Son Preference in an Urban, Low Fertility Context: The Case of Delhi, India

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## Introduction

Strong son preference, particularly in north and northwest India, has been associated with practices of female infanticide, discrimination against daughters, and recently, sex-selective abortion, which account for millions of 'missing' girls in India's population (Sen 1990; 2001). Demographers have long held that son preference results from low economic and cultural status of women in 'traditional' societies, which made sons desirable (Wyon and Gordon 1967; Williamson 1976). As a result, previous theories explaining the dynamics and structural factors underlying son preference have focused largely on rural, high-fertility contexts (Pande and Astone 2007; Das Gupta and Bhat 1997; Das Gupta 1987; Miller 1981). However, the perseverance of son preference, and the unprecedented pace of 'demographic masculinization' as indicated by increasingly skewed sex ratios at birth, in urban, relatively affluent, low fertility areas of north India warrant fresh analyses of this 'ancient preference' in a modern context (Guilmoto 2009). This paper attempts to unpack the dynamics of son preference quantitatively in one such modern context in northwest India. It examines the relationship between individual-level economic, cultural, and household characteristics, and son preference as a fertility preference, in Delhi using data from the National Family Health Survey (NFHS) of India, 2005-06.

Previous quantitative studies of son preference have focused on its adverse demographic manifestations in skewed sex ratios (Agnihotri 2000), excess female child mortality (Kishor 1993, 1995), or differential stopping behaviors that are male-child preferring (Arnold, Choe and Roy 1998). These studies have not focused on son preference through the study of data on ideal fertility preferences in family planning. The only existing study that has analyzed son preference in this way is Pande and Astone (2007), who focus on the determinants of son preference in rural India using data from the 1992-1993 cycle of NFHS. However, the methods used to discern son preference from ideal fertility preference questions in rural, high fertility settings used by Pande and Astone may not be as effective in urban, low fertility settings. Hence, one key aim of this paper is to determine how son preference is expressed within broader family planning ideologies and preferences in developed, low fertility settings. The Delhi dataset of the National Family Health Survey (2005-06) has not been used previously to study expressed ideal fertility composition by sex, fertility behaviors motivated by sex preferences, and their correlations with different individual and household characteristics.

Moreover, existing quantitative studies have concentrated on broad national trends or large regional trends across states. Srinivasan and Bedi's study published in the *Journal of Development Studies* offers an alternative approach, by concentrating on intra-state dynamics in Tamil Nadu using district- level child sex ratio data from the Census and sex ratio at birth and infant mortality data from the National Sample Survey, as well as village-level data on 220 individual married women (Srinivasan and Bedi 2007). Following Srinivasan and Bedi's approach, this paper focuses on variation *within* Delhi, on the basis of survey data collected on 2270 individual married women in order to better understand how son preference is professed as a fertility preference in family planning, as

well as the individual and structural factors underlying it in an urban, developed, low-fertility setting of India.

## Data and Variables

*Data*

I use data from the Delhi sample of the National Family Health Survey (NFHS) India from the most recently collected, third cycle of the survey, 2005- 06. The NFHS follows the format of the Demographic and Health Surveys (DHS), which are large-scale household surveys conducted in Asia, Africa and Latin America. The survey falls under the aegis of the Ministry of Health and Family Welfare of the Government of India. Data for Delhi are available on individual women between the ages of 15-49 and their households, with a wide range of information on education, fertility, family planning, child and maternal health. The data used in this analysis uses all married women in the Delhi sample between the ages of 15-49 (n=2270), who have valid data available on the dependent variables.

NFHS data are collected with a sample size proportionally selected according to the size of the state. The sample within each state was allocated to urban and rural areas according to the proportion of the population that was urban or rural, as per the 2001 Census. For Delhi state, given that the vast area of the state is constituted by Delhi city, 93 percent of the population was urban. The NFHS adopted a two-stage sample design in rural areas and a three-stage sample design for urban areas. In rural areas, the first stage consisted of the selection of Primary Sampling Units (PSUs), which are villages, with probability proportional to population size, followed by the random selection of households within each PSU in the second stage. In urban areas, wards were first selected, followed by the selection of one Census Enumeration Block (CEB) from each ward, and at the last stage, random selection of households were from within the CEBs.

