



Desires for an additional child in developing countries: the role of son preference

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Abstract

The paper considers role of son preference in formation of desires to have an additional child in countries of South and Central Asia, Middle East, North Africa and Balkans. Although son preference has been shown to influence actual fertility and to be present in fertility ideals in many of those countries, no systematic cross-country study of its influence on desires for the next child yet exists. Discovering the role of son preference in shaping these desires is important because they are highly predictive for actual fertility behavior. At the same time, there are reasons to assume that for desires concerning the next child son preference effects can be observed in a less distorted way than they are observable for actual parity progressions. Using Demographic and Health Surveys administered between 2010 and 2020, the relationship between number of living sons to desires concerning the next child was studied with the help of linear probability models for women from 13 countries of the selected regions. The analysis was applied to women having at least one living child and gave three main results. First, the desire to have another child showed a regular negative relation to having at least one living son. Second, son preference also regularly affected desires concerning timing of the next child bearing, as the desire to have the next child within the nearest two years was more probable among women without a living son in most of the countries. The third result, unlike the first two, has indicated considerable cross-country differences. In some countries desires for the next child were weaker associated with son preference in those groups of women in whose families less pronounced gender asymmetries were expected (urban women, highly educated women and women employed outside their household). In other countries, however, effects of son preference did not differ significantly across these groups, contrary to expectation. Possible explanations of these cross-country differences are discussed.

Keywords: fertility, fertility desires, gender preferences, parity progressions, developing countries

Stockholm Research Reports in Demography 2023:4

ISSN 2002-617X

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Introduction

Son preference is a phenomenon widely observed in developing countries with articulated gender asymmetries. There is a plethora of studies on different regions and countries which show that the value of having at least one son (or more sons than daughters) can have a serious impact on reproductive behavior there (see Arnold 1997, Filmer et al. 2009 for most broad cross-country studies). In low fertility contexts, son preference often supports sex-selective abortions (see e.g. Chung and Das Gupta 2007 for South Korea, Guilmoto 2009 for Armenia and Azerbaijan, Murphy et al. 2011 for China, Guilmoto 2012 for Vietnam). In countries where sex-selective abortions are not common, propensity to parity transitions can be higher among couples with no sons or with fewer sons (often this phenomenon is most clearly observed starting from transition to the 3rd parity, see e.g. Chowdhury & Bairagi 1990 for Bangladesh; Yount et al. 2000 for Egypt; Channon 2017 for Pakistan). In this case son preference becomes a factor supporting higher fertility; also, sex ratio at last birth is often higher than normal in such countries because couples tend to stop fertility right after they have ‘enough’ sons (Bongaarts 2013). Comparative research has shown that during the recent decades son preference effects were especially regularly observed in actual fertility in Central, South and South-East Asia, Middle East and North Africa (MENA) and some Balkan countries (Filmer et al. 2009, Guilmoto 2015).

Apart from actual fertility, role of son preference for fertility attitudes and ideals also has got considerable attention in the literature. Fuse (2010), studying women’s preferences regarding proportion of sons and daughters in the 2000s in 50 less-developed countries, shows that in Southern and Western Asia and in North Africa proportion of women who prefer to have more sons than daughters was regularly higher than proportion of those who prefer to have more daughters than sons. Similar results on preferred proportions of sons and daughters were reported by Filmer et al. (2009) based on surveys of the 1980s-2000s for MENA countries and countries of Central and South Asia. Bongaarts (2013:188) shows that in the 1990s-2000s desired sex ratio at birth was considerably skewed towards male off-springs in more than 20 developing countries, mostly belonging to the regions just mentioned.

While role of son preference for actual fertility and for fertility ideals has attracted much attention of researchers, its role for desires concerning particular reproductive steps, such as stopping fertility or having a child within some period of time, so far has received much less attention. Generally, it is natural to expect that in social contexts with a high level of preference for sons, the desire to stop child bearing is more likely to arise, *ceteris paribus*, when number

or proportion of sons among children already born is considered as sufficient. By contrast, wishing to have another child is more expected when number or proportion of sons has not reached the ideal. Regarding timing, a non-ideal number or proportion of sons can strengthen the desire to have another child within some short period of time. However, relatively few studies have undertaken the task of verifying all these expectations concerning fertility desires (among available studies see a cross-country summary in Arnold (1997), a number of papers collected in Gietel-Basten, Casterline & Choe (eds.) (2018), and some more papers overviewed in section 2 below).

There are a number of reasons why role of son preference for desires about the next child is of special interest. First, the role of son preference for these desires can be predictive for its role in actual fertility. Longitudinal studies on different developing countries have demonstrated that woman's actual progression to the next child is regularly associated with the desire for the next child early reported by her at a survey, cf. Michiyama et al. 2019 for Kenya, de Vanzo et al. 2003 for Malaysia, Gibby & Luke 2019 for Malawi, Hayford & Agadjanian 2012 for Mozambique, Bankole & Westoff 1998 for Morocco. Desires concerning timing of having another child reported by women at surveys also have been shown to correlate with timing of the nearest subsequent birth (Yeatman et al. 2020), although for some developing countries relation between desired and actual timing has been questioned (Cleland et al. 2020). It is worth mentioning that the desire to have one more child appears to be a stronger correlate of subsequent actual child bearing than total ideal number of children, as mismatches between ideal and actual total number of children still remain serious in many developing countries (Casterline, Agyei-Mensah 2017, Bongaarts, Casterline 2018). Besides, survey responses on total ideal number (or gender composition) of children are sometimes known to be a result of so-called subsequent rationalization, when they are adjusted to actual fertility outcomes reached before the survey (Bhat & Xavier 2003). Given this, studying the role of son preference for desire to have one more child is expected to be more relevant for predicting actual fertility outcomes than concentration on son preference in ideals of gender composition of children.

