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MOTHERS-IN-LAW AND SON PREFERENCE IN INDIA

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DISCUSSION PAPER 13.04

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Abstract

In India, the mother-in-law is all powerful. At least they are often portrayed as such in Indian popular culture. Similarly, in the socio-economic literature, the influence of the Indian mother-in-law is often taken for granted. However, most of the empirical evidence relies on qualitative data or on small samples. Looking at stated son preference and using a nationally representative dataset (NFHS-3), we show that, indeed, mothers-in-law have an influence on their daughter-in-law, everything else constant. This influence comes mostly from socialization rather than from coercion and selection within the marriage market.

Keywords: son preference, mothers-in-law, India, socialization, coercion.

JEL: J1, J7

Five young girls - the littlest is just three years old - were at home when their father killed their mother at their home in Bareilly in Uttar Pradesh. He blamed his wife for not giving him a son. After a fight on Tuesday night, he strangled her. (NDTV, 11th of July 2012)

A 25-year-old woman received 90 per cent burn injuries when her mother-in-law allegedly sprinkled kerosene on her in the kitchen and set her on fire for not having a child and not bringing more dowry (...). (The Tribune, 26th August 2012).

1. Introduction

For centuries, some Indian communities have been known for preferring sons over daughters, with practices such as sex-selective neglects and outright infanticide taking place. With the advent of sex-selective abortion technologies in the 1980s, technologies aimed to improve maternal and fetuses' health, such as amniocentesis, are now routinely used to selectively eliminate female fetuses in those communities.

While in the past, the elimination of female infants was limited to some particular groups, in recent years this practice has spread across India and even among Indian communities living overseas (Abrevaya 2009). Hence, an estimated half million female fetuses a year are estimated to be sex-selectively aborted in India alone (Jha et al. 2006).¹

Putting aside moral consideration, this strong preference for sons, and its implementation, will bring important challenges for future generations as an estimated 28-32 million men would be in excess in the marriage market by 2020 (Hudson and Den Boer 2002). Unable to find a match, those 'left-over' from the marriage market may vent out their frustration in violent and socially disturbing ways (Hudson and Den Boer 2002).

Given the extent of the problem, an extensive literature on son preference has emerged. While traditionally the focus of the literature has been on revealed son preference, such as sex-selective

¹ This however represents only about 2 to 4% of all yearly female pregnancies (Jha et al. 2011).

neglect, gender bias in child mortality or stopping behavior in fertility history, recently a new stream of literature is picking up, focusing on stated son preference (Gaudin 2011, Pande and Astone 2007, Robitaille 2012). This paper belongs to this latter group.

While stated son preference and sex-selective elimination of girls are correlated, the correlation is not constant over time. Indeed, despite a drop in stated son preference over time, with younger generations having lower stated son preference than their elder, the sex ratio among children remains highly skewed in favor of boys (Figure 1).² In this paper, we argue that this phenomenon can be explained not only by the drop in the “cost” of implementing son preference, thanks to sex-selective abortion, but also by the influence of mothers-in-law in determining which child will live and which child will be eliminated.

[Figure 1, about here]

Indeed, while it is true that in many societies the mother-in-law has bad press, their vilification seems particularly strong in India. As in other countries they are, for example, often accused, rightly or wrongly, of interfering in their children’s marital life thus making life difficult, if not impossible, for their son or daughter-in-law. But the extent of their perceived influence seems impressive for Western eyes.

It is, for example, common for mothers-in-law to participate in the selection of the bride (Sheela and Audinarayana 2003). They are often believed to influence the number of children a daughter-in-law has (Char et al. 2010) as well as her use of sex-selective abortion (Visaria 2007). Newspapers often report the involvement of the mother-in-law in kitchen fires, that is, the elimination of an unwanted daughter-in-law in an “accidental” kitchen fire (Sinha 2011). One common reason for women to commit suicide in India is torture by their in-laws (Batra 2003; Times of India 2011). Unsurprisingly, daughters-in-law

² Authors’ calculation. NFHS and Indian censuses data.

are believed to prefer living in a nuclear household, away from their “controlling” mothers-in-law (Chorghade et al. 2006).

Given the importance of male descendants in Indian culture, the influence of the all-powerful mother-in-law should be felt in this area as well. This could occur through the marriage market—with the mother-in-law selecting the bride-to-be based, notably, on her son preference. It could also occur through the socialization of the young bride in her marital family—as it is not uncommon in India that women are married during adolescence, if not during childhood, and hence an important part of the socialization is done in the marital family rather than in the natal family. And, finally, it could also occur through carrot and stick incentives put in place to bring the daughter-in-law to fit into her new marital family—through, for example, domestic violence, limited mobility and limited involvement in decision making.

After developing a theoretical model explain how mothers-in-law can influence their daughter-in-law’s son preference, we use data from the third nationally representative National and Family Health Survey (NFHS-3) collected in 2005-2006, to empirically test our hypothesis. Our results show that, indeed, the mother-in-law in India is often able to influence her daughter-in-law’s stated son preference. However, given data limitation, we cannot provide definitive answers on the mechanisms used by the mother-in-law to influence her daughter-in-law. We nevertheless present evidence that socialization seems to be the main driver behind a mother-in-law’s influence on her daughter-in-law rather than pre-selection in the marriage market and coercion. Those pieces of evidence need however to be taken with caution as more data is needed to confirm or invalidate these results. There are however interesting results to launch a debate on the importance of a mother-in-law on their daughter-in-law’s son preference.

This paper contributes to the literature in two main ways. First, it contributes to the literature on stated son preference by being the first attempt to show the importance of the mother-in-law on their

daughter-in-law's stated son preference. It also contributes to the literature on family relations as it is, as far as we know, the first paper to use a nationally representative sample to quantify the influence of mothers-in-law on their daughters-in-law.

The remaining part of this paper is organized as follows. In the next section, background information is given on son preference in India and its implication for the sex ratio among children. In section three, the mother-in-law/daughter-in-law relationship in Indian households is discussed, with evidence from demographic, sociologic and anthropologic literatures. In section four, a theoretical model is developed linking mother-in-law's preference to their daughter-in-law's preference. Section five briefly discusses the data and the estimation strategy before turning to descriptive statistics and multivariate results in sections six and seven, respectively. Section eight teases out different mechanisms that can be used by the mothers-in-law to influence/coerce their daughters-in-law. Finally, policy implications and concluding remarks are presented in section nine.

2. Son Preference in India

As early as 1853, the British recorded abnormal sex ratios among some communities in India (J.P. Grant, Officiating Secretary the Government of India, 7 September 1853, cited in Oldenburg, 2002:41). In his report, Grant states that the motivation behind sex-selective neglect and infanticide, leading to these abnormal sex ratios, are for religious, caste and financial reasons. Almost two centuries later, the root causes of son preference remain the same. What has changed, however, is that imbalance in sex ratios has now spread across communities and that sex selective elimination of females has never been so easy. After reviewing the different cultural and economic factors behind son preference in India, this section will discuss how this geographically limited problem has spread to most of India in recent years. It should however be kept in mind that India is an extremely diverse country and, henceforth, the

motivations for preferring boys over girls are not necessarily the same across all communities. What follows is hence only a mere generalization and should be taken as such.

Among the key cultural motivation for preferring sons over daughters is the crucial role played by the son in Hinduism. In particular, a son plays a key role at his parents' funerals and at securing them a good afterlife. A son also continues the family name (Das Gupta et al. 2003) and inherits the land (Kishor and Parasuramam 1998).

Financial motivations, rooted in cultural practices, also play a crucial role. Indeed, once of adult age, a son will marry and will bring a daughter-in-law—and a dowry—to his natal family, he will remain with his parents and the fruit of his labor will be shared with his parents and siblings. In contrast, a daughter would be married off—a dowry would have to be paid—she would live with her marital family and would be banned from supporting her natal family by both cultural taboo and her in-laws (Das Gupta 1987; Das Gupta et al. 2003). Her parents are however expected to offer her gifts and pay for her upbringing. An Indian saying summarizes well this situation: “Raising a daughter is like watering your neighbour’s garden” (Guilmoto, 2007).

As bearing a son is considered a daughter-in-law’s duty and responsibility, a woman who cannot give birth or who gives birth only to daughters may have to live with the wrath of her in-laws until the birth of their first male child (Das Gupta et al. 2003).

