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Son Preference and Gender Gaps in Child Nutrition: Does the Level of Female Autonomy Matter?

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Son Preference and Gender Gaps in Child Nutrition: Does the Level of Female Autonomy Matter?*

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Abstract

This paper first examines whether gender gaps in child nutrition are evident in the presence of parental son preference and then tests if this relationship varies with the level of female autonomy. Using data from the 2005 – 06 round of the National Family and Health Survey, direct measures of son preference and status of female autonomy are derived from responses of couples in rural Indian households. When mothers have a son preference, gender gaps in child nutrition are observed if she is involved in making household decisions. This suggests that mothers, who are primarily responsible for the nutrition needs of small children, are able to act on their son preference when they have autonomy in decision making. In contrast, no independent association is found between child nutrition outcomes and paternal preferences.

Keywords: Nutrition Standards; Son preference; India

JEL Classification: I12, J16, O53

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1 Introduction

A large body of literature has confirmed that son preference, the mindset that sons are more valuable than daughters, is pervasive among Indian parents.¹ Frequently, researchers have deduced the presence of son preference by examining its effects on behavior. Studies have shown that parents who do not have the desired number of sons are less likely to use contraceptives, are more likely to continue having children and have shorter birth intervals (Clark 2000; Haughton and Haughton 1998). An alternate approach has been to focus on the patterns of discrimination against girls. This could be through the differential allocation of resources between male and female children, which becomes evident from gender gaps in health and education outcomes (Subramaniam and Deaton 1991; Kingdon 2002; Oster 2009), or by selectively aborting female fetuses to ensure that daughters are not born at all (Arnold et al. 2002; Kishor and Gupta 2009).

Spouses do not necessarily have identical preferences, an inference made in several studies which have found that household outcomes vary with the identity of the decision maker.² Barring a few exceptions, most empirical studies have concluded that higher female autonomy or improvement in a woman's position within the household is associated with better child outcomes, for instance, greater investments in child health and nutrition (Maitra 2004; Smith et al. 2003).³ These effects are not always gender neutral; the underlying implication being that parental preferences vary with the child's gender (Duflo 2003; Thomas 1990; Thomas 1994).

¹There exist a number of economic, social and religious reasons for the evolution of these preferences. Readers may refer to Shepherd (2008) for a book length exposition on reasons for son preference in India.

²These studies reject the unitary model of household behavior which posits the existence of a representative household member with a single preference function (Becker 1981).

³Other studies have found that household and child welfare are maximized when spouses share the bargaining power (Lancaster et al. 2006; Patel et al. 2007). An exception is the study by Berman et al. (1997), who have found that maternal employment is negatively associated with health care spending when children fall ill.

What is missing from the literature is how female autonomy influences the relationship between son preference and child nutrition outcomes. This paper seeks to examine precisely that question. To conduct this analysis, data from the 2005 – 06 round of the National Family and Health Survey are used. Rather than infer the existence of son preference from its effects on behavior, direct and separate measures are created based on survey responses regarding preferred number of boys and girls. The task of finding a satisfactory measure of female autonomy has been challenging for researchers. Some studies have used proxies such as female education, wealth or physical stature (Patel et al. 2007; Thomas 1994). The drawback is that these measures directly affect outcomes such as child's health. To get around endogeneity problems, other studies have looked at exogenous income shocks such as cash transfers (Duflo 2003; Paxson and Schady 2007). But these studies frequently assume that the recipient of the income shock is also the one who decides how to spend the money, which may not always hold true. A recent approach has been to construct an index of female autonomy from survey questions on female involvement in household decisions, freedom of mobility and control of resources (Chakraborty and De 2011). But this too has come under criticism (Alfano et al. 2011) because answers to these questions are weighted equally in the index even though the relative importance of decisions may well vary with the outcome under study. The measure of female autonomy used in this analysis is based on couples' responses to the survey question on routine household purchases. Not only does this give a direct measure, it focuses on the question that is likely to be the most relevant for investments in child nutrition.

The main findings from this analysis are as follows. Gender gaps in nutrition outcomes of children are observed when mothers have a son preference and are involved in household decision making. This suggests that mothers, who are primarily responsible for the nutrition needs of

small children, are able to manifest their son preference when they have autonomy in making decisions. In contrast, no independent association is found between child nutrition outcomes and paternal son preference.

2 Data and Descriptive Statistics

Data come from the 2005 – 06 round of the National Family and Health Survey (NFHS), a nationally representative cross-sectional household survey conducted in India.⁴ The advantage of this latest round of the NFHS is that in addition to interviewing women, like in the previous two rounds, men have also been interviewed.⁵ The survey contains detailed information on basic household demographics, dwelling characteristics, household assets, and household member educational attainment and employment status. Adult men and women were asked questions about fertility, fertility preferences as well as various aspects of female empowerment. Additionally, information on anthropometry, health and nutrition of children in these households was also collected.

The sample for this analysis is restricted to children under five years of age residing in rural households for whom complete anthropometric information is available and for whom both parents have been interviewed. Children from birth orders higher than nine (above 99th percentile) are excluded from the analysis.⁶ The final sample includes 6,897 children from 4,900 households.

⁴The NFHS data are available upon request from <http://www.measuredhs.com>.

⁵The previous two rounds were conducted in 1992 – 93 and 1998 – 99.

⁶The rationale behind this exclusion is that children in birth orders higher than nine may have exceptionally inferior nutrition outcomes and/or may be subject to greater gender discrimination when family sizes are so high. Results reported in this analysis are robust to the inclusion of these observations.

