Understanding Son Preference: Factors, Consequences and Solutions

State: Andhra Pradesh

By

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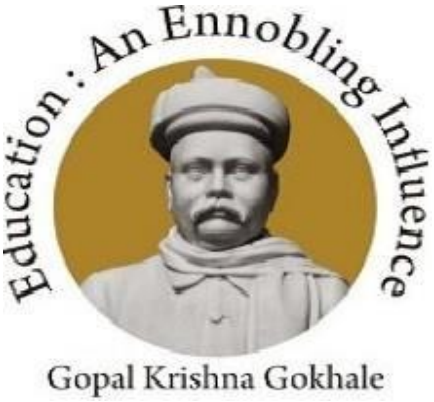
An Academic Project Dissertation Submitted to Fulfil the Requirements of the Advanced Econometrics Course
(2023-25)

Data Support: National Family Health Survey (NFHS)-5

Under the Supervision of:
Dr. Suddhasil Siddhanta



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Aug 26, 2024

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Request Date: 08/26/2024

Dear Suddhasil Siddhanta,

This is to confirm that you are approved to use the following Survey Datasets for your registered research paper titled:"Understanding Son Preference: Factors, Consequences and Solutions in the State of Andhra Pradesh India"**:**

India

To access the datasets, please login at: https://www.dhsprogram.com/data/dataset_admin/login_main.cfm. The user name is the registered email address, and the password is the one selected during registration.

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Sincerely,

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Data Archivist

The Demographic and Health Surveys (DHS) Program

ACKNOWLEDGEMENT

This work is dedicated to Dr. Ajit Ranade, distinguished Economist and past Vice Chancellor of the Gokhale Institute of Politics and Economics.

We extend our deepest gratitude to Dr. Ranade for his extraordinary contributions to the fields of economics and public policy, and for his visionary leadership that has left an enduring impact on this institution and its community. As an academic leader and a mentor, he instilled a deep respect for ethical scholarship and a dedication to social and economic justice, inspiring generations of students and researchers to follow in his footsteps.

Dr. Ranade's commitment to truth, rigor, and intellectual honesty continues to define the spirit of the Gokhale Institute. His belief in the importance of knowledge for social good resonates deeply within our community. Under his guidance, the Institute has fostered an environment where students are encouraged to think critically, question deeply, and engage meaningfully with society's most pressing challenges.

Reflecting his own ethos, Dr. Ranade once reminded us:

"No noble purpose can be achieved through cunning."

With these words, he underscored the essential nature of integrity in both thought and action. His legacy is one of purpose-driven leadership, and his example continues to illuminate the paths of those striving to make a positive difference.

We honor Dr. Ajit Ranade not only for his scholarship but for his dedication to nurturing a generation of thinkers and changemakers who are equipped to carry forward his mission of contributing to a more just and equitable world. Thank you, Dr. Ranade, for your unwavering dedication, your wisdom, and the lasting inspiration you have provided to all who have had the privilege to learn from you.

DECLARATION

This work is part of my personal USAID project, conducted in compliance with the assignment requirements for the students of M.Sc. Economics under my guidance at the Gokhale Institute of Politics and Economics, Pune, adhering to USAID project norms and standard ethical guidelines.

To the best of my knowledge, this work is original and has not been leaked to anyone, nor submitted, in part or in full, to any university or institute for the award of any degree, diploma.

Dr. Suddhasil Siddhanta
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Contents:

PREFACE

The issue of son preference remains deeply ingrained in many societies, shaping demographic trends and influencing socio-economic outcomes. This preference reflects underlying cultural, economic, and social factors that perpetuate gender inequality. Understanding the drivers behind son preference is essential to address its far-reaching consequences, which include skewed sex ratios, unequal access to education and resources, and adverse impacts on women's health and well-being.

This assignment delves into the key factors contributing to son preference, the consequences it generates for families and communities, and the potential solutions to mitigate this bias. By analysing data from National Family Health Survey, the project highlights the role of education, economic development, and policy interventions in challenging traditional norms and promoting gender equity. The analysis aims to provide actionable insights into how society can reduce son preference and foster a more balanced and inclusive environment for future generations.

Abstract: *Son preference, a deeply entrenched socio-cultural issue, continues to persist in Andhra Pradesh, this is largely because of the customary practices that are viewed as natural practices that males would ensure that the family name is carried on, provide for and protect the family. This study attempts to determine the factors that affect son preference using data from the National Family Health Survey-5 (2019–2021). A logistic regression model evaluates the impact of socioeconomic, demographic, and institutional factors on son preference, incorporating variables such as education, wealth, religion, caste, household head's gender, and total children born. These results have indicated that son preference of families in this society is complex and there are many factors that influence it. For Instance poverty and dependence on agricultural production seems to be one of the strongest links . Higher education among women shows a modest association with reduced son preference, whereas wealth and religious affiliations exhibit inconsistent and statistically weak effects. These findings highlight the complexity of son preference and the potential influence of regional or cultural shifts in moderating explicit biases. Son preference contributes to gender imbalances, perpetuating systemic issues such as discrimination, violence against women, and unequal opportunities. Addressing these challenges requires policy interventions, educational initiatives, and grassroots efforts to promote gender equity. This assignment underscores the importance of collective action in fostering a society that values individuals equally, irrespective of gender.*

Key words: ***Andhra Pradesh, Son Preference, Number of Daughters at home, Wealth Index****.*

Introduction

The social-cultural-economic dynamics in India have heavily skewed the preference for sons over daughters. This discrimination leaves a mark on family planning, child nurturing, resource allocation, among other relative factors. Here, we treat the issue as an economics problem, where 'sons' are 'goods' which the family 'purchases'.

Children are sometimes seen as 'benefits' that will help parents to optimise their household consumption and as such dictating whether to have one or more children is similar to purchasing goods as designed or wanted products. Sons are perceived as providers, successors, and signs of prestige and are favoured in society, although it can be strongly argued that are even dowry, insecurities ingrained in customs give the idea that sons are more valuable than daughters at times.