The NFHS asked questions on the ideal number of desirable children (total) and the ideal number of boys and ideal number of girls. Women who had no living children were asked the question: "If you could choose exactly the number of children to have in your whole life, how many would that be?" Women who had living children were asked: "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?" Those who responded to either question with a number were then asked the follow-up question: "How many of these children would you like to be boys how many would you like to be girls, and how many would the sex not matter?" Responses were entered as number of boys, girls, either, or 'other' (IIPS NFHS Women's Questionnaire 2005-06).

Following a slightly modified version of the dependent variable used by Pande and Astone (2007) I create a new categorical variable with the following two categories: zero when a respondent reported wanting an equal number of sons and daughters (including a preference for more daughters or a response of 'either') and one when a respondent reported ideal number of sons to be greater than ideal number of daughters. I call this *explicit son preference.* There is some son preference in the sample as measured by this variable, with fourteen percent of the women desiring more sons than daughters. Operationalizing son preference as an expressed fertility preference in a low-fertility setting is a difficult enterprise. Even if respondents may state an ideal fertility

composition of two with one son and one daughter, this does not directly reveal the relative weight she attributes to sons versus daughters, or in other words how important she considers each to be in completing her own childbearing. Thus, even if a respondent says one son and one daughter, she may consider it absolutely essential to have one son, which may not be the case with her desire for daughters. Furthermore, questions about ideal fertility composition and sex composition of children have been critiqued on the account that respondents are likely to rationalize ideal sex composition with existing number of children when asked to abstract from their actual childbearing histories. As an example, if a respondent had originally desired only one son but had a daughter first, she may have continued childbearing for a second child to attain a son. This respondent then, is likely to respond to ideal fertility question with an ideal family composition of two with one daughter and one son, in accordance with her fertility history, which has arguably contaminated her original ideal fertility preferences.

In order to counter these difficulties I use a separate outcome variable and a different modeling approach to measure *implicit son preference*. The NFHS asked respondents if they desired more children as one of the questions in the fertility questionnaire. I assume the response to this question is shaped by the existing number and sex composition of surviving children. This is a variable with eight separate categories, which I transformed to a categorical variable. The three categories that indicate desire for more children – wants more children in two years, wants after 2+ years, wants but unsure timing - were categorized as one and with zero representing no desire for additional children. This outcome variable seeks to capture whether respondents have *implicit son preference,* that is, a desire for more children if they only have a daughter, or daughters, but no sons.

*Explanatory Variables*

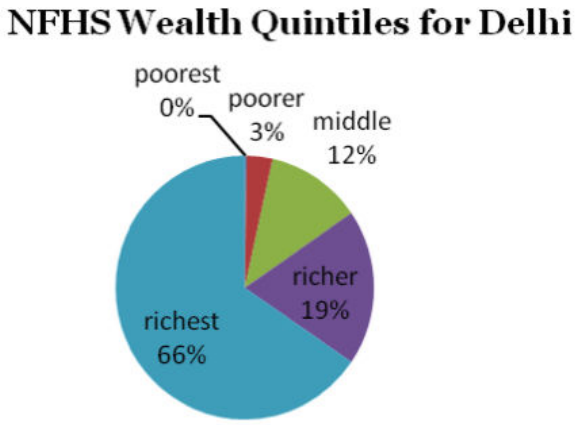
Although all variables are collected at the level of individual women, I conceptualize them as *individual* characteristics, *socio-cultural norms* and *household characteristics* in my models. Hence, while some explanatory variables focus on individual characteristics such as age, level of educational attainment, or employment status, others capture socio-cultural norms such as caste and religion at the level of the individual. Since I give emphasis to contextual factors, I include variables such as household wealth and number of household members as aspects of household characteristics collected of each respondent. The explanatory variables used in the study combine determinants of son preference that have been described in the literature, as well one variable that has so far been largely unexamined in the literature – household structure. This variable of household structure (whether extended multi-generational or nuclear) emerged as a key structural factor explaining son preference in recent qualitative research carried out in Delhi and surrounding urban areas in northwest India, and hence, I pay special attention to this variable (Kashyap 2010).

