



Preference for Sex of Children Among Women in Nepal

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Abstract

The preference for a son at birth is one of the key issues of demographic studies conducted in less-developed countries; however, exploration of preference for sex of children among women in Nepal is rare. This paper estimates the likelihood of preference for a son or a daughter using the 2016 Nepal Demographic and Health Survey (NDHS) data, which contains a nationally representative sample of 12,862 Nepalese women. A multinomial logistic regression analysis shows that son and daughter preferences vary widely across ethnicities, educational and economic status, and rural-urban region. Regarding ethnic origin, women from the *Hill Janajati* (the largest ethnic minority group that consists of many sub-ethnic groups) prefer daughters more than the top two caste groups, the *Hill Brahman* and *Chhetri*, whereas the *Terai Brahman*, *Terai Dalit*, *Muslim*, and other ethnic minority women prefer sons more than the top two caste groups do. Similarly, less educated, poorer, and rural women prefer a son, unlike more educated, richer, and urban women in general. Women who desire more of either sex end up with more children in their household.

Keywords Preference for sex of children · Gender and demographic studies · Caste/ethnicity · Demographic and health survey · Multinomial logistic model · Nepal

Introduction

Distorted sex ratio at birth and its impact on masculinization of the Asian population have gained growing attention in academia (Sen 1989 1990; Chaudhary et al. 2009; Murphy

2014; Guilmoto et al. 2018). Indeed, the preference for a son at birth is a very common behavior that leads to numerous socio-economic consequences in locations where patriarchal kinship is deeply rooted in society, such as in East and South Asia, North Africa, and the Middle East (Bornstein et al., 2016; Das Gupta et al. 2003; Koolwal 2007). The theory of sex ratio transition introduced by Guilmoto (2009) claims that the sex ratio rises due to a combination of patriarchy and advancing sex selection technology, which will decline later as patriarchy weakens. The United Nations (2017) estimates the maximum sex ratio at birth (male births per female births) as 1.16 in China and Azerbaijan, followed by 1.14 in Armenia, 1.12 in Vietnam, 1.11 in India, and 1.09 in Pakistan, while the global average is estimated at 1.07. Miller (2001) defines such uneven sex ratio at birth caused by a patriarchal social system as “patriarchal demographics”.

The World Fertility Survey first categorized Nepal as having considerable levels of son preference (Cleland et al., 1983). Consequently, sex-selective abortions increased in Nepal significantly after abortion was legalized in 2002 (Puri and Tamang 2015; Frost et al., 2013). A considerable level of son preference in Nepal is also evidenced by the sex ratio of last-born children, which was estimated to be 146 sons per 100 daughters (Brunson 2010; Leone et al. 2003; Pradhan

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et al. 1997); this is much higher than the biological constant of 106 sons per 100 daughters ever born (sex ratio at birth) (Scarpa 2016).¹ Despite considerable son preference, Nepal is in the midst of a rapid fertility decline as birth rates have fallen from 5.1 in 1991 to 2.6 in 2011, which is largely due to improved women's education, increased contraceptive use, and growing male migration (Shakya and Gubhaju 2016). Even though declining fertility affects development outcomes positively, sex discrimination could rise with the declining fertility if smaller family size is not accompanied by a decrease in the desired number of sons (Das Gupta and Bhat 1997). Many studies in fact already evidence sex-selective abortion as a major cause of imbalances in the sex ratio in many countries, including Nepal (Frost et al., 2013). However, there is limited research about women's preferences for sex of the child across castes, ethnicities, and ecological areas of Nepal, even though the issue is crucial in addressing the unbalanced sex ratio and managing the overall demographic transition occurring in the country. This paper addresses this aspect.

