance, Jayachandran and Pande (2017) attribute differences in the health of son preference in India vis-a-vis Bangladesh and Pakistan to the predominance of Hinduism in the former which has higher preference for eldest son than Islam.

[12] Puri et al (2011) attribute this to the availability of improved sex-selection technology.

[13] According to the author, a preference for smaller family (i.e. when desired fertility is low), persistent son preference worsens the male-biased sex ratio. With a fewer children born, the probability to have a son declines, increasing the incentive to engage in sex-selective abortion.

For India, recent data confirms a growing imbalance between the numbers of girls and boys at ages 0–6 years (Jha et al. 2011). This, in many instances, results from prenatal sex determination in India. Selective abortion of foetuses, particularly for pregnancies following a firstborn girl, has also increased substantially. Based on census data for the period 1991-2011, Jha et al. (2011) find that sex selective abortions have risen in many more states over time and is more likely among richer households who can afford it.

For Pakistan, survey data shows strong preference for sons in Pakistan (Hafeez and Quintana-Domeque, 2018). Khan and Sirageldin (1977) confirmed son preference among both husbands and wives. However, available research on trends in sex-ratio is limited.

For Nepal, Libois and Somville (2018) find systematic evidence of larger family size for couples with a first-born daughter. On average, sample couples had 4.78 children if they first had a girl, and 4.3 if they first had a boy. "The median number of children is 5 among the families with a first-born girl and 4 among the families with a first-born boy". The difference in the number of births across families by the gender of the first-born child is statistically significant.[14]

For Bangladesh, earlier research confirmed son preference in fertility. Using data from the 1980s, Chowdhury and Bairagi (1990) found that women with no sons had the highest rate of fertility during the study period (1982-1986). According to Chowdhury and Bairagi, fertility would be 8 percent lower in the MCH-FP area and 4 percent lower in the comparison area in the absence of sex preference. Joshi and Schultz (2013) in their evaluation of the Matlab Community Health and Family Planning (MCH-FP) program, introduced in 1977, found no statistically different impact on sex-specific fertility. The effects of sex preference was stronger in the MCH-FP area. Earlier studies also confirmed gender differentials in mortality rates. These trends have improved in recent years and sex ratios have become balanced (Kabeer et al. 2014). Based on data from Matlab area, there is also some evidence that gender disparities in severe wasting has narrowed (Trapp et al. 2004). Based on their review of other studies, Kabeer et al (2014) conclude: "Other indicators of gender discrimination with regard to health, education and nutrition also indicate a lessening of gender discrimination as do our data on stated sex preference".

However, gender bias in within-household investment pattern is still prevalent, particularly using nationally representative data. Using household survey data from 1990s, Rahman (2018) reported strong evidence of son bias in intra-household food allocation in non-poor Bangladeshi households. Brown, Calvi, and Penglase (2020) use more recent survey data to report evidence of within household gender inequality in input allocations. However, using DHS data, Kurata, Takahashi, and Hibiki (2020) find no association between son preference

[14] Subsequently, the authors use the sex of the first-born child to instrument the total number of consecutive children.

and child health outcomes. So whether son preference has completely disappeared in all aspects (i.e. fertility and non-fertility outcomes) is unclear.

Given that gender balanced sex ratios were achieved by 2011, Kabeer et al. (2014) claim that "[Bangladesh] represents an example of a country where a culture of strong son preference appears to be giving way to a growing indifference to the sex of a child." The improvement observed in Bangladesh contrasts with the broader regional trends in child sex ratios, particularly in India, where it has deteriorated.

Son preference in South Asia is arguably rooted in patriarchal culture, instead of individual experience of poverty (Dyson and Moore 1983).[15] This is further reinforced by limited economic opportunities and prospect of property inheritance for women. Das Gupta et al. (2003) attributed the persistence of son-bias in South Asia to traditional family systems and traditions that undermine the economic value of daughters e.g. the custom of dowry and women's role as caregiver within the household. As such, increase in female education and employment is not sufficient. Altering the pro-son incentives calls for policy interventions in the form of legal change and awareness campaign. Community level interventions shifting society-wide attitudes towards daughters is considered more important than changes in individual level circumstances (Chung and Das Gupta 2007). However, recent studies also highlight the importance of economic development -- son preference is reported to be negatively associated with economic value of daughters, particularly among women (Koolwal 2007; Robitaille 2013; Hatlebakk 2017). Using Indian data, Pande and Astone (2007) find that women's education, particularly at post-primary level, is consistently and significantly associated with weaker son preference, regardless of desired family size. Media access also has a significant effect, suggesting an influence of ''modernizing'' ideas.

Therefore, whether son preference in South Asia is primarily attributed to culture or driven by economic motives also needs further examination. Moreover, what factors contributed to weakening of son preference in fertility and a shift in preference for gender balance in the context of Bangladesh remains unclear. The country has gone through a number of structural changes such as better access to manufacturing jobs for women, increased female schooling, steady reduction in poverty, and the decline of joint family living. We explore the role of some of these factors in this paper.

3 Study Context

The lives of women in Bangladesh have undergone dramatic changes during previous 30 to 40 years. The total fertility rate declined from 6.3 in the early 1970s to 2.3 by 2011 (NIPORT et al. 2016), a phenomenon commonly attributed to family planning programmes launched

[15] More recent evidence on East Asian immigrants in high income western countries also supports this hypothesis (Almond, Edlund, and Milligan, 2013). The authors also note the absence of sex selection in favor of boys among Christian or Muslims as these groups follow religious rulings prohibiting sex-selective abortion.

in the 1970s (Joshi and Schultz 2013). Consistent with the decline in fertility, the same period has seen a substantial decline in the prevalence of female early marriage. Close to half of women born in the 1970s were married by the age of 15. For cohorts born in the early 1990s, the proportion is closer to 20% (Wahhaj 2018).

However, a significant fraction of women continue to marry below the legal minimum age of 18. Using data from the Bangladesh DHS, Raj, McDougal and Rusch (2012) find that there has been an *increase* in marriage among girls aged 16-17 years from 15.2% in the early 1990s to 20.6% in the mid-2000s. The 2014 Bangladesh DHS shows a median age of marriage of 17.2 among women in the age group 20-24 (NIPORT et al. 2016).

A number of government-led initiatives were introduced to improve female access to schools in the 1990s, and female school enrolment at the primary and secondary levels have since increased substantially (Asadullah and Chowdhury 2009; Schurmann 2009). According to recent data, 63.6% of women in the age group 20-24 have attended secondary school, compared to just 20.3% among those aged 45-49 (NIPORT et al. 2016).

The last two decades have also seen a number of economic changes that has expanded the scope of women's economic participation. First, there has been a rapid expansion of the export-oriented ready-made garments (RMG) sector, which has given many women access to formal, salaried jobs for the first time (Heath and Mobarak 2015). Between 2000 and 2010, female employment in the export sector increased from around 1.8 million to 3.6 million workers. [16] The expansion of microfinance programmes has also significantly increased women's employment opportunities in rural areas, particularly in the form of microenterprises for rearing poultry and livestock (Khandker, Samad and Khan 1998). The expanding non-state sector for delivering a variety of social services have created additional opportunities for women as community-level service providers throughout rural Bangladesh (Drèze and Sen 2013; Asadullah, Savoia and Mahmud, 2014).