**Household Characteristics**

*Household Wealth*

The NFHS does not have any direct income or consumption data, but instead uses a wealth index that calculates a factor score based on what the family owns, the nature of the house, and their source of heating and light. These five- decimal factor scores from

the component analysis are divided into quintiles. Based on the quintile classification, 68.48 percent of Delhi's population falls into the 'richest' quintile by an all-India standard, and 88 percent within the top two quintiles of the wealth index. I use the wealth index factor score (a five decimal point figure), where a higher factor score denotes greater household wealth to measure the general effect of wealth. I also include the quintile-disaggregated wealth variable in my final model to provide a more nuanced analysis to determine if particular wealth quintiles, which broadly can be assumed to correspond to economic classes, are significantly associated with son preference. While national analyses have shown how low child sex ratios are often concentrated in high per-capita states and districts of India, these analyses do not say anything about intra-state dynamics in these areas that have high per- capita incomes by national standards (Agnihotri 2000).




*Household size*

There are no direct questions in the NFHS dataset that inquire about the type of household organization – whether extended or nuclear – that the respondent resides in. In the absence of such data, I approximate household organization by using a variable for household size. Shah uses this method when using Census data for empirical studies of joint households in India (Shah 1996). Although the number of members in a household does not reveal anything explicitly about relations within the household, I assume that greater number of household members reflect joint household organization. The relationship between an indicated son preference and household size should hence be a positive one, according to the patterns revealed by the qualitative sample. Respondents who have borne more children are likely to have a larger household size. This study, however, is concerned with the impact of a joint household organization in terms of members other than the conjugal couple and their children, particularly in-laws on an expressed preference for sons. In order to counter the effect of more children on the overall household size variable I control for each respondent's total living children.

*Sons and daughters in the household*

Other characteristics I control for include whether the respondent had *at least one* son living in the household with her. These variables were included, particularly when investigating implicit son preference – the respondent's professed desire for more children – to determine how fertility behaviors are shaped in relation to existing sex composition of living children.

**Individual Characteristics**

The individual characteristics include indicators on individual women's age, educational attainment, religion, caste, and employment status. Data on education distinguish educational attainment into six categories, including no education, incomplete primary,

complete primary, incomplete secondary, complete secondary, and higher. Employment status asks whether the respondent was employed at the time of the survey.

*Socio-cultural norms*

Data on religion is categorized into Hindu, Muslim and other. Since son preference has been associated with Hindu communities, I create a separate dummy variable to test whether Hindus are more likely to express son preference, in comparison to Muslims and other religious groups. I also create a Muslim dummy to test whether Muslims are significantly different than other religions. Data on caste has four categories including 'scheduled caste', 'scheduled tribe', 'other backward class' and 'none of the above'. Scheduled caste refers to 'untouchable' or non-caste Hindus, scheduled tribes refer to the constitutionally demarcated indigenous tribes, and 'other backward class' refers to a category of low caste Hindus who have been granted employment and education provisions by the government to improve their economically marginalized status. The final category 'other' includes high-caste Hindus as well as non-Hindus. Historically low-caste and untouchable groups have been associated with less son preference by virtue of their more gender egalitarian cultural practices, and permissive views on women's work outside the home indicating higher economic status for women. I include one dummy for 'low castes' that include scheduled castes and other backward classes - to determine the effect of caste status on son preference.

**Statistical Model**

Since the dependent variables are binary, I use a logistic regression model. Although the coefficients of the logistic model cannot be interpreted directly, the model is able to capture the nonlinear nature of the population regression function. I use two models. The first model calculates the probability of *explicit son preference* - measured in terms of a desire for more sons than daughters in ideal stated fertility. The second logistic model calculates the probability of a desire for more kids expressed by the respondent. This model attempts to capture *implicit son preference.*

**Results**

*Ideal Fertility Composition and Patterns of Son Preference*

The ideal number of children for the sample is small, with 79 percent of the women interviewed stating they wanted either one, or two children at maximum. The most common fertility preference is two children, with 70 percent stating two as their ideal number. The majority of the respondents in the sample (60 percent) clearly identified a desirable sex composition for their total ideal fertility, rather than choosing the option of 'either'. The remaining forty percent chose 'either' for one or more of the children in their total fertility composition. This indicates

