International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Relative Education and Stated Son Preference: An Exploratory Study Over NFHS Rounds

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Abstract (125 words)
Although existing literature explores the determinants of stated son preference (SSP), the role of relative education between a dyad, representing the power dynamics of decision–making within the household, remains understudied. Utilizing logistic regression with time and state fixed effects on pooled unit–level data from NFHS 3, 4, and 5 rounds, the study reveals that Indian women who are more educated than their husbands are less likely to report a preference for sons. Conversely, women with more educated husbands are more inclined to express a higher SSP. Additionally, our findings suggest that this effect is not mediated by relative occupation. Greater relative education within the couple may offer women better economic independence, and withstand social and economic pressures more effectively than their absolute education.

Keywords: Stated Son Preference, Relative Education, Dyad, Power Dynamics, Mediation Effect, Relative Occupation

JEL Classification Code: J16

1. Introduction

Son preference, deeply rooted in various cultures worldwide, is a historical phenomenon that transcends temporal and geographic boundaries. Despite India's evolution one enduring aspect has been the strong preference for sons. This preference is exemplified by the common sight of elderly religious pandits blessing married women with the words ‘Sau putravati bhava’ which translates to ‘May you be blessed with a hundred sons’.Daughters often face discrimination in terms of infanticide (resulting in many missing women), neglect in early childhood rearing, early withdrawal from school, less nutritious food etc and the decisions about these made at the micro level within families, by parents and grandparents, who are traditionally viewed as the primary caregivers for the child. For over a century, there has been a significant disparity in the number of adolescent boys and girls in the Indian census (Pande and Malhotra, 2006), with child sex ratio falling too (Census 1991, 2001, 2011). There has been a large body of existing literature which attempts to capture the correlates of Stated Son Preference (SSP) by women across countries, though no study yet identifies the importance of relative education of the women with respect to her husband within their dyad. This paper, using unit–level nationally representative data of National Family Health Survey over last three rounds (3,4, and 5) in India, attempts to contribute to this literature body by identifying significantly lower SSP in a hypogamous marriage with ivesmoreeducated than husbands. These results remain robust across state groups and separate NFHS rounds.

The preference for sons in India is a multifaceted phenomenon shaped by economic, religious, social, and emotional factors. Fathers may consider the financial assistance a son can provide to their widowed wives after their demise (Robitaille and Chatterjee, 2020). In China, in anticipation of lack of old-age support, couples with only daughters are more likely to participate in social insurance or pension programs designed for old age support than couples with sons(Ebenstein and Leung, 2010). Daughters are frequently viewed as burdens, with the practice of dowry. Moreover,daughters are expected to become part of their in–laws' families following the social norm of virilocal marriage practices(Das Gupta et al., 2003). Primary breadwinners often view daughters as potential financial burdens, as they are expected to bear the cost of their marriage, including dowry payments. According to religious teachings, parents may not attain heaven unless their sons perform the cremation ceremony (Das Gupta et al., 2003).

The lineage and ancestor worship is especially crucial to fathers, as it is the paternal family that benefits from these ceremonies, while the mother's family does not gain any additional benefit. Thus, having at least one son is relatively more important for fathers.In general, mothers are more sensitive to discrimination faced by girls and less likely to neglect children based on gender. Indeed, Robitaille(2013) observe that on average never–married women report a SSP of 104 for every 100 girls for, while never–married men report the same in the tune of 114. Similar difference exists for women and men of all ages.

Amidst various other factors,women'seducation has been identified as a key correlate of son preference, though theoretically, the pathways can vary. Murphy et al.(2011)found that higher levels of maternal education are linked to a decreased desire for more sons, suggesting that education weakens the preference for sons, likely by offering women economic opportunities beyond traditional motherhood roles. Educationcan change her perception of 'feminine worth', thus decreasing her preference for sons (Bourne and Walker, 1991). However, more education can be associated with higher access to prenatal sex determination techniques and preferential stoppage of fertility after reaching the ideal number of sons (Retherford and Roy, 2003),contributing to a higher sex ratio(more sons than girls) at birth (Edlund, 1999). While using Census data from South Korea during 1991–2003, Chung and Das Gupta (2007) reflected a positive effect of maternal education on reducing their preference for sons, a more recent study identified an insignificant impact using similar data of 2008–2021 (Seo et al., 2022). Thus, the impact of **education** on son preference lies in two major ways, firstly in its ability to raise awareness, offer livelihood and reduce reliance on male offspring, and secondly, in educating the population about the availability and better knowledge of sex–selective practices. Thus, mother's education irrespective of her husband's education and her position within the dyad cannot capture the entire dynamics. Relative education of the mother vis–à–vis her husband can play a significant role in shaping her stated preference, which has remained under–studied.In this paper, we aim to explore the role of relative education in greater detail and examine how it influences son preference.