This may result in such thing as the daughter-in-law being given less autonomy, having a higher share of household chores to perform or being given less time to recover from child delivery. As a result, having a son is generally seen as empowering women in their marital family, leading women to dearly desire sons (Das Gupta et al. 2003).

In more extreme case, not giving birth to a son may result in domestic violence, psychological abuse or abandonment. The birth of a son would not only eliminate one reason behind physical and emotional abuse but can also provide protection against future violence, once the son is of age to protect his mother (Rao 1997). Hence, using data from a community in South India, Rao (1997) demonstrates that the risk of physical violence decreases with the birth of a son.

However, the total number of sons a woman will have over her fertility history is not known for young women (with living and co-residing mothers-in-law) as these women have not necessarily completed their fertility history. A proxy is nevertheless available as we have data on the number of sons and the number of daughters those young brides desire.

In this paper, we define stated son preference as the number of extra sons a woman wants relative to the desired number of daughters. More specifically, following Pande and Astone (2007) a woman is classified as desiring either, the same number of sons and daughters, desiring one son more than the desired number of daughters, or desiring at least two more sons than the number of daughters she wants. In the Indian National and Family Health Survey (NFHS-3), a nationally representative survey conducted in 2005-2006, the relevant question for respondents who have no living children is: 'If you could choose exactly the number of children to have in your whole life, how many would that be?'. For respondents who have living children the relevant question is: '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?' Finally, for all respondents, the following question was asked: 'How many of these children would you like to be boys, how many would you like to be girls and for how many would it not matter?'

3. Mother-in-Law in India

Given the importance of male descendants in India and given the perceived important role of mother-in-law in decision making, it would be surprising that mothers-in-law do not influence, or at least try to influence, their son's and daughter-in-law's desire for sons.

While only a limited number of studies have been conducted on the role of mothers-in-law in decision making on matters concerning directly their son, there is some evidence that they do indeed play an important role. This evidence, however, comes mostly from qualitative studies and/or studies that rely on a geographically limited dataset.

Starting with qualitative evidence, in a study in Maharashtra, Ganatra et al (2001) conclude that in-laws' pressure to mother a son were often invoked as a reason for seeking sex-selective abortion. For example, a 21 years old respondent stated that "My mother-in-law used to say: 'I won't say anything, but tomorrow if my son starts feeling that he should have a son and if he thinks about remarrying, then don't blame me at that time. You manage with that'. After all such things, I am having fear in my mind, so I thought let's try and go for checking (the sex)." (Ganatra et al 2001: 115).

Similarly, Puri et al (2011) show that Indian immigrant women in the United States who have performed sex-selective abortion were often facing pressure, not only from their husband, but also from females in-law to abort their female fetus.

Moving next to quantitative studies, Char et al (2010), looking at the influence of mother-in-law on modern contraception use in India, using a sample of 60 daughter-in-law/mother-in-law dyads, and conclude that the mother-in-law does not have an impact on temporary contraception use but they have a say on when the daughter-in-law should get sterilized and that this decision depends on the number of sons she already has.

While among scholars, there seem to be a consensus that mothers-in-law are often powerful in India, the same cannot be said about respondents' opinions. Indeed, in a study in Karachi (Pakistan)³, Kadir's et al. (2003) show that for a range of decision making events, mothers-in-law, and even more so, sons, believe that the mother-in-law has a say. This belief however is not shared by the daughters-in-law!

Hence, while the literature seems to point towards a key role played by the mothers-in-law in decision making, respondents' perception is much less clear cut. In any case, a mother-in-law can use three main strategies to influence the sex ratio among their grand-children.

The first strategy is simply to select a daughter-in-law sharing a similar degree of preference for sons as her mother-in-law. This is feasible in the Indian context given the involvement of parents, particularly the mothers, in selecting the bride/groom of their offspring. Indeed, Mathur (2007) states that most marriages in India involve parents, with varying involvement of the bride and groom-to-be. If this is the case, the "influence" of the mothers-in-law should be felt immediately after marriage.

The second strategy would be to socialize the daughter-in-law so that her son preference mimics her mother-in-law's son preference. This strategy would take some time and, henceforth, the mothers-in-law's influence would be felt only some years after the marriage. We would also expect socialization to be particularly important for daughters-in-law who have been married early and henceforth were in contact with their mother-in-law during their formative years.

Finally, a mother-in-law can use a "stick and carrot" strategy to align her daughter-in-law's son preference to hers. This "stick and carrot" strategy can be overtly stated, with for example the mother-in-law professing physical threat, or can be implicit, with the society promising rewards to mothers of sons but hardship to mothers of daughters. Supporting this latter mechanism, Rao (1997) concludes that women with more sons and women who have not been sterilized are less likely to be abused. Similarly,

³ As India and Pakistan used to be one country before partition in 1947 and are culturally very similar in many aspects, results found in Pakistan are likely to also hold for India.

Fernandez's (1997) study on domestic violence in Bombay argues that, in some cases, violence is caused by the women not giving birth to a son. This perceived 'wrong-doing' of the daughter-in-law results in violence taking a whole range, from verbal abuse to murder.

4. Theoretical Model

In this paper we argue that mothers-in-law are able to influence their daughters-in-law's demand for sons. Theoretical models explaining the demand for children have become fairly standard in the economic literature since Becker's (1991) seminal work.

More specifically, the demand for children depends on price of children, real income of the household, various government programs (baby bonus, aid to mothers, tax exemption) and social position such as the rural-urban divide, rich versus poor, and developed versus developing countries. Becker (1991) constructed a demand for children model by maximizing the utility function $U(n, Z)$ of the parents subject to the budget constraint of $I = p_n \cdot n + p_z \cdot Z$ where n is the number of children, Z is a composite aggregate of other consumption commodities, p_n is the cost (including time cost) of producing and rearing children, p_z is the price of commodities and I is the full income of the household. He observed that the demand for children (that is the optimal quantity of children) is determined by the relative price of children (in an inverse way) and the household income. The cost of children depends on the number of children as well as a number of other factors such as the contribution of children to household income. Becker (1991) went on to include the quality of children and expenditure for such; however, he did not distinguish between two types of children – the male and female. In our model, we distinguish between sons and daughters in the utility function of the daughter-in-law and include the preference of the mother-in-law towards having a grandson.

We assume that the daughter-in-law has a separable utility function

$$U(s)(1 + \beta \cdot M(s)) + (1 - \beta \cdot M(s))V(d) + C(x) \quad \dots(4.1)$$

where s is the number of sons and d is the number of daughters; $U(s)$ and $V(d)$ are the utilities the daughter-in-law has from having sons and daughters respectively. We assume that the mother-in-law's utility is also separable on her number of grandsons, s , and granddaughters, d , with $M(s, d) = M(s) + M(d)$. However, we make the simplistic assumption that $M(d) \cong 0$ and the utility of the mother-in-law is approximated by $M(s)$. Thus the mother-in-law derives utility from only the number of sons her daughter-in-law has⁴. β is the 'power' of the mother-in-law over the daughter-in-law's preference. The utility from consumption of the composite consumption good x for the daughter-in-law is given by $C(x)$. This is a full life-cycle span of consumption for the daughter-in-law and hence savings is not included in our model. We assume $U'(0) > 0, U'' < 0, V'(0) > 0, V'' < 0, M'(0) > 0, M'' < 0, C'(0) > 0, C'' < 0$ and $\beta \geq 0$. There is diminishing marginal utility from having more children for the daughter-in-law as well as for the mother-in-law. The power β of the mother-in-law is given exogenously in this model – it is determined by social norms (such as the involvement of the mothers-in-law in marriage decisions or the respect given to elderly women), the relative position of the mother-in-law in the household and her mental and/or physical control over the daughter-in-law. If $\beta = 0$, then the utility of the daughter-in-law is given as $U(s) + V(d) + C(x)$. The daughter-in-law herself has a higher weightage for having a son than a daughter and this is captured by the fact the utility from having one more son is higher than the utility from having one more daughter or $U'(a) > V'(a) \forall a$. The mother-in-law has a stronger preference than the daughter-in-law for the daughter-in-law to have a son, that is, $M'(s) > U'(s) \forall s$. Also, $U(0), V(0), C(0) = 0$. The preference patterns of the daughter-in-law and the mother-in-law over the daughter-in-law having children is shown in Figure 2.