This research attempts to look at son preference in the Indian culture, through educational attributes economical and infrastructural access and the likes through analysis of NFHS data. It will further look into the options that a family has i.e. to have a few well-taken care children or to have multiple offspring for the sole purpose of ensuring they have a son.

Additionally, the study will explore strategies to reduce son preference. What social and economic changes can shift these deeply ingrained views? How can education, legislation, or awareness campaigns challenge and reshape these beliefs? Using regression analysis and other statistical models, this research will offer insights into the root causes of this issue and potential solutions.

Ultimately, the goal of the project is to understand the factors behind this bias and propose ways to foster a society where children are valued equally, irrespective of their gender.

Literature Review

Son preference has been a strong socio - cultural behaviour in most of the regions in India as well as in Andra Pradesh and this has been supported by history, economy and social factors. The literature around this dichotomy seeks to conceptualize sons as 'goods', address the factors influencing son preference, and advances to discuss the ramifications to such preferences on a social order.

Economic concept and evaluation of Sons as Goods

The children market is where Becker's theory of son preference originates, which has a zero negative utility. Therefore son preferences are based on market expectations where children are termed as commodities and namely sons who are able to serve well to the family, Becker (1981) Vision of the son as a high utility good is because maternal perception has always positioned them as able to sustain and support the lineage of the family and fulfil the social or religious expectations of the family. As such this explains the trade-off that occurs within the household such that either quantity of children or the quality of children predominates the long run satisfaction of the family.

Kabeer (1999) argued that investing in sons is also economically motivated, controlled by inheritance and norms of patriarchy where it is possible for male children to have social benefits including family wealth. Female children on the other hand are usually regarded as economic costs due to expenses for their dowry and less rights to inheritance. This preference is further intensified in rural agrarian economy

Gender preference for buttons or girls, particularly sons, is influenced by several socio-economic and demographic factors and education and wealth are identified as important factors. According to Iyer and Joshi (2013), for example, a woman who has attained a high level of education will have lower gender preference bias because she is able to challenge the norms. On the other hand, the impact of education is most times inhibited by cultural biases, which does not allow its full transformation (Desai & Andrist, 2010). The results gathered from the NFHS-5 survey validate this argument while also stating that education reduces the desire to have many sons, meant to be on average less meaningful than the statistical significance.

There are wealthier households who have a different pattern of son preference, for example. Affluence reduces dependence on the sons for economic sustenance; however, the males in the wealthy class are still considered desirable for the continuity of the lineage and family name (Kumar & Reddy, 2020). This polarization is a manifestation of the relationship between the income level of the household and the sociocultural attributes, and wealth in itself is not

sufficient to overcome the gender challenge (Pande & Astone, 2007). For instance, wealthier families in certain sociocultural settings are said to be able to access sex selection technologies which perpetuates the son preference (Bhat & Zavier, 2007).

Rural-urban differences in son preference also warrant attention. Urbanization and media exposure contribute to shifting gender norms in rural areas, narrowing the divide between rural and urban communities (Sharma & Gupta, 2021). However, rural households continue to exhibit stronger son preference due to traditional values and the economic utility of male labor (Krishna & Kumar, 2020). The NFHS-5 data suggests that rural residency does not significantly predict son preference, indicating progressive shifts in rural gender attitudes.

Religious and cultural factors also push for son preference, but to a lesser extent. Bhalotra et al. (2018) observe that religious affiliation influences gender norms, but the effect usually wanes as economic drivers gain importance. Such a trend is in consonance with NFHS-5, which found religious affiliation not to have significant effects on son preference in Andhra Pradesh. It is indicative of the decline of religion in family planning policies, as a broader form of secularization of gender norms is being observed.

The economic literature commonly delves into the trade-off on the quantity and quality of children. Thus, Becker and Lewis, 1973, assert that as families acquire more wealth, they tend to invest in quality rather than increase the number of offspring. Son preference manifests itself in this sense as a trade-off wherein families choose fewer but well-educated sons. However, NFHS-5 data reveal that families with one daughter are more likely to continue more children until a son is born. This reflects the persistence of the bias toward the birth of a male heir (Rao et al., 2015).

Families with two or more daughters show lower chances of having more children, thereby showing that there is an acceptance of daughters (Sen, 1992). This corresponds to the economic principle of diminishing marginal returns, where the desire for sons diminishes with the increase in the number of daughters (Narayan et al., 2016). Such findings bring out the significance of economic incentives and policy interventions that focus on promoting gender balance within households.

Policy interventions play a crucial role in addressing son preference by altering the economic and social incentives associated with gender bias. Programs such as 'Amma Vodi' in Andhra Pradesh, which promote girls' education, have shown promise in challenging traditional biases (Naidu & Prasad, 2015). Cash transfer schemes, conditional on daughters' education and health, further reduce the economic disadvantage associated with raising girls (Sekher & Hatti, 2010).

Public education programs focused on gender equality and celebrating women's achievements mobilize attitudes (Pande et al., 2006). Mobilizing community and religious leaders in gender equality work helps to strengthen positive discourses and weaken cultural resistance to policy interventions (George et al., 2017). Secure inheritance rights for daughters strengthen legal reforms that help dismantle the economic logic for son preference (Agarwal, 1994).

The persistence of son preference even in the face of economic and educational development calls for further research into the socio-cultural underpinnings of this bias. Qualitative studies on family dynamics, intergenerational attitudes, and peer influence can help in understanding more deeply the drivers of son preference (Deshpande & Gupta, 2020). Cross-state

comparisons with different levels of gender development can also inform more targeted policy interventions (Klasen & Wink, 2003).