Although the demand for a son is not only determined by gender discrimination within a household and society but is also led by the aspirations for an idealized family composition (Dahl and Moretti 2008; Arnold 1992), son preference generally hurts daughters (Leone et al. 2003). As resources are very limited in most households of low-income countries, son preference undermines daughters' health and education (Coale and Banister 1994) and directly leads to abuse of women, sex-selective abortion, and female infanticide (Bardhan 1982; Das Gupta and Bhat 1997). For example, in their household survey, Center for Research on Environment Health and Population Activities (CREHPA) (2007) found that all the 1263 women whose first birth had been a daughter faced different forms of psychological or mental abuse. Specifically, 86% faced continuous scolding and other mental torture, husbands of 40% threatened to marry again, 38% received inferior meals or clothes, and 18% were physically abused. Similarly, many studies (e.g., Arnold et al., 1998; Mutharayappa, 1997) show that son preference leads to severe gender discrimination and an unbalanced sex ratio in neighboring India. Another neighbor of Nepal and China also suffers seriously from high sex ratio caused by the son preference and one child policy of the nation (Golley and Tyers 2014; Zhou et al., 2012; Hesketh et al., 2011). Some experts even argued that a large number of girls, nearly 80 million, are "missing" in Asia due to neglect, sex-selective abortions, and even direct killings (Sen 1990; Kevane and Levine 2003). Therefore, there is an urgent need to uncover the determinants of preference for sex of children among women in developing countries like Nepal where there is strong son preference.

Such exploration is more important in Nepal, a country that has a very high degree of socio-cultural as well as geographical diversity. There are more than 130 ethnic groups under the four major Hindu hierarchical caste divisions and more than 120 languages (CBS 2012) in Nepal. The caste system provides the main foundation for the ethnic division in the country as most of the population (81.3%) follow the Hindu religion (ibid). The first ethnic group is *Brahman-Chhetri*, which includes the top two caste groups, *Brahman* and *Chhetri* of both the Hills and *Terai* areas. Although *Brahman* is the so-called highest caste and *Chhetri* is in the second caste rank, both are considered historically privileged caste groups, and they are scattered all over the country. The second ethnic group is *Janajati*, which includes the largest number of Nepal's indigenous population. People from this group reside in all areas and generally follow the Buddhist religion. This group can be divided into *Hill* and *Terai Janajati*. The third group is the *Dalit*, which includes the so-called untouchable low castes of the Hill and the *Terai* areas, divided into *Hill Dalit* and *Terai Dalit*. The so-called low caste people are historically the most deprived group, with limited access to the benefits of development (Arora and Sanditov 2015). They follow the Hindu religion. The fourth group is the *Newar*. People of this ethnic group mostly live in cities, including Kathmandu valley, and mainly engage in trade and commerce. Consequently, they have the highest level of human development with the highest average income and better health and educational status than any other ethnic group (NPC and UNDP 2014). The fifth group is the *Muslim*. They follow Islam. The remaining are grouped as *other*, which includes other caste/ethnic groups from both the Hills and the *Terai* areas. Furthermore, despite being moderate in size with an area of 147,181 km², Nepal has tremendous geographic diversity with wide variations in climate, including extreme cold and tropical rain (ibid); it is also a matter of interest whether the preference for sex of children differs across rural-urban dimensions. Thus, it is an interesting question whether preference for sex of children among women differs across their ethnic origin and other backgrounds.

Therefore, this paper aims to determine the preference of women in Nepal if they are given the opportunity to choose between a son and a daughter. It also aims to find out the socio-economic characteristics of women that influence their preference. The null hypothesis was that there is no difference in women's preference for son and daughter and that women have the same preference for sex of the child regardless of their economic status, caste/ethnicity, and rural-urban location.² If it

¹ Some other literature uses different terms and numbers, such as Bongaarts and Guilimoto (2015: 241) stating 105-106 as the "natural level" of sex ratio at birth (SRB). However, this variation does not make any difference to our analysis.

² As our respondents are women, we refer to the preference for sex of children as "women's preferences" or "women prefer" throughout the paper. However, it should be noted that both parents (and to some extent grandparents) are involved in the pregnancy decision, and women's preference is affected significantly by their spouse, parents, and society. Therefore, women's preference referred in this study can be considered as parent's preference or the general preference of society.

is not true, policy targeting the problem of son preference among different socio-economic strata of Nepal is necessary. To answer these questions and to test the hypotheses, we employed a multinomial logistic model using data from the 2016 Nepal Demographic and Health Surveys (NDHS), which contains a nationally representative sample of 12,862 Nepali women aged from 15 to 49 years (Ministry of Health and Population 2017), to estimate the likelihood of a preference for a son or a daughter.