Relatively more education among wives compared to their husbands, called educational hypogamy, theoretically offer more bargaining power to women, thus translating the power of axes to the wife. Women in intra–household bargain models can become empoweredby strengthening their threat options, ie, improving resources that women can control and opportunities outside their households they can exploit(Samarakoon and Parinduri, 2015).In the altruist model(Becker 1974), the equilibrium corresponds to the point that maximizes the altruist's utility, irrespective of individual's utility. He postulates that the family contains one 'altruistic' individual–the husband, father, patriarch, dictator,

whose preferences reflect his concern for the welfare of other family members. It is he, who makes positive transfers to each member of the family to induce purely selfish but rational family members to maximize family income. The source of the altruist's power is not his concern with the individual's welfare of all members, rather his assumed ability to confront others with 'take–it–or–leave–it' choices, thus forcing the others to accept his decision at the threat point. In the bargaining model of Manser and Brown(1980), the equilibrium is determined by the feasible consumption set and a threat point is interpreted as the utility of remaining single or of getting divorced, assuming identical implications for distribution of resources in two–parent families. They treat marriage as a cooperative game: spouses with conflicting interests or preferences are assumed to resolve their differences in a manner prescribed by the Nash or some other explicit bargaining solution. A distinguishing feature of bargaining models is that family's demand behavior depends not only on total family resources but also on the resources controlled by each spouse individually.Lundberg&Pollak(1993) propose the 'separate spheres' bargaining model, where the threat point is not divorce but a non–cooperative equilibrium defined in terms of traditional gender roles and gender role expectations. This non–cooperative equilibrium, although it is not Pareto optimal, may be the final equilibrium because of the presence of transaction cost of one or both members.

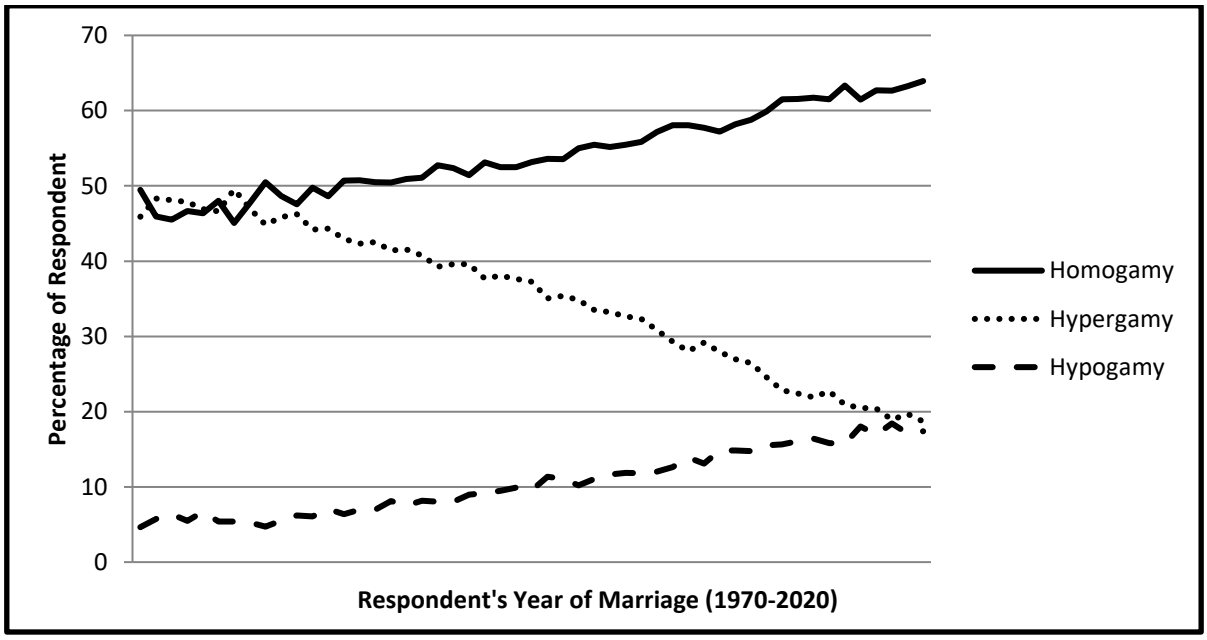
In this type of models, education may increase women's bargaining power within their households because it endows them with knowledge, skills, and resources to make life choices that improve their welfare(Duflo, 2012). More education than husband is expected to improve this bargaining power even more. In the non–cooperative bargain model, where the husband and the wife believe in two different mind–sets, wife, if more endowed, can question the authority of the husband and what he thinks can suit best for the household by having more sons. Thus, women are expected to respond differently depending upon their relative resources, primarily their human capital.