Defining a 'Good' in Economic Terms and Classifying a ‘Son’ as a Good

According to economic theory, a "good" refers to any object or service capable of satisfying human wants and needs, thereby having utility, scarcity, and an ability to be exchanged or consumed. There are wide categories of different types based on consumption characteristics and effects on society. Private goods are excludable because they can only be consumed by specific people, whereas their consumption reduces the supply for others as it's rivalrous. Public goods are non-excludable and non-rivalrous; clean air and public parks are examples. Merit goods, like education, and demerit goods, like tobacco, classify those products based on social value and externalities. Classifying these is essential for the application of economic theories toward understanding preferences, consumption, and allocation of resources.

Applying this framework to relationships, especially about children, entails careful consideration for identifying a child—and a son particularly—qua "good". Since children are complex mixes of both emotional, cultural, social, and economic worth affecting the direction of choices made by parents and decisions regarding actions taken on a child, a child- especially a son, will also require a precise and adequate classification of being identified as a "good" when evaluating preferences using the insights offered by economic theories.

Utility in the Context of a Son as a Good

Utility in economics is described as the satisfaction or benefit derived from the consumption of a good or service. A child, especially a son, provides parents with various types of utility. This utility can be categorized into three major categories: emotional, cultural, and functional.

1. **Emotional Utility:** Sons can provide emotional satisfaction for their parents by fulfilling family and cultural expectations, which include the continuation of the family name and acting as emblems of continuity and stability. In cultures where strong patriarchal values are apparent, sons often play a strong role in preserving lineage and perpetuating social status.

2. **Cultural and Religious Utility**: Sons in most cultures are required to fulfill specific religious rites, care for aged parents, or perform some other functions. All these make the sons of great utility to their respective cultures.

3. **Economic Utility**: Male children may also be regarded as potential earners of both household income and labor. In the agrarian economy, male children are often valued because they can work on hard-labor tasks. Second, they are regarded as long-term economic resources for they are expected to generate cash to support their parents during old age.

Determinants of Son Preference

To model son preference within an economic framework, it is crucial to understand the determinants that drive this behavioural outcome. These determinants can be broadly classified into socioeconomic, demographic, and cultural factors:

1. **Socioeconomic Factors:**

- **Income and Wealth:** Economic constraints and perceptions of sons as economic contributors influence son preference, particularly in low-income households.
- **Education:** Parental education plays a critical role in shaping gender norms and reducing son preference. Educated parents are more likely to value daughters and recognize their potential contributions.
- **Employment:** The economic roles of parents, particularly the mother's employment status, can affect son preference. Working mothers may exhibit lower son preference as they recognize the economic potential of daughters.

2. **Demographic Factors:**
    - **Household Composition:** The number of existing sons or daughters in a family can influence preferences. Families without sons may exhibit stronger son preference.
    - **Fertility Rates:** Higher fertility rates often correlate with stronger son preference, as families seek to ensure the birth of at least one son.
3. **Cultural and Institutional Factors:**
    - **Patriarchal Norms:** Societal norms that prioritize male lineage and inheritance rights significantly influence son preference.
    - **Religious Beliefs:** Certain religious practices and beliefs reinforce the preference for sons by assigning them specific cultural and spiritual roles.
    - **Legal and Institutional Contexts:** Weak enforcement of gender equality laws, such as those prohibiting sex-selective abortions, contributes to the persistence of son preference.

Preferences in Economics: Maximizing Current and Future Utility

In economic theory, preferences are foundational to understanding consumer behaviour. Preferences refer to an individual's ranking of alternatives based on the satisfaction or utility they derive. People consume or invest in goods and services primarily to maximize their current or future utility, which represents the level of satisfaction, benefit, or well-being they experience.

Current Utility

Consumers derive **current utility** from goods and services that satisfy their immediate needs and desires. For instance, the joy of owning a new car or the fulfilment of eating a meal addresses present wants. Similarly, the birth of a child, particularly a son in many patriarchal societies, fulfils an immediate emotional or cultural desire. Sons are seen as sources of happiness, pride, and societal approval, contributing directly to the emotional satisfaction of parents.

Future Utility

Future utility involves the **long-term benefits** and potential returns from investing in goods and services. Investments in education, housing, or retirement funds aim to secure future well-being. In the context of children, sons are perceived as investments that yield future returns in the form of financial support, caregiving, and continuity of family lineage. This perception drives parents to "prefer" sons over daughters, as they expect higher long-term benefits or utility from male children.

Trade-Offs in Preferences: Number vs. Quality of Sons

The Quantity-Quality Trade-Off

In family choices with children, families face the trade-off between the number of children and the quality of investments in each child. Economic constraints force parents to prioritize resource allocation. That is, a smaller family size may be better on education, health, and opportunities for each child. On the other hand, a larger family may be diluted.

This trade-off is skewed in societies with a strong son preference. In such societies, families continue having children until they produce at least one son and tend to value the "quantity" of sons more than the "quality" of investments. In contrast, once a son is produced, investments in daughters decrease, reflecting a lower valuation of their potential utility.

Quality of sons

The perceived capabilities of sons greatly influences preferences. A son who is well-educated and successful can be regarded as a better "good" that is more likely to generate greater future returns. Such perception prompts parents to invest substantial resources into the education and upbringing of their male offspring at the expense of their female offspring.

Motivations Behind Efficient Consumption or Investment in Sons

Parents' motivation to efficiently consume or invest in their children stems from both intrinsic and extrinsic factors:

1. **Cultural Expectations:**
    - Sons are often seen as carriers of family heritage and traditions. This cultural weight motivates parents to prioritize their well-being and future success.
    - Religious rituals, such as the performance of last rites in Hinduism, often require a son, reinforcing their perceived indispensability.
2. **Economic Considerations:**
    - In agrarian or labour-intensive economies, sons contribute to family labour, enhancing household income and productivity.

- Sons are seen as financial security in old age, motivating parents to invest in their education and professional development.