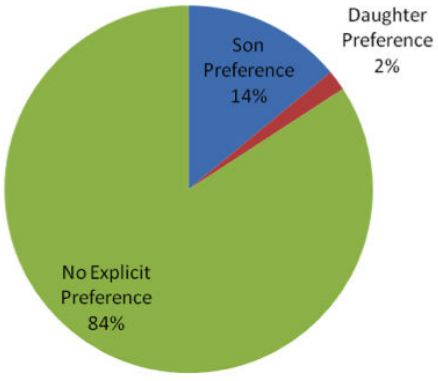



**Figure 4.2:** Explicit son preference in sample (N=2270)

that by and large most parents are *not indifferent* to the sex of their children. Breaking this total ideal fertility number according to sex reveals that the most commonly stated fertility preference is one son and one daughter. About one-third of respondents who stated an ideal fertility composition of two stated an indifference to the sex of child, giving a response of 'either'. Using the outcome categorical variable defined above, fourteen percent of the respondents expressed a desire for *more* sons than daughters. Daughter preference in the sample is negligible with only 1.8 percent of the sample (41 out of 2270) saying they wanted more daughters than sons.

Among those who desired more sons than daughters, the majority (90 percent) wanted one more son than daughter. There were four types of preferences that constituted this group who expressed a preference for more sons than daughters: those who wanted three children with two sons and one daughter being the largest component, followed by those who wanted two children with one son and one of either sex, those who wanted just one son and no daughters, and finally, those who wanted two sons. Figure 4.3 shows to what extent each of these groups contributes to explicit son preference for the sample.

There is reason to believe that this method of measuring son preference underestimates the degree of son preference in the population. Pande and Astone point out in their study of son preference in rural India using NFHS 1992-93 data how questions that rely on abstractions of ideal fertility are likely to be contaminated by actual childbearing histories of the respondent (Pande and Astone 2007, 13). Moreover, in a setting such as India, where issues of daughter aversion and son preference are charged public ones, the door-to-door survey format of the NFHS allows for the concealment of any overt son preference.

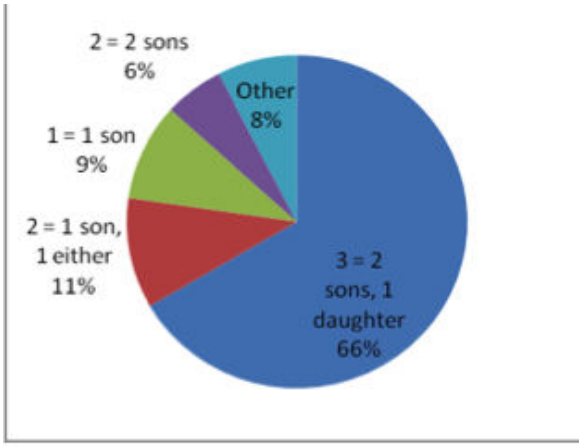



**Figure 4.3:** Breakup of explicit son preference by ideal family size (n = 318)

*Models with Explicit Son Preference as Dependent Variable*

Table 4.1 presents four models for the sample to examine the effects of individual and household characteristics on the dependent variable explicit son preference, measured as a fertility preference in which the respondent desires at least one more son than daughter. The key variable of interest, which is included in all four models presented here, is household size, which is used as a proxy for household structure.

Model 1 examines the effects of four individual explanatory variables – respondent's age, religion, caste and employment status – and the household variable – household size. It controls for respondent's professed ideal family size. Since Hindu communities have been associated with stronger son preference, I include a dummy for Hindu respondents to determine whether their expressed son preference is stronger than non-Hindus (including Muslims and other religions). The caste variable 'low caste' includes respondents from the scheduled castes and'other backward class' categories. This model shows that 'low caste' respondents (including scheduled and other backward classes) and household size are strongly associated with son preference. Although the coefficient value cannot be directly interpreted in the model, both coefficients are