The outcome of interest is the weight-for-height z score of a child, which is an anthropometric measure used to assess a child’s short-run nutritional status.⁷ This measure is based on the World Health Organization (WHO) growth standards. A z score is calculated, which is expressed as standard deviations below or above a median value in the corresponding age and sex group in the reference population (World Health Organization 2006). For example, a weight-for-height z score of -0.5 would imply that a child’s weight-for-height is 0.5 standard deviations below the median weight-for-height of a well-nourished child.

Table 1 reports the characteristics of children, who form the units of observation in this analysis. The sample size is 3,454 female children and 3,443 male children. The average child is approximately 30 months old. The mean weight-for-height z scores of female and male children are -0.95 and -0.94 respectively. The negative signs indicate that the z scores of children in this sample fall below the median score of a well-nourished child. Figure 1 shows the distribution of z scores by gender. It can be seen that female children fare slightly worse than male children, a fact also apparent from their lower mean z scores reported in Table 1.⁸ The difference, however, is not statistically significant.

Table 2 illustrates the sample characteristics of parents and households. The average mother’s age is 27 years while the average father is 32 years old. The fathers’ and mothers’ average educational attainment are 6 years and 4 years respectively. 41 percent of mothers and 97 percent of fathers report to have worked in the last twelve months. The NFHS asked questions on the ideal number and ideal sex composition of children to elicit information on the fertility preferences of parents. The mean ideal number of boys and girls reported by mothers are 1.56 and 1.21

⁷Similar results are obtained for BMI-for-age, another short-run measure. However, no significant results are obtained for height-for-age, which is a long-run indicator of nutritional status.

⁸The use of z scores makes gender comparisons possible since they are adjusted for both age and gender of a child.

respectively which adds to 2.77, their mean ideal number of children. Fathers report their ideal number of boys and girls to be 1.57 and 1.18 respectively, adding up to 2.75 ideal number of children. Based on wealth quintiles reported by NFHS for the entire survey sample, the majority of the households in this sample fall in the first four wealth quintiles and only 6 percent of the total 4,900 households fall in the highest wealth quintile.⁹ Majority (about three-quarters) of the households belong to the Hindu community and the household is headed by a male member in 95 percent of the sample. The average number of children in these households is 3.18.

3 Measuring Son Preference

The term son preference refers to “the attitude that sons are more important and more valuable than daughters” (Clark 2000). The NFHS includes questions on the ideal number and ideal sex composition of children which are asked to both parents. Specifically, the two questions asked to obtain information on fertility preferences are: (1) “If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?” and (2) “How many of these children would you like to be boys and how many would you like to be girls?” A point to note is that because of the manner in which these questions have been framed, they are more likely to capture innate preferences rather than dynamic ones that could evolve due to factors such as the sex composition of children already born.

Separate measures of son preference for each parent are derived from their responses to the second question mentioned above. Using information from a parent’s report on the number of

⁹NFHS reports the wealth quintiles of the surveyed households. Wealth indices are constructed from information on ownership of household assets (such as furniture and vehicles), dwelling characteristics (such as water source), home construction materials and whether a household member has a bank or post office account. These composite indices are then categorized by quintiles (relative to households in the survey round). Quintile 1 denotes the poorest households and quintile 5 denotes the wealthiest households.

boys and girls they would ideally like to have, son preference is calculated as a binary variable. If the ideal number of boys reported is greater than the ideal number of girls, then this measure has a value of one and implies that the parent has a son preference. This measure has a value of zero if the ideal number of sons is less than or equal to the ideal number of daughters.¹⁰

A related measure has been used by Clark (2000); the ratio of ideal number of sons to the ideal number of children, where a higher ratio implies a greater preference for sons. This measure makes it possible to assess differing magnitudes of son preference. Due to a much smaller sample size (about 6 percent of the sample size in Clark (2000)) in this analysis, there is not sufficient variation that can be exploited to use such a measure. Instead, the binary measure of son preference used can be conceived as an aggregated version of Clark's measure where parents who would like more than 50 percent of their children to be boys are designated as those with a son preference.

Variation in the son preference of parents is reported in Table 3. Approximately 34 percent of mothers and 35 percent of fathers in the sample report having a preference for sons. Parental preferences match in 63 percent of the 4,900 households. Of those households, in 2,318 cases (47 percent) neither parent has a son preference while both parents have a son preference in 780 cases (16 percent). In the remaining 1,802 households (37 percent), preferences do not match and either the mother or the father has a son preference.

Appendix Table A.1 outlines some basic characteristics associated with son preference. Household characteristics include higher probability of falling in the lower wealth quintiles as well as greater number of children. Older age and lower educational attainment of both parents

¹⁰Consider for example, three mothers each of whom report their ideal number of children to be four. Suppose that the first mother wants three boys and one girl, the second mother wants two boys and two girls and the third mother wants one boy and three girls. Then only the first mother is designated to have a son preference.

are found to be associated with son preference. It can also be seen that parents with a son preference desire a greater ideal number of children.

4 Measuring Female Autonomy

For purposes of this analysis, female autonomy is defined as “the ability of women to make choices/decisions within the household relative to their husbands” (Anderson and Eswaran 2009). The NFHS asked adult male and female household members questions on decision making on a number of household matters, namely, household purchases, own health care, visits to family or relatives, and spending of spousal earnings. Household purchases were categorized into large purchases and purchases made for daily needs of the household. The two types of purchases differ on the amount of money to be spent and whether the purchase is routine or not: daily purchases being more routine and requiring a relatively smaller amount of money to be spent than large purchases (Kishor and Subaiya 2005).