In spite of these changes to the economy, the latest survey-based estimates show low rates of female paid work participation at around 10% (Mahmud and Tasneem 2011; Asadullah and Wahhaj 2019); and a slow increasing trend in female labour force participation, increasing from 23.9% in 1990 to 36.0% in 2010 (Rahman and Islam 2013).

Alongside these changes, women in Bangladesh appear to have undergone a transformation not only in their desire for children but also their child sex preferences, a phenomenon shared with neighbouring countries. In Figure 1, we use Demographic and Health Survey data to plot the mean of the ideal number of children, sons and daughters, by cohort, for four South Asian countries: Bangladesh, India, Nepal and Pakistan. Historically, all four countries have been characterised by high fertility rates, female early marriage and low levels of female schooling.

[16] Figures from the Bangladesh Garment Manufacturers and Exporters Association at http://www.bgmea.com.bd

We use for this purpose all the available DHS waves for these countries.[17] The figure reveals some important trends and patterns. In all four countries, the ideal number of children is on a declining trend. In three of the four countries (Bangladesh, India and Nepal), the mean values of the ideal number of sons and daughters appear to be converging. In Bangladesh and Nepal, the ideal number of children of either sex (i.e. the respondent has no preferences regarding the sex of these children) is on a clear increasing trend. The evolution of child sex preferences seem to have gone furthest in Bangladesh where, for the most recent cohorts, the mean of the ideal number of boys and girls are almost identical.

4 Methodology

In this section, we describe the methods we use to test for different types of child sex preferences and to investigate the determinants of these preferences.

A potential shortcoming of questions on the *ideal* number of children, sons and daughters (see footnote 8 for the wording of these questions in the DHS) is that they induce respondents to abstract away from their own personal circumstances when giving answers. Therefore, we use instead responses on questions on the number of sons, daughters and children of either sex that the respondent would like to have *in the future*, and restrict the analysis only to respondents in couples physically capable of bearing children.

4.1 Desire for Future Children

Whether and to what extent these responses are affected by the number and sex composition of existing children may provide information about the respondent's child sex preferences. For example, if respondents have a strong son preference (or a strong daughter preference), then their preferences regarding the sex of future children should be unaffected by the sex composition of existing children. On the other hand, if respondents have a preference for gender balance – i.e. equal numbers of sons and daughters – then a child of either sex will have a strong negative effect on the desire for future children of that sex and an increase in the desire for future children of the opposite sex. If respondents have no child sex preferences, then the desire for *additional* children should be unaffected by the sex composition of existing children. Based on the reasoning above, we formulate the following regression equations:

$$y_{id} = \alpha + \sum_{k=1}^{K} \gamma_k s_{idk} + \sum_{m=1}^{M} \beta_m X_{idm} + \delta_d + \varepsilon_{id} \qquad [1]$$

[17] The data is based on a survey question on "the ideal number of children that the respondent would have liked to have had in her whole life, irrespective of the number she already has", followed by questions on the ideal number of boys, girls, and children of either sex.

where y_{id} is (i) the number of desired children in the future; or a binary indicator for whether the respondent has specifically indicated a desire for (ii) future sons or (iii) future daughters, by respondent *i* in district *d*. The variables X_{idm} include the respondent's socio-economic characteristics realised prior to the onset of fertility, such as age of marriage, schooling, parental landholdings, etc. and δ_d is a district fixed-effect. The variables s_{ik} include binary indicators describing the sex composition of existing children.

We estimate equations of the form in [1] for the subsamples of respondents with (a) one child, (b) two children (and in a couple physically capable of bearing children) at the time of the survey. For the regressions with subsample (a), the child sex composition is captured by a single binary variable (*K*=1) indicating whether or not the existing child is male (couples with a female child is the excluded category). For regressions with subsample (b), the child sex composition is captured by binary variables (*K=2*) indicating whether the two children are both sons or include a son and a daughter (couples with two daughters is the excluded category).

For subsample (a), a strong son preference would mean that, when the dependent variable is the desire for future sons or future daughters, the coefficient of the "male child" dummy is close to zero. On the other hand, a preference for gender balance would imply that the coefficient is negative for future sons and positive for future daughters.

For subsample (b), a strong son preference would imply that the coefficient of the "two sons" dummy is negative when the dependent variable is the number of desired future children, and close to zero for future daughters. On the other hand, a preference for gender balance would imply that the coefficient of "son & daughter" is negative for future sons; and the coefficient of "two sons" is positive for future daughters.

To explore heterogeneity in child sex preferences in the population, we estimate alternative specifications where the child sex composition variables in equations [1] are interacted with binary variables indicating whether the respondent (a) lives in close proximity to readymade garments factories; (b) has completed secondary school; (c) is co-resident with the mother-in-law. The rationale for this choice of interaction terms is as follows. Readymade garments factories are a major source of paid employment for women in Bangladesh. Therefore, respondents who live close to factories may differ in their perceptions of the economic value of daughters versus sons. Similarly, completing secondary schooling may change a respondent's perception of the range of economic opportunities available to a daughter compared to a son.

Even if the respondent does not have a strong son preference, the birth of a son may improve her bargaining power vis-à-vis members of the extended family. The literature has documented how an important dimension of intra-household bargaining in South Asia is that which occurs between the mother-in-law and the daughter-in-law (Gram et al. 2018). Therefore, we hypothesize that son preference may be stronger among women who are co-resident with their mother-in-law.

4.2 Fertility Decisions

The equations above provide a way for testing for son preference using the respondents' stated future fertility preferences. It is important to note, however, that stated fertility preferences may not be reflected in actual fertility outcomes if, for example, the husband or mother-in-law have opposing preferences that influence fertility decisions. For this reason, we also investigate how the sex composition of existing children affect subsequent fertility behaviour.

Given that our sample consists of women who are physically capable of bearing children, it is likely that we do not observe the full fertility history for many of them. An effective approach for studying how child sex composition affects subsequent fertility behaviour using such censored data, extensively used in the demographic literature, is hazard model analysis (see Haughton and Haughton 1998 and the references within). We use a hazard model that takes the following form:

$$h_{idc}(t|\boldsymbol{X}_{id}, \boldsymbol{\beta}, \boldsymbol{\gamma}) = h_0(t)exp(\sum_{k=1}^{K}\gamma_k s_{idk} + \sum_{m=1}^{M}\beta_m X_{idm} + \delta_d) \qquad [2]$$

where $h_{idc}(t|\boldsymbol{X}_{id}, \boldsymbol{\beta}, \boldsymbol{\gamma})$ is the hazard rate of child of birth order *c* of respondent *i* in district *d*; $\boldsymbol{X}_{id}$ is a vector of pre-determined socio-economic characteristics of the respondent, the variables s_{idk} describe the sex composition of the first *(c—1)* children of the respondent, and δ_d is the district fixed-effect; $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ are vectors of parameters to be estimated. We use a Weibull hazard specification for the baseline hazard rate: $h_0(t) = pt^{p-1}exp(\beta_0)$.

We use equation [2] to estimate (i) the hazard rate of the birth of a second child in the subsample of respondents with one or more children and (ii) the hazard rate of the birth of a third child in the subsample of respondents with two or more children.