Research indicates that reallocating assets or bargaining power in favor of women benefits daughters more than sons. For example, changes in marriage regulations and inheritance rights have shifted resources towards female children(Rangel, 2006). Maternal education positively impacts daughters' height, while paternal schooling negatively affects daughters' height and positively relates to sons' height (Thomas, 1994).Grandmothers' receipt of government transfers improves girls' prospects, while transfers to grandfathers show no difference, suggesting grandmothers prefer spending on grand–daughters(Duflo, 2000).In short, higher relative education of the mother gives them more power to express their non–preference for sons, or rather be reluctant on the gender of the child.

Assortative mating represents a systematic departure from random selection in education or panmixia.It is expected that as societies develop, achieved traits (education and occupation) become increasingly important criteria of matching, whereas the roles of ascribed traits(race, ethnicity, religion) weaken (Blossfeld, 2009). As women get more education, educational hypergamy (women marrying men with higher education) has been decreasing over the last few decades in most of the countries, with India being no exception (Lin et al., 2020). **Figure 1**finds that in India more marriages gradually turnout to be hypogamous (women's relative education being higher than the husband) over the years of marriage. The question that remains whether more education within the dyad can offer differential power to the wife express her own son preference, which is not controlled or conditioned by her husband. In the backdrop of rising educational hypogamy, this is a question which is not yet answered in the context of strong and culturally embedded son preference in India and hence this paper attempts to contribute to the

extant literature on son preference by locating the importance of relative education on parental stated preference of having more male offspring.

Figure 1: Temporal shifts in relative educational attainment across National Family Health Survey (NFHS) rounds 3-5



Note: Homogamy means wife's education and husband's education are same. Hypergamy means husband is more educated than wives. Hypogamy means wives are more educated than husbands.
Source: National Family Health Survey-3(2005-06), 4(2015-2016) and 5(2019-2020), India
After the introduction, the data section presents the dataset used for the study along with the variable constructions. Section 3 outlines the methodology used. The three sub–sections 4.1, 4.2 and 4.3 present the results from data exploration, confirmatory analysis and mediation analysis. The discussions of the result are added in the same section. Finally, Section 5 contains conclusions.

2. Data

The paper is based on data from National Family Health Survey (NFHS), a publicly available databasefrom a nationally representative comprehensive survey carried out in a diverse sample of households across India. Since its inception in 1992–93, the survey has been conducted in five rounds, offering information at both state and national levels in India. The data used in the papercomprises of pooled unit–level individual cross–section data from the 3rd, 4th, and 5th rounds of the NFHS, 2005–06, 2015–16, and 2019–20. We restrict our sample to ever–married women. The sample size is reduced to 241,097 because we use only unit–level data on females for whom the husband's education and occupation are available. We also use Ministry of Statistics and Program Implementation (MoSPI) data of the respective rounds for corresponding years, for the State Domestic Products (SDP).
For a comparative detailing we have divided the 28 states and 8 union territories into two groups according to the female literacy rate(as per NFHS pooled data), with states below median female illiterate share for the country has been considered as high female literacy states and those above the median are grouped under low female literacy states.

Low female literacy states: These are the states where the percentage of illiterate females is high. This category consists of Haryana, Assam, Ladakh, West Bengal, Gujarat, Karnataka, Odisha, Arunachal Pradesh,Jammu and Kashmir, Chhattisgarh, Andhra Pradesh, Uttaranchal, Madhya Pradesh, Uttar Pradesh, Telangana,Jharkhand,Rajasthan, and Bihar.
High female literacystates: The states with low percentage of illiterate females are categorized here, the states are Kerala, Lakshadweep, Mizoram, Puducherry, Andaman and Nicobar Islands, Goa, Himachal Pradesh, Manipur, Chandigarh, Nagaland, Sikkim, Tripura, Tamil Nadu, Maharashtra, Meghalaya, Delhi, Punjab, Uttarakhand, Dadra & Nagar Haveli and Daman & Diu[i].
The focal independent variable is the relative education, with the first category where husbands and wives are equally educated coded 0 (used as reference category), the second category where husbands are more educated than wives (coded 1) and the third category where wives are more educated than husbands (coded 2). In addition, we included relative occupation of the couple, husband's education, respondent age, religion, household caste, household wealth, and respondent's land ownership statusas control variables. We created three new state fixed variables to capture the percentage of respondents engaged in agriculture in the state, the percentage of respondents not engaged in the labor force in the state, and the SDP. They have been used as control variables along with state and time fixed effects. These variables were included because agricultural work is thought to require more men in families(Pande and Astone, 2007) and because women's low labour force participationmeans that women are economically dependent on men, both of which might increase the preference for sons, already discussed in the introduction.