⁴ This assumption can be justified by the fact that a mere 1.85% of the mothers-in-law in our data sample expressed a preference for granddaughters. If we relax this assumption to allow for $M(s) \geq M(d) > 0$, then the utility of the daughter in law would be $U(s)(1 + \beta \cdot M(s) - \alpha \cdot M(d)) + (1 - \beta \cdot M(s) + \alpha \cdot M(d))V(d) + C(x)$. Our propositions would still hold under the restrictive assumption of $\beta \cdot M(s) - \alpha \cdot M(d) \geq 0$ but would not significantly alter the result.

[Figure 2, about here]

The preference of the mother-in-law puts a higher weightage on the daughter-in-law's preference for having a son and a lower weightage for daughter preference. We also assume that the cost of having children includes time cost of raising them and there is no bequest in this model. The daughter-in-law maximizes her utility subject to a budget constraint

$$p_x \cdot x + p_n \cdot (s + d) \leq I \quad \dots(4.2)$$

where p_x is the price of x , p_n is the cost (time cost and money cost) of raising children, and I is the household income from other sources (income of other household members, assets). We assume, given no savings, equality to hold in the budget constraint and construct the Lagrangian utility function of the daughter-in-law as

$$L(s, d, x) = U(s)(1 + \beta \cdot M(s)) + (1 - \beta \cdot M(s))V(d) + C(x) + \tau[I - p_x \cdot x - p_n \cdot (s + d)] \quad \dots(4.3)$$

The daughter-in-law maximizes her utility from x , s and d . Detailed derivations are presented in the Appendix. The first order conditions yield:

$$\frac{C'(x)}{p_x} = \frac{V'(d)(1 - \beta M(s))}{p_n} = \frac{U'(s)(1 + \beta M(s)) + [U(s) - V(d)]\beta M'(s)}{p_n} \quad \dots(4.4)$$

If $\beta = 0$, then we can say that optimum value for x , s and d are such that the money value of consumption is the same as the money value of having a son or a daughter at the margin for the

daughter-in-law. Then $\frac{C'(x_0)}{p_x} = \frac{V'(d_0)}{p_n} = \frac{U'(s_0)}{p_n}$ where the subscript 0 denotes the optimum value at

$\beta = 0$. That is to say, $V'(d_0) = U'(s_0)$. Since $V'(a) < U'(a) \forall a$, this implies that $d_0 < s_0$ which

means that even if the mother-in-law had no influence on the daughter-in-law's preference, the latter

would want more sons than daughters. However, if the mother-in-law has $\beta > 0$, then $V'(d^*) = \frac{U'(s^*)(1+\beta M(s^*))}{(1-\beta M(s^*))} + \frac{[U(s^*)-V(d^*)]\beta M'(s^*)}{(1-\beta M(s^*))} > U'(s^*)$ where d^* and s^* denote the optimum number of daughters and son that the daughter-in-law will want to have. This implies that $d^* \leq d_0 < s_0 \leq s^*$ suggesting that the mother-in-law uses her power to decrease the number of daughters and increase the number of sons that the daughter-in-law would want to have in the optimum. This leads us to the following propositions:

Proposition 1: *The power of the mother-in-law has a positive influence on the relative son preference of the daughter-in-law.*

Proposition 2: *As the power of the mother-in-law over the daughter-in-law increases, the daughter-in-law wants to have increasingly more sons and fewer daughters.*

Let us look at the comparative static with β . From the first order optimality condition $V'(d^*)(1 - \beta M(s^*)) = U'(s^*)(1 + \beta M(s^*)) + [U(s^*) - V(d^*)]\beta M'(s^*)$ we can see that as β increases the left hand side of the equality gets smaller and the right hand side gets larger keeping d^* and s^* unchanged. This means that equality will now hold at d^β number of daughters and s^β number of sons such that $d^\beta \leq d^*$ and $s^\beta \geq s^*$.

In summary, Propositions 1 and 2 imply that the power of the mother-in-law distorts the preference of the daughter-in-law towards wanting to have sons. The more powerful the mother-in-law, the greater is the distortion of the daughter-in-law's preference away from having daughters and towards having sons. The power of the mother-in-law has been assumed to be exogenous in this model and a high β can be attained through a physical, social, or psychological dominance of the mother-in-law over the daughter-in-law. We now move on to empirically test the above propositions.

5. Data and Estimation Strategy

To empirically test our model, we use the third National Family and Health Survey (NFHS-3), a nationally representative survey conducted from November 2005 to August 2006. Each of the 26 Indian states has been divided into rural, urban and sometimes slum/non-slum areas, having a probability of one to be sampled. Each rural stratum has then been subdivided into primary sampling units (PSU), with a probability of being sampled proportional to size. In urban areas, within each PSU sampled, a census enumeration block was selected with a probability proportional to size. Households have then been randomly selected from those PSU/census enumeration blocks, and a household questionnaire was administered. A woman questionnaire was also administered to all women aged 15 to 49 years old.

In order to study the impact of a mothers-in-law's son preference on their daughters-in-law's son preference, we need to observe both the daughter-in-law and the mother-in-law. In NFHS-3, this situation occurs whenever the mother-in-law and her daughter-in-law co-reside.

More precisely, NFHS-3 data contains information about all women aged 15-49 years old in the surveyed household. Given the young average age of marriage in India (18 years old for women and 23 years old for men in 2006), we are able to match the daughter-in-law with her mother-in-law in 3,534 cases.⁵

One caveat is that the information is only available for relatively young daughters-in-law and mothers-in-law, as mothers-in-law cannot be aged more than 49 years old if they are to be part of the sample. Young women are, however, the most important group as they are the one starting their fertility history and, hence, are the ones whose decision on the number of extra sons they will bear matters in determining the overall population sex-ratio among young children. Another limitation is that we are

⁵ In India, most women enter wedlock before the age of 25, with 72% of our sample married at this age. In the case of men, 45% are married by the age of 25.

only looking at the preference of daughters-in-law living in extended households, a phenomenon widespread in India, with 46% of the women surveyed by NFHS-3 living in such households.⁶ It is, however, possible that women living in nuclear households have different unobservable characteristics such as being more empowered and, therefore, less permeable to their mothers-in-law' influence than women living in extended households (Bloom et al. 2001). To account for this sample selection, a Heckman model is estimated as a robustness check. The main conclusions remain. Finally, we do not have data on mother-in-law's stated son preference *for her daughter-in-law* but rather need to rely on mother-in-law's stated son preference *for her-self*. Despite these two variables not necessarily taking the same value, they are likely to be highly correlated. This is however a non-tested assumption.

Using NFHS-3 data, we want to estimate the impact of mothers-in-law's stated son preference on their daughter-in-law's stated son preference, holding constant the other determinants of son preference identified in the literature, that is, we want to estimate:

$$pref_d = \alpha + \beta pref_m + \dots + \varepsilon \quad \dots(5.1)$$

where $pref_d$ is the daughter-in-law's stated son preference, as previously defined, $pref_m$ is her mother-in-law's stated son preference and ε is the error term. β is again the 'power' of the mothers-in-law on their daughters-in-law. The control variables are: a dummy variable taking the value of one for women living in a rural area (*rural*); a dummy variable taking the value of one for women living in a household owning cattle (*cattle*); a dummy variable taking the value of one for women living in a household owning land (*land*); a set of dummy variables for the main religious denominations (*christian*, *muslim*, *sikh*, *buddhist* and *otherrel*); a set of dummy variables for caste (*schcaste*, *schtribe*, *bwdcaste* and *caste_dk*); a dummy variable taking the value of one for women listening, watching or reading media at least once a week (*media*); years of education (*educ*); age (*age*); a dummy variable taking the value of

⁶ Excluding non de jure residents.

one for working women (*work*); a set of dummy variables for the different wealth quintile (*poorest*, *poorer*, *richer* and *richest*); the number of children a woman desires (*numbchild*); a dummy variable taking the value of one for women believing it is acceptable for men, in some circumstances, to beat their wife (*dom_violence*); and, a set of dummy variables for the main cultural regions in India (*north*, *east* and *west*).⁷ Those control variables are fairly standard in the literature on son preference (see, for example: Arnold and Kuo 1984, Chung and Das Gupta 2007, Koolwal 2007, Pande and Astone 2007, Robitaille 2012 and, Yount 2005). The characteristics at the household level are shared by the daughter-in-law and her mother-in-law, while the characteristics specific to the daughter-in-law are: religion, caste, *media*, *educ*, *age*, *work*, *numbchild* and *dom_violence*.