| | (Model 1) | | (Model 2) | | (Model 3) | | (Model 4) | |
|---|---|---|---|---|---|---|---|---|
| | Coefficient | SE | | SE | Coefficient | SE | Coefficient | SE |
| ***Individual Characteristics*** | | | | | | | | |
| Respondent's age | 0.00 | 0.01 | -0.01 | 0.01 | -0.01 | 0.01 | -0.01 | 0.01 |
| Employed | 0.02 | 0.15 | -0.11 | 0.16 | -0.10 | 0.16 | -0.09 | 0.16 |
| Educational Attainment | | | | | -0.15* | 0.05 | | |
| ***Socio-cultural Norms*** | | | | | | | | |
| *Religion* | | | | | | | | |
| Hindu | -0.23 | 0.17 | 0.00 | 0.36 | -0.03 | 0.36 | -0.02 | 0.18 |
| Muslim | | | 0.11 | 0.40 | 0.01 | 0.41 | | |
| *Caste* | | | | | | | | |
| Low Caste | 0.59** | 0.13 | 0.18 | 0.14 | 0.13 | 0.14 | 0.12 | 0.14 |
| ***Household Characteristics*** | | | | | | | | |
| Household Size | 0.09** | 0.02 | 0.07* | 0.03 | 0.07* | 0.03 | 0.06* | 0.03 |
| Household Wealth | | | -3.99e-06** | 8.75e-07 | -2.16e-06* | 1.06e-06 | | |
| ***Control Variables*** | | | | | | | | |
| Ideal No. Children (Total) | -0.01 | 0.01 | -0.01 | 0.01 | -0.02 | 0.01 | -0.02 | 0.01 |
| Total No. Children | | | 0.21** | 0.06 | 0.18** | 0.06 | 0.19** | 0.06 |
| ***Wealth quintiles*** | | | | | | | | |
| Richest Quintile (1st) | | | | | | | -0.70* | 0.31 |
| Richer Quintile (2nd) | | | | | | | -0.41 | 0.29 |
| Middle Quintile (3rd) | | | | | | | -0.49 | 0.30 |
| ***Levels of Education*** | | | | | | | | |
| Primary | | | | | | | -0.23 | 0.26 |
| Incomplete Secondary | | | | | | | -0.35* | 0.18 |
| Secondary | | | | | | | -0.70* | 0.30 |
| Higher | | | | | | | -0.93** | 0.26 |
| Constant | -2.55** | | -2.26** | | -1.87** | | -1.44** | |
| N | 2261 | | 2261 | | 2260 | | 2260 | |
| Psuedo R2 | 0.02 | | 0.06 | | 0.06 | | 0.07 | |
| Log likelihood | -891.11 | | -857.87 | | -853.13 | | -851.37 | |

* p<0.05; ** p<0.01

**Table 4.1**: Results from logistic regressions of explicit son preference on individual and household characteristics (NFHS 2005-06)

positive, indicating that respondents from lower and scheduled castes, and those living in larger households (and by inference joint households) are more likely to express son preference. Religion and employment status are not significant in the model.

Model 2 adds the effect of household wealth, a dummy for Muslims and a control variable for total family size (total children born to respondent) to control for the effect of a greater number of children on the household size variable. The inclusion of household wealth renders caste status insignificant, which suggests that 'lowcaste' may be picking up the effect of household wealth. Since poorer households often tend to be those of low and scheduled castes the 'low caste' variable may have been picking up this effect in Model 1. The coefficient on wealth is negative, indicating that respondents from richer households expressed less son preference. The Muslim dummy included in this model is not significant indicating that Muslim respondents did not express son preference more than other non-Hindu, non-Muslim groups. Women's work, religion and age are also not significant in Model 2. The control variable for total number of children borne to the respondent is significant. Despite the inclusion of this variable to counter the effects of greater number of children on larger household size, the model still shows household size to be significant and positively correlated with son preference.

Model 3 adds the effect of respondent's educational attainment in the model. Higher levels of education are associated with reduced son preference. Moreover, the introduction of education in this model appears to reduce the effect of household wealth slightly, even though household wealth remains significant in the model. Household size remains positively associated with son preference. Caste, religion, women's work and age are not significant in the model.

Model 4 attempts to disentangle the specific quintile effect of household wealth by including dummies for three wealth quintiles ('richest', 'richer' and 'middle' quintiles) and dummies for levels of educational attainment to determine which specific wealth groups and levels of education are significantly associated with reduced explicit son preference. The son preference of these groups is compared with reference to those of the bottom two quintiles ('poorer' and 'poorest') for wealth and 'uneducated' and 'incomplete primary' respondent groups for education. The dummy for the richest quintile is significant, suggesting that the richest quintile (by national standards) has reduced explicit son preference. The 'richer' and 'middle' groups are not significant in the model. Higher than secondary level education is highly significant suggesting that respondents who have education at the college level and beyond are less likely to express explicit son preference than those who are uneducated or who have not completed primary level education. Secondary and incomplete secondary are also significant in the model, suggesting that respondents who have completed secondary level education are also less likely to express explicit son preference. These levels are not as highly significant as the coefficient on those who have higher than secondary education. The incomplete secondary coefficient is only barely significant.