3. Methodology

Logistic regression has been used to determine the relationship between stated son preference and the relative education of the respondents. Logistic regression, also called a logistic model or logit model, analyzes the relationship between multiple independent variables and a categorical dependent variable and estimates the probability of an event occurring by fitting the data to a logistic curve. Binary logistic regression is typically used when the dependent variable is dichotomous and the independent variables are either continuous or categorical. The dependent variable is the stated preference for at least one son. The question that was asked 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? How many of these children would you like to be boys?' A categorical variable, capturing the stated preference was created, which consists of two categories: assuming a code 1 if the respondent indicates that she prefers having at least one sonand 0 if the respondent indicates she has no strict preference for at least one son or her ideal number of sons is zero, regardless of the stated number of daughters. This is because preference for sons does not necessarily imply non–preferenceof daughters, and hence our study is based only on SSP per se and we do not examine comparative preference for sons and daughters.
Table 1 shows that only 16.59% of the Indian female population reports to have no preference for sons, while 83.41% of the population has some kind of preference for sons. The changes over NFHS rounds,alsoreported in the table, indicates that SSP for at least son hovers around 80-82% across the rounds.As highlighted by Varma and Babu (2007) and reiterated by Robitaille and Chatterjee(2020), Indian parents continueto favor having at least one male offspring. Taking the SSP as the dependent variable, we run a logistic regression and attempt to estimate the nature of correlation relative education has with the preference.

Table 1: Percentage of respondents preferring at least one son

Stated Preference		Percentage of the respondents	
	NFHS round	Reduced sample	Full NFHS corresponding round data
Zero Son Preference	3	21.00	24.37
Prefers having at least one Son Child		79.00	75.63
Zero Son Preference	4	14.52	16.56
Prefers having at least one Son Child		85.48	83.44
Zero Son Preference	5	14.00	17.04
Prefers having at least one Son Child		86.00	82.96
Zero Son Preference	3 rounds pooled data	16.59	17.40
Prefers having at least one Son Child		83.41	82.60

Source: Analysis on unit level data from National Family Health Survey-3(2005-06), 4(2015-2016) and5(2019-2020),India

To explore this relationship further, a mediation analysis is conducted to ascertain whether the significance of the focal variable, namely relative education, stems from its association with relative occupation. By investigating mediational processes that clarify how the treatment achieves the study outcome, not only can we further our understanding of the pathology of the effect and the mechanisms of treatment, but we may also be able to identify alternative, strategies to control for the dependent variable.

Following Baron and Kenny (1986),Mediation Equations are represented as:

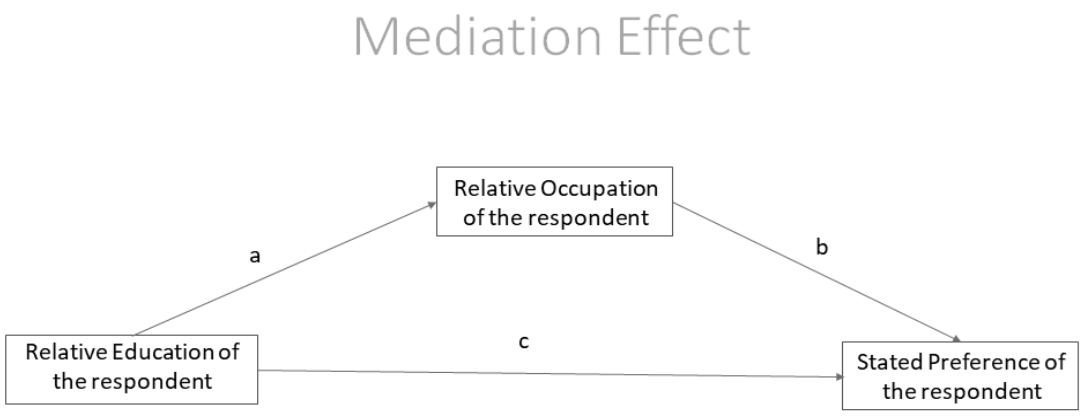
$Y_i = \alpha_i + \beta_1 X_i + \varepsilon_i$ ..... (1)

$M_i = \alpha_i + \beta_2 X_i + \varepsilon_i$ ..... (2)

$Y_i = \alpha_i + \beta_3 X_i + \gamma M_i + \varepsilon_i$ ..... (3)

Where Y_i is the SSP of the respondent, $\alpha_i$denotes the control variables, X_i is the focal independent variable(that is relative education),M_i is the potential mediator, that is the relative occupation of the respondents. This test is represented under **Figure 2**, where the paper tests the significance of the paths a, b and c. If $\beta_1$from equaltion (1) is significant, then we test (2) and (3) with the null hypothesis that β_2 is significant and $\beta_3 < \beta_1$.