Given the ordered nature of the dependent variable, an ordered logit model is used. Interpreting the ordered logit coefficients is not as straightforward as in the OLS case. To facilitate the interpretation of the results, predicted probabilities for changes in the variables of interest are presented.

6. Descriptive Statistics

From a public perspective, the influence of mothers-in-law on the child sex ratio matters only if mothers-in-law have, on average, higher son preference than their daughters-in-law. As shown in Table 1, this is indeed the case. While co-residing daughters-in-law have no preference for sons at a proportion of 79%, this is true for only 65% of co-residing mothers-in-law, a statistically significant difference.^{8,9}

⁷ We consider the states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu to be Southern states; the states of Arunachal Pradesh, Bihar, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Nagaland, Punjab, Rajasthan, Uttaranchal and Uttar Pradesh to be Northern states; the states of Assam, Jharkhand, Manipur, Meghalaya, Mizoram, Orissa, Sikkim, Tripura and West Bengal to be Eastern states; and, the states of Goa, Gujarat and Maharashtra to be Western states.

⁸ While with our data we can only show that mothers-in-law have on average stronger stated son preference than their daughters-in-law, there are evidences in the literature that they may also see female foeticide with a more favorable eye than their daughters-in-law. Indeed, Joshi and Bajwa (2012) using a sample of 200 respondents from the Jat Sikh community in Ludhiana district (Punjab) find that while 78% of the mother-in-law are neutral vis-à-vis female foeticide and 12% are favorable, among the daughter-in-law 78% are unfavorable and 23% are neutral, with none being favorable.

This difference in son preference between daughters-in-law and mothers-in-law is likely to be due, in part, to differences in characteristics. In Robitaille (2012), it was shown that younger women, more educated women and women more exposed to media have, everything else constant, a lower stated son preference. Daughters-in-law are more likely to have those characteristics than their mothers-in-law (Table 1).

[Table 1 about here]

Mothers-in-law not only have stronger son preference than daughters-in-law, the two of them are also highly correlated. As shown in Table 2, the higher the mothers-in-law's son preference is, the higher the proportion of daughters-in-law with a strong son preference. More precisely, while 82% of daughters-in-law with a mother-in-law having no son preference have no son preference themselves, this proportion drops to 75% among daughters-in-law with a mother-in-law preferring one extra son, and dropping further to 69% for those with a mother-in-law preferring two extra sons or more.

[Table 2 about here]

However, this relationship between the mothers-in-law's son preference and their daughters-in-law's son preference may be due to some shared characteristics believed to influence stated son preference such as the state of residence and household's wealth. We, therefore, turn next to multivariate analysis.

⁹ Alongside a decrease in stated son preference, an important decline in desired fertility has also occurred in India in recent years. In our sample, while mothers-in-law have on average a desire for 2.9 children, their daughters-in-law desire only 2.2 children. Higher fertility, by allowing more 'free space' for daughters, should result in smaller stated desired sex ratio, our measure of stated son preference. Indeed, if women have a desire for at least one or two sons (49% and 22% of all 124,355 women in NFHS-3 express such a desire, respectively), a lower overall fertility will automatically increase the desired sex ratio, a result first discussed by Das Gupta (1987). Henceforth, if mother-in-law were to have the same desired fertility than their daughter-in-law, we should expect mothers-in-law to state an even stronger stated son preference than what they do in our data.

7. Multivariate Results: Mother-in-law's Influence

7.1 Base Model

From Table 3 (Column 2), it is clear that the mothers-in-law's stated son preference is significantly correlated with their daughters-in-law's stated son preference, everything else constant (and, nothing else constant, Column 1). Having a mother-in-law desiring one extra son is associated with an increase in the odds of having a son preference and even more so if the mother-in-law has a son preference of at least two extra sons. For a non-working rural North Indian Hindu woman, owning cattle and land, from a backward caste and of average wealth, who has access to media at least once a week, aged 21 years old and having six years of education and desiring 2 children, the predicted probability of desiring no extra son decreases by about 4 points of percentage by having a mother-in-law desiring two extra sons and by almost 3 points of percentage by a having a mother-in-law desiring one extra son (Table 4, Panel A).

[Tables 3 and 4 about here]

The results for the control variables are as expected. As the number of males in the nuclear family determines the share of land inherited once the extended family split up (Vera-Sanso 1999), owning land increases son preference. We also find that Muslim and Christian women have lower son preference, everything else constant.¹⁰ Desires for lower fertility, women's education and their exposure to media are all negatively associated with son preference. Those latter results are in line with the literature.¹¹

¹⁰ In contrast, Pande and Astone (2007) conclude that Muslim women have higher son preference than Hindu women but that non-Hindu-non-Muslim women have lower son preference than Hindu women.

¹¹ For education, see Chung and Das Gupta (2007), Koolwal (2007), Pande and Astone (2007), Robitaille (2012), Yount (2005). For media exposure, see Pande and Astone (2007) and Robitaille (2012).

7.2 Selection Bias

As previously mentioned, a limit to the approach adopted so far is that women who are living in extended households, with their mother-in-law, may have different characteristics than women living in nuclear households. As data on the mother-in-law's preference and characteristics are not available for women living in a nuclear household, we need to rely on a selection model to ensure that our limited sample does not bias the results.

More precisely, we use Miranda and Rabe-Hesketh's (2006) technique, an adaptation to Heckman's original idea, to handle the sample selection issue in the context of an ordered logit model. As an exclusion restriction, we use the year since marriage, since Indian women are more likely to live in an extended household soon after marriage and, only later on, move into a nuclear household (Ram and Wong 1999).

Specifically, for an ordinal variable y (*stated son preference*) that we observe conditional on a variable S (*coresiding*) being true, we can express the latent variables y_i^* and S_i^* as:

$$y_i^* = x_i' \beta + \lambda \varepsilon_i + \tau_i \quad \dots(7.1)$$

$$S_i^* = z_i' \gamma + \varepsilon_i + \zeta_i \quad \dots(7.2)$$

with ε_i , an unobserved heterogeneity term and, τ_i and ζ_i , two random noises. The value of y_i is determined by the value taken by the latent variable y_i^* following the rules:

$$y_i = \begin{cases} y_1 & \text{if } -\infty < y_i^* \leq \kappa_1 \\ y_2 & \text{if } \kappa_1 < y_i^* \leq \kappa_2 \\ \vdots & \vdots \\ y_H & \text{if } \kappa_{h-1} < y_i^* \leq \infty \end{cases} \quad \dots(7.3)$$

The correlation between the two error terms $(\lambda\varepsilon_i + \tau_i)$ and $(\varepsilon_i + \zeta_i)$ is $\rho = \frac{\lambda}{\sqrt{2(\lambda^2+1)}}$. A ρ statistically significantly different than zero indicates that the model suffers from selection bias.

As shown in Table 5 (Columns 1 and 2), we conclude that there is no selection bias (ρ is not statistically significantly different than 0). Moreover, despite the correction, the main conclusions remain. In other words, even with a more representative sample, we would have concluded that mothers-in-law's stated son preference matters in explaining their daughters-in-law's stated son preference.

[Table 5 about here]

7.3 Endogeneity

Another potential limit to the approach adopted so far is that the mother-in-law's son preference might be endogenous. Indeed it is plausible that unobservable variables influence both the mother-in-law's and her daughter-in-law's son preference, such as how traditional the household is, how religious the household is, etc. The effect of those omitted variables would end up in the error term, leading to a biased coefficient for the mother-in-law's variable.

To deal with this issue, the mother-in-law's preference is instrumented. As instruments, we use variables believed to influence a woman's stated son preference but that are not shared at the household level. Specifically, we use the variables: *media*, *educ*, *age*, *work*, *numbchild* and *dom_violence*, this time measured at the mother-in-law's level. Those variables should influence daughters-in-law's stated son preference only through their mothers-in-law's stated son preference.¹²

¹² As robustness checks, a model is estimated using as instrumental variable the variable with the largest (second largest) significance level in the equation explaining mothers-in-law's stated son preference (based on Table 6 results), *numbchild* (*media*). The results are very similar to those obtain with the full sets of instrumental variables. The coefficient for mothers-in-law's stated son preference is 1.1077 (1.3490) with a *p*-value of 0.0000 (0.0000). Results are available on request.