As noted in the previous section, the total fertility rate in Bangladesh remains above 2 for the latest cohorts of women. Therefore, most women have borne, or is likely to bear during their fertile period, at least two children. Therefore, the hazard rate of the birth of a second child essentially captures the birth spacing between the first and second child. In this context, the sex of the first child may affect the birth spacing between the first two children. In particular, in a population with strong son preference, couples whose first child is a daughter may choose to have a second child sooner than they would have had the first child been a son. If couples have no sex preference regarding their children or a preference for gender balance, then the sex of the first child should not affect the birth spacing or hazard rate between the first two children.

Given the total fertility rate in Bangladesh is close to 2 for the latest cohorts, a significant fraction of women will not have third child during their fertile period. The decision whether or not to have a third child may depend on the sex composition of the first two children, a

phenomenon called the 'stopping rule' in the literature. Thus, the hazard rate of a third child captures a combination of the birth spacing between the second and third child, and the decision whether or not to bear a third child. In a population with a strong son preference, couples whose first two children are daughters will be more likely to have a third child – or have the third child sooner, than they would have otherwise. If couples have a preference for gender balance, then the hazard rate should be lowest for couples who have both a son and a daughter among their first two children. In the absence of sex preferences, the hazard rate ought to be independent of the sex composition of the first two children.

5 Description of the Data

For our empirical analysis, we use the 2014 Women's Life Choices and Attitudes Survey (WiLCAS), a nationally representative survey of women in Bangladesh with detailed information on their education, employment, marriage, fertility history and preferences regarding future children.[18]

The WiLCAS sample was constructed on the basis of the 2010 Bangladesh Household Income and Expenditures Survey (HIES). Specifically, WiLCAS covered all rural households in HIES that had one or more women aged between 16 and 35 in 2010 (i.e. between 20 and 39 in 2014). In addition, WiLCAS covers 87 urban primary sampling units (PSUs) that were randomly selected from the 2010 HIES urban PSUs. In each of the urban PSUs, the enumeration team conducted a census, and 17 households were randomly chosen among those that had one or more women aged between 20 and 39. All women in the targeted age range 20 to 39 years in the rural and urban households were interviewed for the survey.[19] A total of 6,293 women were interviewed during the survey, 4,736 in rural areas and 1,557 in urban areas.

An important difference between the WiLCAS and the Bangladesh Demographic and Health Surveys (BDHS) relate to the phrasing of the questions on fertility preferences. In the BDHS, these questions are posed in terms of the *ideal* number of children, daughters and sons; such that responses may involve declared fertility preferences that are unattainable for the respondent. By contrast, respondents in the WiLCAS were asked if the couple was physically able to conceive in the future and, if so, the *additional* number of children they desire. Those who answered with a positive number where subsequently asked about the number of (additional) sons and daughters they desired.

[18] The survey was funded by an ADRAS (Australian Development Research Awards Scheme) grant on "The Role of Secondary Schooling and Gender Norms in the Long-term Opportunities and Choices in Rural Bangladeshi Women". The survey was conducted by the University of Kent and the University of Malaya in collaboration with DATA, Bangladesh (Data Analysis and Technical Assistance).

[19] WiLCAS also includes households that do not have any women in the age group 20-39 years. But no data on fertility preferences were collected from these households and, as such, they were not included in the analysis.

5.1 Descriptive Statistics

For our analysis, we consider all female respondents to the 2014 WiLCAS except 45 individuals who reported ages outside of the targeted age range but were nevertheless interviewed. The summary statistics for the sample of respondents are provided in Table 1. The average age of respondents is 29.01 years. The respondents have, on average, 5.26 years of schooling which is slightly more than that of their husbands (4.67 years). The average age of the women at the time of their first marriage was 16.43 years, and the average age gap between the husband and the wife was 7.35 years. At the time of the survey, 89% of the respondents were married (more precisely, not single, separated, widowed or divorced) and 81% were in a couple that was physically able to conceive. Couples had been married, on average, for about 13 years. About 22% of the respondents had exactly one child (12% had a son and 10% had a daughter), while about 32% of the respondents had exactly two children (9% had two sons, 6% had two daughters, and 17% had a daughter and a son).[20]

Table 2 provides descriptive statistics on the characteristics of the respondent's parents and parents-in-laws. On average, the parents had very little schooling (2.95 years for fathers and 1.63 years for mothers). About half the respondents grew up in a 'poor' household, which we define as households that either had less than half an acre of cultivable land or the father was an unskilled labourer or artisan. Only 5% of the respondents grew up in landless households. Similar proportions of respondents are married to men who also grew up in 'poor' (48%) and landless (6%) households.

5.2 Child Sex Preferences

In Tables 3 and 4, we provide descriptive statistics on child sex preferences for women in couples that were able to conceive at the time of the survey. About 1.8% of respondents replied to the question "How many more children do you wish to have?" with a non-numeric answer – "Don't know" or "It is up to God" – and they are excluded from the figures reported in the tables. Among those who gave a numeric, positive answer, about 7% replied to the questions about the specific number of sons and daughters with a non-numeric response ("Don't know" or "It is up to God"). We define the variables "Sons Wanted" and "Daughters Wanted" as binary indicators that take a value of 1 if the respondent answered the corresponding questions with a positive number and zero otherwise. The table reports the means of the number of (additional) children, the variables "Sons Wanted" and "Daughters Wanted", grouped by the number and sex composition of the existing children.

Women in (currently) childless couples desire, on average, 1.54 children, which is lower than the numbers we obtain for the most recent cohorts in the Bangladesh DHS (see figure 1). The mean values of "Sons Wanted" and "Daughters Wanted" are very similar (0.810 versus 0.775).[21] Among women with one child, there is a sharp drop (compared to childless couples)

[20] In constructing these measures, we include both living children and children who have passed way.

[21] Note that the desired number of sons and daughters do not necessarily add up to the desired number of additional children because the latter may also include children about whom the respondents had no sex preference.

in the mean desire for children of the same sex as their existing child, but almost no change in the mean desire for children of the opposite sex. Thus, the difference between "Sons Wanted" and "Daughters Wanted" is negative for couples with a son, positive for couples with a daughter and, in both instances, significantly different from the corresponding value for childless couples.

Among women with two children, we find that the mean desire for additional sons is close to zero if they have at least one son, and the mean desire for additional daughters is close to zero if they have at least one daughter. On the other hand, the mean desire for children of a particular sex is significantly higher if they do not yet have a child of that sex (compared to couples who do).

In summary, these figures suggest that, before childbirth, women have an almost equal desire for sons and daughters; and their preferences regarding the sex of future children evolve according to whether they have been able to achieve this target. However, this interpretation is based on the assumption that the subsamples of women with different child sex compositions are otherwise comparable in terms of their socio-economic characteristics. In the next subsection, we formally test this assumption. In the following section, we estimate the effect of the sex of existing children on future fertility preferences in a regression framework.

5.3 Balance Tests

The key identification assumption for our empirical analysis is that, conditional on the number of existing children, respondents who differ in terms of the sex composition of their children are, on average, identical in terms of their background characteristics. The basis for this assumption is that the child sex is randomly determined. However, the identification assumption may not hold because we consider for our analysis couples who are still capable of bearing children; thus, couples can 'select out' of their current child sex composition by choosing to bear another child – a form of attrition – and their probability of doing so may vary according to their background characteristics.