Figure 2: The graphical representation of the probable mediation effect

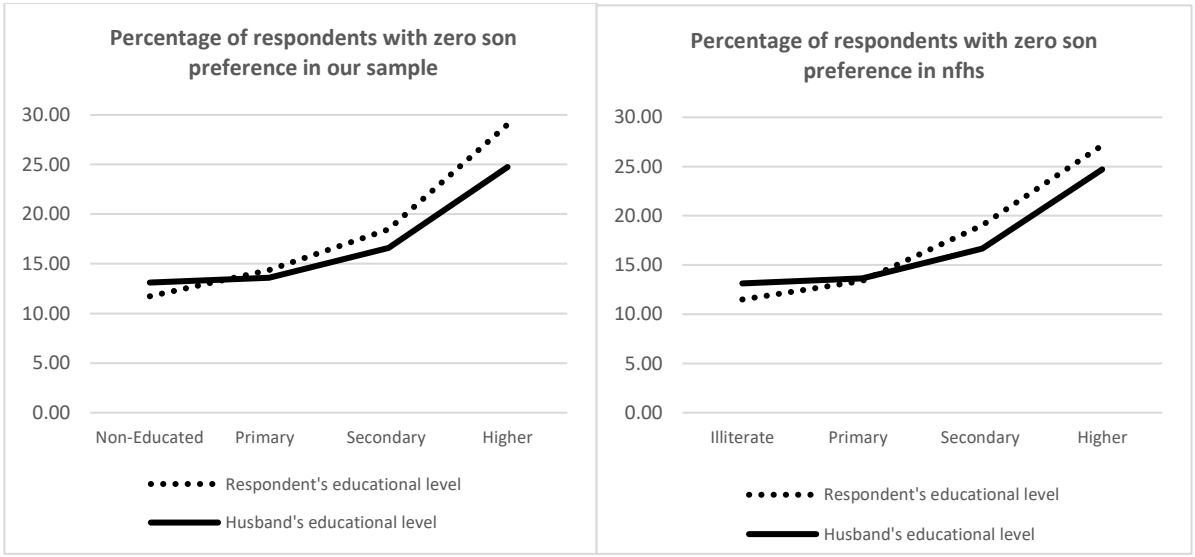


For evaluating equation (2) we employ multinomial logistic regression. multinomial logistic regression is a statistical method suitable for modeling categorical dependent variables with more than two unordered categories. This approach offers flexibility in handling independent variables, accommodating both categorical and continuous forms. The relative occupational status of the respondent served as the dependent variable. The reference category comprised households where the husband was the sole earner. The remaining three categories included households where the respondent was the sole earner, both spouses were employed, and neither spouse was employed.The multinomial logistic regression model was usedbecause the dependent variable had more than two categories that could not be ordered.

4. Results

4.1 Descriptive Analysis

Figure 3: Percentage of respondents with zero son preference



Source: National Family Health Survey-3(2005-06), 4(2015-2016) and 5(2019-2020), India

Figure 3 shows the percentage of respondents with zero son preference both in shorter sample used in the study and the entire NFHS datarises with increase in both respondent and her husband's education. As the level of education of the respondent increases from no education to highereducation, the percentage of respondents who indicated having no strict preference for even one son increasesfrom 11.73% to 29.04%. This indicates that education controlsthe respondents' preference for a son (the chi-square test also indicates that the change is significant at the 1% level). A similar trend is visible in the NFHS data so our reduced sampling is representative of the NFHS data. When the husband's education level increases from no education to higher education then the percentage of respondents who has no strict preference increases from 13.11% to 24.75%, and the difference is again significant at the 1% level. Thus, we can conclude that education could be an important tool to reduce son preference to some extent.

It is evident from Figure 3 that the decline in the wife's SSP corresponding to her own education surpasses marginally the decrease associated with her husband's level of education, as the dotted curve is steeper in the rising area. As a result, it will be important to examine how the stated preference changes as the relative education of the dyad increases.

The relative education of the dyad affects the choice for son (**Table 2**). The smallest percentage is for the cohort when the husband is more educated than the wife—13.79 percent of them have no strict son preference, remaining 86.21 percent of this cohort prefers to have at least one son. The proportion of respondents who prefer having at least one son child declines to 81.11% (100–18.89) for the cohort where the wife's education is more than the husband's. However, when the husband and wife have the same level of education, 82.19% of individuals want to have at least one boy, which is in the middle of the two extremes. Since the difference in SSP is once again highly significant at1% level, we may conclude that the relative education of the wife has a discernible influenceon the level of son preference. The results will be more reliable when the other factors affecting such preference are controlled for.

Table 2: Percentage of respondents with zero son preference

	Zero son preference in selected sample	Zero son preference in NFHS
Preference with relative education of the dyad		
Equally educated	17.81	17.78
Husband is more educated	13.79	13.70
Wife is more educated	18.89	17.95
Preference across religion		
Hindu	16.91	17.66
Christian	13.49	14.48
Muslim	16.14	16.95
Others	17.01	18.93
Preference across different economic classes		
Poorest	9.77	11.56
Poorer	12.08	14.31
Middle	15.69	17.02
Richer	18.46	19.70

Richest	24.97	24.74

Source: Analysis on unit level data from National Family Health Survey-3(2005-06), 4(2015-2016) and 5(2019-2020), India

4.2 ConfirmatoryAnalysis

The results of the logistic regression are shown in **Table 3** (the odds ratios are reported in the Table with specifications 2,4& 6). The analysis is repeated over the entire sample and then on two sub–samples: states with high and low share of illiterate respondents. Additionally, the table also consists the results of mediation analysis where the probable mediation variable is not considered in specification 1 (to be discussed in the following sub-section).