Moreover, there are reasons to assume that for desires concerning the next child son preference effects can be observed in less distorted way than they are observable for actual parity progressions. It is well known that in developing countries, despite serious advances of family planning during the recent decades, level of unwanted fertility still remains considerable (Bongaarts & Casterline 2018). On the other hand, unrealized desired fertility also is observed in many of those countries, as there are still rather high proportions of women whose desires

to have another child remain unrealized by the end of their reproductive careers (Casterline & Han 2017). In this way, role of son preference for actual transition to the next child in developing countries can be obscured by mismatches between desires and actual births. Studying desires for the next child allows to observe effects of son preference without these intervening factors.

There is also one important question about son preference which can be studied for desires concerning the next child without methodological problems which arise when it is studied for actual parity transitions. This is the question whether son preference varies in its strength across population groups, e.g. between parents of different educational levels or between urban and rural parents etc. (see Dubuc 2018 for an overview on developing countries of Asia in this aspect). Addressing this question can give better understanding of conditions which support son preference. This, in turn, gives more possibilities to predict how son preference in a society can be influenced by social changes which affect proportions between different educational strata, or between urban and rural population, etc. However, comparing son preference in actual fertility across population groups is to some extent problematic, at least when the study is based on cross-sectional sample surveys (as most studies on son preference in developing countries unavoidably are). Such surveys normally provide relevant socio-economic parameters for the time of the interview, whereas actual fertility events registered by them refer to earlier periods of time (e.g. woman's educational level at the time of the survey can differ from her educational level at the time of the latest child bearing). This temporal mismatch brings in risks of biases when one attempts to study role of socio-economic parameters for son preference. This biases, however, cannot occur when desires concerning additional child bearing are considered instead of actual fertility, as long as these desires refer to the time of the survey as well as the socio-economic parameters do¹.

The present study addresses effects of son preference upon desires to have one more child and differences of these effects across groups of women with different socio-economic characteristics in developing countries. It attempts to compare desires for an additional child of parous women already having at least one living son and those having no living sons in several regions of the world: countries of Central and South Asia and the Mediterranean regions

¹ Note that these biases also are not expected for ideals of gender composition of children, but studying fertility ideals in their distribution between social groups is less relevant because, as we have seen above, the ideals are generally less predictive for fertility behavior than the desires are.

(MENA and Balkans). This choice of world regions is justified by the fact that son preference in actual fertility behavior has been regularly reported for them in the literature (see section 2). Demography and Health Surveys (DHS) conducted between 2010 and 2020 in countries of these regions are used as the data source. We first consider whether women's desire to have a child within a short period of time (two years) and the desire to stop child bearing are related to having at least one son among their living children. Then we turn to the question whether certain socio-demographic groups of women in the countries under study differ in degree to which son preference shapes their desires for one more child. Socio-demographic groups are compared that generally are expected to differ in 'strength' of gender asymmetries: urban vs. rural women, women with tertiary education vs. with lower educational attainments, women having vs. not having a job outside their household.

This study contributes to current research on the phenomenon of son preference in three distinct ways. First, so far studies on relations of desires concerning the next child bearing to sex composition of children already born for most part have been concentrating on separate countries (see some examples in section 2), unlike studies of the same relation for actual fertility and fertility ideals, many of which were comparative (e.g. Filmer et al. 2009, Fuse 2010, Guilmoto 2015). In the present study, using data from the standardized surveys allows to obtain comparable results for countries of different regions. Second, separate analysis of the desire to stop child bearing and of the desire to have a child within the period of two years allows to distinguish potential impact of son preference on desires which concern quantum (having a child at some point in the future or stopping) and timing (birth within two years). No attempts to compare roles of son preference for these two types of desires concerning the next child, even in studies on individual countries, have been undertaken so far. Given that tendencies in fertility timing in many developing countries, including those covered by our analysis, are under intensive discussion in current literature (see Casterline & Odden 2016, Timæus & Moultrie 2020), our result could contribute to understanding factors which shape birth intervals there. Third, possible differences in 'strength' of impact of son preference on fertility desires concerning the next child across different social groups have almost not been addressed earlier, at least in a comparative perspective (studies of this kind so far have been undertaken mostly for actual fertility and fertility ideals; see section 2 for some details).

2. Background

2.1. Son preference across countries and social groups

For a considerable number of countries of the regions under study, effects of son preference were discovered in actual fertility behavior of the recent decades. In Albania (Grogan 2018) and Armenia (Guilmoto et al. 2009) ‘masculinization’ of births took place on the edge of 20-21 centuries, what was manifested by skewed sex ratio at birth under falling total fertility. In most other countries of these regions son preference, if observed, is indicated by higher propensity to parity progressions of parents without sons, or with smaller number of sons, or of parents whose previous child was a girl. Specifically, in Turkey, according to surveys conducted in the 1990s-2000s, fertility stopping was more probable after birth of a son than after birth of a daughter (Altindag 2016). For Bangladesh, using data from the 1980s, Chowdhury and Bairagi (1990) found that women with no sons had the highest rate of fertility in 1982-1986 (but see Asadullah et al. 2020 for somewhat more complex dynamics of sex preferences for children in that country in later years). For Pakistan, Channon (2017) argued that propensity to contraceptive use significantly increases with number of sons. Similar results were obtained for Egypt in Yount et al. (2000). For Nepal, Libois & Somville (2018) showed that couples with a first-born daughter normally have higher resulting number of children. For Kyrgyzstan, it was found that odds of transition to the third and fourth parities are significantly higher among women who had only daughters before (Kazenin 2021). Role of son preference has also been discovered for fertility behavior of migrants from some countries of these regions and their children (Mussino et al. 2019).

For a number of countries fertility ideals also were shown to be influenced by son preference. According to the study by Fuse (2010) mentioned above, South and Central Asia and MENA are the regions where women who report to prefer to have more sons than daughters regularly outnumber those who report the opposite ideal. In studies for separate countries, the same was shown for India (Pande & Astone 2007), Pakistan (Channon 2017), countries of post-Soviet Central Asia (Spoorenberg 2018), among others.