The model is then estimated using a probit model for the first stage equation (explaining mother-in-law's preference) and an ordered probit for the second stage equation (explaining daughter-in-law's preference). Given the advance of econometrics techniques in dealing with endogeneity problems in ordered models, the mother-in-law's stated son preference has to be included as a dichotomous variable, taking the value of one if she expresses a desire for at least one extra son. The model is estimated using the user written *cmp* command in Stata 12 (Roodman 2009).

As shown in Table 6, we again conclude that the mothers-in-law's stated son preference positively influence their daughters-in-law stated son preference.

[Table 6 about here]

8. Influence Channels

In the previous section, we have seen that mother-in-law's preference has a significant impact on her daughter-in-law's preference. This result holds true for different specifications. We however still do not know which mechanisms are successfully used by mothers-in-law to influence their daughters-in-law.

As previously discussed, we believe that there are three main mechanisms used by mothers-in-law.

First, a mother-in-law can select a daughter-in-law with similar preference than herself. This "technique" is feasible in the Indian context given the high prevalence of arranged marriages and the important involvement of parents, in particular the mothers. To give an example, it is not uncommon to see a marriage advertisement, either in newspapers or on the internet, posted by the parents of the would-be husband/wife. It is also fairly common for the spouses-to-be to only briefly meet each other before the wedding, with most of the negotiation being done by the parents. If selection via the marriage market takes place, we should observe that recently married women express, already, similar son preference to their mother-in-law. This, however, would not be the case if the influence of the mother-in-law is mostly felt through socialization and coercion.

Indeed, another way for the mothers-in-law to influence their daughters-in-law is through socialization. Co-residing women are likely to spend a fair amount of time together and to influence each other's preference, through discussing and sharing ideas on the pros and cons of raising boys and girls. If this is the case, the size of the coefficient for the mother-in-law's son preference variable should increase with years of cohabitation and decreasing with the daughter-in-law's age at marriage.

Finally, a mother-in-law can influence their daughter-in-law through coercion, using a "stick and carrot" strategy. By withholding resources and liberty to a daughter-in-law not given birth to son(s) or by using physical and emotional abuse, a mother-in-law can bring her daughter-in-law to share a high desire for sons, so as to improve her daily life. Support for this hypothesis would be if the mothers of sons are healthier and have more liberty than mothers of daughters. This would also be verified if, everything else constant, in areas where mothers of daughters are worse off than mother of sons, the influence of the mother-in-law is more strongly felt or if a mother-in-law supporting domestic violence has a stronger influence on their daughter-in-law's preference.

In this section, we present empirical evidence testing these three hypotheses.

8.1 Selection of the Bride or Socialization

As previously discussed, if the mothers-in-law selects daughters-in-law with similar son preference than themselves, we should observe from the first year of marriage an "influence" of the mother-in-law on her daughter-in-law, that is, the coefficient in front of the mother-in-law's stated son preference should be positive for women who have been married for less than one year. If, however, socialization occurs, women who have been married for a longer period of time and, henceforth, who have been exposed to their mother-in-law's stated son preference over a long period of time, should be more influenced by their mother-in-law than women who just got married.

To test this hypothesis, we allow the coefficient in front of the mothers-in-law's stated son preference variable to vary according to the time since marriage. More specifically, we differentiate between women who have been married for less than one year, women who have been married for 1 to 2 years, women who have been married for 3 to 5 years and women who have been married for more than 6 years.

The results presented in Table 7 (Column 1) indicate that for the first 2 years of marriage, there is no significant impact of the mother-in-law's stated son preference on her daughter-in-law's preference (reference group: mothers-in-law with no son preference for a given number of years since marriage). However, after 3 years of marriage, we observe a positive and significant influence. Hence, while appealing, and probably happening in some cases, the idea that the relation between the mother-in-law's and daughter-in-law's stated son preference comes from the marriage market does not appear in empirical data.

Future support is provided on the importance of socialization to explain mothers-in-law's influence by the model presented in Table 7 (Column 2). While the Indian law forbids marriage before the age of 18 for women, marriage before this age is very common, with 53% of our sample being married by the age of 17. The importance of mothers-in-law in socializing those very young brides should influence their stated son preference. Hence, showing that women who have been married very young are more likely to be influenced by their mothers-in-law's stated son preference would support our conclusion that socialization is a key factor determining a daughter-in-law's stated son preference.

The results from Table 7 (Column 2) speak for themselves. Women who have been married before the age of 18 are significantly influenced by their mothers-in-law stated son preference. The more so, the younger they were at the time of marriage (we have only 47 observations for mother-in-law with a

preference for 2 extra sons and a daughter-in-law who was married by the age of 15, explaining the lack of significance for this variable).

[Table 7 about here]

8.2 Socialization or Coercion

In the previous section, we have seen that a mother-in-law's influence increases over time. While the media often gives the impression that the mother-in-law's influence is mostly done via coercion, such as emotional or physical abuse, deprivation of food and freedom or over-burdening their daughter-in-law with chores, it is also possible that the influence is coming from a peaceful relation between the mother-in-law and her daughter-in-law, with the daughter-in-law listening to her mother-in-law's opinions.

Comparing the daily life outcomes of women who meet their mother-in-law's expectation in terms of sex ratio to the ones who have a sex ratio more biased towards girls than what is desired by the mother-in-law, we conclude that there are no statistically significant differences for our eight measures of daily life quality (Table 8).¹³

[Table 8 about here]

Similarly, when we allow the impact of the mother-in-law's stated son preference on her daughter-in-law's preference to vary according to the mother-in-law's opinion on the acceptability of physical violence for a disrespectful daughter-in-law, we do not find any statistically significant difference between those two groups (Table 9, Column 1).

But, while individual mothers-in-law's view on domestic violence do not have any significant impact on their influence on their daughters-in-law's stated son preference, the simple fact that in some regions

¹³ Specifically, the variable takes the value of one if the daughter-in-law *has given birth* to the number of sons *desired* by the mother-in-law and zero otherwise. Interestingly, the results hold even when we limit the sample to women who have reached their mother-in-law's ideal number of children.

a woman without a son who has at least 2 children fares worse, either in terms of physical violence, emotional violence, low BMI (less than 18.5) or say in terms of (1) daily purchase, (2) large purchase, (3) visit to friends or family, (4) how to spend husband earnings or (6) how to spend on her own health, increases the influence of the mother-in-law's preference on her daughter-in-law's preference (Table 9, Column 2). Hence, a social environment where women can observe the importance of having son(s) to improve their daily life seems a powerful "convincing" tool to align a daughter-in-law's stated son preference to her mother-in-law's preference. Hence, rather than direct coercion by the mother-in-law, socialization on the "advantages" of having sons seem to be the key tools used by mother-in-law to align their daughters-in-law's stated son preference to theirs.

[Table 9 about here]

9. Discussion and Policy Implication

In this paper, we have tested empirically a common assumption in the anthropological and sociological literature, namely, that Indian mothers-in-law have a strong influence on the decisions taken by their sons and their daughters-in-law on important personal questions, such as the number of sons they will have.

In line with our theoretical model, we find that in India, holding constant the daughter-in-law's characteristics, the mother-in-law's stated son preference still has a significant impact on their daughters-in-law's stated son preference. The result is robust to different specifications.

Due to data limitation we cannot prove which mechanisms are used by mothers-in-law to influence/coerce their daughters-in-law. However, we have provided some evidence that socialization, rather than marriage selection and coercion, seems to be the dominant mechanism behind a mother-in-

law's influence. Thus our results present a much more peaceful image of daughters-in-law/mothers-in-law relations than what is usually presented in the media and in popular culture.¹⁴

The focus of this paper is on stated son preference. However, it is likely that mothers-in-law's influence is not felt only on how many sons to bear. For example, Char et al. (2010) find that Indian mothers-in-law also have a say in the use of contraception by the young couple. Moreover, it is highly plausible that mothers-in-law's influence could also be felt on decision regarding children's education, children's vaccination, child care such as breastfeeding, etc. More research on those questions is necessary.

From a policy perspective, our results indicate the importance of not only targeting the reproductive age married couples to encourage them not to abort their female fetuses, to adopt contraception or to send their children to school, but also to target the mothers-in-law and, potentially, also the fathers-in-law. In this latter case, however, the limited availability of male respondents in NFHS-3 did not allow us to test the importance of fathers-in-law's stated son preference on their daughter-in-law's stated son preference. This would be an interesting avenue for future research.