Table 3: Logistic regression results (odds ratio) on stated son preference (SSP)

SSP (at least one son coded as 1, the rest coded as 0)	India		States with a high percentage of illiterate respondents		States with a low percentage of illiterate respondents	
	Odds Ratio					
	Specification 1	Specification 2	Specification 3	Specification 4	Specification 5	Specification 6
Relative education (Ref: Husband and wife are equally educated)						
The husband is more educated	1.302*** (0.019)	1.303*** (0.019)	1.314*** (0.023)	1.314*** (0.023)	1.279*** (0.030)	1.278*** (0.030)
The respondent is more educated	0.842*** (0.016)	0.843*** (0.016)	0.825*** (0.020)	0.824*** (0.020)	0.862*** (0.025)	0.863*** (0.025)
Relative occupation (Ref: Only husband works)	-	0.871** (0.046)	-	0.909 (0.064)	-	0.817** (0.068)
Only respondent works	-	0.948*** (0.012)	-	0.963** (0.016)	-	0.921*** (0.019)
Both work	-	0.886*** (0.028)	-	0.906** (0.035)	-	0.857*** (0.046)
None works	1.302*** (0.019)	1.303*** (0.019)	1.314*** (0.023)	1.314*** (0.023)	1.279*** (0.030)	1.278*** (0.030)
Land ownership (Ref: Does not own)	1.223*** (0.015)	1.223*** (0.015)	1.221*** (0.018)	1.221*** (0.018)	1.197*** (0.025)	1.199*** (0.025)
Percentage of the female population engaged in agriculture	1.023*** (0.002)	1.023*** (0.002)	1.003 (0.003)	1.003 (0.003)	1.024*** (0.005)	1.024*** (0.005)
Percentage of female population outside the workforce	1.026*** (0.002)	1.025*** (0.002)	0.992** (0.003)	0.991** (0.003)	1.053*** (0.004)	1.052*** (0.004)

SDP	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.071	0.071	0.064	0.064	0.067	0.068
Number of observations	2,41,097	2,41,097	1,64,687	1,64,687	76,410	76,410
Model significance	***	***	***	***	***	***

Note: The robust standard errors are reported in parenthesis.Source: National Family Health Survey-3(2005-06), 4(2015-2016) and 5(2019-2020), India

It is evident that the relative education of the wife is highly significant in determining the wife's reported son preference. Relatively higher husband's education significantly increases the wife's SSP whilerelativelyhigher wife's education has negative impact on her reported son preference.Furthermore, the analysis of the relative occupation variable reveals that cohorts in which only the respondent works, both the respondent and the husband work, or neither member of the dyad works exhibit lower son preferences compared to cohorts where **the husband is the sole breadwinner.** This suggests that when the husband becomes the primary provider for the family, he tends to influence and potentially alter his wife's expressed preference for sons through negotiation or through his acceptance to social norm.It has been observed that when the husband is in a more advantageous position, either due to higher education or being the sole earner in the dyad, the wife's reported preference for sons tends to increase. Conversely, when the wife is in a more favorable situation, characterized by higher education and being the sole earner in the dyad, her reported preference for sons tends to decrease, thus conforming the intra-household bargain model of two spheres, where women can afford to question the gender norm.

At all India level, we see that if the husband has a higher education than his wife then the odds of expressing a preference for a son by the wife increase to 1.30 times, whereas,the odds reduce to 0.84 times if the wife is more educated(both significant at 1% level).

In states with a high percentage of illiterate respondents, the likelihood of valuing at least one son is 1.31times higher than a wife whose husband is more educated; however, this figure decreases to 1.27 times in states with lower illiteracy rates, though retains the significance. So,regions with high illiteracy rates tend to exhibit a higher SSP,particularly in educational hypergamy couples, while the preference falls more steeply among educational hypogamy couples(OR being 0.82 compared to 0.86 in states with low illiterate respondents).In the areas where female literacy is low and share of illiterate respondents is high, traditional gender roles and societal expectations strongly influence the preference for male offspring via patriarchy. This preference is molded by a complex interplay of cultural, social, and economic factors, where having sons is often viewed as essential for upholding the family name and securing support in later years. In contrast, regions with low female illiteracy ratestend to adopt a more progressive stance on gender roles, resulting in a diminished emphasis on son preference amongst these cohorts.Women in these areas typically have greater economic autonomy and more opportunities beyond traditional roles, fostering a more equitable perspective on their children's gender. This trend is also evident when men in the couple have lower education levels.In states with a high percentage of illiterate respondents, women who are more educated than their husbands tend to resist conforming to traditional norms and are less inclined to prioritize pleasing others, leading to a reduced preference for sons. This is in contrast to situations where women have lower education levels compared to their husbands, where they often feel pressured to compromise and conform to their husbands' preference for sons, especially

in regions with high illiteracy rates where women's initial positions are vulnerable. This pattern may be attributed to entrenched gender roles and societal expectations that give husbands more decision–making authority in family matters. In short, the power of relative education appears stronger in states where female education is poor. In other words, in states with low share illiterate women (that is to say higher average female literacy),the difference in SSP for hypogamous and hypergamous couples from homogamous couples tend to get muted owing to diminishing marginal returns from higher education in either way.

