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Research Article

Desired Family and Expected Family Size under Various Stopping Rules: The Socio-Demographic Nexus and Realisations

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Abstract

The failure of the Indian women of child bearing ages in realising their desired fertility has been one of the main concerns of the Indian policy planners. This study attempts to explore the variability in desired family, expected family size associated with these desired families and realisations of these fertility desires with respect to key socio demographic variables in the state of Uttar Pradesh. Using statistical methods in conjuntion with the representative data from Measurement, Learning, and Evaluation (MLE) Project for the Urban Health Initiative in Uttar Pradesh, India, this study establishes the existence of variation in fertility desires, associated expected family sizes and implementation of these desires, with respect to place of residence, caste/ religion, educational qualification, age of the respondents at survey time, wealth index and city in which the respondent resides.

Introduction

In order to understand the population dynamics, it is indispensable to have knowledge about fertility intentions and family size preferences. For substantiating the various studies of fertility transition one requires to have the indicators providing a measure of these fertility intentions and family size preferences. Two such indicators defining the family size preferences are the ideal family size and desired family size. The ideal family size reflects a normative paradigm regarding the child bearing preferences, desirable for all members of society under specified contexts. The ideal family size refers to a social ideal not to the individual answering the question.According to Thomson(2001) the desired family size may be defined as "the number of children wanted in one's lifetime", and can be viewed as the demand for children. While Gary(1983) insinuated desired family size as "the number of children parents would have if there were no subjective or economic problems involved in regulating fertility". Desired family size corresponds to the couple in question and it reflects the child bearing preferences of the couples for themselves but in the absence of any obstacles. In this study, we have considered desired family size since it is the most direct measure of the respondent's own child bearing preferences and fertility desires (Goldstein, 2003). Though these desires may not instantly render actual implications on fertility transition but they provide a measure of current attitude which shapes the future trends of child bearing practices. Over the years, there have been considerable reductions in total fertility across the world and some nations have total fertility rates below the replacement level (Bryant, 2005 and Schultz, 1998), still in many developing countries a substantial proportion of unintended children exist. Also, oft times there are large gaps in fertility desires and their realizations(Uddin, 2011). According to NFHS-3 reports(NFHS, 2007) the TFR for India is 2.7

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while if all the Indian women were to have the number of children they desired the total fertility rate would be 1.9 instead of 2.7. As is the case for India as a whole, in the state of Uttar Pradesh the total fertility rate is 3.8, while the desired family size for Uttar Pradesh couples is 2.3 children (NFHS, 2007). This clearly suggests that the women's reproductive behaviour in Uttar Pradesh is perplexed by substantial normative and social impediment and these barriers are holding them back from achieving their reproductive desires.

There are several plausible explanations for this desired-actual gap.The desired family size of the couples may change with time leading to the desired-actual gap, or they made no or little utilization of available means to achieve their desired family size. But, the variability of desired family size can be ruled out by appropriate framing of schedules/questionnaires and asking the married respondents "If you could go back to the time you did not have any children and if you could choose exactly the number of children to have in your whole life, how many would that be?"

In addition to the above-mentioned factors responsible for these discrepancies in desired and actual fertility behaviour of couples, there exist one more interesting aspect that the couples may have preferences regarding the sex composition of their children. The couple may desire to have children of only particular sex, at least one child of each sex, a minimum number of children of a particular sex and much more such sex preferred compositions. A number of research studies have established the relationship among these sex preferences in child composition by couples, the number of children and expected number of children they have (Sheps, 1963 and Winston, 1932). The present study is an attempt to explore the nexus among expected family size associated with sex preferred desired family size and socio-demographic characteristics in Uttar Pradesh. Furthermore, this study addresses the gap in the expected and actual family sizes for the women who have completed their family and gauges the extent to which the fertility desires have been realised.

Methodology

Expected family size

The general mathematical expression of an average number of children for the case when a couple desire to have at least n children, of which b are boys g are girls $(b+g=n)$, before they achieve their desired minimum family size have been derived(Sheps, 1963). It was a theoretical model for varying values of b, g and n. The author assumed that only fertile unions are included, desire is constant and the parents stop to have children as soon as their desired family composition is achieved.