Therefore, we investigate whether, for a given number of children, respondent characteristics are 'balanced' across different child sex compositions. In Table 3, we report on balance tests on 13 variables describing characteristics of respondents with exactly one child who are currently married and able to conceive. The differences in means between respondents with a daughter and those with a son are statistically significant at the 5% for two of the variables, 'Respondent Age' and 'Years Married', although the differences are small (0.63 and 0.80 years respectively). A joint test of orthogonality based on a regression for predicting the sex of the child using these variables returns an F-statistic of 1.750 that is statistically significant at the 5% level. However, the normalised differences in the background characteristics across the

two groups are all below the threshold of 0.25, which indicates good balance across the two groups (Imbens and Rubin, 2015).[22]

In Table 4, we report on the corresponding balance tests for respondents with exactly two children who are currently married and able to conceive. The joint tests of orthogonality based on regressions for predicting the sex composition of children are statistically significant at the 1% level. Of the 39 pairwise normalised differences shown in the table, four are above the threshold of 0.25 but all are below the threshold of 1 (see footnote 8). The normalised differences exceed the threshold of 0.25 in the case of the age and years of marriage of respondents with two daughters, relative to respondents with other child sex compositions. This suggests that couples with two daughters tend to have another child more quickly than couples with two sons, or a son and daughter. Consequently, the couples whose first two children were female and did not opt for a third child by the time of the survey likely have *weaker* son preference than the rest of the sample. We discuss how this type of attrition may bias the estimates for couples with two children after we present our results in the next section.

6 Empirical Results on Child Sex Preferences

6.1 Base Specification

The estimates from our base specification are shown in Table 7. In the first three columns, we report estimates using the sample of couples who have one child and are physically able to conceive again. In the last three columns, we report estimates using the sample of couples who have two children and are physically able to conceive again. In each regression, we control for the respondent's current age, age at marriage, age gap within the couple, number of years of marriage, years of schooling attained by the husband and the wife, and the socio-economic status of their parents. (We do not control for the respondent's gender as all respondents are female). The key variables of interest in each specification are those describing the sex composition of the existing children of the couple.

The estimated coefficient in the first column (negative but not statistically significant) suggests that, among couples with one child, the sex of the child does not affect the number of additional children desired by the respondent. However, the sex of the child has a strong, statistically significant effect on whether the mother desires additional sons (second column; a male child lowers the probability by 63 percentage points) and whether she desires additional daughters (third column; a male child raises the probability by 60 percentage points). These estimates provide some indication that the respondent has a desire for children

[22] The normalised difference is the difference in means between two groups, divided by the square root of half the sum of the group variances. Imbens and Rubin (2015) show that differences below 0.25 indicate good balance while differences of 1 or more are problematic.

of both sexes among her children rather than an unconditional preference for children of one particular sex.

We conduct similar regressions with couples with two children where the sex composition of the existing children are captured by the variables "Two Boys" and "Boy and Girl".[23] The effect of "Two Boys" on the total number of additional children wanted (relative to respondents with two daughters) is negative but statistically insignificant. The effect of "Boy and Girl" is also negative, and significantly different from zero. However, we cannot reject the hypothesis that the estimated coefficient of "Two Boys" and "Boy and Girl" are equal.

We obtain clearer results with the variables indicating the desire for additional sons and daughters. "Two Boys" has a strong, negative effect on the desire for additional sons (relative to couples with two daughters); the effect of "Boy and Girl" is also negative and similar in size to that of "Two Boys" (the probabilities decline by about 28 and 32 percentage points respectively in the two cases), although we can reject the hypothesis that they are equal.

"Two Boys" also has a strong positive effect on the desire for a daughter (relative to respondents with two daughters): the probability increases by 14.5 percentage points). In the case of "Boy and Girl", the effect is also positive but it is an order of magnitude smaller – a decline of 1.8 percentage points – and we can reject the hypothesis that the two effects are identical.

The estimated effects of the child sex composition variables for respondents with two children indicates a strong desire for children of both sexes. In particular, the presence of at least one son among existing children has a strong negative effect on the desire for additional sons (captured by the coefficient of "Boy and Girl"), while the presence of a second son has little further effect (the coefficient of "Two Boys" is close in magnitude to that of "Boy and Girl"). Similarly, the presence of at least one daughter among existing children has a strong negative effect on the desire for additional daughters (captured by the difference in the coefficients "Two Boys" and "Boy and Girl"), while the presence of a second daughter has little further effect (captured by the negative of the coefficient of "Boy and Girl").

These estimates potentially mask heterogeneity in preferences across respondents, which we explore in the next sections.

As discussed in the previous section, the child sex composition variables are potentially affected by attrition. Therefore, our estimates of the effects of the sex composition of existing children on the desire for additional sons and daughters include the causal effect of the birth of sons and, potentially, a selection effect. We discuss here the direction of bias in our estimates due to this selection effect.

[23] In alternative specifications (not shown), we also distinguish – among couples with a son and a daughter – those whose elder child is male and those whose elder child is female but, when we do so, the estimated coefficients are almost identical for these two categories.

Couples whose first two children are daughters and who have a strong son preference are more likely to have a third child and, therefore, more likely to have 'exited' the sample of couples with two children at the time of the survey. Consequently, the couples with exactly two daughters in our sample are likely to have a *weaker* son preference than the couples with two sons and those with a son and a daughter. Therefore, the estimated effect of one or two sons on the desire for additional sons and daughters are likely to be under-estimates. This suggests that the desire for gender balance in sex composition is even *stronger* than that implied by the estimates we obtain.

6.2 Proximity to Garments Factories

In Table 8, we report regression estimates from specifications where we interact the child sex composition variables with a binary indicator indicating proximity of the respondent's village to garments factories. The binary indicator takes a value of 1 if there are x or more factories within a radius of 10 kilometres of the respondent's village and 0 otherwise. In the table, we report results from regressions where x = 1, 5 and 50.

In the case of couples with one child, we find that the effect of the child's sex on preferences regarding the sex of future children tends to be stronger for women who live in proximity to garments factories. In particular, a male child negatively affects the desire for additional sons, and the effect is stronger by 15-18 percentage points in areas close to garments factories (the effect is statistically significant at the 1% or 5% level depending on the choice of x). A male child positively affects the desire for daughters, and the effect is stronger in areas with higher concentration of garments factories (x = 5 or 50). These results suggest that the desire for gender balance in the sex composition of children is even stronger among respondents who live in close proximity to garments factories.

In the case of couples with two children, we again obtain the patterns described in the previous subsection, but we do not find any differences among women who live in proximity to garments factories.

6.3 Secondary Schooling

In Table 9, we report on regression estimates from specifications where we interact the child sex composition variables with a binary variable indicating whether the respondent has completed secondary school. In the case of couples with one child, we find that the effect of the child's sex on preferences regarding the sex of future children tends to be stronger for women who have completed secondary school. In particular, a male child negatively affects their desire for additional sons to a greater extent than for women who have not completed secondary school (by about 13 percentage points). There is also some indication that the positive effect of a male child on the desire for daughters is stronger in the case of women who have completed secondary school but the effect is not statistically significant. Thus, there is suggestive evidence that women who have completed secondary school have a stronger desire for gender balance than those who have not.

In the case of couples with two children, we find no clear evidence of differential patterns between women who have completed secondary school and those who have not (the estimated effects of the interaction terms are all statistically insignificant).