Method

The Data

In this study, we used the 2016 NDHS data. This nationally representative dataset covers all 75 districts of Nepal. The 2016 NDHS is the fifth nationally representative, comprehensive household survey conducted in the country as part of the worldwide demographic and health survey project. It was carried out under the overall guidance of the Ministry of Health and Population of Nepal.

NDHS administered three sets of questionnaires to obtain information from the sample households: the household questionnaire, the woman's questionnaire, and the man's questionnaire. In this study, we select variables regarding the preference for sex of children, respondent and household characteristics, economic status, region, and ethnicity from these questionnaires as they are the key to answering our research questions. For this study, we use births data, namely Birth's Recode (BR) dataset. This dataset has one record for every child ever born to a total of 12,862 interviewed women.

Empirical Strategy

Operationalization of Main Concept

The main concept of this study came from the woman's questionnaire. For women with children, the following question was asked: "If you returned to a time when you did not have any children and could choose the number of children that you would have during your lifetime, how many would that be?" For women without children, the questionnaire asked the following question: "If you could choose the number of children that you would have during your lifetime, how many would that be?" Then, they were further asked to answer the following question: "How many of these children would you like to be boys, how many would you like to be girls and how many would it be no matter if it were a boy or a girl?"

Therefore, the responses were operationalized as multinomial with three different values: a preference for more sons (1), a preference for more daughters (2), and indifference between sons and daughters or a preference for an equal number

of sons and daughters (0). By using the woman's questionnaire, we operationalized our dependent variable as multinomial.

Furthermore, due to the non-proportional allocation of the sample to different domains and oversampling of urban areas in each domain, sampling weights were required to analyze the 2016 NDHS data to ensure the actual representativeness of the sample at the national and domain levels. Considering the non-proportionality in the allocation process for domains and urban-rural strata, sampling weights were calculated separately for each sampling stage on the basis of sampling probabilities, because the sample of the survey is a two-stage stratified cluster sample. According to NDHS, there are two main sampling weights—household weights and individual weights. The inverse of the household selection probability multiplied by the inverse of the household response rate of its household response rate group gives the household weight for a particular household. Similarly, the household weight multiplied by the inverse of the individual response rate of their individual response rate group provides the individual weight of a respondent.

The Model

Multinomial logistic models have been widely used in many studies that have a dependent variable with more than two values (Okwechime and Roberson 2015; Matejka and McKay 2015; Paudel 2011). We used a multinomial model in this paper to analyze the preference for sex of children as the dependent variable, which consisted of more than two values. This model compares the alternative decisions with a reference category.

Other things being equal, a household (both husband and wife) maximizes its *utility* (level of satisfaction) when a woman gives birth. Sometimes, either male or female makes the decision to give birth, but mostly, they make the decision jointly. The respondents have information symmetry about child preferences. Therefore, they chose a number of children that would provide them with the greatest possible satisfaction regarding the sex of the babies. Some may prefer more sons, some more daughters, and some equal or are indifferent. Because the questionnaire did not ask about the children who were actually born, but about the ideal number of children they wanted, both women with children and women without children could be participants in the survey.

For simplification, suppose that an i^{th} respondent (woman) derives maximum utility by choosing the j^{th} sex of children. Therefore, the i^{th} respondent has three choices: more sons (1), more daughters (2), or indifference between sons and daughters or an equal number of both (0). The following equation is the formulation of this concept:

$$Y_{ij} = X_{ij} + \varepsilon_{ij} \quad (1)$$

Where Y_{ij} is the household utility that the i^{th} respondent can obtain by choosing the j^{th} sex of children, X_{ij} is a function of observable variables (respondent woman's household characteristics, household economic status, rural-urban region, and ethnicity), and ε_{ij} is the noise term that represents unobservable variables. The covariates in the model are determined based on the existing literature and the country's unique characteristics. For instance, household characteristics are the basic covariates in most of the studies that use household survey data.