3. **Social Prestige:**
    - The birth of a son often elevates a family's social status in patriarchal societies, fulfilling societal expectations and gaining approval.
    - Families may face societal pressure to "produce" male offspring, pushing parents to continue having children until a son is born.
4. **Policy and Institutional Influences:**
    - Policies that reward families for educating daughters (e.g., scholarships or cash transfers) can influence parental behaviour but may not entirely erase the deeply rooted preference for sons.

Determinants of Preference and Behavioural Outcomes

Understanding why individuals prefer sons requires a detailed look at the determinants of such behaviour. Key factors include:

Economic Determinants

- **Income Levels:** Low-income families exhibit stronger son preference due to the immediate economic benefits sons provide(as per Marx), such as labour and financial contributions.
- **Wealth Accumulation:** Wealthier families may view sons as heirs who will preserve and grow their assets, perpetuating son preference.

Social Determinants

- **Patriarchal Norms:** Deep-rooted gender biases shape preferences, as sons are often seen as "assets" while daughters are perceived as "liabilities."
- **Family Size:** Larger families may prioritize sons to ensure lineage continuity, while smaller families may focus on investing in a single high-quality child, often a son.

Cultural and Religious Determinants

- **Religious Obligations:** In many societies, sons are required for performing rituals that are believed to secure spiritual well-being for parents.
- **Cultural Legacy:** Sons are often regarded as symbols of family honor and legacy, making their preference a cultural norm.

DATASET AND VARIABLE INTERPRETATION

The National Family Health Survey (NFHS) 2019-20 dataset for Andhra Pradesh provides a comprehensive overview of the state's demographic, health, and socio-economic characteristics. As part of the fifth round of NFHS, this dataset serves as a crucial tool for evidence-based policy-making in health and family welfare.

This subset focuses specifically on households and individuals in Andhra Pradesh, enabling region-specific insights. It captures information across various dimensions, such as fertility patterns, maternal and child health, family planning, socio-economic status, and cultural dynamics. The dataset is invaluable for understanding gender dynamics, health outcomes, and the interplay between socio-economic and cultural factors in one of India's most populous states.

Dependent Variable

has_son

- **Definition**: Shows whether a household has at least one son.
- **Type**: Binary (1 = At least one son; 0 = No sons).
- **Relevance**: Reflects the cultural and socio-economic phenomenon of son preference in Indian households, shaped by traditions, inheritance practices, and economic factors.

Independent Variables

1. ***v106*** **– Highest Education Level**
    a. **Rationale**: Education influences attitudes toward gender equality. Higher education is often associated with reduced gender bias.
    b. **Hypothesis**: Families with higher educational attainment are less likely to exhibit son preference.
    c. **Definition**: The highest education level attained by the respondent.
    d. **Categories**:
        i. 0: No education
        ii. 1: Primary
        iii. 2: Secondary
        iv. 3: Higher education
    e. **Type**: Categorical

2. ***v012*** **– Respondent's Current Age**
    a. **Rationale**: Age reflects life stage and fertility behaviour. Older respondents may hold more traditional views on son preference.
    b. **Hypothesis**: Older respondents are more likely to exhibit stronger son preference.

c. **Definition**: The current age of the respondent.
d. **Filtering**: Analysis includes respondents aged above 30 (v012 > 30).
e. **Type**: Continuous

3. ***s190s* – Wealth Index within State**
    a. **Rationale**: Economic status impacts fertility preferences. Poorer households may favour sons for economic security, while wealthier families may exhibit less gender bias.
    b. **Hypothesis**: Wealthier households are less likely to exhibit son preference.
    c. **Definition**: State-specific wealth index measuring household economic status.
    d. **Categories**:
        i. 1: Poorest
        ii. 2: Poorer
        iii. 3: Middle
        iv. 4: Richer
        v. 5: Richest
    e. **Type**: Categorical

4. ***v025* – Type of Place of Residence**
    a. **Rationale**: Rural households often adhere to traditional norms, while urban households might have more progressive views.
    b. **Hypothesis**: Rural households are more likely to exhibit stronger son preference than urban households.
    c. **Definition**: Type of residence (urban or rural).
    d. **Categories**:
        i. 1: Urban
        ii. 2: Rural
    e. **Type**: Categorical

5. ***s116* – Belonging to Scheduled Caste**
    a. **Rationale**: Social identity influences fertility preferences due to cultural and economic factors. SC households might exhibit unique patterns due to historical marginalization.
    b. **Hypothesis**: Scheduled Caste households may display distinct fertility preferences.
    c. **Definition**: Indicates if the respondent belongs to a Scheduled Caste.
    d. **Type**: Binary (1 = Yes; 0 = No)

6. ***v130* – Religion**
    a. **Rationale**: Religious beliefs influence cultural norms, including gender roles and son preference.
    b. **Hypothesis**: Some religious groups may exhibit stronger son preference than others.
    c. **Definition**: Respondent's religion.

d. **Categories**: Hindu, Muslim, Christian, Sikh, Other
e. **Type**: Categorical

7. ***v705* – Husband/Partner's Occupation**
    a. **Rationale**: Socio-economic factors tied to occupation influence gender preferences. Manual labour households may prioritize sons for economic reasons.
    b. **Hypothesis**: Households with professional occupations are less likely to exhibit son preference.
    c. **Definition**: Husband's/partner's occupation.
    d. **Categories**: Professional, Agricultural, Manual labour, Not working, etc.
    e. **Type**: Categorical

8. ***v203* - Number of Daughters at Home**
    a. Having more daughters at home significantly decreases the likelihood of having another son
    b. Interpretation: Families with more daughters may feel the need to balance their offspring's gender composition.

Software for Statistics

Stata, a statistical program frequently used for econometric and health data analysis, was utilized to do the analysis. The data and visuals were produced using commands for descriptive analysis and logistic regression.