Role of son preference for desires concerning the next child generally has been studied in the regions under consideration much less than its role for actual fertility and fertility ideals. Nevertheless, Arnold (1997), using results of DHS of the 1980s-1990s, argued that in Bangladesh, Egypt, India, Nepal, Pakistan, Tunisia and Turkey number of married women in age 15-49 wanting another child would have been 8-20 percent lower if son preference was not

affecting desires concerning the next child. Subsequent research has shown that probability of the desire to stop child bearing is positively related to number of sons already born and/or to having at least one son in Pakistan (Zaidi & Morgan 2016), Bangladesh (Barkat-e-Khuda 2018), some post-Soviet countries (Billingsley 2011, Spoorenberg 2018), Morocco and Tunisia (Obermeyer 1996, showing that number of living sons has a more profound negative impact on wanting to have one more child compared to number of living daughters).

The importance of son preference for fertility ideals, desires and actual fertility behavior makes relevant the question about social correlates of son preference. The general idea advocated in many studies is that son preference is related to subordinate position of women in her family, to low degree of women's autonomy, to societal norms imposing strict differences in status between men and women, to privileges of men at labor market (see Dyson & Moore 1983 and Das Gupta 1996 as path-breaking studies on this issue; Guilmoto 2015: 207-211 and Dubuc 2018: 22-24 for overviews). As shown in these and many other studies, such factors, below altogether termed "gender asymmetries", can strengthen son preference in two distinct ways. On the one hand, they account for higher value of sons compared to daughters, which is a consequence of higher status of men at the level of family, community, or society as a whole. On the other hand, they can lead to disadvantages of having a daughter. Specifically, in some societies having a daughter can be considered as disadvantageous because of special responsibilities imposed on her parents. These can be financial responsibilities arising from marital norms (obligatoriness of a big dowry paid by parents of a bride, etc.; cf. Arnold et al. 2002 for India), and moral obligations to guarantee daughter's 'honor' and virginity. Also, in societies where norms of patrilocality are observed, daughters are likely to be viewed as 'burdens' with little prospect of support to their parents after marriage (cf. Agarwal 1994; Dubuc 2018: 22).

If son preference originates from these gender asymmetries, it is natural to suggest that it is weaker in those groups of women in whose families the asymmetries are less articulated. Specifically, it can be expected that son preference is lower among women with high educational level and among women who are employed outside their households. The logic behind it is that women with higher education or women who have a wage-work are less economically dependent upon their husbands, have more possibilities to take part in important family solutions, enjoy higher respect in their communities etc. (see Basu 1992, Das Gupta 1996, Jejeebhoy & Sathar 2001, Bongaarts 2013:202, Dubuc 2018: 23; see also Jejeebhoy 2001: 225-233 for a discussion of education and work among other indicators of women

autonomy). It is also natural to suppose that gender asymmetries normally are more pronounced in families of rural women. The most general reason to assume this relates to the well-known fact that in rural areas family practices generally change in a slower fashion (see e.g. Lerch 2019 showing this on the example of fertility decline among urban and rural population of developing countries). Relative stability of traditional gender asymmetries in rural areas can be additionally supported by more strict opposition of roles in households between spouses in the agricultural economic context (cf. Clough 2009, Wegren et al. 2017).

However, for actual fertility the expectation of different strength of son preference across the population groups mentioned above often is not borne out. Filmer et al. (2009) in their broad comparative study argue that in most of developing countries which they consider sex composition of children already born, if at all significant for transition to the next parity, has nearly the same significance among both urban and rural women and among women of different educational groups. Some country-specific studies demonstrate that effects of son preference are equally observed in actual fertility of women of different educational levels (Altindag 2016 for Turkey) or even are weaker among less educated women (e.g. Chowdhury 1994 for Bangladesh, Guilmoto 2012 for Vietnam).

The situation seems to be different for fertility ideals. A number of studies have shown that ideal sex composition of children tends to be more male biased among less educated or poorer women in a number of developing countries (see Dubuc 2018 for an overview). Asadullah et al. (2021) find that in Bangladesh higher education of women correlates with more balanced desired sex preference for children as opposed to stronger desire to have boys among less educated women. Similar conclusions are reached by Ambrosetti et al. (2021) for Egypt, Bhat & Zavier (2003) and Pande & Astone (2007) for India, Channon & Karki (2018) for Nepal.

Unlike actual fertility and ideals of gender composition of children, desires for an additional child so far have not been studied in the aspect of possible differences in the role of son preference across population groups.

2.2. Fertility desires vs. intentions in DHS data

In the DHS surveys conducted between 2010 and 2020, which are used in the present study, the question on desires to have an additional child addressed to women aged 15-49 was uniformly formulated as follows: *‘Would you like to have (another) child, or would you prefer not to have any (more) children?’* The following answers could be chosen: *‘(want to) have another child’*, *‘no more’*, *‘can’t be pregnant’*, *‘do not know’*. If a woman responded that she

would like to have (another) child, she was asked in how many months or years she would prefer to give a birth. Based on these answers and on information concerning woman's fecundity and possible sterilization of her and her partner, a parameter was constructed in DHS databases which had the following meanings: 'wants to have a child within two years', 'wants to have a child after two years', 'wants, unsure timing', 'undecided', 'wants no more', 'declared infecund', 'she or her partner is sterilized'.

It is important to distinguish between fertility desires and intentions when interpreting the above DHS question. Although desires and intentions for such events as having another child are sometimes confused in the literature, theoretically they are quite distinct. According to Thomson (2015), desires only suppose positive attitude towards an additional child bearing (in general or within a certain time period), whereas intentions reflect a decision to implement specific behaviors required for having one more child. In the Traits-Desires-Intentions-Behavior (T-D-I-B) framework suggested by Miller (1995, 2011) for human reproduction, fertility intentions precede and influence actual fertility behavior and are themselves preceded and influenced by fertility desires (this theoretical approach is based on the much more general Theory of Planned Behavior suggested by Ajzen 1991, 2005). In this way, desires and intentions for another child bearing are two consequent mediators between ideals of cumulative fertility (number and gender composition of children) and actual reproductive behaviour.