Specification of Variables

The preference for sex of a child takes the value of 1 if the respondent prefers to have more sons than daughters, 2 if the respondent prefers to have more daughters than sons, and 0 if the respondent is indifferent as to sons or daughters. The analytical sample size is 12,862 including all births of children. Moreover, the age of the respondent woman, the years of schooling, the sex ratio of children in the household, and whether the household head was male are included in the respondent and household characteristics.

Furthermore, economic status is based on the wealth index of the respondents and is calculated using household asset data via a principal components analysis. In many empirical analyses, the wealth index represents the indicator of the level of wealth that is also consistent with expenditure and income measures (Rutstein 1999). The wealth index is a composite index composed of key asset ownership variables and is used as a proxy indicator of household economic status. Wealth index consists of variables using productive assets (hand mill, sickle, axe, hoe, tractor, plow, etc.), non-productive assets (radio, television, refrigerator, bicycle, motorbike, car, phone/cell phone, chair, table, bed, etc.), household amenities (types of water supply, toilet, flooring, walls/house, roof, cooking fuel, light source, etc.), and others (persons per sleeping room, number of rooms, land ownership, livestock, etc.). We give different weights to construct the wealth index. For example, we give the weight one for radio and two for television. Similarly, we give the weight one for bicycle, three for motorbike, and five for car or truck, etc. We transfer categorical variables into separate, dichotomous (0–1) indicators. We examine these indicators and those that are continuous using principal components analysis to produce a common factor score for each household. The specified categories of the respondent's household economic status are poorest, poorer, middle, richer, and richest. Similarly, respondents are grouped as rural or urban and according to caste/ethnicity as *Hill Brahman-Chhetri*, *Terai Brahman-Chhetri*, *Hill Janajati*, *Terai Janajati*, *Hill Dalit*, *Terai Dalit*, *Newar*, *Muslim*, and *Other*.

The Results

Table 1 shows that the majority of the respondent women (78%) were indifferent about choosing between a son or daughter. The descriptive statistics of the dependent variable in the table also reveal that 20% respondents prefer son but only 2% respondents prefer daughter. Clearly, preference for son is considerably larger than the preference for daughter. However, the indifferent preference of a majority of the women indicates the weakening son preference in Nepali society.

Table 2 shows the total number of children in the sample households. While the number ranges from 0 to 15 with an average of 2.02, the households with 13, 14, or 15 children are just one each. The largest number of households, 28.25%, have no child, followed by 21.08% households with two children, 15.81% with one child, 15.17% households with three children, and 9.14% households with four children. Clearly, the most common number of children in a Nepali household is two.

Table 3 shows the composition of sons and daughters in the sample households. Total households with 0–8 sons in the rows and 0–11 daughters in the columns provide the combinations of sons and daughters in households. For instance, there are 3633 households with no children (both sons and daughters zero), 5128 households with no son, and 5925 households with no daughter. One household with the maximum number of 15 children has a combination of eight sons and seven daughters. Similarly, 926 households have no son but one daughter and 1108 households have no daughter but one son. One thousand four hundred ninety-five households have one son and one daughter, an ideal number and sex composition of children for a family (Rainwater 2017). In a similar way, all the combinations in households can be taken out for 0–15 children.

Table 4 shows the descriptive statistics for independent variables. The average age of respondent women is 29.24, 28.27, 33.28, and 27.10 years for the full sample, indifferent, preferring son, and preferring daughter, respectively. Similarly, average year of schooling is highest 5.16 years for indifferent sample, whereas it is 5.81, 2.40, and 6.81 for full, preferring son, and preferring daughter, respectively. On average, 0.68 households are male-headed.