6.4 Co-Residence with Mother-in-Law

In Table 10, we report on regression estimates from specifications where we interact the child sex composition variables with a binary variable indicating whether the respondent co-resides with her mother-in-law. In the case of couples with one child, we find that the birth of a son *decreases* the desire for future children among respondents who are not co-resident with their mother-in-law, but the effect is absent for co-resident respondents (the overall effect is positive but statistically insignificant). We find no difference in the effect of a birth of a son on the desire for future sons and daughters among respondents who are co-resident with their mothers-in-law and those who are not. These patterns do not suggest that son preference is stronger among respondents who are co-resident with their mother-in-law.

In the case of couples with two children, we find that, among respondents who are co-resident with a mother-in-law, those with a son and a daughter have a *lower* desire for future children compared to those with two daughters. The corresponding effect for those with two sons is also negative but we cannot reject the hypothesis that it is equal to zero. However, we do find that the positive effect of two sons (relative to two daughters) on the desire for future daughters is stronger in households where the respondent is co-resident with a mother-in-law. These results suggest that the desire for gender balance in the sex composition of children is, in fact, *stronger* among respondents who are co-resident with their mothers-in-law.

7 Empirical Results on Fertility Decisions

In Table 11, we report hazard ratios based on estimates of the hazard model for childbirth described by equation [2]. Specifically, using the subsample of respondents with at least one child, we estimate the hazard rate for the birth of a second child conditional on having one child; and using the subsample of respondents with at least two children, we estimate the hazard rate for the birth of a third child, conditional on having two children. In each case, we split the sample between older respondents (aged 28-39 years) and younger respondents (aged 20-27 years). We control for the respondent's current age, age at marriage, age gap within the couple, number of years of marriage, years of schooling attained by the husband and the wife, and the socio-economic status of their parents.

We find that, among older cohorts, if the first child is male, this reduces the hazard rate of a second child relative to the case where the first child is female (the hazard ratio is below 1). In other words, couples whose firstborn is male take, on average, more time to have their second child compared to couples whose firstborn is female. The drop in the hazard rate is about 15%. Among younger cohorts, the corresponding hazard ratio is closer to 1 and we

cannot reject the null hypothesis that it is equal to 1. These estimates provide some evidence of son preference among older couples (to the extent that they are quicker to have a second child when the firstborn is female), and is suggestive of a decline in son preference in younger cohorts.

We find that if the first two children are male, or they consist of one son and one daughter, this leads to a sharp reduction in the hazard rate of a third child relative to couples whose first two children are female (the hazard ratio is close to 0.5 in each case). In other words, the birth of at least one son among the first two children reduces the risk, during any subsequent time interval, of a third birth. This may be because these couples take more time to have a third child or because they are less likely to have further children. These effects are nearly identical for older and younger cohorts. Crucially, the hazard ratios for couples with two sons and couples with a son and a daughter are similar in magnitude and we cannot reject the null hypothesis that they are equal. This implies that fertility decisions after the birth of the first two children depend on whether the couple has at least one son. Conditional on having at least one son, whether or not they have achieved gender balance in their first two children does not affect the decision whether and when to have a third child.

8 Discussion

The analysis in Section 6, using recent nationally representative survey data on child sex preferences, provides evidence of a desire for gender balance in children for recent cohorts of women in Bangladesh. Specifically, our regression estimates indicate that the sex composition of existing children has a strong causal effect on the desire for future sons and daughters: a male firstborn lowers the desire for future sons and raises the desire for future daughters, compared to a female firstborn; and respondents who have two children of the same sex have a strong desire for a child of the opposite sex relative to those who have one child of each sex. These patterns are not consistent with either son preference or the absence of child sex preferences. But they are consistent with a desire for gender balance in child sex composition.

Recent work in the literature provides evidence that son preference is weakening in Bangladesh (Kabeer et al. 2014). Our findings corroborate this trend using more recent, nationally representative data and further showing that son preference is giving way, not to an indifference to child sex composition, but a desire for gender balance.

The heterogeneity analysis in Sections 6.2-6.4 provides some indicative evidence about the evolution of child sex preferences. The negative effect of the sex of the firstborn on the desire for future children of that sex is stronger among women who have completed secondary school and those who live in close proximity to ready-made garments factories. Thus, women with secondary schooling and 'exposure' to the industry that dominates female employment in the manufacturing sector have evolved further in terms of their child sex preferences compared to the historic prevalence of son preference. A possible reason is that secondary

education and exposure to female paid work provide women with alternative role models and information that improve their perceptions of the economic opportunities available to women and, consequently, the economic potential of daughters.

Another hypothesis we examined is whether co-residence of a mother-in-law affect the child sex preferences of women. The previous literature has documented how, in joint families in South Asia, the competition and control of resources between the mother-in-law and the daughter-in-law is a key element of intra-household bargaining (Gram et al. 2018). Given the traditional prevalence of son preference, the birth of a son may strengthen the authority of the daughter-in-law within the household. Yet, our analysis reveals no evidence that women who are co-resident with their mothers-in-law have a stronger son preference. On the contrary, our estimates suggest that they have a *stronger* desire for gender balance in child sex composition compared to women who are not co-resident with their mothers-in-law. Our counter-intuitive findings suggest that the relationship between joint family living and child sex preferences in South Asia requires better understanding.

In Section 7, we used hazard model analysis to examine if actual fertility decisions are driven by the preference for gender balance that is reflected in women's stated desire for future sons and daughters. We find that this is not so. A female firstborn accelerates the birth of a second child, relative to the case of a male firstborn. Among women with two children, the presence of at least one son is a key determinant of subsequent fertility decisions; whether or not she has a daughter does not, otherwise, affect these decisions. These findings suggest that although son preference among women is in decline in Bangladesh, their fertility outcomes still reflect son preference.

The disparity between the child sex preferences of women in Bangladesh and their fertility behaviour suggests that other household members, with more traditional child sex preferences, may have a say in fertility decisions. If so, the effects of son preference on fertility decisions, and its adverse consequences documented in the literature (discussed in Section 2) may persist even if women of childbearing age no longer express son preference.