Table 3 also revealsthat land ownership has a positive influence on SSP because the family needs an heir to their property after their death; they are not willing to transfer the property to their daughter who is the daughter–in–law of some another family. Similar results are achieved when we divide the states into low and high Female Labor Force Participation(FLFP) states (presented in **Table 3A**),as Behera (2013) discusses the importance of women's economic empowerment,so the model is robust across different ways of state division.

4.3 Mediation

These results, however, can be questioned on the ground that the identification strategy is weak and the pathway of relative education to affect son preference is via relative occupation. It could indicate that the relative occupational position lends the relative education variable higher leveraging power, thus the focal point should be occupation. In order to test this, the paper uses mediation analysis to identify whether the effect of relative education is mediated via relative occupation or not.

The equations (1) and (3)are represented in Table 3, where the Specification 1 represents the equation (1) only with the focal variable and Specification 2 represents the equation(3) with focal and probable mediation variable. From the table, we find that the β_1 is significant (represented in specifications 1, 3, and 5), $\beta_3$is also significantly evident from specifications 2, 4, and 6, which reconfirms that the magnitude and significance of our focal variable remain intact even in the presence of the potential mediator.In specification 1 we see that if the husband has a higher education than his wife then the odds of SSP by the wife increase to 1.30 times, whereas, the odds reduce to 0.84 times if the wife is more educated (Significant at 1% level). In Specification 2, the identical analysis is reiterated, but with the added control for the relative occupational status of the respondents. A similar result is again obtained with no alteration in the significance or magnitude of the relative education variable.Therefore, we can conclude that there is no mediation effect in the model, as the condition β_3 is significantly less than β_1 does not hold. The figures obtained in Specification 1 are exclusively attributable to the bargaining dynamics and leveraging the power of the respondent's relative education. Also, equation (2) has been studied using Multinomial Logistic Regression, and we find that our focal variable does not quite predict the relative occupation variable; it is only significant for the cohort where the respondent is relatively more educated than her husband(given in **Table 4**).

Table 4:Multinomial logistic regression on Relative Occupation(Ref: Only husband works)

	Only respondent works		**Both work**		**None works**	
Relative education (Ref: Husband and wife are equally educated)	RRR	P>z	RRR	P>z	RRR	P>z
The husband is more educated	1.056 (0.053)	0.276	1.021* (0.012)	0.079	0.987 (0.028)	0.669

The respondent is more educated	1.264*** (0.082)	0.000	0.978 (0.016)	0.179	1.143*** (0.044)	0.001
SDP	**Yes**		**Yes**		**Yes**	
State Fixed Effect	**Yes**		**Yes**		**Yes**	
Time Fixed Effect	**Yes**		**Yes**		**Yes**	
Pseudo R2	0.101		0.101		0.101	
Number of observations	241,097		241,097		241,097	
Model significance	***		***		***	

Note: The robust standard errors are reported in parenthesis.Source: Analysis on unit level data from National Family Health Survey-3(2005-06), 4(2015-2016) and 5(2019-2020), India

The findings reveal that the paths labeled 'b', and 'c' emerges as the significant decisive factors.Consequently, we assert that relative occupation and respondent's relative education has no significant association effect on the outcome variable.Therefore, the odds of preferring sons derived from the relative education variable can be attributed solely to its independent contribution.The probable reason behind this absence of mediation can be suggested from **Table 5**, where it appears that women's labour market participation is uncorrelated with relative education. The share of women working outside the home lingers around 35–37%(summing the shares of both husband and wife work and only wife working) irrespective of the status of relative education. In fact, 64.86% wives among hypogamous couples do not work outside.The findings of the mediation analysis revealed that the magnitude and significance of the focal variable persist both when controlling and not controlling for relative occupation, suggesting that the relative education's effects are attributable to its independent intrinsic value.

Table 5: Percentage share of respondents across various types of relative occupations within each educational cohort

	Relative occupation			
Relative education	Only husband working	Only respondent working	Both working	None working
Equally Educated	61.85	1.03	33.80	3.31
Husband More	60.30	1.15	35.37	3.18
Wife More	61.25	1.23	33.91	3.61

Source: Analysis on unit level data from National Family Health Survey-3(2005-06), 4(2015-2016) and 5(2019-2020), India

Despite the detailed discussion of this analysis, we recognize and acknowledge the possibility thatourfindingscould be influenced by other unaccounted variables. Cultural factors, for instance, may play a significant role, with certain cultures potentially exhibiting lower levels of son preference, thereby facilitating marriages between sons and more educated women and thus resulting in outcomes that we achieve in the study. Conversely, cultures with higher son preference may exhibit different patterns. We try to capture this by North–South division in India (**Table 3C**), where we locate similar effect of

relative education categories in the northern states (assuming a far more stronger cultural patriarchy) and in southern states(with a significantly different cultural milluie).