The household economic status measured by the average wealth index of the full sample households is specified for the five categories—poorest, poorer, middle, richer, and richest—as 0.21, 0.21, 0.20, 0.20, and 0.18, respectively. For full sample, on average, 36% respondents are from rural areas, while 64% are from urban areas. Respondents indifferent between son and daughter, prefer son, and prefer daughter vary with rural-urban location. Table 4 also shows that respondents indifferent between son and daughter, prefer son, and prefer

Table 1 Descriptive statistics of the dependent variables: the preference for sex of children among women

Variables	Mean	Standard deviation	Number of respondents
0: Indifferent between son vs daughter	0.78	0.41	10,127
1: Prefer son	0.20	0.40	2522
2: Prefer daughter	0.02	0.13	213
Total			12,862

Source: Authors' calculation

daughter also vary with ethnicity. Although the percentages of the sample in each group category are not the same as the percentages of the respective group in the whole population, the differences are not large, and the group composition in each category represents the population well.

We present the results from the estimation model (1) in the next section showing the marginal effects on the preference for sex of children decision. We observe the results for son preference decision ($Y = 1$) in the first part denoted as (1) and the results for daughter preference decision ($Y = 2$) in the second part denoted as (2).

Son Preference Decision

In case of son preference decision, as shown in Table 5, the significant variables are the age of the respondent woman, years of schooling of respondent woman, household economic status (poorest, poorer, middle, richer, and richest), urban region, and caste/ethnicity variables (*Terai*

Table 2 Total number of children in households

Number of children	Frequency	Percent
0	3633	28.25
1	2034	15.81
2	2711	21.08
3	1951	15.17
4	1175	9.14
5	686	5.33
6	353	2.74
7	179	1.39
8	80	0.62
9	42	0.33
10	7	0.05
11	8	0.06
13	1	0.01
14	1	0.01
15	1	0.01
Total	12,862	100

Source: Authors' calculation

Brahman-Chhetri, Hill Janajati, Terai Dalit, Newar, Muslim, and Other). However, there are three insignificant variables: household head male, *Terai Janajati* and *Hill Dalit*. Women with a higher age and lower schooling are more likely to prefer a son than be indifferent to the choice between them. It means that education is crucial for being indifferent to the sex of the child and that younger women give less preference to sons.

Similarly, richer households are less likely to prefer sons than the poorer households. Compared with the poorest households, those of poorer, middle, richer, and the richest are less likely to prefer sons or more likely to be indifferent to sex of the child. Furthermore, the results show that urban households are less likely to prefer sons than their rural counterparts. Regarding the results with respect to the ethnicity variables, we found that the *Terai Brahman-Chhetri, Terai Dalit, Muslim*, and other ethnic women are more likely to prefer sons than the *Hill Brahman-Chhetri* women, while the *Hill Janajati* and *Newar* are less likely to prefer sons than the *Hill Brahman-Chhetri*.

Terai Brahman-Chhetri, Terai Dalit, and Muslim are ethnicities from Terai region where dowry system is still common. Generally, the bride side should pay dowry to groom side. Therefore, women from these ethnicities prefer son more than *Hill Brahman-Chhetri* to avoid the cost and get the benefits of dowry. In contrast, *Hill Janajati* prefer son less than *Hill Brahman-Chhetri*, because the parents of the bride get cash or some kind of payment from the groom's side in this community. These traditions are alive in *Limbu, Rai, Gurung*, and *Sherpa* communities in the form of bottles of liquor, pork or other kinds of meat, and money. In these communities, women are more empowered than among other ethnic groups, because they used to practice a matriarchal system. However, this system is not as extensive as the dowry system in *Terai*, and gender discrimination and disparity persist considerably among *Hill Janajati* as well (Neupane 2017). Interestingly, the situation for the *Newar* is different. They usually reside in the urban centers, and they are generally richer and more educated than other caste/ethnic groups. Thus, they have less son preference than the *Brahman-Chhetri*.

Daughter Preference Decision

Regarding the preference for a daughter, the age of the respondent woman, richest household, and the ethnicity variable, *Hill Janajati* are significant, while others are not. This result is consistent with Pande and Astone (2007), who found a weaker son preference among women in wealthier households in rural India. Education did not matter on daughter preference. Younger women prefer a daughter rather than being indifferent to the sex of the child.