Regression Model: Logit Model

$$\underline{\text{Logit}(P(\text{has\_son})) = \beta_0 + \beta_1 \cdot \text{i.v106} + \beta_2 \cdot \text{i.s190s} + \beta_3 \cdot \text{i.v025} + \beta_4 \cdot \text{i.s116} + \beta_5 \cdot \text{i.v130} + \beta_6 \cdot \text{i.v131} + \beta_7 \cdot \text{i.v203} + \epsilon \quad (\text{if v012}>30)}$$

Regression Result (Logit Model)

```
. logit has_son i.v106 i.s190s i.v025 i.v130 i.s116 ib5.v705 i.v203 if v012 > 30, or

note: 8.s116 != 0 predicts failure perfectly;
      8.s116 omitted and 1 obs not used.

Iteration 0:   log likelihood = -605.97696
Iteration 1:   log likelihood = -576.61148
Iteration 2:   log likelihood = -576.47086
Iteration 3:   log likelihood = -576.47084

Logistic regression                                     Number of obs =    886
                                                        LR chi2(22)   =  59.01
                                                        Prob > chi2   = 0.0000
Log likelihood = -576.47084                             Pseudo R2     = 0.0487
```

has_son	Odds ratio	Std. err.	z	P>|z|	[95% conf.	interval]
v106						
primary	.857809	.174963	-0.75	0.452	.5751422	1.279399
secondary	1.031687	.19032	0.17	0.866	.7186588	1.481061
higher	.6279376	.227807	-1.28	0.200	.3083986	1.278558
s190s						
poorer	1.153939	.2648351	0.62	0.533	.7359148	1.809414
middle	1.021291	.2387369	0.09	0.928	.6459106	1.614828
richer	.9631693	.2265382	-0.16	0.873	.6074343	1.527235
richest	1.593704	.4405095	1.69	0.092	.9271079	2.739586
v025						
rural	1.114095	.2115003	0.57	0.569	.7679441	1.616273
v130						
muslim	.7763801	.2025769	-0.97	0.332	.465559	1.294715
christian	.8111813	.2346009	-0.72	0.469	.460196	1.429858
s116						
schedule tribe	.9535149	.4004565	-0.11	0.910	.4186397	2.171774
obc	1.253013	.2529829	1.12	0.264	.8435251	1.861285
none of them	1.316523	.3167807	1.14	0.253	.8215106	2.109813
don't know	1	(empty)				
v705						
professional / technical / managerial	1.494619	.6261068	0.96	0.337	.6575914	3.397074
clerical	1.725088	1.090698	0.86	0.388	.4996125	5.956471
sales	1.431775	.5010656	1.03	0.305	.7210868	2.842905
agricultural	1.513743	.4461868	1.41	0.160	.8494825	2.697429
skilled and unskilled manual	1.620616	.4846096	1.61	0.106	.9018762	2.912147
other	1.254453	.6367824	0.45	0.655	.4638411	3.392651
v203						
1	2.055009	.3293728	4.49	0.000	1.501014	2.813472
2	.4984569	.1286193	-2.70	0.007	.3005992	.8265466
3	.1764746	.1404095	-2.18	0.029	.0371053	.839322
_cons	.5739532	.2147948	-1.48	0.138	.275629	1.195165

Note: **_cons** estimates baseline odds.

Interpretation of the Model

1. Education Level (v106)

- **Primary Education:** OR = 0.858 (p value=0.452)
    - Not statistically significant; primary education does not significantly change the likelihood of having a son.
- **Secondary Education:** OR = 1.032 (p value=0.866)
    - No significant effect.
- **Higher Education:** OR = 0.628 (p value=0.200)
    - Indicates a potential reduction in the odds of having a son, but not statistically significant.

Potential Reasons for lower significance:

The insignificant effect of education on son preference in Andhra Pradesh can be attributed to **the state's progressive socio-economic landscape and cultural context**. Andhra Pradesh boasts a **sex ratio above the national average**, reflecting societal shifts toward gender equity. These shifts, supported by government initiatives like Amma Vodi, which incentivizes education for girls, and public campaigns against gender bias, have diminished the traditional reliance on sons for economic and social reasons.

Economic factors play a role as well. Increasing **female participation in the workforce and rising household affluence have reduced the dependency on sons for financial security**. Moreover, as education becomes widely accessible, its transformative effect on gender attitudes diminishes, as progressive values are already embedded in the broader social fabric.

Cultural norms in Andhra Pradesh, shaped by **diverse religious and caste compositions**, tend to exhibit lower son preference compared to more patriarchal regions of India. This cultural backdrop mitigates the unique influence of education**.**

2. Wealth Index (s190s)

- **Richer (OR = 0.963, p value=0.873) and Richest (OR = 1.594, p value=0.092)**
    - Richest households exhibit borderline significance (p=0.092p = 0.092p=0.092), suggesting higher wealth may slightly increase the likelihood of having a son.
- Other wealth categories (poorer, middle, richer) are not significant**.**

Reasons:

The borderline significance for wealthier households (OR = 1.594, p = 0.092) in the likelihood of having a son can be attributed to several factors. Wealthier families may place more emphasis on having a son due to cultural traditions and inheritance, where sons are often expected to inherit family wealth or business, thus maintaining the family legacy. Additionally,

social status and legacy may play a role, as affluent families may seek to continue their name or societal position, often by having a son.

Furthermore, wealthier households typically have **better access to healthcare and family planning technologies**, allowing them to exercise more control over the gender of their children, potentially increasing son preference through methods like sex-selective practices. Although richer families are less dependent on children for financial security, they may still favour sons for reasons of **social prestige** or cultural expectations that persist in higher-income brackets.

3. Place of Residence (v025)

- **Rural:** OR = 1.114 (p value=0.569), No significant effect; rural residence does not influence the likelihood of having a son.