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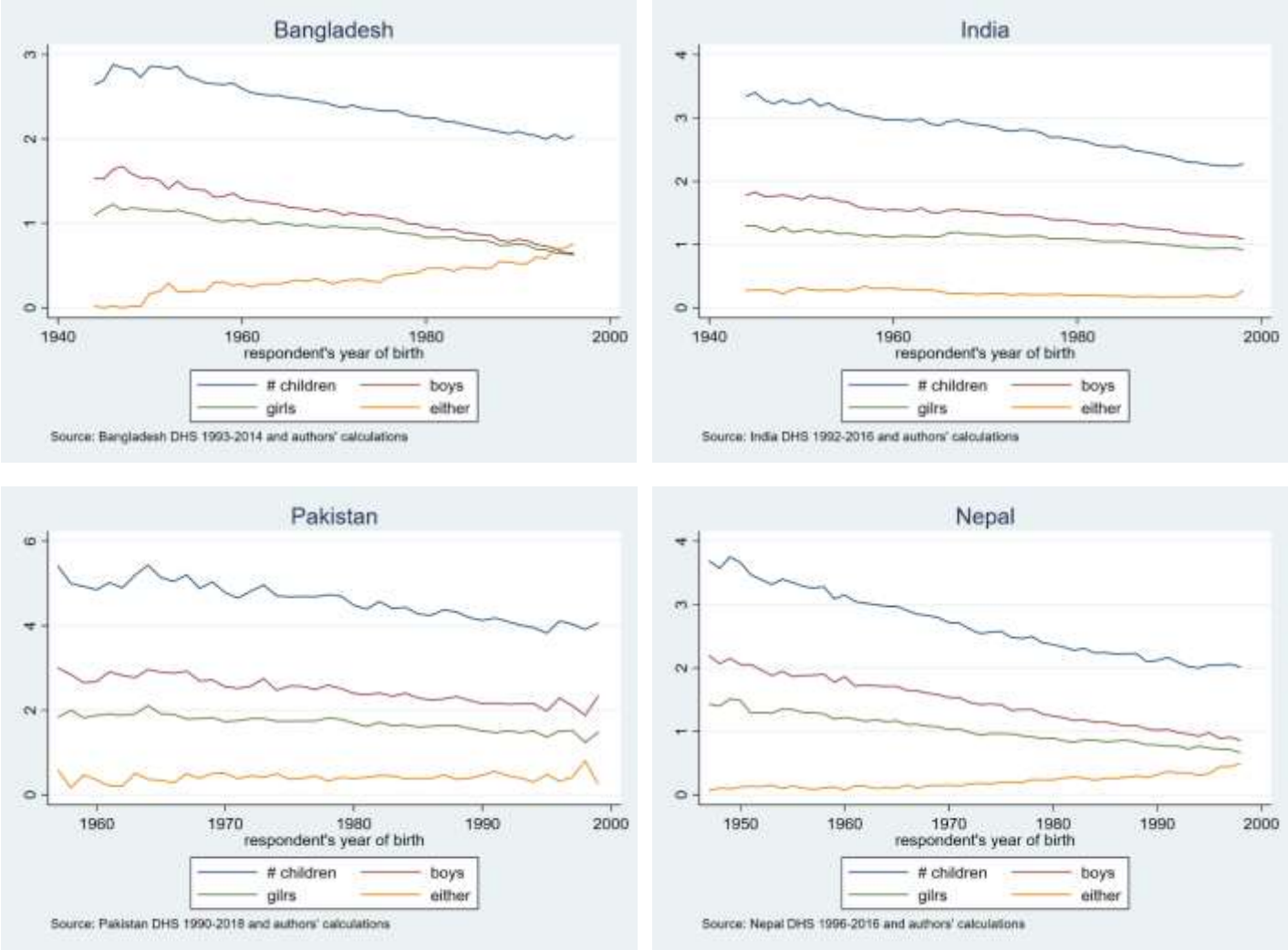
Figures

Figure 1: Ideal Number of Children (reported by married women aged 18+)



Tables

Table 1: Summary Statistics

	mean	sd	min	max	obs
Respondent Age	29.01	5.58	20.00	39.00	6,248
Respondent Educ	5.26	3.80	0.00	12.00	6,248
Ever Married	0.94	0.24	0.00	1.00	6,248
Age at Marriage	16.43	2.67	10.00	32.00	5,869
Husband Wife Age Gap	7.35	3.91	-6.00	33.00	5,763
Currently Married	0.89	0.31	0.00	1.00	6,248
Years Married	13.01	6.26	0.00	29.00	5,579
1 Son	0.12	0.32	0.00	1.00	6,248
1 Daughter	0.10	0.31	0.00	1.00	6,248
2 Sons	0.09	0.29	0.00	1.00	6,248
2 Daughters	0.06	0.24	0.00	1.00	6,248
1 Son 1 Daughter	0.17	0.38	0.00	1.00	6,248
Able to Conceive	0.81	0.39	0.00	1.00	6,248

Source: 2014 WiLCAS and authors' calculations

Table 2: Summary Statistics Cont'd.

	mean	sd	min	max	obs
Husband Educ	4.67	4.18	0.00	12.00	5,877
Father Educ	2.95	3.87	0.00	12.00	6,248
Mother Educ	1.63	2.78	0.00	12.00	6,248
Muslim	0.88	0.32	0.00	1.00	6,248
Father Poor	0.52	0.50	0.00	1.00	6,248
Father-in-law Poor	0.48	0.50	0.00	1.00	6,248
Father Landless	0.05	0.22	0.00	1.00	6,248
In-law Landless	0.06	0.23	0.00	1.00	6,248

Source: 2014 WiLCAS and authors' calculations

Table 3: Child Sex Preferences for Childless and One-Child Respondents

Variable	(1) Childless Mean/SE	(2) Son Mean/SE	(3) Daughter Mean/SE	T-test Difference (1)-(2)	(1)-(3)	(2)-(3)
Add. Children Wanted	2.168	1.615	1.817	0.552	0.351	-0.201
	(0.435)	(0.357)	(0.420)			
Add. Sons Wanted	0.810	0.128	0.799	0.682***	0.011	-0.672***
	(0.023)	(0.014)	(0.019)			
Add. Daught. Wanted	0.775	0.700	0.095	0.075**	0.681***	0.606***
	(0.024)	(0.019)	(0.013)			
Sons - Daught. Wanted	0.035	-0.573	0.705	0.608***	-0.670***	-1.277***
	(0.020)	(0.025)	(0.023)			
N	316	611	518			

Notes: The summary stats. and t-tests are based on currently married couples in the 2014 WiLCAS who have zero or one child and are able to conceive. The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 4: Child Sex Preferences for Respondents with Two Children

Variable	(1) Boys Mean/SE	(2) Boy & Girl Mean/SE	(3) Girls Mean/SE	T-test Difference (1)-(2)	(1)-(3)	(2)-(3)
Add. Children Wanted	0.394	0.726	0.956	-0.332	-0.562	-0.231
	(0.195)	(0.260)	(0.404)			
Add. Sons Wanted	0.020	0.064	0.363	-0.044***	-0.344***	-0.299***
	(0.006)	(0.008)	(0.026)			
Add. Daught. Wanted	0.176	0.023	0.026	0.153***	0.150***	-0.003
	(0.017)	(0.005)	(0.010)			
Sons - Daught. Wanted	-0.156	0.041	0.337	-0.198***	-0.494***	-0.296***
	(0.018)	(0.009)	(0.027)			
N	505	923	344			

Notes: The summary stats. and t-tests are based on currently married couples in the 2014 WiLCAS who have two children and are able to conceive. The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 5: Child Sex Balance Tests for Respondents with One Child

Variable	(1) Daughter Mean/SE	(2) Son Mean/SE	T-test Difference (1)-(2)	Normalized difference (1)-(2)
Respondent Age	25.057	25.686	-0.629**	-0.144
	(0.179)	(0.177)		
Respondent Educ	6.737	6.669	0.068	0.021
	(0.137)	(0.133)		
Husband Educ	6.061	6.039	0.022	0.006
	(0.167)	(0.156)		
Father Educ	3.142	3.572	-0.430*	-0.104
	(0.169)	(0.167)		
Mother Educ	1.815	2.105	-0.289	-0.094
	(0.124)	(0.125)		
Muslim	0.892	0.863	0.030	0.091
	(0.013)	(0.014)		
Father Poor	0.532	0.489	0.043	0.086
	(0.021)	(0.020)		
Father-in-law Poor	0.484	0.511	-0.027	-0.054
	(0.021)	(0.020)		
Father Landless	0.072	0.058	0.014	0.057
	(0.011)	(0.009)		
In-law Landless	0.050	0.073	-0.023*	-0.096
	(0.009)	(0.010)		
Ln(Father Land)	3.742	3.914	-0.172*	-0.101
	(0.072)	(0.068)		
Age at Marriage	17.265	17.086	0.179	0.065
	(0.111)	(0.113)		
Years Married	7.796	8.600	-0.804***	-0.172
	(0.192)	(0.188)		
N	558	640		
F-test of joint significance (F-stat)			1.750**	
F-test, number of observations			1198	