The conclusion reached by this paper may also apply to countries other than India. In particular, in China, a country with an even higher sex ratio at birth, there is some evidence that grandparents' preference matters. For example, in a study by Xiaolei et al (2013), a respondent explains the imbalance by sex ratio by saying: "It's the fault of the grandparents. The older generation still prefer sons and they put pressure on their children to have sons (Male aged 35, urban Guizhou)". Quantifying the impact of grandparents' preference on China's sex ratio is another interesting avenue for future research.

¹⁴ See, for example: Satyameva Jayate, Episode 1: Daughters are Precious (TV Reality Talk Show, 2012), Kyunki Saas Bhi Kabhi Bahu Thi (TV Drama Series 2000-2008), Kahaani Ghar Ghar Kii (TV Drama Series 2000-2008), Biwi Ho To Aisi (Movie, 1988), Jawani Zindabad (Movie, 1990), Karuththamma (Movie, 1994), Akhiyan Udeekdiyan (Movie, 2009).

Appendix to Section 4

The Lagrangian utility function of the daughter-in-law is given as:

$$L(s, d, x) = U(s)(1 + \beta \cdot M(s)) + (1 - \beta \cdot M(s))V(d) + C(x) + \tau[I - p_x \cdot x - p_n \cdot (s + d)] \quad \dots(\text{A.1})$$

The daughter-in-law maximizes her utility from x , s and d . The first order conditions (FOCs) yield:

$$\frac{\partial L}{\partial x} = C'(x) - \tau p_x = 0 \quad \dots(\text{A.2})$$

$$\frac{\partial L}{\partial s} = U'(s)(1 + \beta \cdot M(s)) + U(s)\beta \cdot M'(s) - \beta \cdot M'(s)V(d) - \tau p_n = 0 \quad \dots(\text{A.3})$$

$$\frac{\partial L}{\partial d} = V'(d) - \tau p_n = 0 \quad \dots(\text{A.4})$$

The second order conditions (SOCs) imply:

$$\frac{\partial^2 L}{\partial x^2} = C''(x) < 0 \quad \dots(\text{A.5})$$

$$\frac{\partial^2 L}{\partial s^2} = U''(s)(1 + \beta \cdot M(s)) + [U(s) - V(d)]\beta \cdot M''(s) + 2\beta U'(s)M'(s) < 0$$

$$\text{or } |U''(s)(1 + \beta \cdot M(s)) + [U(s) - V(d)]\beta \cdot M''(s)| > 2\beta U'(s)M'(s) \quad \dots(\text{A.6})$$

$$\frac{\partial^2 L}{\partial d^2} = V''(d) < 0 \quad \dots(\text{A.7})$$

From the FOCs, equations A.2-A.4, we have

$$\tau = \frac{C'(x)}{p_x} = \frac{V'(d)(1 - \beta M(s))}{p_n} = \frac{U'(s)(1 + \beta M(s)) + [U(s) - V(d)]\beta M'(s)}{p_n} \quad \dots (\text{A.8})$$

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Tables

Table 1: Descriptive Statistics

	Household	Co-residing Daughter-in-Law	Co-residing Mother-in-law
<i>pref0</i>		0.7889	0.6520***
<i>pref1</i>		0.1851	0.2719***
<i>pref2</i>		0.0260	0.0761***
<i>rural</i>	0.6630		
<i>cattle</i>	0.6163		
<i>land</i>	0.5413		
<i>hindu</i>		0.7900	0.7882
<i>christian</i>		0.0308	0.0303
<i>muslim</i>		0.1398	0.1402
<i>sikh</i>		0.0224	0.0227
<i>buddhist</i>		0.0074	0.0091**
<i>otherrel</i>		0.0096	0.0096
<i>schcaste</i>		0.1924	0.1944
<i>schtribe</i>		0.1143	0.1138
<i>bwdcaste</i>		0.3591	0.3568
<i>castedk</i>		0.0368	0.0371
<i>othercaste</i>		0.2974	0.2980
<i>educ</i>		6.0037 (4.7721)	1.7341*** (3.2451)
<i>media</i>		0.6853	0.5648***
<i>age</i>		21.3331 (3.4874)	44.1573*** (3.8235)
<i>work</i>		0.3101	0.4965***
<i>middle</i>	0.1924		
<i>poorest</i>	0.1299		
<i>poorer</i>	0.1814		
<i>richer</i>	0.2334		
<i>richest</i>	0.2629		
<i>numbchild</i>		2.2020 (0.7021)	2.8687*** (1.1908)
<i>dom_violence</i>		0.4383	0.5116***
<i>Obs.</i>		3,535	3,535

Notes: *t*-tests have been performed between the co-residing daughters-in-law sample and the co-residing mothers-in-law sample. ***, *p*-value<0.01, ***p*-value<0.05 and **p*-value<0.10.

Table 2: Daughter-in-law's Son Preference for Given Level of Mother-in-law's Son Preference

Co-residing daughter-in-law's son preference	Co-residing mother-in-law's son preference			Obs.
	<i>Same number of sons and daughters</i>	<i>One extra son</i>	<i>At least two extra sons</i>	
<i>Same number of sons and daughters</i>	0.8190	0.7451	0.6877	2867
<i>One extra son</i>	0.1602	0.2268	0.2491	671
<i>At least two extra sons</i>	0.0208	0.0281	0.0632	93
<i>Obs.</i>	2379	982	270	3631

Table 3: Daughters-in-law's Stated Son Preference: Ordered Logit

	(1)	(2)
<i>rural</i>		0.0880 (0.5373)
<i>cattle</i>		-0.0549 (0.6787)
<i>land</i>		0.3622*** (0.0012)
<i>christian</i>		-0.7089** (0.0477)
<i>muslim</i>		-0.2580* (0.0969)
<i>sikh</i>		-0.2362 (0.5155)
<i>buddhist</i>		-0.1798 (0.8374)
<i>otherrel</i>		0.0591 (0.9143)
<i>schcaste</i>		-0.0280 (0.8444)
<i>schtribe</i>		-0.0355 (0.8428)
<i>bwdcaste</i>		0.0500 (0.6751)
<i>castedk</i>		0.3519 (0.1508)
<i>educ</i>		-0.0334*** (0.0055)
<i>media</i>		-0.2287** (0.0262)
<i>age</i>		-0.0148 (0.2544)
<i>work</i>		0.0210 (0.8391)
<i>poorest</i>		-0.2196 (0.1630)
<i>poorer</i>		-0.0093 (0.9441)
<i>richer</i>		0.0767 (0.5823)
<i>richest</i>		-0.0190 (0.9091)
<i>numbchild</i>		1.2564*** (0.0000)
<i>dom_violence</i>		0.0785 (0.3960)

		(1)
<i>north</i>		0.8566*** (0.0000)
<i>east</i>		0.7054*** (0.0011)
<i>west</i>		0.8642*** (0.0003)
<i>ml_pref1</i>	0.4357*** (0.0000)	0.1907** (0.0493)
<i>ml_pref2</i>	0.7503*** (0.0000)	0.2827* (0.0552)
cut1	1.5101	4.6972
cut2	3.8294	7.3269
Observations	3,535	3,535
Pseudo R-squared	0.010	0.147
Log pseudolikelihood	-2082	-1792

Notes: Standard errors are adjusted for cluster at the primary sampling unit level. ***, p -value<0.01, ** p -value<0.05 and * p -value<0.10.

Table 4: Predicted Probability

	<i>ml_pref0</i>	<i>ml_pref1</i>	<i>ml_pref2</i>
<i>pref0</i>	0.8352 [0.8028, 0.8676]	0.8072 [0.7690, 0.8454]	0.7925 [0.7426, 0.8424]
<i>pref1</i>	0.1508 [0.1214, 0.1802]	0.1759 [0.1413, 0.2104]	0.1890 [0.1442, 0.2338]
<i>pref2</i>	0.0140 [0.0099, 0.0182]	0.0169 [0.0118, 0.0220]	0.0185 [0.0121, 0.0249]

Note: 90% confidence interval in bracket.