Different interpretations of the above DHS question in light of the desires vs. intentions distinction are observed in existing studies. E.g. Bankole & Westoff 1998 and Zaidi & Morgan 2016 treat answers to this question as indicators of 'intentions' to have one more child. Spoorenberg (2018) uses the terms 'intentions' and 'wanting' to have another child apparently as synonyms. Obermeyer (1996) and Samosir et al. (2018) treat this question as indicating 'desire' for another child. For Casterline & Agye-Mensah (2017) and Barkat-e-Khuda et al. (2018), this question is about 'preferences' for additional children. Casterline & Han (2017:435) note that the answer about the desire to have one more child might be negative both in case a woman actually does not want more children and in case she does want more children, but considers an additional child bearing infeasible for some reasons. In this way, they actually show that answers to the question may be indicative either for desires or for intentions, depending upon the context. Kodzi et al. (2010), separately noting the importance of distinguishing between intentions and desires in surveys data on developing countries, conclude that the formulation of the DHS questions still corresponds to desires more closely than to intentions. We follow this interpretation in the present paper, using the term 'desire'

rather than intention but keeping in mind that distinguishing between the two in survey answers sometimes may be not straightforward.

3. Hypotheses

Two hypotheses on desires for having an additional child will be considered in the present study.

The *first hypothesis* concerns relations between desires of parous women to have one more child and already having at least one son. The hypothesis suggests that, first, having at least one son makes desires to have another child less probable and, second, lack of sons enhances probability of desires to have one more child in the nearest future. In this way, one component of this hypothesis concerns desires related to fertility quantum, and the other one concerns desires related to timing. Another reasoning behind this choice of these two particular desires is that they correspond to two ‘extremes’: not to ever have another child and to have one in the nearest time.

The *second hypothesis* suggests that socio-economic groups of women vary in degree to which son preference shapes desires for having an additional child. Specifically, the expectation is that already having a son plays a more modest role in formation of fertility desires among urban women compared to rural, among higher educated compared to lower educated women, among women employed outside their households compared to not working or working at their household or for their family member. As shown in section 2.1, these groupings of women are expected in the literature to differ in degrees of gender asymmetries, with urban, higher educated and employed women normally enjoying higher gender equality².

4. Data and Method

Our data source are DHS conducted between year 2010 and 2020. These time limits allowed to consider data on different countries within a rather limited time period. The analysis was undertaken separately for each country of the regions under study for which the database of a DHS conducted in the period of interest was available (in case more than one DHS survey was conducted between 2010 and 2020, the latest one was chosen; the list of the countries and

² The reason why the present study concentrates on these particular three ‘proxies’ of gender asymmetries in woman’s family is that they are fairly simple in definition and measurement, unlike some other potential correlates of son preference, such as parameters of women’s participation in household decisions, women’s autonomy in her personal sphere etc. (cf. Jejeebhoy 2001).

surveys used in the study is in Table 1). Only married women and women living with a partner at the time of the survey were included in the study, because fertility desires of single women, even if expressed at surveys, largely depend upon their plans for entering marriage or partnership. This is especially the case in countries with low level of non-marital fertility, which most of the countries included in the study belong to. Women who reported to be pregnant at the time of the survey were excluded, as well as women declared infecund and those who reported themselves or their partner to be sterilized.

To test *the first hypothesis*, two sets of linear probability models were estimated, one for the desire not to have children anymore and the other one for the desire to have a child within the nearest two years after the survey. Dummy variables for both desires were constructed on the basis of the parameter of desire to have an additional child in the DHS databases. The first dummy had the meaning 1 if the respondent reported the desire not to have a child anymore and 0 otherwise. The second dummy had the meaning 1 if the respondent reported the desire to have a child within the nearest two years and 0 otherwise³. Both dummies were assigned the meaning 0 if the respondent reported she had no decision about the next child yet. In this way, each dummy contrasted women with the relevant desire to all those women who had natural preconditions to conceiving one more child, but did not the desire in question.

The analysis was undertaken separately for women with one, two and three children living at the time of the survey. The categorization by living children rather than the more traditional categorization by parities was justified because of still rather high levels of infant mortality in some of the countries selected for the study. The independent parameter of interest was having at least one living son. Control parameters included age, educational level (tertiary vs. lower), rural/urban residence, woman's age at 1st birth, wealth quintile, and months passed after the latest birth.

³ We considered the desire to have a child within two years as the indicator of 'quick' desired timing, following the categorization suggested by the parameter of desired timing in DHS databases (see section 2.2 for details). The DHS data available for the countries under study also contained a more detailed gradation of timing desires, which allowed to separately consider the desire to have a child within different numbers of months (for those who desired to have a child within a year), as well as within one, two, three etc. years. However, proportion of those desiring a child within a year was very low (<1%) among parous women in some of the countries chosen for analysis, especially among women with three children already born, what made statistical analysis problematic. As robustness check, we have estimated models for the desire to have a child within three year (see section 5 for details).

Table 1. Countries and years of DHS included in the study

Country	Year	N ⁴
Afghanistan	2015	22,571
Albania	2017-2018	7,403
Armenia	2015-2016	3,932
Bangladesh	2017-2018	18,564
Egypt	2014	19,490
Jordan	2017-2018	13,090
Kyrgyzstan	2012	5,364
Myanmar	2015-2016	7,685
Nepal	2016	9,724
Pakistan	2019	13,987
Tajikistan	2017	7,352
Turkey	2013	6,656
Yemen	2013	15,213

For *the second hypothesis*, the analysis was restricted to fertility desires of women having two or more living children. This group was chosen because, as the analysis testing the first hypothesis has shown (see Section 5), desires concerning transition to the second child appear to be less effected by son preference in the countries under study. Linear probability models included interactions of the parameter of having at least one son with the parameter of type of residence, or with the parameter which indicated women's having tertiary education, or with the parameter which indicated women's employment within 12 months before the survey (women who reported that they were working for their family member were not considered as employed). To the controls used in the models checking the first hypothesis, parameters indicating total numbers of living children and of children who had died were added.