Notes: The balance tests are based on currently married couples in the 2014 WiLCAS who have one child and are able to conceive. The value displayed for t-tests are the differences in the means across the groups. The value displayed for F-tests are the F-statistics. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 6: Child Sex Balance Tests for Respondents with Two Children

Variable	(1) Girls Mean/SE	(2) Boy & Girl Mean/SE	(3) Boys Mean/SE	Normalized difference (1)-(2)	(1)-(3)	(2)-(3)
Respondent Age	28.218	29.752	29.527	-0.338	-0.289	0.049
	(0.224)	(0.148)	(0.206)			
Respondent Educ	5.768	5.294	5.406	0.133	0.104	-0.032
	(0.185)	(0.116)	(0.153)			
Husband Educ	5.096	4.687	4.840	0.099	0.063	-0.037
	(0.216)	(0.135)	(0.182)			
Father Educ	2.992	2.888	3.016	0.027	-0.006	-0.034
	(0.209)	(0.122)	(0.169)			
Mother Educ	1.616	1.457	1.467	0.060	0.056	-0.004
	(0.148)	(0.084)	(0.113)			
Muslim	0.876	0.866	0.871	0.028	0.014	-0.015
	(0.018)	(0.011)	(0.015)			
Father Poor	0.506	0.501	0.496	0.009	0.019	0.010
	(0.027)	(0.016)	(0.022)			
Father-in-law Poor	0.528	0.492	0.537	0.073	-0.018	-0.091
	(0.027)	(0.016)	(0.022)			
Father Landless	0.045	0.049	0.053	-0.019	-0.035	-0.016
	(0.011)	(0.007)	(0.010)			
In-law Landless	0.068	0.066	0.057	0.008	0.047	0.038
	(0.013)	(0.008)	(0.010)			
Ln(Father Land)	3.791	3.910	4.018	-0.071	-0.132	-0.065
	(0.089)	(0.053)	(0.077)			
Age at Marriage	16.477	16.112	16.248	0.149	0.092	-0.056
	(0.136)	(0.078)	(0.108)			
Years Married	11.740	13.640	13.279	-0.384	-0.308	0.071
	(0.240)	(0.162)	(0.230)			
N	354	956	512			
F-test of joint significance (F-stat)				3.878***	3.387***	1.159
F-test, number of observations				1310	866	1468

Notes: The balance tests are based on currently married couples in the 2014 WiLCAS who have two children and are able to conceive The value displayed for t-tests are the differences in the means across the groups. The value displayed for F-tests are the F-statistics. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 7: OLS Estimates of Child Sex Preferences

	Couples with One Child			Couples with Two Children		
Dep. Variable	Total Wanted	Sons Wanted	Daughters Wanted	Total Wanted	Sons Wanted	Daughters Wanted
First born is Male	-0.3568	-0.6251***	0.5966***			
	(0.309)	(0.023)	(0.022)			
Two Boys				-0.1162	-0.3192***	0.1471***
				(0.195)	(0.027)	(0.018)
Boy and Girl				-0.2316**	-0.2829***	0.0187**
				(0.111)	(0.026)	(0.009)
Test (χ^2)				0.22	9.89	69.03
$Prob > \chi^2$				0.6418	0.0017	0.000
Observations	1,258	1,211	1,215	1,800	1,783	1,784
R-squared	0.066	0.481	0.430	0.046	0.228	0.167

Notes: Robust standard errors are in parentheses, adjusted for 459 clusters. *** p<0.01, ** p<0.05, * p<0.1. The dependent variables are (i) number of additional children that the respondent wants, and binary variables indicating whether the respondent wants (i) additional sons and (ii) additional daughters. Each equation includes controls (not shown) for the mother's current age, the mother's age at marriage, the age gap within the couple, number of years of marriage, the couples' years of schooling, and the grandparents' socio-economic status, and district fixed-effects. "Test (χ^2)" refers to the chi-squared test statistic for a test of the equality of the coefficients of "Two Boys" and "Boy and Girl". The p-values are shown below the test statistics.

Table 8: OLS Estimates of Child Sex Preferences: Proximity to Garments Factories

	Couples with One Child				Couples with Two Children		
Dep. Variable	Total Wanted	Sons Wanted	Daughters Wanted		Total Wanted	Sons Wanted	Daughters Wanted
Factory (>0)	1.1656	0.0595	0.0203		0.0987	-0.0866	0.0106
	(1.258)	(0.054)	(0.044)		(0.150)	(0.060)	(0.023)
First Born is Male	-0.2197	-0.5901***	0.5980***				
	(0.351)	(0.027)	(0.025)				
First Born is Male × Factory	-0.7423	-0.1507***	0.0067				
	(0.880)	(0.054)	(0.059)				
Two Boys					-0.3544*	-0.3382***	0.1439***
					(0.184)	(0.030)	(0.020)
Two Boys × Factory					0.9451	0.0558	0.0089
					(0.901)	(0.068)	(0.047)
Boy and Girl					-0.1674	-0.2982***	0.0231**
					(0.134)	(0.029)	(0.009)
Boy and Girl × Factory					-0.4288	0.0537	-0.0253
					(0.275)	(0.065)	(0.024)
Test (χ^2)					1.40	2.19	17.19
$Prob > \chi^2$					0.2375	0.1388	0.000
Observations	1,252	1,204	1,208		1,792	1,775	1,776
R-squared	0.070	0.485	0.435		0.053	0.235	0.172
Factory ($\geqslant 5$)	-0.3696	0.0615	-0.0139		0.1329	0.0710	0.0137
	(0.299)	(0.068)	(0.056)		(0.256)	(0.097)	(0.038)
First Born is Male	-0.3973	-0.6071***	0.5856***				
	(0.340)	(0.025)	(0.024)				
First Born is Male × Factory	0.2789	-0.1451**	0.1265*				
	(0.405)	(0.069)	(0.075)				
Two Boys					-0.3693*	-0.3238***	0.1443***
					(0.188)	(0.027)	(0.019)
Two Boys × Factory					2.4418	-0.0302	0.0098
					(2.339)	(0.116)	(0.072)
Boy and Girl					-0.2041*	-0.2812***	0.0169*
					(0.120)	(0.027)	(0.009)
Boy and Girl × Factory					-0.4645	-0.0639	0.0067
					(0.285)	(0.103)	(0.039)
Test (χ^2)					1.29	0.04	4.97
$Prob > \chi^2$					0.2553	0.8425	0.0258
Observations	1,252	1,204	1,208		1,792	1,775	1,776
R-squared	0.068	0.484	0.437		0.057	0.234	0.172
Factory ($\geqslant 50$)	0.0854	0.1686**	-0.0320		0.0272	0.0680	0.0231
	(0.370)	(0.067)	(0.067)		(0.175)	(0.119)	(0.052)
First born is Male	-0.3972	-0.6088***	0.5884***				
	(0.339)	(0.025)	(0.024)				
First born is Male × Factory	0.3685	-0.1685**	0.1266**				
	(0.466)	(0.067)	(0.064)				
Two Boys					-0.1662	-0.3254***	0.1458***
					(0.193)	(0.027)	(0.019)
Two Boys × Factory					0.0972	-0.0077	-0.0138
					(0.260)	(0.147)	(0.095)
Boy and Girl					-0.2393*	-0.2847***	0.0166*
					(0.130)	(0.027)	(0.009)
Boy and Girl × Factory					-0.1449	-0.0376	0.0133
					(0.241)	(0.123)	(0.051)
Test (χ^2)					1.69	0.03	1.72
$Prob > \chi^2$					0.8593	0.9172	0.1900
Observations	1,252	1,204	1,208		1,792	1,775	1,776
R-squared	0.068	0.485	0.436	0.049		0.233	0.172