The richest groups of households are more likely to prefer daughters than the poorest households. Interestingly, richest

Table 3 Combination of son and daughter in households

Son/daughter		Total daughters in households										Total
		0	1	2	3	4	5	6	7	8	11	
Total sons in household	0	3633	926	368	121	58	10	10	1	1	0	5128
	1	1108	1495	725	303	157	46	21	4	4	0	3863
	2	848	852	515	238	91	45	9	2	1	0	2601
	3	253	239	181	105	46	20	6	3	0	1	854
	4	60	86	63	37	19	13	1	3	0	0	282
	5	14	30	21	21	8	1	2	0	1	0	98
	6	8	8	5	4	0	1	0	0	0	0	26
	7	0	0	5	1	1	0	0	0	0	0	7
	8	1	0	0	1	0	0	0	1	0	0	3
Total		5925	3636	1883	831	380	136	49	14	7	1	12,862

Source: Authors' calculation

groups are also less likely to prefer sons. It implies that richer households prefer daughters than poorer ones, because most of them are educated and think that daughters are more caring to parents than sons.

Regarding the caste/ethnicity variables, we observe that the *Hill Janajati* prefer daughters more than the *Brahman-Chhetri*, but other ethnicities do not significantly prefer daughters. Comparing this result with son

Table 4 Descriptive statistics for independent variables

Independent variables	(1) Full sample (Y)	(2) Indifferent (Y = 0)	(3) Prefer son (Y = 1)	(4) Prefer daughter (Y = 2)
Resident's and household characteristics				
Age of respondent	29.24 (9.75)	28.27 (9.54)	33.28 (9.53)	27.10 (9.59)
Years of schooling of respondent	5.16 (4.38)	5.81 (4.29)	2.40 (3.58)	6.81 (4.23)
Household head male	0.68 (0.46)	0.67 (0.46)	0.71 (0.45)	0.67 (0.47)
Household economic status				
Poorest	0.21 (0.41)	0.21 (0.40)	0.24 (0.42)	0.15 (0.35)
Poorer	0.21 (0.40)	0.20 (0.40)	0.24 (0.42)	0.17 (0.40)
Middle	0.20 (0.40)	0.19 (0.39)	0.23 (0.42)	0.17 (0.37)
Richer	0.20 (0.39)	0.20 (0.40)	0.19 (0.39)	0.14 (0.35)
Richest	0.18 (0.38)	0.20 (0.40)	0.10 (0.29)	0.37 (0.48)
Rural urban				
Rural	0.36 (0.48)	0.34 (0.47)	0.44 (0.50)	0.25 (0.43)
Urban	0.64 (0.47)	0.66 (0.47)	0.56 (0.49)	0.75 (0.44)
Ethnicity				
Hill Brahman-Chhetri	0.34 (0.47)	0.35 (0.47)	0.27 (0.44)	0.36 (0.48)
Terai Brahman-Chhetri	0.02 (0.12)	0.02 (0.13)	0.01 (0.11)	0.01 (0.10)
Hill Janajati	0.20 (0.40)	0.22 (0.42)	0.11 (0.31)	0.29 (0.46)
Terai Janajati	0.11 (0.31)	0.12 (0.32)	0.10 (0.30)	0.08 (0.27)
Hill Dalit	0.10 (0.29)	0.10 (0.30)	0.09 (0.29)	0.08 (0.27)
Terai Dalit	0.03 (0.17)	0.02 (0.14)	0.08 (0.26)	0.02 (0.14)
Newar	0.03 (0.18)	0.04 (0.19)	0.02 (0.13)	0.05 (0.21)
Muslim	0.05 (0.20)	0.04 (0.18)	0.09 (0.28)	0.02 (0.15)
Other	0.12 (0.32)	0.09 (0.29)	0.23 (0.42)	0.09 (0.29)
Number of observation	12,862	10,127	2522	213