The measure of status of female autonomy used in this paper is based on responses to the decision making question on household purchase for daily needs, which is likely to be the most directly relevant for investments in child nutrition. Fathers were asked about who they think the decision making power should rest upon while mothers were asked about who actually takes the decision in the household. Specifically, the question posed to the father was “Who do you think *should have* the most say in making decisions on household purchases for daily needs?” while the mother was asked “Who do you think *has* the most say in making decisions on household purchases for daily needs?”

Table 4 reports parental responses to the decision making question. The father responds whether the decision should be taken by himself (1,137 households, 23 percent), jointly with

his wife (1,975 households, 40 percent) or by his wife alone (1,788 households, 36.5 percent). The mother responds whether the actual decision is taken by her husband (1,268 households, 26 percent), jointly with her husband (1,472 households, 30 percent), by herself (1,456 households, 30 percent) or by others (for instance, mother-in-law) in the household (566 households, 11.5 percent).¹¹ These response categories provide variation in the status of female autonomy with decision making power of the mother being the strongest when she takes (should take) the decision all by herself and weakest when the decision is taken (should be taken) solely by her husband. When the couple jointly takes a decision, female autonomy lies in between. Since identity and details on preferences of the decision maker are not available when the mother responds that “others” take the decision, observations for this category are excluded from the analysis based on the mother’s response.¹²

Two features are worth noting from the cross tabulation of parental responses presented in Table 4. First, agreement of responses by both spouses on identity of the decision maker is observed only in 1,671 (34 percent) households. In contrast, the frequency of agreement in spousal responses is much higher for decisions related to other household matters, for example, large household purchases (46 percent, statistics not reported). Second, in comparison to the fathers’ report, mothers’ reports are skewed to portray a greater involvement of fathers in deciding matters related to daily household needs. For example, among the 1,268 mothers who say that their husbands are the sole decision makers, spouses of 358 of these mothers agree with this report while the remaining 517 and 393 fathers think that it should be a joint decision or that only their wives should be involved in decision making. There are two potential

¹¹The mothers’ responses do not add up to 100 percent due to 138 observations which have missing value.

¹²As a check, regressions are estimated for this category but the coefficients are not found to be statistically significant.

explanations that can account for this apparent difference in perceptions. One relates to the nature of the decision under analysis. When exploring the decisions relating to large household purchases (statistics not reported), both parents report a greater likelihood of the father being involved in decision making. This suggests that in matters which are considered more important and involve the outlay of a larger sum of money, fathers are less willing to entrust their wives with the power to make decisions than in the case of relatively routine matters. The second explanation is that in a patriarchal society such as India (as is evidenced by the majority (95 percent) of households in this sample being headed by a male member), established norms might make women less likely to perceive that she could take independent decisions that are not vetted by her spouse.

Appendix Tables A.2 and A.3 summarize household and parental characteristics separately by the fathers' and mothers' response to the decision making question. These descriptive statistics reveal characteristics that are associated with the greatest level of female autonomy (father or mother reporting that the mother should be (is) the sole decision maker). Household characteristics include fewer children and lower probability of being in the lowest (poorest) wealth quintile. Parental characteristics include high BMI of mother, greater likelihood of the mother being employed as well as older age and higher educational attainment of both parents. These accord well with the correlates of female bargaining power from previous literature and validates the separate measures of female autonomy from the fathers' and mothers' reports used in this analysis.

5 Empirical Specification

This paper first examines whether gender gaps in child nutrition are evident in the presence of parental son preference and then tests if this relationship varies with the level of female autonomy. To answer these questions, the following regression specification is estimated.

$$y_{ibs} = \alpha_0 + \alpha_1 Male_{ibs} + \alpha_2 MotherSonPref_{is} + \alpha_3 FatherSonPref_{is} + \alpha_4 (Male_{ibs} \times MotherSonPref_{is}) + \alpha_5 (Male_{ibs} \times FatherSonPref_{is}) + X_{is}\theta + \phi_b + \gamma_s + \epsilon_{ibs} \quad (1)$$

where y is the weight-for-height z score of child i of birth order b residing in state s . $Male_{ibs}$ specifies the gender of the child. $MotherSonPref_{is}$ and $FatherSonPref_{is}$ are binary variables which indicate if the mother or the father has a son preference. X is a vector of controls and includes mother's BMI, age of mother at childbirth, reported ideal number of children, educational attainment, and dummies for work status of both parents, total number of children in the household, dummy for female household head, and dummies for wealth quintile and religion. ϕ_b and γ_s represent birth order and state fixed effects; these are included in all regressions to control for any birth order and state level heterogeneity. The regressions are estimated first for the full sample and then separately by who makes decisions in household purchases for daily needs, which are based on the fathers' and mothers' reports. The estimation method is ordinary least squares.

The basic idea of the specification equation is thus to compare the outcomes of children whose parents have a son preference to ones where they do not. The coefficients of interest are the interaction terms between gender of the child and son preference of parents. α_4 gives the difference in gender gap in nutrition when the mother has a son preference compared to when she does not. α_5 gives the analogue when the father has a son preference.

6 Results

6.1 Results Based on Parental Preferences

The starting point of this analysis is to examine whether gender gaps in child nutrition are observed when parents have a son preference compared to when they do not. The regression results from estimating equation (1) for the full sample are reported in Table 5. The coefficient on the *Male* dummy is statistically insignificant, which indicates the absence of a gender gap when neither parent has a son preference. The average weight-for-height z score of female children is found to be 0.12 standard deviations lower when the mother has a son preference compared to when she does not. Interestingly, this relation is not found when fathers have a son preference. The interaction term of gender of the child and the son preference of mother is positive, which indicates that a gender gap exists when mothers have a son preference. However, the coefficient estimate is not statistically significant.