Table 5: Daughters-in-law's Stated Son Preference: Selection Model

	SSP	Extended Household
<i>yearmarr</i>		-0.0131*** (0.0013)
<i>rural</i>	0.0509 (0.0822)	0.0858*** (0.0123)
<i>cattle</i>	-0.0314 (0.0748)	0.3989*** (0.0116)
<i>land</i>	0.2093*** (0.0638)	0.2235*** (0.0107)
<i>christian</i>	-0.4095** (0.2050)	-0.2507*** (0.0203)
<i>muslim</i>	-0.1490* (0.0871)	-0.0021 (0.0148)
<i>sikh</i>	-0.1364 (0.2350)	0.0374 (0.0308)
<i>buddhist</i>	-0.1040 (0.5103)	-0.1902*** (0.0403)
<i>otherrel</i>	0.0342 (0.3196)	0.0726** (0.0366)
<i>schcaste</i>	-0.0161 (0.0821)	0.0296** (0.0143)
<i>schtribe</i>	-0.0205 (0.1003)	-0.0058 (0.0182)
<i>bwdcaste</i>	0.0289 (0.0685)	0.0395*** (0.0116)
<i>castedk</i>	0.2032 (0.1400)	0.0108 (0.0237)
<i>educ</i>	-0.0193*** (0.0068)	0.0057*** (0.0013)
<i>media</i>	-0.1321** (0.0579)	-0.0357*** (0.0119)
<i>age</i>	-0.0086 (0.0074)	-0.0193*** (0.0014)
<i>work</i>	0.0121 (0.0589)	-0.0158 (0.0096)
<i>poorest</i>	-0.1270 (0.0892)	-0.2763*** (0.0174)
<i>poorer</i>	-0.0055 (0.0735)	-0.1280*** (0.0155)
<i>richer</i>	0.0444 (0.0788)	0.1785*** (0.0142)
<i>richest</i>	-0.0106 (0.0934)	0.4336*** (0.0166)
<i>numbchild</i>	0.7254*** (0.0565)	-0.0023 (0.0053)
<i>dom_violence</i>	0.0453 (0.0513)	
<i>north</i>	0.4946*** (0.1073)	0.0856*** (0.0130)
<i>east</i>	0.4073*** (0.1197)	0.0456*** (0.0146)
<i>west</i>	0.4990*** (0.1278)	0.1148*** (0.0164)
<i>ml_pref1</i>	0.1101** (0.0542)	
<i>ml_pref2</i>	0.1632* (0.0858)	
<i>cons</i>		0.2539***

	(0.0359)
<i>cut1</i>	2.7129***
	(0.2474)
<i>cut2</i>	4.2312***
	(0.2720)
<i>phi</i>	0.0016
	(0.899)
Observations	124,365
Log likelihood	-57327.861

Notes: Standard errors are adjusted for cluster at the primary sampling unit level.

***, p -value<0.01, ** p -value<0.05 and * p -value<0.10.

Table 6: Daughters-in-law's Stated Son Preference: Instrumental Variables

	Daughter-in-law	Mother-in-law
rural	0.0443 (0.0755)	-0.0280 (0.0773)
Cattle	-0.0417 (0.0707)	0.0545 (0.0715)
Land	0.1268** (0.0606)	0.0880 (0.0598)
Christian	-0.2096 (0.1669)	-0.4141** (0.1723)
Muslim	-0.1462* (0.0794)	0.0275 (0.0776)
Sikh	0.0175 (0.1791)	-0.2599 (0.1747)
Buddhist	0.0601 (0.3657)	-0.1253 (0.2742)
Otherrel	0.1587 (0.2777)	-0.4338* (0.2324)
Schcaste	-0.0986 (0.0757)	0.1358* (0.0742)
Schtribe	-0.1006 (0.0950)	0.1563 (0.0952)
Bwdcaste	-0.0694 (0.0635)	0.1662*** (0.0645)
Castedk	0.0998 (0.1284)	0.1601 (0.1429)
Educ	-0.0165*** (0.0060)	-0.0152* (0.0092)
Media	-0.1145** (0.0531)	-0.1111** (0.0525)
Age	-0.0040 (0.0065)	-0.0077 (0.0061)
Work	0.0338 (0.0516)	-0.0011 (0.0516)
Poorest	-0.0504 (0.0855)	-0.1060 (0.0902)
Poorer	0.0241 (0.0739)	-0.0298 (0.0811)
Richer	0.1108 (0.0756)	-0.0891 (0.0776)
Richest	0.0739 (0.0897)	-0.0440 (0.0902)
Numbchild	0.5175*** (0.0471)	0.2286*** (0.0274)
dom_violence	0.0255 (0.0469)	0.0633 (0.0486)
North	0.2066** (0.1030)	0.5479*** (0.0869)
East	0.2728** (0.1072)	0.2861*** (0.0980)
West	0.2479** (0.1248)	0.5363*** (0.1101)
ml_pref_son	1.1257*** (0.1688)	
Constant		-1.1780*** (0.3011)
Atanhrho		-0.7614*** (0.1735)
Cut 1		2.3477*** (0.2157)

Cut 2		3.5093*** (0.2423)
Observations	3,598	3,598
Log pseudolikelihood		-1829.805
Test of joint significance: Instrumental Variable (Chi-2)		96.04*** (0.0000)

Notes: Standard errors are adjusted for cluster at the primary sampling unit level. ***, p -value<0.01, ** p -value<0.05 and * p -value<0.10.

Table 7: Daughters-in-law's Stated Son Preference: Selection or Socialization? Ordered Logit.

	(1)	(2)
rural	0.0750 (0.5978)	0.1226 (0.3939)
cattle	-0.0310 (0.8155)	-0.0707 (0.5959)
land	0.3513*** (0.0018)	0.3564*** (0.0016)
christian	-0.6131* (0.0909)	-0.6380* (0.0763)
muslim	-0.2510 (0.1045)	-0.2316 (0.1361)
sikh	-0.2219 (0.5434)	-0.2785 (0.4431)
buddhist	-0.1359 (0.8779)	-0.1514 (0.8629)
otherrel	0.2177 (0.6850)	0.1211 (0.8192)
schcaste	-0.0433 (0.7626)	-0.0363 (0.8010)
schtribe	-0.0662 (0.7165)	-0.0528 (0.7723)
bwdcaste	0.0413 (0.7302)	0.0466 (0.6999)
castedk	0.2971 (0.2229)	0.3271 (0.1715)
educ	-0.0316*** (0.0095)	-0.0319*** (0.0086)
media	-0.2256** (0.0280)	-0.2089** (0.0436)
age	-0.0337** (0.0212)	-0.0061 (0.6426)
work	0.0042 (0.9679)	-0.0042 (0.9683)
poorest	-0.2377 (0.1337)	-0.2292 (0.1460)
poorer	-0.0359 (0.7909)	-0.0370 (0.7843)
richer	0.0843 (0.5470)	0.0660 (0.6378)
richest	0.0050 (0.9761)	-0.0029 (0.9862)
numbchild	1.2645*** (0.0000)	1.2470*** (0.0000)
dom_violence	0.0783 (0.3979)	0.0682 (0.4654)
north	0.8109***	0.8470***

	(0.0000)	(0.0000)
east	0.6554***	0.6958***
	(0.0026)	(0.0015)
west	0.8376***	0.8722***
	(0.0004)	(0.0003)
ml_p1_ymarr_0	-0.0515	
	(0.7894)	
ml_p2_ymarr_0	-0.5802	
	(0.1655)	
ml_p1_ymarr_1_2	-0.0430	
	(0.7729)	
ml_p2_ymarr_1_2	0.2272	
	(0.3492)	
ml_p1_ymarr_3_5	0.2528*	
	(0.0855)	
ml_p2_ymarr_3_5	0.4870**	
	(0.0214)	
ml_p1_ymarr_6	0.5755***	
	(0.0007)	
ml_p2_ymarr_6	0.5501	
	(0.1045)	
ml_pref1_age_15		0.5720***
		(0.0008)
ml_pref2_age_15		-0.1978
		(0.5900)
ml_pref1_age_15_18		0.2238*
		(0.0658)
ml_pref2_age_15_18		0.5350***
		(0.0022)
ml_pref1_age_18_21		-0.1814
		(0.2091)
ml_pref2_age_18_21		0.1450
		(0.6085)
ml_pref1_age_21		-0.1362
		(0.6743)
ml_pref2_age_21		-1.2098
		(0.2340)
cut1	4.2763***	4.8568***
	(0.0000)	(0.0000)
cut2	6.9109***	7.4974***
	(0.0000)	(0.0000)
Observations	3,518	3,518
Pseudo R-squared	0.150	0.151
Log pseudolikelihood	-1780	-1778

Notes: Standard errors are adjusted for cluster at the primary sampling unit level. ***, p -value<0.01, ** p -value<0.05 and * p -value<0.10.