5. Results

Table 2 shows distributions of the fertility desires under study among women in marriage/partnership with different numbers of living children at the time of the survey. As could be expected, proportions of those who reported their desire to have another child within the nearest two years decreased, but proportions of those who reported their desire to stop child bearing increased with number of living children. Particular proportions for each desire among women with a given number of living children, however, varied across countries. This variation was clearly related to fertility levels: in countries with higher total fertility proportions of those who desired to have another child were regularly higher for each category of women. E.g. in

⁴ Subsamples of women in marriage or partnership are shown, as only these women are included in the analysis.

Afghanistan, whose TFR was 4.63 children per woman at the time of the survey, proportion of those who desired to stop fertility among women with one living child was equal to negligible 2%, whereas in Albania, whose TFR was 1.62-1.64, this proportion amounted to 25%. By contrast, the proportion of those who desired to have another child within two years among those who already had three living children was 19.2% in Afghanistan and only 1.0% in Albania.

Table 2. Proportions of women with the desire to have a child withing two years and with the intention to stop child bearing, by different numbers of living children, %

	1 living child	2 living children	3 living children	1+ living children	2+ living children
<i>Albania</i>					
Within 2 years	24.4	4.4	0.8	7.6	2.9
Stop	25.4	76.8	91.3	70.5	82.9
N ⁵	1,397	3,032	1,559	6,475	5,078
<i>Afghanistan</i>					
Within 2 years	23.1	18.6	16.0	13.6	11.9
Stop	2.7	6.0	12.9	27.7	32.14
N	2,727	2,880	2,907	18,091	15,364
<i>Armenia</i>					
Within 2 years	30.5	5.6	1.2	9.3	4.2
Stop	10.6	79.4	88.8	61.3	73.3
N	633	1,809	748	3,319	2,686
<i>Bangladesh</i>					
Within 2 years	20.4	5.8	2.4	8.4	3.7
Stop	18.5	79.0	93.3	67.8	87.3
N	4,175	5,393	3,017	14,756	10,581
<i>Egypt</i>					
Within 2 years	31.4	14.1	5.84	11.8	7.7
Stop	11.8	53.8	82.1	64.3	75.3
N	2,949	5,016	4,677	17,035	14,086
<i>Jordan</i>					
Within 2 years	37.5	24.9	16.3	16.3	12.7
Stop	11.3	29.3	51.7	54.9	62.3
N	1,556	2,069	2,218	10,671	9,115
<i>Kyrgyzstan</i>					
Within 2 years	26.9	19.6	11.8	14.6	11.7
Stop	4.0	15.5	36.1	32.2	39.1
N	849	1,164	1,073	4,346	3,497
<i>Myanmar</i>					
Within 2 years	19.8	9.7	7.4	11.1	7.4
Stop	32.7	65.0	79.9	63.4	76.4
N	1,850	1,761	1,171	6,228	4,378
<i>Nepal</i>					
Within 2 years	17.6	4.9	3.3	8.0	3.8
Stop	36.1	87.5	92.4	74.3	91.0
N	2,008	2,200	1,164	6,604	4,596
<i>Pakistan</i>					
Within 2 years	42.5	27.2	15.4	20.1	15.1
Stop	7.0	26.2	51.7	46.4	55.3
N	1,973	2,276	2,067	10,689	8,716
<i>Tajikistan</i>					

⁵ N indicates here number of observations included in the analysis after all the exclusions mentioned in section 4.

Within 2 years	43.2	21.1	9.4	15.6	10.5
Stop	7.3	31.6	59.2	49.6	57.5
N	951	1,601	1,678	6,021	5,070
<i>Turkey</i>					
Within 2 years	26.5	8.8	6.4	11.8	7.13
Stop	24.7	66.4	81.0	62.7	74.7
N	1,212	2,079	977	5,041	3,829
<i>Yemen</i>					
Within 2 years	31.4	21.0	15.5	15.3	12.0
Stop	9.6	23.0	35.0	45.0	52.0
N	2,088	2,208	1,975	12,567	10,479

Table 3 contains results of checking the first hypothesis for the desire to have a child within the nearest two years, and Table 4 for the desire to stop child bearing. The tables contain coefficients of the parameter of having at least one son from the linear probability models which also included all the control parameters listed in section 4 (models without the controls, not shown here, did not differ seriously from these models on effects of number of living sons). As the results show, both desires are sensitive to sex composition of children already born among women with two and three living children in most of the countries. Those who have at least one son have significantly lower probability of wishing to have one more child within two years and significantly higher probability of desiring to stop child bearing in most of the countries (the only exception are Turkey for the desire to have another child within two years and Afghanistan for the desire to stop child bearing). By contrast, for women with only one living child, its sex is significant for (at least one of) the desires in less than half of the countries included in the study. Even for the countries where the relation is significant, the coefficients are regularly much smaller than for women with two or three living children. Note also that for women with only one living child, the countries where having a son is significant for desire to stop child bearing and those where having a son is significant for desire to have a child within two years do not coincide. Only in two countries, Bangladesh and Nepal, having a son is significant for both desires of women with only one living child.

Table 3. Linear regressions for desires to have a child within the nearest two years: coefficients of the binary parameter of having at least one son, by women with different numbers of living children

	AFG	ALB	ARM	BGLD	EGT	JORD	KYRG	MYANM	NPL	PAK	TJK	TURK	YMN
<i>1 living child</i>													
One living son	-0.04*	-0.01	-0.01	-0.03**	0.02	-0.04	-0.05	-0.02	-0.06***	-0.02	0.07*	-0.02	-0.04*
<i>2 living children</i>													
At least one living son	-0.04*	-0.07***	-0.09***	-0.08***	-0.08***	-0.06**	-0.07**	-0.04**	-0.15***	-0.14***	-0.15***	-0.02	-0.08***
<i>3 living children</i>													
At least one living son	-0.05*	-0.02***	-0.01	-0.04***	-0.09***	-0.12***	-0.05	-0.10***	-0.15***	-0.15***	-0.15***	-0.01	-0.12***

*p<0.1, **p<0.05, ***p<0.001

Table 4. Linear regressions for desires to stop child bearing: coefficients of the binary parameter of having at least one son, by women with different numbers of living children

	AFG	ALB	ARM	BGLD	EGT	JORD	KYRG	MYANM	NPL	PAK	TJK	TURK	YMN
<i>1 living child</i>													
One living son	0.01	-0.02	-0.01	0.04***	0.01	0.04***	0.01	0.04*	0.17***	0.03**	-0.03*	-0.01	0.01
<i>2 living children</i>													
At least one living son	-0.01	0.11***	0.19***	0.26***	0.14***	0.05*	0.04*	0.06**	0.35***	0.13***	0.13***	0.06**	0.04
<i>3 living children</i>													
At least one living son	0.05**	0.10***	0.12***	0.13***	0.18***	0.12***	0.13***	0.13***	0.34***	0.31***	0.27***	0.06*	0.16***

In this way, the first hypothesis is confirmed for women with two and three living children, but less so for women with only one living child.