This result naturally raises the question of why only maternal preferences matter. A potential explanation is that mothers are primarily responsible for feeding young children and therefore can act on their preferences. Altering the quantity or quality of food are examples of how they might manifest their preferences.

But is it true that the mother is always able to act upon her preferences? Or does her ability to do so vary with the level of autonomy she enjoys in the household? The next two subsections seek to answer these questions. A source of concern with such an analysis is the systematic under or over representation of parental preferences across different autonomy levels. However, from Appendix Tables A.4 and A.5, this does not seem to be the case. Preferences are found to be distributed across the different autonomy structures (considering both the fathers' and the mothers' response) in approximately the same proportion as in the full sample.

6.2 Results Based on Fathers' Response

To explore if the level of female autonomy has a bearing on the relationship between son preference and child nutrition, regressions are estimated separately based on the fathers' report on who he thinks should make decisions in household purchases for daily needs. Table 6 reports the estimation results of equation (1). The coefficient estimates on the *Male* dummy in all three columns are found to be statistically insignificant, implying the absence of a gender gap when neither parent has a son preference. In column (3), when the father thinks the decision making power should rest on his wife (the mother), the average z score of female children is found to be 0.25 standard deviations lower when the mother has a son preference. The coefficient on the interaction term *Male*Mother has son preference* indicates that the average z score of male children is 0.19 standard deviations higher than female children when the mother has a son preference compared to when she does not. These results are not obtained in columns (1) and (2), where the father reports that he alone or both he and his wife should participate in household decision making. In both these cases, there appear to be no relation between son preference of parents and child nutrition. As with the results for the full sample, reported in Table 5, the son preference of father plays no significant role. This is true no matter who the father thinks the decision maker should be.

These results indicate that mothers are only able to manifest their preferences when they have the sole power to make decisions on household purchases for daily needs but cannot do so when the father wields his influence. The son preference of fathers, on the other hand, does not matter even when he believes that he alone should be in charge of daily household purchases.

The cross tabulation of parental responses to the decision making question, presented in Table 4, attested to the low frequency of agreement in spousal responses as well as the greater likelihood of mothers reporting involvement of fathers in decisions related to household purchases for daily needs. In what follows, the analysis is repeated based on the mothers' response to the decision making question to examine if the difference in responses alters any of the above results.

6.3 Results Based on Mothers' Response

Table 7 reports estimation results of equation (1) based on the mothers' report. As before, regressions are estimated separately for households where the father, mother or both parents participate in decision making. Columns (1) and (3) reveal that when the father or the mother is the sole decision maker, there is no baseline gender gap or variation in this gap depending on whether the parents also have a son preference. However, results from column (2) indicate that the son preference of mothers are associated with a gender gap when both parents participate in the decision making process. The weight-for-height z score of the average female child is 0.11 standard deviations lower when her mother has a son preference, although the coefficient is statistically insignificant. The estimated coefficient on the interaction term *Male*Mother has son preference* is 0.26, which suggests that the average gap in z scores between male and female children is 0.26 standard deviations when the mother has a son preference compared to when she does not.

No statistically significant association is found between the son preference of fathers and child nutrition outcomes. The result that it is only the preference of mothers that matter is consistent with the previously reported results. The difference is observed in the autonomy structure in which mothers are found to be able to manifest their preferences.

6.4 Discussion - Reconciling Results

Results from this analysis confirm the existence of a significant association between maternal son preference and gender bias in short run indicators of child nutrition. However, some ambiguity is observed on the exact household decision making structure where mothers can act upon their preferences. Based on the fathers' response, this association is observed when mothers are the sole decision makers while results based on the mothers' response suggest that this association exists when both parents are involved in making decisions.

One way to explain this apparent discrepancy is through the examination of the couples' responses to the decision making question, which is presented in Table 4. As discussed before, due to the routine nature of the decision and established gender roles in the society under analysis, mothers are found to report far greater involvement of fathers in deciding matters related to daily household needs. Therefore, it is not surprising that results based on the mothers' response are found in the "both" category as opposed to the "mother" category. Table 4 also indicates that parental responses to the decision making question match in 1,671 (34 percent) households. Results based on this subsample, where parental responses match, are presented in Appendix Table A.6. The results resemble those based on the fathers' response although the positive coefficient on *Male*Mother has son preference* in column (3) is statistically insignificant.

There is another reason to place a greater emphasis on the results based on the fathers' response. These responses are indicative of the degree of autonomy husbands are actually willing to grant to their wives (Chakraborty and De 2011). Consequently, the husband's perception

likely presents a more accurate picture of female autonomy, especially in a patriarchal society such as India.

7 Interaction of Parental Preferences

The specification given by equation (1) examines the relationship between gender gaps in child nutrition and son preference of each parent independent of the other parent's preference. Table 3 presents evidence that parental responses match in 3,098 households (63 percent) and do not match in the remaining 1,802 households (37 percent). To analyze whether the matching of preferences matter, the following model with interaction of parental preferences is estimated.

$$\begin{aligned}
y_{ibs} = & \beta_0 + \beta_1 Male_{ibs} + \beta_2 MotherSonPref_{is} + \beta_3 FatherSonPref_{is} + \beta_4 (Mother \\
& SonPref_{is} \times FatherSonPref_{is}) + \beta_5 (Male_{ibs} \times MotherSonPref_{is}) + \beta_6 (Male_{ibs} \\
& \times FatherSonPref_{is}) + \beta_7 (Male_{ibs} \times MotherSonPref_{is} \times FatherSonPref_{is}) \\
& + X_{is}\theta + \phi_b + \gamma_s + \epsilon_{ibs}
\end{aligned} \tag{2}$$

where y is the weight-for-height z score of child i of birth order b residing in state s . As before, $MotherSonPref_{is}$ and $FatherSonPref_{is}$ are binary variables which indicate if the mother or the father has a son preference. X includes the same controls as in equation (1). ϕ_b and γ_s represent birth order and state fixed effects.