Overall these models show that explicit son preference is predicted by household wealth, educational attainment and household size. Increased household wealth, specifically for those who are in the richest wealth quintile by all-India standards, and respondents with higher levels of educational attainment (particularly post-secondary education) are associated with reduced son preference. Even when controlling for respondent's total living children, bigger household sizes, which I assume reflect

extended or joint household organization, are associated with increased explicit son preference.

*Model for Implicit Son Preference ('morekids') as dependent variable*

This model (Table 4.2) attempts to operationalize implicit son preference, as measured by the respondent's desire to have more kids, in relation to the sex composition of children she already has and other household characteristics. I estimate the logit model with 'More Kids' as the dependent variable and household wealth, household size, caste and respondent's educational attainment as control variables. I test for implicit son preference by including two dummies – one for those respondents who have *at least* one son, and another for those who have *at least* one daughter. I also include an interaction term between the household size and son at home variables. This model is run for all women who have had at least one child. I use this model to directly examine the impact of household size on respondent's desire for more children, when she has no sons in her family composition. I do this by generating simulations with specific parameters on the logit model, based on existing sex composition of total children and household size, whilst controlling for other characteristics like household wealth, caste and educational attainment.

The results from these simulations presented in Figure 4.4 clearly demonstrate how existing sex composition of children influences respondents' future fertility decision-making. Across different household sizes, this model predicts that women who do not have a son, but have one or more daughters, nevertheless express a desire to have more children. A respondent is significantly less likely to express a desire for more children if she has *at least* one son in her family composition. More interestingly for this study, the figures indicate how as the size of the household increases, holding constant other parameters, the predicted probability of a respondent desiring more children, if she does not already have a son, also increases. Assuming that a household size of four roughly corresponds to a nuclear household organization, a respondent in a nuclear household is less likely to express a desire for more children if she does not have a son (37.8%) than if she lives in a household of eight members. The predicted probability of a desire for more children is 75.2% for a respondent in an eight- person household, which I assume to be of joint household organization.

In urban low fertility contexts such as Delhi, this is a clearer pattern by which son preference is manifest, rather than through an insistence on large families with more sons than daughters. It is unsurprising then that, in the first modeling approach based on explicit son preference of wanting *at least* one more son than daughter, only a relatively small proportion of respondents (14%) expressed son preference. However, the second modeling approach that seeks to capture fertility preferences in relation to existing sex composition of a woman's total children, clearly illustrates how having *at least* one son is crucial for the closure of childbearing, thereby suggesting implicit son preference. This model also demonstrates how implicit son preference is likely stronger in a joint or extended household setup, a finding which I have recently argued through qualitative fieldwork (Kashyap 2010).

| | (1) | |
|---|---|---|
| | Coefficient | SE |
| *Individual Characteristics* | | |
| | 0.16** | 0.06 |
| *Household Characteristics* | | |
| Household Size | 0.41** | 0.04 |
| Household Wealth | -8.89e-06** | 1.30e-06 |
| Son(s) at home | -0.65* | 0.28 |
| Daughter(s) at home | -2.15** | 0.19 |
| HH size X Son at home | -0.31** | 0.03 |
| Caste | -0.05 | 0.07 |
| Constant | -0.01 | |
| N | 2077 | |
| Psuedo R2 | 0.31 | |
| Log likelihood | -582.05 | |