The question that remains is why a woman's preference would alter with her relative education vis–à–vis her husband. Actually, Robitaille and Chatterjee (2020) identified that marriage alters a woman's priorities, increasing her emphasis on her marital family. This change frequently leads to a greater value placed on sons, influenced by cultural and social norms that the family believes in. The alignment with her partner's preferences may stem from factors like respect, altruism(motivated by a desire to please the spouse), or concern about marriage stability.The social costs of marital dissolution are notably higher for Indian women than for men, especially for those who bear the economic burdens of separation. More so for the group that has lower education levels than their husbands, and factors such as the gender wage gap, decreasing female labour force participation, and limited work experience contribute to this disparity. Women often prioritize household responsibilities and choose employment that fits their family lifestyles, leading to their absence from the workforce and lack of experience.

The limited education of women intensifies these challenges, restricting their opportunities beyond the household, as noted by Doss (2013). This situation reinforces and prolongs the fear of marriage dissolution. Education emerges as a critical factor shaping women's choices and empowerment, as emphasized by Doss (1996). Higher education often provides women with a more robust foundation, reducing anxiety and the necessity for compromise even in the event of marriage dissolution.Patrilineality, the practice of passing down main productive assets through the male lineage and living with sons in old age, intensifies women's economic reliance on male family members.

Research on family decision–making underscores the importance of relative education and earnings in shaping power dynamics (Brinberg and Schwenk, 1985). The relative assets of husband and wife can significantly impact the choices available to women, even if these choices are not individually preferred. Influences from the husband, extended family, and broader patriarchal systems often pressure women to strongly prefer sons and overlook daughters, despite their maternal love for all offspring. In the intra–household bargaining model, greater relative education enables women to manage social and financial stresses more effectively.

5. Conclusion

In India's patriarchal societal structure, males traditionally hold greater power within families, wielding decision–making authority, superior asset allocation, and social preference over females. This deeply ingrained preference for sons has persisted through time, shaping behavioral patterns. Several factors influence this son preference, with education emerging as a pivotal one—higher maternal education relative to husband correlates with reduced son preference, demonstrating a positive educational spillover effect. However, when husbands possess higher education levels within marital dyads, son preference tends to be stronger than when wives are more educated, underscoring education's role in enhancing bargaining power at the family level. Interestingly, the education effect is not actually mediated by occupation and participation in labour market; rather the educational hypogamous marital relation do offer intrinsic values to express a mother's equal stated preference for her children irrespective of their sex. The study also identifies that in states with low female literacy, the higher education of the wife in the dyad reduces son preference in higher degree, compared to states with high female literacy, where this effect is attenuated, suggesting that SSP is influenced by women's educational attainment relative to their husbands and their neighborhood which helps in strengthening

their bargaining power within the household. It also locates that culture as an omitted variable does not affect the results as the basic tenant of the paper remains robust in two culturally polarized locales: northern and southern states.

Saying this, the paper does not claim that hypogamous marriage in education can help to actually practice less son preference, which needs even more empowerment perhaps. Being educated more than husband at least can offer the wives to differ in their SSP. This analysis uncovers crucial insights into the intricate interplay of socio–economic factors and son preference, illuminating the multifaceted nature of family decision–making, gender roles, and cultural traditions within India's context.

The analysis emphasizes how educational disparities impact family preferences and challenge traditional norms. More education of both husband and wife per se might lower the son preference, unless it is enough to have a hypogamy marriage, through which the women gain empowerment to report lower son preference.

This study further reveals that in states with a high illiteracy rate, couples with the husband having higher level of education exhibit a stronger preference for sons. This can be attributed to more entrenched gender roles and societal expectations in these regions.Marriage significantly influences women's priorities, often increasing son preference due to cultural values and concerns about economic independence post–separation, particularly among less educated women. Patrilineal inheritance systems can limit women's financial independence but reinforceeducation's role in mitigating this. It further notes that women with higher education or those who are primary earners have more influence in family decisions, reducing son preference. In conclusion, the analysis affirms the importance of education and economic empowerment in promoting equitable family preferences regarding child gender, emphasizing the need for a deeper understanding of the cultural and social factors influencing son preference and their potential impact on gender equality and family dynamics.

Data availability statement: Secondary data has been used for the study from the following sources:

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[i]Lakshadweep, Dadra & Nagar Haveli and Daman & Diu, Ladakh and Uttaranchal were dropped due to the lack of availability f SDP data from MoSPI.