β_2 gives the mean difference in the nutrition outcome of female children when only the mother has a son preference relative to the baseline case of neither parent having a son preference. β_3 gives the analogue when only the father has a son preference. β_5 (β_6) gives the difference in gender gap in nutrition when only the mother (father) has a son preference compared to neither parent having a son preference. The coefficient on the interaction of parental preferences, β_4 ,

gives the differential influence on female outcomes of mothers having a son preference when fathers have a son preference relative to when they do not. The triple interaction term, β_7 , gives the differential influence on the gender gap.

The discussion in the previous section alludes to reasons why the fathers' report might be a more accurate representation of female autonomy in the household. Therefore, regressions results for equation (2) are estimated based on the fathers's response to the decision making question. These results are reported in Table 8. Similar to Table 6, gender gaps are observed only in column (3), where fathers report that their wives should be the sole decision makers. The coefficient on *Mother has son preference*Father has son preference* is -0.44 , which suggests that when fathers have a son preference, the z scores of female children are 0.44 standard deviations lower if mothers also have a son preference. The differential gender gap when both parents have a son preference is 0.48 standard deviations. Interestingly, the negative influence of mothers' son preference on girls is only to be found when fathers have a son preference but not when only the mother has a son preference. The coefficient on *Male*Father has son preference* is -0.29 , which implies that when only fathers have a son preference, female children fare better than male children. This suggests that mothers are able to protect female children against discrimination in nutrition investments if she has no son preference and greater autonomy in the household. As before, no independent association is found between child nutrition outcomes and father son preference.

8 Conclusion

Using separate reports from couples on their preference for sons and perceptions of status of female autonomy in their household, this paper examines how the relationship between parental

son preference and gender gaps in child nutrition varies with the level of female autonomy. Using data from the 2005 – 06 round of the NFHS, gender gaps in child nutrition are observed when mothers have a son preference and are also involved in household decision making. In contrast, no independent association is found between child nutrition outcomes and paternal preferences. Overall, these results suggest that explicitly accounting for parental preferences may be important when studying the dynamics of intra-household bargaining.

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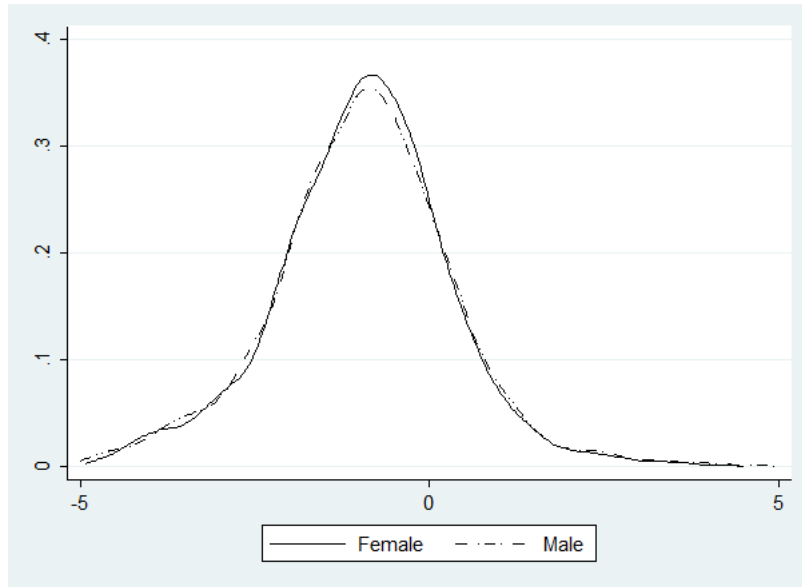


Figure 1: Distribution of weight-for-height z scores of children

Table 1: Characteristics of Children

	Female		Male	
	Mean	S.D.	Mean	S.D.
	(1)	(2)	(3)	(4)
Weight-for-height z score	-0.95	1.25	-0.94	1.31
Age (months)	30.02	16.86	30.74	16.97
Birth Order				
1	0.25		0.22	
2	0.26		0.26	
3	0.18		0.20	
4+	0.31		0.32	
<i>N</i>	3,454		3,443	

Table 2: Parental and Household Characteristics

	Mean (1)	S.D. (2)
Mother Characteristics		
Age	27.20	5.71
Education	3.67	4.38
Worked in last year	0.41	
Ideal no. of children	2.77	1.00
Ideal no. of boys	1.56	0.66
Ideal no. of girls	1.21	0.55
BMI	19.67	2.82
Father Characteristics		
Age	32.23	6.56
Education	5.92	4.75
Worked in last year	0.97	
Ideal no. of children	2.75	1.02
Ideal no. of boys	1.57	0.70
Ideal no. of girls	1.18	0.56
Household Characteristics		
Wealth Quintile		
1	0.25	
2	0.28	
3	0.25	
4	0.16	
5	0.06	
Religion		
Hindu	0.73	
Muslim	0.10	
Christian	0.13	
Others	0.04	
Male household head	0.95	
Total no. of children	3.18	1.87
Number of households	4,900	

Table 3: Distribution of Parental Preferences

		Father has son preference		Total (3)
		No (1)	Yes (2)	
Mother has son preference	No	2,318 (71.32) [72.71]	932 (28.68) [54.44]	3,250 (100.00) [66.33]
		Yes		
		870 (52.73) [27.29]	780 (47.27) [45.56]	1,650 (100.00) [33.67]
	Total	3,188 (65.06) [100.00]	1,712 (34.94) [100.00]	4,900 (100.00) [100.00]

Notes: Son preference for either parent is calculated as a binary variable which equals one if the parent reports that their ideal number of boys is greater than their ideal number of girls and is zero otherwise. Figures in parenthesis and square brackets present the row and column percentages respectively.