Notes: Robust standard errors in parentheses adjusted for 459 clusters. *** p<0.01, ** p<0.05, * p<0.1. The dependent variables are (i) number of additional children that the respondent wants, and binary variables indicating whether the respondent wants (i) additional sons and (ii) additional daughters. Each equation includes controls (not shown) for the mother's current age, the mother's age at marriage, the age gap within the couple, number of years of marriage, the couples' years of schooling, and the grandparents' socio-economic status, and district fixed-effects. "Factory" is a binary variable indicating whether the number of readymade garments factories within a 10km radius of the respondent's village exceeds x where x = 0, 5 and 50. "Test (χ^2)" refers to the chi-squared test statistic for the test of the equality of the coefficients corresponding to "Two Boys"+"Two Boys × Factory" and "Boy and Girl"+"Boy and Girl × Factory". The p-values are shown below the test statistics.

Table 9: OLS Estimates of Child Sex Preference: Secondary Schooling

	Couples with One Child			Couples with Two Children		
Dep. Variable	Total Wanted	Sons Want	Daughters Wanted	Total Wanted	Sons Want	Daughters Wanted
Secondary	-0.2910	0.0421	-0.0031	0.0066	0.0409	-0.0195
	(0.245)	(0.049)	(0.042)	(0.247)	(0.076)	(0.021)
First born is Male	-0.4215	-0.6033***	0.5806***			
	(0.382)	(0.027)	(0.025)			
First born is Male × Secondary	0.3724	-0.1254**	0.0809			
	(0.481)	(0.054)	(0.061)			
Two Boys				-0.1329	-0.3149***	0.1413***
				(0.208)	(0.028)	(0.019)
Two Boys × Secondary				0.1484	-0.0508	0.0556
				(0.245)	(0.077)	(0.057)
Boy and Girl				-0.2372**	-0.2830***	0.0151
				(0.106)	(0.028)	(0.010)
Boy and Girl × Secondary				0.0050	-0.0092	0.0318
				(0.247)	(0.080)	(0.025)
Test (χ^2)				0.94	6.18	7.83
$Prob > \chi^2$				0.0129	0.9266	0.0052
Observations	1,258	1,211	1,215	1,800	1,783	1,784
R-squared	0.065	0.482	0.425	0.045	0.227	0.167

Notes: Robust standard errors in parentheses adjusted for 456 clusters. *** p<0.01, ** p<0.05, * p<0.1. The dependent variables are the number of additional children wanted, sons wanted and daughters wanted. Each equation includes controls for the mother's current age, the mother's age at marriage, the age gap within the couple, number of years of marriage, the couples' years of schooling, and the grandparents' socio-economic status, and district fixed-effects. These controls are not shown. "Secondary" refers to secondary education compleated. "Test (χ^2)" refers to the chi-squared test statistic for a test of the equality of the coefficients of "Two Boys × Secondary" and "Boy and Girl × Secondary". The p-values are shown below the test statistics.

Table 10: OLS Estimates of Child Sex Preferences: Co-residence with Mother-in-law

	Couples with One Child			Couples with Two Children		
Dep. Variable	Total Wanted	Sons Want	Daughters Wanted	Total Wanted	Sons Want	Daughters Wanted
Mother-in-law	-0.6180*	0.0215	-0.0423	0.1950	0.0463	-0.0285
	(0.371)	(0.041)	(0.034)	(0.206)	(0.062)	(0.024)
First born is Male	-0.7166*	-0.6200***	0.5975***			
	(0.371)	(0.028)	(0.028)			
First born is Male × Mother-in-law	1.1268*	-0.0276	0.0251			
	(0.633)	(0.048)	(0.051)			
Two Boys				-0.0879	-0.3135***	0.1236***
				(0.264)	(0.030)	(0.019)
Two Boys × Mother-in-law				-0.3239	-0.0641	0.0924**
				(0.417)	(0.064)	(0.045)
Boy and Girl				-0.1552	-0.2758***	0.0179*
				(0.150)	(0.030)	(0.010)
Boy and Girl × Mother in-law				-0.4075*	-0.0463	-0.0022
				(0.243)	(0.065)	(0.026)
Test (χ^2)				1.46	5.09	34.25
$Prob > \chi^2$				0.2272	0.0248	0.0000
Observations	1,231	1,184	1,188	1,780	1,763	1,764
R-squared	0.070	0.487	0.440	0.050	0.236	0.178

Notes: Robust standard errors in parentheses adjusted for 454 clusters. *** p<0.01, ** p<0.05, * p<0.1. The dependent variables are (i) number of additional children that the respondent wants, and binary variables indicating whether the respondent wants (i) additional sons and (ii) additional daughters. Each equation includes controls (not shown) for the mother's current age, the mother's age at marriage, the age gap within the couple, number of years of marriage, the couples' years of schooling, and the grandparents' socio-economic status, and district fixed-effects. "Mother-in-law" indicates whether mother in-law lives with the respondent. "Test (χ^2)" refers to the chi-squared test statistic for the test of the equality of the coefficients corresponding to "Two Boys"+"Two Boys × Mother in-law" and "Boy and Girl"+"Boy and Girl × Mother in-law". The p-values are shown below the test statistics.

Table 11: Hazard Model Estimates for Fertility Decisions

	Couples with 1+ Child		Couples with 2+ Children	
Dep. Variable	Older Cohorts	Young Cohorts	Older Cohorts	Young Cohorts
First born is Male	0.8583***	0.9317		
	(0.03770)	(0.0737)		
Two Boys			0.5106***	0.5092***
			(0.0400)	(0.0378)
Boy and Girl			0.5341***	0.5433***
			(0.0330)	(0.0313)
Test (χ^2)			0.39	0.88
$Prob > \chi^2$			0.5346	0.3487

Notes: Robust standard errors are in parenthese. *** p<0.01, ** p<0.05, * p<0.1. The table reports the *hazard ratios* for the birth of a second child (for couples with at least one child) and a third child (for couples with at least two children). A *Weibull* distribution is assumed for the baseline hazard. "Older Cohort" refers to the sample of respondents aged 28-39. "Young Cohort" refers to the sample of respondents aged 20-27. Each equation includes controls (not shown) for the mother's current age, the mother's age at marriage, the age gap within the couple, number of years of marriage, the couples' years of schooling, and the grandparents' socio-economic status, and district fixed-effects. "Test (χ^2)" refers to the chi-squared test statistic for a test of the equality of the coefficients of "Two Boys " and "Boy and Girl". The p-values are shown below the test statistics.