Potential Reason for lower significance:

The lack of a significant effect of rural residence on the likelihood of having a son (OR = 1.114, p = 0.569) can be explained by several factors. First, **changing rural norms** show that rural areas are increasingly influenced by education, media exposure, and government programs, reducing traditional gender biases. **Government policies** like **Beti Bachao Beti Padhao and Amma Vodi** are promoting gender equity, even in rural regions. Additionally, **economic shifts**, such as urban migration and diversification of income sources, have reduced the reliance on sons for agricultural labour or old-age support. Finally, **family structure** in rural areas, influenced by migration patterns and healthcare access, may also lessen son preference. While rural areas traditionally showed stronger son preference, these changes have reduced its impact, making rural residence less significant in determining son preference.

4. Religion (v130)

- **Muslim:** OR = 0.776 (p value=0.332)
- **Christian:** OR = 0.811 (p value=0.469)

Reasons for Insignificant result

The lack of a significant effect of religious affiliation on the likelihood of having a son—indicated by the odds ratios of 0.776 for Muslim and 0.811 for Christian, both with p-values greater than 0.05—can be attributed to several factors:

1. **Cultural Shifts**: Both Muslim and Christian communities in Andhra Pradesh are undergoing **shifts towards modernity and gender equity**, reducing traditional son preference. These changes are often driven by increasing access to education, government policies promoting gender equality, and exposure to global trends, which have lessened the importance of gender in family decisions.

2. **Economic Factors**: The impact of religion on son preference has diminished as economic factors, rather than religious beliefs, have gained importance in family decisions. For instance, changes in the labour market, urbanization, and rising female participation in the workforce have shifted the focus away from traditional gender roles associated with religious communities.
3. **Diverse Social Norms Within Communities**: Both Muslim and Christian communities in Andhra Pradesh are diverse, with varying practices, norms, and levels of adherence to traditional values across different regions. These differences can dilute the effect of religion on son preference, as internal community dynamics may vary widely.

5. Occupation (v705)

- All occupation categories (e.g., professional, clerical, sales, agricultural) fail to reach statistical significance ($p>0.1$). The lack of significance for occupation in influencing son preference ($p > 0.1$) likely reflects broader societal changes. First, **gender roles have shifted**, with women increasingly entering diverse professions, reducing traditional gender biases. **Economic independence** through employment has lessened reliance on sons for financial security. Additionally, **homogeneity** in occupation types across income groups may make occupation less relevant in shaping preferences. Finally, **cultural factors** and **social norms** regarding family composition and gender equality may override occupation's influence. Overall, occupation's impact is diminished by these evolving economic and societal dynamics.

6. Caste/Tribe (s116)

- Categories (e.g., "Schedule Tribe", "OBC") do not significantly influence the likelihood of having a son, with $p>0.1$ for all.
- The lack of a significant effect of caste/tribe on son preference ($p > 0.1$) can be attributed to factors like **social and economic mobility** in traditionally disadvantaged communities, driven by government policies like reservations. **Changing societal attitudes** around caste and gender, alongside programs promoting **gender equality**, have reduced caste-based son preference. Additionally, **caste effects** may be overshadowed by other variables such as wealth, education, and family structure. In progressive regions like Andhra Pradesh, with a higher sex ratio, caste-based son preference has become less pronounced due to broader social and economic changes.

7. Number of Daughters at Home (v203)

- **1 Daughter:** OR = 2.055 (p value<0.001)
    - Households with one daughter are **twice as likely** to have a son compared to those without daughters.
- **2 Daughters:** OR = 0.498 (p value=0.007)

    - Households with two daughters are significantly **less likely** to have a son (50% lower odds).

- **3+ Daughters:** OR = 0.176 (p value=0.029)
    - Having three or more daughters drastically reduces the odds of having a son (by ~82%).

The significant impact of the number of daughters at home on the likelihood of having a son, as shown by the odds ratios, can be explained by several social and cultural factors:

1. **1 Daughter (OR = 2.055, p < 0.001)**: Households with one daughter are more likely to have a son, which may reflect a desire for gender balancing. In many societies, having a son after a daughter is viewed as a way to fulfil traditional family expectations of having both genders, especially in cultures that value having a male heir. Thus, families with one daughter may actively seek a son to achieve this balance.
2. **2 Daughters (OR = 0.498, p = 0.007)**: Households with two daughters are significantly less likely to have a son, possibly due to **gender balancing** strategies or concerns about family size. After having two daughters, some families may feel satisfied with their family structure and may not desire more children, leading to a reduced probability of having a son. This could also reflect a conscious choice to limit family size, as families may prioritize quality over quantity in children's education and resources.
3. **3+ Daughters (OR = 0.176, p = 0.029)**: With three or more daughters, the likelihood of having a son drastically decreases (by around 82%). This could indicate **family size constraints** or a shift towards accepting daughter-only households. Families with multiple daughters might be less inclined to continue trying for a son, especially if they are satisfied with their children or have already reached a desired family size. Additionally, with higher numbers of daughters, there might be reduced societal pressure to have a son, leading to lower attempts to balance gender further.

ROBUSTNESS CHECK

1. Variance inflated Factor

```
. vif, uncentered
```

Variable	VIF	1/VIF
v106		
1	1.37	0.732191
2	1.96	0.509061
3	1.52	0.658074
s190s		
2	1.90	0.526970
3	1.98	0.505242
4	2.22	0.450121
5	2.55	0.392637
2.v025	4.61	0.217041
v130		
2	1.18	0.846450
3	1.19	0.838814
s116		
2	1.19	0.838066
3	3.97	0.251696
4	2.36	0.423995
v705		
1	1.81	0.551310
3	1.17	0.856818
4	1.93	0.519041
6	5.62	0.177958
7	3.41	0.292841
9	1.24	0.805434
v203		
1	1.56	0.639978
2	1.16	0.861634
3	1.03	0.968487
Mean VIF	2.13	

Variance Inflation Factor (VIF) and Multicollinearity:

The **Variance Inflation Factor (VIF)** is a statistical measure used to detect **multicollinearity** in regression models. Multicollinearity appears when independent(explanatory) variables in a regression model are highly correlated with one another, which can distort the estimation of their individual effects on the dependent variable. VIF helps in finding how much the variance of an estimated regression coefficient is inflated due to collinearity with other independent variables. A higher VIF coefficient indicates greater multicollinearity and potential problems with model interpretation.