Table 4: Decision Making: Variation in Parental Response

		Mothers' response					Total (6)
		Father (1)	Both (2)	Mother (3)	Others (4)	Missing (5)	
Fathers' response	Father	358 (31.49) [28.23]	326 (28.67) [22.15]	270 (23.75) [18.54]	153 (13.46) [27.03]	30 (2.64) [21.74]	1,137 (100.00) [23.20]
	Both	517 (26.18) [40.77]	662 (33.52) [44.97]	535 (27.09) [36.74]	209 (10.58) [36.93]	52 (2.63) [37.68]	1,975 (100.00) [40.31]
	Mother	393 (21.98) [30.99]	484 (27.07) [32.88]	651 (36.41) [44.71]	204 (11.41) [36.04]	56 (3.13) [40.58]	1,788 (100.00) [36.49]
	Total	1,268 (25.88) [100.00]	1,472 (30.04) [100.00]	1,456 (29.71) [100.00]	566 (11.55) [100.00]	138 (2.82) [100.00]	4,900 (100.00) [100.00]

Notes: This is a cross tabulation of mothers' and fathers' responses to the decision making question. Items in bold font reflect agreement in the parents' responses. Figures in parenthesis and square brackets present the row and column percentages respectively.

Table 5: Results: Preferences and Child Nutrition

	Weight-for-height (1)
Male (= 1)	0.0090 (0.040)
Mother has son preference (= 1)	-0.12** (0.049)
Father has son preference (= 1)	0.022 (0.048)
Male * Mother has son preference	0.074 (0.062)
Male * Father has son preference	-0.056 (0.066)
N	6,897
R^2	0.091

Notes: This table presents the regression results for equation (1) for the full sample of children. The dependent variable is the weight-for-height z score of a child. All controls are included but are not reported. Excluded categories include birth order 1, wealth quintile 1, Hindu religion, working father and non-working mother. Robust standard errors clustered at the primary sampling unit level are reported in parenthesis.
*** p< 0.01, ** p< 0.05, * p< 0.1.

Table 6: Results: Fathers' Response

	Decision Maker in HH		
	Father (1)	Both (2)	Mother (3)
Male (= 1)	-0.00096 (0.077)	0.0040 (0.061)	0.041 (0.069)
Mother has son preference (= 1)	-0.14 (0.094)	0.018 (0.075)	-0.25*** (0.082)
Father has son preference (= 1)	-0.029 (0.090)	0.12 (0.076)	-0.037 (0.084)
Male * Mother has son preference	-0.00040 (0.13)	-0.0026 (0.099)	0.19* (0.11)
Male * Father has son preference	0.070 (0.13)	-0.070 (0.10)	-0.12 (0.11)
<i>N</i>	1,585	2,792	2,520
<i>R</i> ²	0.131	0.099	0.098

Notes: This table presents the regression results for equation (1) where the sample is stratified by the fathers' response to the decision making question. The dependent variable is the weight-for-height z score of a child. All controls are included but are not reported. Excluded categories include birth order 1, wealth quintile 1, Hindu religion, working father and non-working mother. Robust standard errors clustered at the primary sampling unit level are reported in parenthesis.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Table 7: Results: Mothers' Response

	Decision Maker in HH		
	Father (1)	Both (2)	Mother (3)
Male (= 1)	-0.042 (0.076)	0.053 (0.071)	0.034 (0.076)
Mother has son preference (= 1)	-0.070 (0.087)	-0.11 (0.093)	-0.12 (0.094)
Father has son preference (= 1)	0.063 (0.086)	-0.033 (0.087)	0.032 (0.090)
Male * Mother has son preference	-0.10 (0.12)	0.26** (0.12)	0.014 (0.12)
Male * Father has son preference	0.015 (0.12)	-0.083 (0.12)	-0.077 (0.13)
<i>N</i>	1,806	2,089	2,018
<i>R</i> ²	0.102	0.117	0.125

Notes: This table presents the regression results for equation (1) where the sample is stratified by the mothers' response to the decision making question. The dependent variable is the weight-for-height z score of a child. All controls are included but are not reported. Excluded categories include birth order 1, wealth quintile 1, Hindu religion, working father and non-working mother. Robust standard errors clustered at the primary sampling unit level are reported in parenthesis.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8: Results: Interaction of Parental Preferences