Source: Authors' estimation

Standard deviation in parenthesis

Table 5 Marginal effects on the preference for sex of children decision

	(1)		(2)	
	Prefer son (Y = 1)		Prefer daughter (Y = 2)	
	Coef.	SE	Coef.	SE
Respondent woman's household characteristics				
Age of respondent woman	0.033***	0.003	− 0.017**	0.002
Years of schooling of respondent woman	− 0.121***	0.008	0.004	0.023
Household head male	0.086	0.053	0.009	0.150
Household economic status				
Poorest	—	—	—	—
Poorer	− 0.133*	0.074	0.182	0.253
Middle	− 0.327***	0.079	0.285	0.263
Richer	− 0.398***	0.083	0.023	0.278
Richest	− 0.691***	0.102	1.006***	0.260
Rural urban				
Rural	—	—	—	—
Urban	− 0.094*	0.052	0.176	0.175
Caste/ethnicity				
Hill Brahman-Chhetri	—	—	—	—
Terai Brahman-Chhetri	0.468**	0.203	− 0.862	0.723
Hill Janajati	− 0.687***	0.080	0.332***	0.075
Terai Janajati	− 0.064	0.089	− 0.268	0.281
Hill Dalit	− 0.091	0.088	− 0.053	0.279
Terai Dalit	1.053***	0.118	0.009	0.535
Newar	− 0.378**	0.168	− 0.044	0.343
Muslim	0.929***	0.109	− 0.499	0.482
Other	1.101***	0.079	− 0.086	0.273
Constant	− 1.795***	0.132	− 3.939**	0.410
Pseudo R-squared	0.131			
Chi-square	1950.950			
Log likelihood value	− 6427.969			
No. of observations	12,862			

Source: Authors' estimation

Coef., coefficient; SE, standard error

*** significant at 1%, ** significant at 5%, * significant at 10% level

preference, women from *Hill Janajati* have significantly less preference for sons than daughters compared to *Hill Brahman-Chhetri* ethnicities.

Discussion and Conclusion

In this study, we used the data from the 2016 NDHS to examine women's preference for sex of the child across ethnicities and across rural and urban areas of Nepal. It revealed that education is important in reducing son preference among Nepalese women, as the multinomial logistic regression analysis clearly shows that more educated women have lesser preference for sons. Similarly, younger women are less gender

biased in Nepali society. Regarding economic status and geographical attributes, we found that women from the poorest households in rural areas are more likely to prefer a son than their counterparts from other groups. However, our findings seem to conflict with the existing studies which found that sex-selective abortion is widespread among richer urban households in Nepal (Frost et al., 2013). In this case, we need to understand that sex-selective abortion is not only associated with son preference but is also influenced by the easy availability of technology and the users' capacity to bear the costs (Robitaille and Chatterjee 2018). The cost of sex-selective abortion is very high, since it is not legal. Clearly, as poverty is considerably higher, and quality of health services is much lower in the rural areas compared to urban centers (Ministry of

Health and Population 2017), women are less likely to avail of abortion services despite their higher level of son preference. However, Bongaarts (2013: 185) rightly posed the question, “What will happen to the sex ratio in developing countries with son preferences when technology for sex-selective abortion becomes more widely available and affordable?” Certainly, if policymakers are not keen on curbing the already skewed sex ratio by addressing the key factors that raise or reduce the sex ratio, the sex ratio could rise at a faster pace in future. Arguably, better understanding of the factors that affect son preference will lead to an effective policy targeting reduction of the gender biases in society, which lie at the core of solving the problem of a highly skewed sex ratio. In this regard, this study indicates that educating girls and women, particularly from rural poor households, would effectively reduce son preference to help in balancing the sex ratio at a natural level.