The models with interactions, which checked the second hypothesis, give less consistent results. Urban residence weakens son preference effects on the desire to have another child within two years in 6 of the 13 countries under analysis: Afghanistan, Bangladesh, Egypt, Myanmar, Nepal, Pakistan (Table 5). For these countries coefficients of the interaction term are significant and positive, in this way counterbalancing the negative effect of having at least one son on women's desire to quickly continue the reproductive carrier. In the remaining countries, urban residence does not affect the role of son preference for this desire in a statistically significant way. The role of son preference for the desire to stop child bearing is still less frequently dependent upon type of residence, as also shown in Table 5: only in 4 countries (Bangladesh, Egypt, Myanmar, Nepal) the interactions show that urban residence significantly decreases the role of son preference. Moreover, in one of the remaining countries, Kyrgyzstan, the coefficient of the interaction term shows that urban residence makes even stronger the positive effect of having at least one son on the desire to stop child bearing, contrary to the hypothesis. The coefficient of the interaction term also is significant and positive for Afghanistan, but there the effect of having at least one son among rural women is not significant.

Tertiary education (Table 6) weakens the negative effect of having at least one son on the desire to have a child within two years in Afghanistan, Egypt, Nepal and Pakistan. In Yemen tertiary education, contrary to the hypothesis, strengthens the negative effect of having at least one son (but only at the 90% confidence level). The positive effect of having at least one son on the desire to stop child bearing becomes weaker among women with tertiary education only in two countries, Albania and Nepal. In two other countries, Bangladesh and Jordan, contrary to the expectation, the positive effect of having a son on the desire to stop child bearing becomes still stronger among women with tertiary education.

Finally, woman's employment outside her household (Table 7) significantly decreases the negative effect of having at least one son on the desire to have another child within two years only in Armenia and Bangladesh. For the desire to stop child bearing, the positive effect of having at least one son is weaker among employed women in Albania, Armenia, Bangladesh and Nepal.

Table 5. Linear regressions for desires to have another child within two years and to stop child bearing of women with two or more living children: interactions with urban residence

	AFG	ALB	ARM	BGLD	EGT	JORD	KYRG	MYANM	NPL	PAK	TJK	TURK	YMN
Desire to have a child in 2 years													
Urban	-0.12***	-0.03**	-0.04	-0.04***	-0.08***	0.01	0.02	-0.11***	-0.04**	-0.13***	0.03	-0.02	-0.03
at least one living son	-0.09***	-0.06***	-0.09***	-0.08***	-0.12***	-0.10***	-0.08***	-0.07***	-0.19***	-0.22***	-0.14***	-0.02	-0.10***
urban*at least one son	0.07**	0.02	0.03	0.04***	0.06***	-0.01	-0.03	0.07**	0.05**	0.07***	-0.04	-0.01	0.01
Desire to stop													
Urban	0.05*	0.03	0.04	0.09***	0.09***	0.02	-0.05	0.20***	0.13***	0.10***	0.01	0.03	0.02
at least one living son	0.03	0.13***	0.20***	0.24***	0.19***	0.15***	0.08***	0.12***	0.43***	0.28***	0.21***	0.10***	0.15***
urban*at least one son	0.08**	-0.04	-0.02	-0.07***	-0.05**	-0.01	0.10**	-0.12***	-0.13***	-0.04	-0.03	-0.03	-0.02

Table 6. Linear regressions for desires to have another child within two years and to stop child bearing of women with two or more living children: interactions with woman's tertiary education

	AFG	ALB	ARM	BGLD	EGT	JORD	KYRG	MYANM	NPL	PAK	TJK	TURK	YMN
Desire to have a child in 2 years													
Tertiary education	-0.19***	0.01	-0.01	0.01	-0.09***	-0.03	0.04	-0.05	-0.15***	-0.17***	-0.01	-0.04	0.11
at least one living son	-0.07***	-0.05***	-0.08***	-0.07***	-0.10***	-0.11***	-0.07**	-0.05***	-0.17***	-0.20***	-0.16***	-0.02	-0.10***
tertiary education * at least one son	0.13*	-0.01	0.01	-0.01	0.07***	0.01	-0.04	-0.01	0.12***	0.07**	0.02	-0.01	-0.15*
Desire to stop													
tertiary education	0.02	0.04	0.02	-0.10***	0.02	-0.08**	0.01	0.15**	0.18***	0.12***	0.03	0.01	0.09
at least one living son	0.05***	0.12***	0.20***	0.20***	0.16***	0.11***	0.11***	0.09***	0.36***	0.27***	0.21***	0.07***	0.14***
tertiary education * at least one son	0.04	-0.07*	-0.02	0.11***	-0.03	0.08**	0.02	-0.05	-0.13***	0.01	-0.06	0.03	-0.06

Table 7. Linear regressions for desires to have another child within two years and to stop child bearing of women with two or more living children: interactions with woman's employment¹

	AFG	ALB	ARM	BGLD	EGT	JORD	KYRG	MYANM	NPL	PAK	TJK	YMN
Desire to have a child in 2 years												
employment	0.06	-0.02	-0.05**	-0.02*	-0.03	-0.13	0.02	0.03	-0.02	0.03	0.03	0.10*
at least one son	-0.06***	-0.06***	-0.09***	-0.07***	-0.09***	-0.11***	-0.09***	-0.04**	-0.17***	-0.18***	-0.15***	-0.10***
employment * at least one living son	-0.09	0.02	0.05**	0.02*	0.02	0.15	0.02	-0.03	0.02	-0.04	-0.03	-0.08
Desire to stop												
employment	0.05***	0.13***	0.14***	0.06***	0.05**	-0.07	-0.05	-0.01	0.11***	-0.01	0.03	0.03
at least one son	0.03	0.15***	0.23***	0.23***	0.17***	0.14***	0.10***	0.08***	0.38***	0.25***	0.20***	0.14***
employment * at least one living son	-0.04	-0.11***	-0.12***	-0.05**	-0.04	-0.02	0.02	0.02	-0.09***	0.08	0.01	0.01

¹Turkey is not included because the Turkey DHS dataset did not contain the parameter indicated whether a woman was employed by her family member or had a job outside her family.