	Decision Maker in HH		
	Father (1)	Both (2)	Mother (3)
Male (= 1)	-0.034 (0.082)	-0.0026 (0.065)	0.085 (0.074)
Mother has son preference (= 1)	-0.21* (0.11)	0.034 (0.097)	-0.084 (0.10)
Father has son preference (= 1)	-0.091 (0.11)	0.14 (0.092)	0.11 (0.10)
Mother has son preference * Father has son preference	0.17 (0.18)	-0.040 (0.15)	-0.44*** (0.17)
Male * Mother has son preference	0.12 (0.17)	0.017 (0.13)	0.0087 (0.13)
Male * Father has son preference	0.18 (0.17)	-0.051 (0.13)	-0.29** (0.14)
Male * Mother has son preference * Father has son preference	-0.30 (0.25)	-0.044 (0.20)	0.48** (0.23)
<i>N</i>	1,585	2,792	2,520
<i>R</i> ²	0.132	0.099	0.101

Notes: This table presents the regression results for equation (2) where the sample is stratified by the fathers' response to the decision making question. The dependent variable is the weight-for-height z score of a child. All controls are included but are not reported. Excluded categories include birth order 1, wealth quintile 1, Hindu religion, working father and non-working mother. Robust standard errors clustered at the primary sampling unit level are reported in parenthesis.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

A Appendix

Table A.1: Parental and Household Characteristics: Stratification by Parental Preferences

	Mother has son preference				Father has son preference			
	No		Yes		No		Yes	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother Characteristics								
Age	27.05	5.65	27.49	5.82	26.72	5.51	28.10	5.97
Education	4.25	4.51	2.53	3.86	4.14	4.48	2.82	4.05
Worked in last year	0.41		0.42		0.41		0.41	
Ideal no. of children	2.61	1.02	3.10	0.87	2.63	0.94	3.04	1.05
Ideal no. of boys	1.27	0.51	2.13	0.53	1.45	0.61	1.77	0.69
Ideal no. of girls	1.33	0.55	0.97	0.45	1.18	0.52	1.27	0.58
BMI	19.75	2.86	19.51	2.74	19.75	2.91	19.52	2.65
Father Characteristics								
Age	32.30	6.52	32.08	6.66	31.83	6.47	32.97	6.66
Education	6.30	4.77	5.17	4.62	6.30	4.75	5.20	4.67
Worked in last year	0.97		0.96		0.97		0.97	
Ideal no. of children	2.67	1.01	2.92	1.03	2.55	0.99	3.12	0.97
Ideal no. of boys	1.49	0.68	1.73	0.73	1.24	0.49	2.18	0.63
Ideal no. of girls	1.18	0.56	1.19	0.56	1.31	0.54	0.94	0.51
Household Characteristics								
Wealth Quintile								
1	0.21		0.33		0.21		0.32	
2	0.27		0.29		0.28		0.28	
3	0.26		0.23		0.26		0.23	
4	0.19		0.12		0.18		0.13	
5	0.07		0.04		0.08		0.04	
Religion								
Hindu	0.72		0.75		0.74		0.71	
Muslim	0.10		0.12		0.09		0.12	
Christian	0.15		0.11		0.13		0.13	
Others	0.04		0.03		0.04		0.04	
Male household head	0.95		0.97		0.95		0.96	
Total no. of children	2.98	1.77	3.58	1.99	2.94	1.74	3.64	2.02
Number of households	3,250		1,650		3,188		1,712	

Table A.2: Parental and Household Characteristics: Stratification by Fathers' Response

	Decision Maker in HH					
	Father		Both		Mother	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
	(1)	(2)	(3)	(4)	(5)	(6)
Mother Characteristics						
Age	26.75	5.53	27.26	5.72	27.43	5.81
Education	3.07	4.08	3.69	4.39	4.04	4.50
Worked in last year	0.40		0.41		0.43	
Ideal no. of children	2.66	0.90	2.77	1.01	2.85	1.04
Ideal no. of boys	1.51	0.63	1.57	0.67	1.59	0.66
Ideal no. of girls	1.15	0.48	1.20	0.54	1.26	0.59
BMI	19.34	2.59	19.67	2.85	19.87	2.91
Father Characteristics						
Age	31.83	6.29	32.22	6.42	32.49	6.87
Education	5.24	4.63	6.09	4.79	6.15	4.75
Worked in last year	0.97		0.96		0.97	
Ideal no. of children	2.65	0.91	2.73	1.02	2.85	1.08
Ideal no. of boys	1.54	0.67	1.55	0.71	1.61	0.72
Ideal no. of girls	1.11	0.50	1.18	0.56	1.24	0.59
Household Characteristics						
Wealth Quintile						
1	0.31		0.24		0.22	
2	0.30		0.28		0.26	
3	0.22		0.24		0.28	
4	0.14		0.17		0.17	
5	0.04		0.07		0.07	
Religion						
Hindu	0.82		0.72		0.68	
Muslim	0.11		0.11		0.09	
Christian	0.05		0.13		0.19	
Others	0.02		0.04		0.04	
Male household head	0.96		0.95		0.95	
Total no. of children	3.17	1.89	3.25	1.90	3.12	1.82
Number of households	1,137		1,975		1,788	

Table A.3: Parental and Household Characteristics: Stratification by Mothers' Response