Combining the result with the household economic status and rural-urban region, we observe that women from the poorest rural regions have greater preference for sons than other households. However, the results do not mean that urban, rich, and educated women have no significant gender bias. In fact, Frost et al. (2013) found that there were an increasing number of sex-selective abortions after abortion was legalized in 2002 in Nepal, and the trend was concentrated in urban areas. Specifically, educated, young women who knew the legal provisions and who had better access to health facilities, and who had sufficient capacity to pay for the services tended to use abortion services more than others. Despite causing an increase in sex-selective abortion, abortion liberalization around the world is driven by women’s rights (Boyle et al., 2015), combined with many other public health consequences of unwanted pregnancies (Gerdtz et al., 2016), and hence, a complete ban on abortions is not a rational policy option. Therefore, particularly in urban centers, sex-selective abortion can be discouraged through strong control mechanisms, such as longer prison sentences and huge monetary penalties for everyone involved in the process.

Regarding caste/ethnicity, most of the ethnicities from the Terai region are less likely to prefer daughters (i.e., more likely to prefer sons). Similarly, *Muslim* and *Other* ethnic groups are more likely to prefer sons than the *Brahman-Chhetri*. Interestingly, the *Hill Janajati* prefer daughters more and sons less than the *Brahman-Chhetri*. There are a number of reasons behind these results. For instance, the Madhesi community lives in the Terai region of Nepal, which shares a border with India and has a dowry system similar to India. In this system, they have to give a huge amount of property as a dowry to the son-in-law and his family at the time of the marriage, which creates a huge burden on the parents of the daughter (Banerjee 2014). In the Muslim community, sons have more privileges than daughters, and therefore, they also prefer sons. Similar socio-cultural practices are persistent in the other ethnic

groups, which include the rest of the castes from the Terai region. In contrast, the *Hill Janajati*’s cultural traditions generally require the parents of the groom to pay some amount, similar to a dowry, to the parents of the bride. Due to this tradition, these groups prefer sons less than the *Brahman-Chhetri*. Interestingly, kinship system of the *Hill Janajati* is less patriarchal than other groups (Bennett 2008), which is reflected in the *Hill Janajati* women’s stronger preference for girls than among women from any other ethnic group. It can have significant policy implications for targeting gender inclusion and sex-selective abortion in Nepal.

In general, the findings of the study are consistent with the previous studies that showed a significant association between son preferences and socio-demographic as well as economic factors in other social settings such as in China, India, South Korea (Guilmoto 2010; Das Gupta et al. 2003), Bangladesh, Pakistan (Jejeebhoy et al. 2015), and Vietnam (Guilmoto 2012). Their conclusions and policy recommendations are strongly relevant to Nepal, that the pace of progress on minimizing son preference through urbanization, education, and employment is too slow. Therefore, the government, civil society, and mass media through effective legislation and social movements should play more powerful roles to eliminate gender bias and value daughters equally with sons.

In the context of a high level of socio-cultural as well as geographical diversity, the findings of this study have even more significant policy implications in Nepal for targeting health and education services, together with advocacy and awareness of the underprivileged groups. Although the importance of policy targeting underprivileged groups is intuitive, the findings of this study further emphasize that the *Hill Janajati* need more income generation types of support than advocacy and awareness, since they already prefer sons less even than the most privileged *Hill Brahman-Chhetri*. Thus, the so-called high-caste *Hill and Terai Brahman-Chhetri* need awareness programs about the cost of gender discrimination and son preference, more than the *Hill Janajati* groups.

Furthermore, the problem of an unbalanced sex ratio is becoming more acute as Nepal is in the midst of a rapid demographic transition, with declining fertility and increasing life expectancy. For instance, the total fertility rate (births per woman) has dropped from 5.2 to 2.2 from 1990 to 2015, whereas life expectancy at birth (for females) increased from 54.84 to 71.45 years during the same period (World Bank 2017). Similar to other aspects of gender issues, empowerment of women throughout the country by targeting rural, poor *Terai Dalit and Muslim*, and other ethnic groups can significantly minimize son preference among women. On the other hand, educated urban women from privileged groups tend to misuse the rapidly advancing health technologies and legal provisions for abortion, which contributes to the unbalanced sex ratio of the young generation of the nation. Thus, the result of this study implies that more advocacy, awareness,

and vigilant and strong legal provisions are urgently required in urban centers of the nation. Further studies are required for specific policy formulation.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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