Table 8: Daily Life Consequences of Having a Sex Ratio Less than Desired by the Mother-in-law

	\geq Desired	< desired	T-test (<i>p</i> -value)
<i>Violence</i>			
Physical	21	22	(0.8170)
Emotional	12	10	(0.5024)
<i>Depravation</i>			
BMI < 18.5	37	36	(0.4580)
<i>Decision Making: Daughter-in-law Has a Say on:</i>			
Own Health Care	46	46	(0.7437)
Large Purchase	26	23	(0.1864)
Daily Purchase	28	27	(0.3598)
Visit to Family and Relatives	39	36	(0.2762)
Husband's Earning	52	48	(0.1068)

Notes: Percentage of the women, conditional on having achieved or not the desired sex ratio
 ***, *p*-value<0.01, ***p*-value<0.05 and **p*-value<0.10.

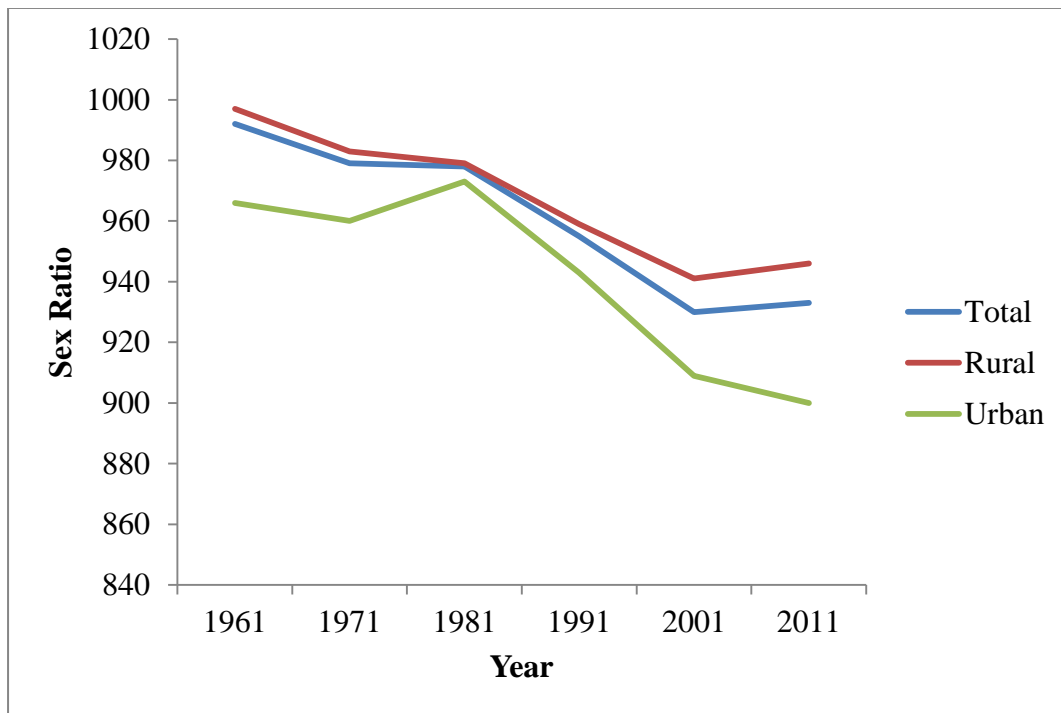
Table 9: Daughters-in-law's Stated Son Preference: Socialization or Coercion? Ordered Logit.

	(3)	(1)
rural	0.1176 (0.4153)	0.0982 (0.4917)
cattle	-0.1164 (0.3841)	-0.0622 (0.6417)
land	0.3827*** (0.0007)	0.3574*** (0.0017)
christian	-0.7604** (0.0363)	-0.7405** (0.0412)
muslim	-0.2718* (0.0829)	-0.2516 (0.1060)
sikh	-0.2148 (0.5582)	-0.2357 (0.5172)
buddhist	0.1554 (0.8265)	-0.2047 (0.8174)
otherrel	0.0569 (0.9187)	0.0317 (0.9545)
schcaste	-0.0148 (0.9173)	-0.0260 (0.8552)
schtribe	-0.0114 (0.9493)	-0.0278 (0.8770)
bwdcaste	0.0468 (0.6969)	0.0454 (0.7071)
castedk	0.3879 (0.1139)	0.3439 (0.1589)
educ	-0.0327*** (0.0069)	-0.0324*** (0.0073)
media	-0.2170** (0.0361)	-0.2333** (0.0236)
age	-0.0147 (0.2633)	-0.0145 (0.2648)
work	0.0222 (0.8310)	0.0108 (0.9171)
poorest	-0.2084 (0.1878)	-0.2221 (0.1572)
poorer	-0.0122 (0.9272)	-0.0111 (0.9330)
richer	0.0685 (0.6257)	0.0697 (0.6178)
richest	-0.0278 (0.8685)	-0.0227 (0.8921)
numbchild	1.2749*** (0.0000)	1.2546*** (0.0000)
dom_violence	0.0650 (0.4977)	0.0781 (0.3979)
north	0.8621*** (0.0000)	0.7679*** (0.0087)
east	0.7125*** (0.0012)	0.6876*** (0.0048)
west	0.8268*** (0.0005)	0.7785** (0.0157)
region_coercion		-0.0292

ml_pref1	0.1649 (0.1988)	(0.9017) -0.0914 (0.7566)
ml_pref2	0.2315 (0.3346)	-0.5952 (0.2613)
ml_pref1_coer		0.3327 (0.2867)
ml_pref2_coer		0.9948* (0.0716)
ml_beat_inlaw	0.0068 (0.9565)	
ml_p1_ml_beat_inlaw	0.0635 (0.7392)	
ml_p2_ml_beat_inlaw	0.1073 (0.7266)	
cut1	4.7434*** (0.0000)	4.6062*** (0.0000)
cut2	7.3760*** (0.0000)	7.2399*** (0.0000)
Observations	3,499	3,535
Pseudo R-squared	0.150	0.148
Log pseudolikelihood	-1774	-1790

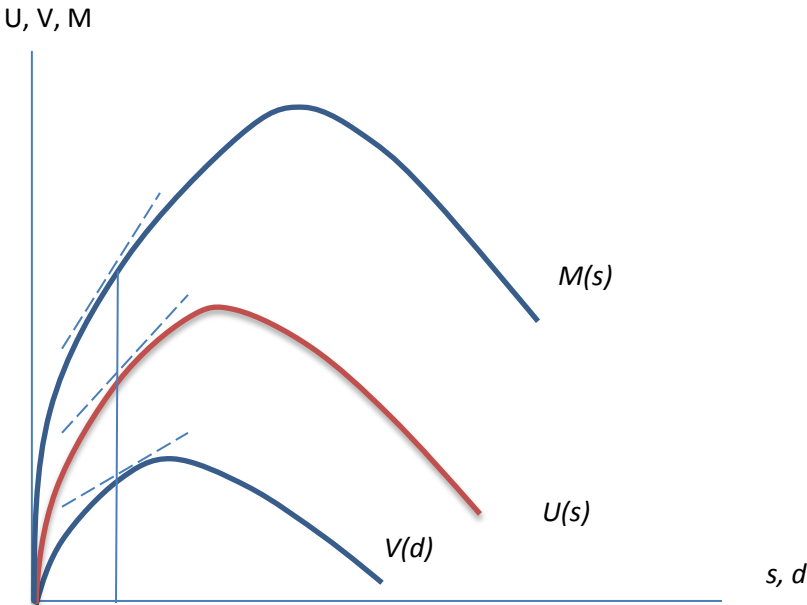
Notes: Standard errors are adjusted for cluster at the primary sampling unit level. ***, p -value<0.01, ** p -value<0.05 and * p -value<0.10.

Figure 1: Sex Ratio Among Less than 6 Years Old



Source: Census data.

Figure 2: Preference Pattern over the Sons, s , and Daughters, d , born to the Daughter-in-law.



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