	Decision Maker in HH					
	Father		Both		Mother	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
	(1)	(2)	(3)	(4)	(5)	(6)
Mother Characteristics						
Age	27.31	5.71	27.68	5.72	28.38	5.64
Education	2.88	4.06	3.79	4.44	3.96	4.40
Worked in last year	0.40		0.40		0.46	
Ideal no. of children	2.66	0.91	2.84	1.02	2.94	1.11
Ideal no. of boys	1.53	0.64	1.59	0.65	1.63	0.70
Ideal no. of girls	1.13	0.49	1.26	0.58	1.31	0.61
BMI	19.29	2.67	19.70	2.85	19.99	2.97
Father Characteristics						
Age	32.22	6.35	33.04	6.54	33.51	6.48
Education	5.37	4.60	5.72	4.79	5.91	4.76
Worked in last year	0.97		0.97		0.97	
Ideal no. of children	2.64	0.95	2.82	1.05	2.93	1.14
Ideal no. of boys	1.51	0.67	1.61	0.72	1.66	0.76
Ideal no. of girls	1.13	0.50	1.21	0.58	1.27	0.63
Household Characteristics						
Wealth Quintile						
1	0.30		0.28		0.21	
2	0.29		0.28		0.28	
3	0.24		0.23		0.27	
4	0.12		0.16		0.18	
5	0.05		0.06		0.06	
Religion						
Hindu	0.80		0.71		0.64	
Muslim	0.13		0.09		0.09	
Christian	0.05		0.16		0.23	
Others	0.02		0.04		0.05	
Male household head	0.96		0.97		0.95	
Total no. of children	3.40	1.96	3.27	1.88	3.39	1.88
Number of households	1,268		1,472		1,456	

Table A.4: Distribution of Parental Preferences: Stratification by Fathers' Response

		Father has son preference		
		No	Yes	Total
		(1)	(2)	(3)
Panel A: Decision Maker, Father				
Mother has son preference	No	527	222	749
		(70.36)	(29.64)	(100.00)
		[72.89]	[53.62]	[65.88]
	Yes	196	192	388
		(50.52)	(49.48)	(100.00)
		[27.11]	[46.38]	[34.12]
	Total	723	414	1,137
		(63.59)	(36.41)	(100.00)
		[100.00]	[100.00]	[100.00]
Panel B: Decision Maker, Both				
Mother has son preference	No	938	359	1,297
		(72.32)	(27.68)	(100.00)
		[72.43]	[52.79]	[65.67]
	Yes	357	321	678
		(52.65)	(47.35)	(100.00)
		[27.57]	[47.21]	[34.33]
	Total	1,295	680	1,975
		(65.57)	(34.43)	(100.00)
		[100.00]	[100.00]	[100.00]
Panel C: Decision Maker, Mother				
Mother has son preference	No	853	351	1,204
		(70.85)	(29.15)	(100.00)
		[72.91]	[56.80]	[67.34]
	Yes	317	267	584
		(54.28)	(45.72)	(100.00)
		[27.09]	[43.20]	[32.66]
	Total	1,170	618	1,788
		(65.44)	(34.56)	(100.00)
		[100.00]	[100.00]	[100.00]

Notes: This table presents the distribution of son preference of parents where the sample is stratified by the fathers' response to the decision making question. Son preference for either parent is calculated as a binary variable which equals one if the parent reports that their ideal number of boys is greater than their ideal number of girls and is zero otherwise. Figures in parenthesis and square brackets present the row and column percentages respectively.

Table A.5: Distribution of Parental Preferences: Stratification by Mothers' Response

		Father has son preference		
		No	Yes	Total
		(1)	(2)	(3)
Panel A: Decision Maker, Father				
Mother has son preference	No	595	218	813
		(73.19)	(26.81)	(100.00)
		[71.26]	[50.35]	[64.12]
	Yes	240	215	455
		(52.75)	(47.25)	(100.00)
		[28.74]	[49.65]	[35.88]
	Total	835	433	1,268
		(65.85)	(34.15)	(100.00)
		[100.00]	[100.00]	[100.00]
Panel B: Decision Maker, Both				
Mother has son preference	No	669	304	973
		(68.76)	(31.24)	(100.00)
		[71.47]	[56.72]	[66.10]
	Yes	267	232	499
		(53.51)	(46.49)	(100.00)
		[28.53]	[43.28]	[33.90]
	Total	936	536	1,472
		(63.59)	(36.41)	(100.00)
		[100.00]	[100.00]	[100.00]
Panel C: Decision Maker, Mother				
Mother has son preference	No	716	289	1,005
		(71.24)	(28.76)	(100.00)
		[75.13]	[57.46]	[69.02]
	Yes	237	214	451
		(52.55)	(47.45)	(100.00)
		[24.87]	[42.54]	[30.98]
	Total	953	503	1,456
		(65.45)	(34.55)	(100.00)
		[100.00]	[100.00]	[100.00]

Notes: This table presents the distribution of son preference of parents where the sample is stratified by the mothers' response to the decision making question. Son preference for either parent is calculated as a binary variable which equals one if the parent reports that their ideal number of boys is greater than their ideal number of girls and is zero otherwise. Figures in parenthesis and square brackets present the row and column percentages respectively.

Table A.6: Results: Matching Response

	Decision Maker in HH		
	Father (1)	Both (2)	Mother (3)
Male (= 1)	-0.067 (0.15)	-0.0027 (0.10)	0.076 (0.12)
Mother has son preference (= 1)	0.092 (0.14)	0.023 (0.14)	-0.34** (0.15)
Father has son preference (= 1)	-0.16 (0.15)	-0.066 (0.13)	-0.14 (0.14)
Male * Mother has son preference	-0.036 (0.21)	0.20 (0.18)	0.21 (0.20)
Male * Father has son preference	0.0086 (0.22)	-0.0058 (0.17)	-0.15 (0.20)
N	502	949	918
R^2	0.179	0.144	0.134

Notes: This table presents the regression results for equation (1) based on the subsample where parental responses to the decision making question match. The dependent variable is the weight-for-height z score of a child. All controls are included but are not reported. Excluded categories include birth order 1, wealth quintile 1, Hindu religion, working father and non-working mother. Robust standard errors clustered at the primary sampling unit level are reported in parenthesis.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.