All in all, the second hypothesis is borne out only in a restricted number of cases. For none of the socio-demographic variables is the hypothesis confirmed in at least half of the countries. This means that across the countries covered by the analysis, we find a very consistent role of son preference in shaping desires concerning the next child, but a much less consistent relation between son preference and the proxies for family-level gender asymmetries.

Several robustness checks were undertaken (all results available from the author upon request). As robustness checks for both hypothesis, binary logistic regressions were estimated instead of the linear probability models. For the first hypothesis, results of the logistic models showed very small differences from the linear models, in terms of statistical significance of having at least one son and negative/positive direction of its association with the desires. For the second hypothesis, almost none of the interaction terms was significant in the logistic models. Besides, for both hypotheses linear probability models were estimated for the desire to have a child within three years. Results were quite similar to the models for the desire to have a child within two years. Finally, for the second hypothesis, the linear models with interactions were estimated for women with one or more living children. The results did not change considerably compared to the models for women with two and more children discussed above, except that for women with one or more children, the number of countries where the interactions were significant was slightly lower in most of the models, and confidence levels for the interaction coefficient were lower, too.

6. Discussion

We have studied the role of son preference for the desires to stop child bearing and to have another child within two years in 13 countries of the world regions where son preference is known to be an important factor for actual fertility behavior and for fertility ideals. The analysis has shown that in most of the countries both desires are related to already having at least one son. The directions of the relation detected for both kinds of desires show the expected son preference effect. This result not only ‘completes the picture’, adding the knowledge about the impact of son preference upon desires concerning an additional child to what has been known about its impact on actual fertility and on ideals of cumulative gender composition of children. It also allows to conclude that son preference affects desires which concern not only fertility quantum (to stop or to continue child bearing), but also fertility timing (to have the next child within the exact time period). As we have seen in section 2.1, so far role of son preference for fertility desires was studied for the desire to have or not to have one more child, but not for

desires concerning timing of the next child bearing. Given that tendencies in fertility timing in many developing countries, including some of those covered by our analysis, are under intensive discussion in the literature (see Casterline & Odden 2016, Johnson-Hanks 2004, Timæus & Moultrie 2008, 2020, Yeakey et al. 2009, among many others), our result contributes to understanding factors which shape birth intervals there.

In connection to this general result, the observed contrast between women with different numbers of living children is of separate interest. We have seen that the relation of the desires for an additional child to having at least one living son was very uniform across countries for women having two or three children. For women with only one child, not only was the relation weaker, both in terms of significance and coefficient sizes, but it also showed much higher cross-country variability. Seeking for an explanation of this difference, it could be natural to suggest that in countries where total fertility is well above two children per woman, transition to the second child is likely to be very common and “unconditional”, with son preference coming into play only for desires for higher order children. By contrast, in countries where fertility level is about two children per women or lower, transition to the second child can already be shaped by various factors, one of which can be sex of the only existing child. However, this way of explanation is not empirically confirmed for the countries included in the analysis. Consider, for example, countries where, for women who have only one living child, the child’s sex was not significant for desires concerning the next child bearing. They include both countries with TFR even lower than 2 at the time of the survey (Albania – TFR 1.62-1.64 in 2017-18; Armenia – 1.74 in 2016) and a country with TFR higher than 3 (Egypt – 3.44 in 2014). In a similar way, countries where sex of the only living child was significant for at least one of the analyzed desires include those with TFR about 2 (Bangladesh – 2.06 in 2017; Nepal – 2.03 in 2016) and those with much higher fertility levels (Pakistan – 3.45 in 2019, Yemen – 4.33 in 2013). So, contrary to the expectation, significance of the living child for desires concerning the next child bearing among women with only one child does not correlate with fertility level in the country. Therefore, explaining the cross-country variability on this significance, in its contrast to the uniform significance of having at least one son for prospective desires of women with two or three children, is a task for future research⁶.

⁶ In connection with possible cross-country idiosyncrasies observed for women with only one living child, it is interesting to note that that at least in Albania and Armenia, transition to the second child in actual fertility was to a large extent governed by son preference in the recent decades, as evidenced by high frequency of sex selective abortions there, also among women

Another result of the analysis is that in the countries under study role of son preference for desires for an additional child did not become universally weaker among urban women, women with tertiary education and women having a job outside their household. For each of these groups of women, we expected less articulated gender asymmetries in their families and, therefore, weaker role of son preference. For each of these groups, however, the expected weakening effect on son preference was observed only in 2 to 6 countries under analysis. In Section 2.1 it was mentioned that in actual fertility son preference also for most part does not show variability across these groups of women in countries for which relevant studies are available. We have also mentioned in section 2.1 that measuring the effect of socio-demographic parameters on strength of son preference in actual fertility has a risk of biases, which are not present when the same effect is measured for desires to have one more child. Therefore, with the result obtained for the desires we get firmer evidence that effects of son preference on particular reproductive steps (having one more child, stopping or postponing child bearing) do not show regular cross-country differences associated to the socio-economic ‘proxies’ of family-internal gender asymmetries.

Given that results for the socio-economic groups differ across countries, it can be suggested that impact of gender asymmetries in a family on the role of son preference for fertility desires can vary depending upon some country-specific conditions. Below we discuss only some possible sources of this cross-country variability.