VIF Interpretation:

- **VIF = 1**: No correlation between the variable and other predictors.
- **VIF > 1 but < 5**: Low to moderate correlation. This is generally considered acceptable and does not pose serious problems for the regression model.
- **VIF > 5 but < 10**: High multicollinearity. The variables are somewhat correlated with each other, and this could start to affect the stability of the regression coefficients.
- **VIF > 10**: Severe multicollinearity. This is a red flag, indicating that the variable is highly correlated with other predictors and should likely be examined further or removed from the model.

VIF Results Interpretation for the Model:

The table of VIFs shows the VIF values for each of the variables in the model. The **mean VIF is 2.13**, which indicates that, on average, multicollinearity across the model is low to moderate, and there is no immediate cause for concern about multicollinearity in the overall model.

- **Variables with low VIFs** (e.g., **v106 = 1.37**, **v130 = 1.18**, **v203 = 1.56**) have minimal multicollinearity. These values suggest that these variables are not highly correlated with other variables in the model and do not pose a risk for inflating the variances of their coefficients.
- **Variables with higher VIFs** (e.g., **v025 = 4.61**, **v705 = 5.62**, **s116 = 3.97**) indicate moderate multicollinearity. In particular, **v025** has a VIF of **4.61**, and **v705** has a VIF of **5.62**, both of which are higher than 4, suggesting some correlation with other predictors.
- The **mean VIF of 2.13** suggests that overall, multicollinearity is not a major issue for the model.

2. Omitted Variable Bias Test

To assess the specification of the logistic regression model for factors influencing son preference, **a linktest** was conducted. This test evaluates whether the model is appropriately specified by testing for omitted variable bias or an incorrect functional form.

```
.
. linktest

Iteration 0:   log likelihood = -605.97696
Iteration 1:   log likelihood = -575.90194
Iteration 2:   log likelihood = -575.75102
Iteration 3:   log likelihood = -575.75088
Iteration 4:   log likelihood = -575.75088

Logistic regression                                     Number of obs =    886
                                                        LR chi2(2)    =  60.45
                                                        Prob > chi2   = 0.0000
Log likelihood = -575.75088                             Pseudo R2     = 0.0499
```

has_son	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
_hat	.9297343	.1445247	6.43	0.000	.6464712	1.212997
_hatsq	.1965631	.1599737	1.23	0.219	-.1169796	.5101058
_cons	-.0467339	.0875921	-0.53	0.594	-.2184113	.1249434

```
.
```

The results show that:

1. The predicted values (_hat) are statistically significant ($p<0.05$), indicating that the model's predictions are strongly correlated with the dependent variable.
2. The squared predicted values (_hatsq) are not statistically significant ($p=0.219p = 0.219p=0.219$), **suggesting no evidence of model misspecification due to omitted variables** or incorrect functional form.

These findings indicate that the logistic regression model is appropriately specified and does not suffer from apparent omitted variable bias or functional form errors.

Forces that can help neutralising or Reversing the preference

1. Economic Empowerment of Daughters

- **Uniform Inheritance and Educational Access**: Equal inheritance rights and the same share of property and assets for daughters and sons can help empower daughters. This approach helps break down the idea that sons keep families stable and preserve wealth. Also, making sure girls can go to school can change things. Studies in Andhra Pradesh hint that more schooling might not cut down on wanting sons. But more women working and helpful government programs (like Amma Vodi) show daughters can be valuable for the economy.
- **Tackling Dowry Practices:** The dowry system makes people want sons more by putting money stress on families with daughters. Trying to lower or get rid of dowries can ease the money troubles linked to daughters. This could make people want sons less. In Andhra Pradesh, as people get richer and have more chances to learn, this practice is fading away.

2. Educational Campaigns

- **Promoting Gender Equality:** Public awareness campaigns have a big impact on changing how society thinks. Media government, and community groups can run campaigns to question old-fashioned gender roles and show why gender equality matters. Education by itself might not fix son preference in Andhra Pradesh , but the changing social and economic situation, along with helpful programs, shows how education helps create more balanced families.
- **Expanding Girls' Access to Education:** Making sure girls can go to school just like boys is key to changing society in the long run. When people see girls can be smart and make money too, they might not favour sons as much. Programs like “Beti Bachao Beti Padhao” in Andhra Pradesh prove that education helps fight against treating boys and girls.

3. Policy and Legal Measures

- **Strict Enforcement of Anti-Sex Selection Laws:** Effective enforcement of the PCPNDT Act (Pre-Conception and Pre-Natal Diagnostic Techniques) is vital in tackling sex-selective practices that reinforce son preference. Strengthening legal frameworks, coupled with rigorous monitoring and strict penalties, is essential for addressing this issue.
- **Conditional Cash Transfers:** Programs that offer financial incentives to families for investing in daughters' health and education can effectively diminish son preference. Conditional cash transfer schemes, similar to “Amma Vodi” in Andhra Pradesh, have

shown success in encouraging families to prioritize their daughters' well-being and development.

4. **Community and Cultural Involvement**

- **Engaging Religious and Community Leaders:** Religious and community figures wield significant influence in shaping societal values. By encouraging these leaders to advocate for gender equity, communities can adopt more progressive views. In Andhra Pradesh, cultural shifts driven by religious and caste diversity provide an opportunity for leaders to promote gender equality further.
- **Role Models and Media Representation:** Featuring successful women in various fields through media campaigns can inspire families to value daughters. Real-life examples of accomplished women, whether in business, sports, or public service, help challenge entrenched gender stereotypes. Media has the power to reshape societal perceptions and highlight the potential of daughters.