* p<0.05; ** p<0.01

**Table 4.2:** Results from Logistic Regression of Implicit Son Preference ('more kids')

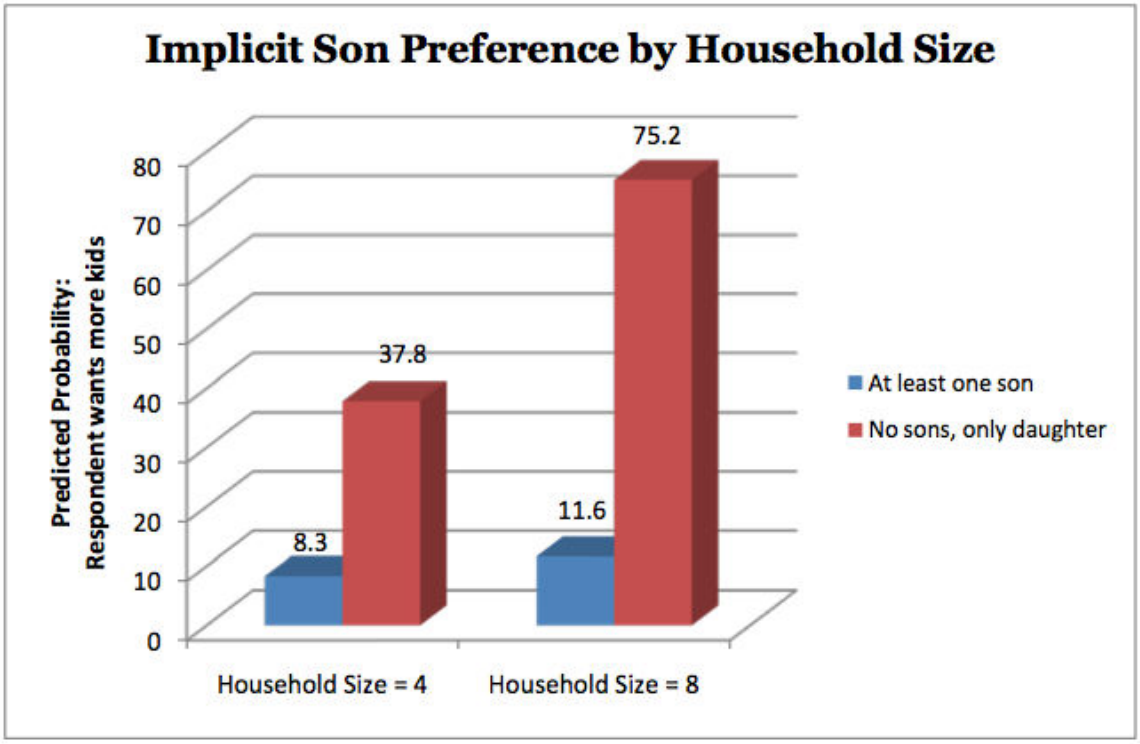



**Figure 4.4**

**Conclusion**

The NFHS data thus help to study son preference directly as a significant expressed fertility preference, rather than from demographic manifestations like imbalanced child sex ratios or sex ratios at birth. The data in this paper indicate that respondents from poorer households are more likely to desire a greater number of sons than daughters in their ideal family composition when compared to the richest quintile. This, however, does not mean that respondents from the richest quintiles do not express son preference altogether. They are likely to express their son preference *differently*, by wanting *at least* one son rather than many sons, which I take to be a marker of implicit son preference. These households are also more likely to have access to pre-natal sex determination technologies that allow for an effective realization of a 'desirable' sex composition. These results suggest how in this urban, low-fertility setting of Delhi, son preference is expressed differently by different classes, rather than expressed in specific, mostly upper, castes as it has been historically.

Why are poorer households in this urban setting more likely to want a greater number of sons? Various concerns of social reproduction, old-age security, economic mobility, and for low castes ritual mobility, underlying a preference for sons are likely to be at play. Although ideological concerns of upward (social and ritual) mobility may be significant factors explaining son preference in low-middle and middle-classes, greater material vulnerabilities, particularly of old-age support, may explain the desire for a *greater number* of sons among poorer households.

Higher levels of educational attainment were associated with reduced explicit son preference in the first modeling approach. The fact that women with higher levels of education are also likely to want smaller families, as indicated by a strong negative correlation between ideal family size and education level, may in part be responsible for lower son preference in the first model. Nevertheless the high significance of women's education, especially at the post-secondary level, even when controlling for ideal family size, suggests that there is something important in women's education that makes women desire fewer sons. Even upon controlling for education, household wealth, total number of children, however, household size remains an important determinant of son preference. When viewed in light of qualitative fieldwork that suggests household structure is a key factor explaining son preference in urban developed contexts, the significant effect picked up by household size is likely indicative of the structure of the household, which strongly influences sex-specific fertility preferences.

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