First, if in some country son preference operates upon fertility desires of women of different social groups, this could mean that son preference is supported by some gender asymmetries which are observed across these groups, at the level of the society as a whole rather than at the family level. These higher-level factors can neutralize differences across families, forcing women from families with lower degree of gender asymmetries to also follow son preference. Examples from the literature suggest some ways in which it could take place. In some countries

at the first parity (Guilmoto 2009). Sex of the only living child, however, was not significant for the desire to have another child in those countries, as we have seen. It might be the case that desires reported at surveys in these countries did not completely match actual fertility behavior: while in practice decisions on having the second child were taken in connection with sex of the first one, women having only one child could still be reluctant to report at surveys their desire to stop or postpone child bearing at such an early stage. Such behavior at surveys can be related to unwillingness of women to declare low intended fertility in countries with highly ‘familialistic’ culture (see Kazenin & Kozlov 2020; see also Kalamar & Hindin 2015 on other possible cases of mismatches between preferences reported at surveys and actual fertility behavior in developing countries).

of Asia son preference is to a large extent motivated by male-oriented norms of inheritance (cf. Brunson 2010 for Nepal), or patrilocal norms which require girls to leave their parental family after marriage (cf. Arnold et al. 2002 for India). In many cases such norms are not restricted to particular social groups, being of equal power for urban and rural population, population of different educational levels, etc. These norms make having at least one son necessary for practical reasons, irrespectively of gender asymmetries present in a particular family: one always needs to have a male heir, or has to take into consideration that the daughter will move away from parental family and will be able to provide only very limited support to her parents when they become old⁷. It can be suggested, therefore, that when no difference in son preference is observed between groups which differ on one of the proxies of gender asymmetries, son preferences is supported by some of these society-level normative factors. Surely, this explanation needs to be separately checked in each of the relevant countries.

Second, it might be the case that in some of the countries, the socio-economic parameters which we used were not quite adequate as ‘proxies’ for gender asymmetries. Current studies on some developing countries, including some of those covered by our analysis, suggest some conditions in which this could occur. Al-Zalak & Goujon (2017) show that in the 2010th in Egypt, young women with university education for most part found themselves in a vulnerable position at labor market. This was accompanied by growth of fertility and by its shifting to younger ages among this group of women. As the authors suggest, highly educated women could prefer the more ‘traditional’ career of a mother seeing that education does not give them considerable perspectives in life. In families of such women, their education may lose its meaning for gender relations, which return to more asymmetric patterns. It is also possible to suggest that the impact of urban residence on gender relations in some developing countries can vary depending upon conditions in urban settlements. It has been shown that in low quality urban conditions, still quite common in many developing countries, rural family practices often are reproduced (cf. Gries & Grundmann 2018, Hasan and Mahabir 2018 for higher fertility in slums compared to other urban districts in developing countries, including some countries considered in the present paper). Besides, heterogeneity of urban families in developing countries in the aspect of gender relations can be high because of high percent of first and second generation rural-to-urban migrants among their rural population.

⁷ Interestingly, the importance of society-level norms in supporting son preference has been emphasized for at least one country where son preference has been seriously reduced during the recent decades, the Republic of Korea: as argued in Chung & Das Gupta 2007, this reduction was in the first turn triggered by shifts in society-level norms rather than by certain changes observed at the level of individuals or families.

It has to be emphasized that we do not know whether any of the suggested explanations is valid in the countries where son preference does not significantly differ across the socio-economic groups. Only country-specific studies can shed light upon this question. It is also important that the inconsistency of the relation between son preference and the socio-demographic parameters, in whatever way it is explained, does not undermine the high consistency of the son preference effects for the whole samples of women in the countries under study.

Although the present study has suggested evidence for an important role of son preference for formation of fertility desires in the selected regions of the world, the study has some obvious limitations. One limitation comes from the just mentioned potential problems with the socio-demographics parameters as indicators of gender asymmetries. Another limitation is related to possible biases in answers to survey questions about fertility desires. It has been shown that answers to such questions can be biased because of willingness of respondents to give socially acceptable answers (see Kazenin & Kozlov 2020 for an overview). This problem, however, to some extent exists for all studies dealing with survey questions on fertility intentions and hardly allows any straightforward solution. Still another limitation comes from the fact that only fertility desires of women were considered. As shown e.g. in Doepke & Tertilt 2018, for actual fertility in developing countries attitudes and preferences of the husband often are more important. It could be suggested, nevertheless, that survey answers of women could at least partly reflect attitudes worked out together with their partners. Finally, our analysis detected son preference effects using only the parameter of having at least one son. Although the necessity to have at least one male heir is usually taken to be the essential component of son preference, it cannot be excluded that sex of the most recent child as well as exact number of sons can have effects upon the desire for the next child, which need a separate study (cf. Altindag 2016, Basu & de Jong 2010 on significance of these parameters for actual fertility stopping).

Despite of these limitations, the paper has demonstrated that in several regions for which effects of son preference had been reported in actual fertility and fertility ideals (Central and South Asia, Middle East, North Africa, Balkans), surveys conducted between 2010 and 2020 also show regular effects of son preference upon desires for having one more child. It was shown that effects of son preference are detected not only for desires concerning having or not having one more child (quantum), but also for preferred timing of child bearing. Differences in fertility desires among women with different number of living children have been detected: son preference plays more important role in formation of desires of women with two or three living

children compared to women with one living child. At the same time, it has been demonstrated that the expected variability of effects of son preference on fertility desires across the socioeconomic groups of women is present not in all the countries under study. Country-specific studies are called for to account for this result. All the observed differences between countries and between groups of women do not undermine the general conclusion that son preference plays a crucial role in shaping desires concerning the next child bearing in the regions covered by our analysis.

Acknowledgements

For helpful comments and discussion, the author is thankful to Gunnar Andersson, Sunnee Billingsley, Martin Kolk, Eleonora Mussino, and Ben Wilson. All remaining errors are only the author's responsibility.

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Stockholm Research Reports in Demography
Stockholm University,
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