5. **Wealth and Economic Factors**

- **Wealth and Son Preference:** Wealthier families, particularly those with significant assets, may exhibit a subtle bias towards sons as heirs to family wealth or businesses. Addressing this requires targeted government programs and awareness campaigns that emphasize the economic role daughters can play. In Andhra Pradesh, while wealthier families may show slight son preference, their economic status also facilitates access to reproductive technology, complicating the issue.

6. **Rural and Urban Dynamics**

- **Changing Rural Attitudes:** Rural areas have traditionally favoured sons due to their role in agricultural labour and caregiving for old aged parents. However, increasing educational opportunities, media exposure, and government interventions are gradually eroding this bias. In Andhra Pradesh, the minimal difference in son preference between urban and rural areas reflects this cultural shift**.**

7. **Religion, Caste, and Social Structure**

- **Religious Influence:** In Andhra Pradesh, religion (specifically Muslim and Christian communities) does not significantly impact son preference. This could be attributed to socio-economic progress and modernization rather than traditional religious doctrines. Encouraging religious leaders to promote gender equality can further diminish residual biases.
- **Caste and Social Mobility:** While caste-based son preference has historically been prevalent, increasing mobility and government policies promoting gender equality are reducing this trend. In Andhra Pradesh, caste-related son preference is less pronounced, highlighting the effectiveness of broader socio-economic programs over caste-specific interventions.

8. **Family Dynamics and Composition**

- **Impact of Daughters on Son Preference:** The likelihood of son preference increases in families with one daughter, reflecting a desire for gender balance. However, families

with two or more daughters are less inclined to pursue additional children for the sake of having a son. Promoting the value of daughters, regardless of family size, can help reduce the focus on having sons. Emphasizing quality of life and smaller family sizes through public campaigns can shift these preferences**.**

9. Additional Strategies

- **Encouraging Male Participation in Domestic Roles:** Promoting male involvement in household responsibilities and childcare can challenge traditional gender roles, reducing the emphasis on sons as primary providers. This approach is particularly relevant in rural areas and culturally conservative communities.
- **Family Support Policies:** Introducing policies such as paid parental leave, childcare support, and family welfare programs can help ease the financial and social burdens of raising daughters, fostering a more gender-inclusive environment.

Conclusion

The study on son preference in Andhra Pradesh using NFHS-5 data has provided valuable insights into the various socio-economic, demographic, and cultural factors that influence this persistent issue. The results highlight that while certain factors like education and wealth impact gender preferences, deeply ingrained cultural norms continue to shape household decisions.

From an economic perspective, children—particularly sons—can be conceptualized as 'goods' that households value and invest in, similar to other commodities. In this framework, families maximize their utility by preferring sons over daughters due to perceived long-term benefits such as financial security, inheritance, and social standing. This model aligns with the broader economic theory that individuals consume goods and services to enhance their current or future utility. However, in the context of son preference, the trade-off emerges between the 'quantity' of children and the 'quality' or perceived future return of having a son. Families may continue to have children until a son is born, underscoring the societal pressure to invest in male offspring.

One of the key findings is that higher education among women correlates with reduced son preference, although this relationship is not statistically significant. This suggests that while education plays a role in shifting attitudes, cultural and social factors still hold significant sway. Initiatives like 'Amma Vodi,' which focus on promoting girls' education, reflect progress in challenging traditional biases. However, the limited effect of education indicates that cultural inertia remains a barrier to gender equality.

Wealthier households showed a marginal preference for sons, which may stem from inheritance practices and the desire to continue family lineage. This suggests that economic prosperity alone is insufficient to eliminate gender bias, as cultural traditions and social expectations

continue to influence family planning decisions. The trade-off between economic affluence and traditional gender norms illustrates that while wealth can reduce dependency on sons for economic security, social prestige and legacy considerations perpetuate son preference.

Interestingly, rural residency did not significantly predict son preference, suggesting that rural areas are becoming more progressive due to the influence of media, education, and government policies. This reflects a narrowing gap between rural and urban areas in terms of gender attitudes, signalling positive changes in societal norms. Economic development and exposure to urban lifestyles may be contributing to this shift, demonstrating that cultural narratives are evolving across different socio-economic backgrounds.

Religious affiliation was not found to significantly impact son preference, indicating that economic and educational factors may override religious biases. This trend reflects broader social changes and a shift towards secular decision-making in family planning. The diminishing role of religious influence on son preference highlights the growing importance of policy interventions and public awareness campaigns in shaping family decisions.

The analysis showed that the number of daughters in a household plays a crucial role in shaping son preference. Families with one daughter were more likely to pursue having a son, driven by the desire for gender balance or societal pressure to have a male heir. Conversely, families with two or more daughters showed reduced likelihood of continuing to try for a son, indicating increasing acceptance of daughters and changing family dynamics. This pattern aligns with the economic theory of diminishing marginal returns, where the desire for a son decreases as the number of daughters increases.

Based on these findings, policy interventions should adopt a multifaceted approach. Expanding educational initiatives, offering economic incentives for families with daughters, and promoting gender equity through media campaigns are essential steps. Strengthening enforcement against sex-selective practices and engaging community leaders can further reinforce these efforts. Additionally, policies that challenge the economic rationale for son preference—such as inheritance laws favouring gender equality—can reduce the perceived utility of having a son over a daughter.

Future research should delve deeper into the socio-cultural factors that were not captured in this analysis. Exploring family dynamics, cultural narratives, and the influence of intergenerational changes will provide a more comprehensive understanding of son preference. Additionally, conducting similar studies in other states can offer comparative insights, aiding in the development of more effective national policies.

Addressing son preference requires a combination of education, economic incentives, and cultural transformation. By fostering an environment that values all children equally, society can move towards achieving true gender equality and sustainable development.

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