The expression for the expected family size without any upper limit for total family size is given as

$$E(N_{bg}) = \frac{b}{p}\sum_{x=0}^{b} {}^{n}\mathrm{C}_{\mathrm{x}}\; p^{x} q^{n-x} + \frac{g}{q}\sum_{y=0}^{g} {}^{\mathrm{n}}\mathrm{C}_{\mathrm{y}}\; p^{n-y} q^{y} \qquad (1)$$

Further, keeping all the other assumptions same, the authors fixed the upper limit to the total family size by assuming that as a family reaches the size of L children it stops growing, regardless of the sex distribution. In this case the expected family size is given by

$$E(N_{bg}) = L - p^{b} q^{g} \sum_{M=n}^{L-1} (L-M)\left[{}^{M-1}C_{b-1}\, q^{M-n} + {}^{M-1}C_{g-1}\, p^{M-n}\right] \qquad (2)$$

where; b, g = the minimum number of boys and girls desired, respectively.

N_{bg} = size of family when the minimum number of boys and girls is achieved.

p = probability of having a male child.

q = probability of having a female child and $q = 1 - p$.

L = upper limit on total family size, $n = b + g$.

In this study, to gaze the fertility desires and actual behaviours, the model (2) have been utilised in conjunction with a real data under a set of sex preferred stopping rules. Obviously, no couple will go on reproducing children indefinitely instead, they have preferences regarding the size and sex composition of their family. We defined some stopping rules characterizing these family preferences. It is possible to define a number of stopping rules corresponding to each desired family size with sex preferences, but from the application point of view, we considered nine such stopping rules, each having a specified upper limit. The nine stopping rules are

S1 : Desire to have only one child of either sex.

S2 : Desire to have two children of either sexes(male or female).

S3 : Desire to have one son only and will proceed maximum up to parity 3 to have one son.

S4 : Desire to have two sons only and will proceed maximum up to parity 4 to have two sons.

S5 : Desire to have one son and one daughter but proceed maximum up to parity 4 to achieve this desired combination.

S6 : Desire to have two sons and one daughter but proceed maximum up to parity 5 to achieve this desired combination.

S7 : Desire to have one son and two daughters but proceed maximum up to parity 5 to achieve this desired combination.

S8 : Desire to have two sons and two daughters but proceed maximum up to parity 6 to achieve this desired combination.

S9 : Others, this category represents those who desire combinations other than above mentioned or provide non numeric responses like don't know, it's god's will etc.

The upper limits for each of the nine stopping rules(characterising the desired family sizes with sex preferences) have been taken to be two more than the total number of desired children, other than that for S9. Using equation (2) and given the values of L, n, b, g and p expected family sizes for each of S1, S2,... S8 can easily be obtained (Table 1). The expected family size for S9 has been considered to be 5.5. For the sake of simplicity, in equation (2), the probability of having a male child have been considered to be 0.5, consequently, the probability of having a female child is also 0.5.

A number of socio-demographic characteristics may inveigle the desired family size and it's composition. Now, given the bivariate distribution of the women according to the considered socio-demographic variables and the nine stopping rules, one can easily calculate the expected family size for women from different socio-demographic backgrounds by taking the weighted average of expected family sizes for each of nine stopping rules S1, S2,... S9, the weights being equal to the proportion of women in a specified category of a socio-demographic variable opting for S1, S2, ...S9. Chi-square test has been performed to verify if the there exists any association between the considered socio-demographic variables and expected family size. To affirm the variation of expected family size from one category to another within each explanatory variable one-way analysis of variance has been performed.

Degree of preference implementation

Bongaart proposed a model which summarizes the quantitative relationship between fertility and it's determinants (Bongaarts, 1993). According to this model, observed fertility F is the sum of it's wanted and unwanted components:

$$F = F_w + F_u, \tag{3}$$

where F = total fertility (births per woman); F_w = wanted total fertility and F_u = unwanted total fertility. Unwanted fertility is a function of difference between supply and demand $F_n - F_w$, and the degree of preference implementation

$$F_u = (F_n - F_w) \times (1 - I_p), \tag{4}$$

where F_n = natural total fertility and I_p = index of preference implementation, and

$$F_n = F/C, \tag{5}$$

$$C = 1 - 1.02 \times U, \tag{6}$$

where C is an index between 0 and 1 that measures the proportional reduction in natural fertility ascribable to deliberate birth control and U is the proportion of married women who practices contraception. On rearranging equation (4) we get:

$$I_p = \frac{F_n - F}{F_n - F_w} \tag{7}$$

To observe the extent to which the respondents(with completed family formation) implemented their fertility desires in their actual fertility performances, we followed the above model with little alterations. In place of F_w we considered F_e = expected family size and F is taken as total number of children per woman. Therefore, we have

$$F = F_e + F_u, \tag{8}$$

$$F_u = (F_n - F_e) \times (1 - I_p), \tag{9}$$

where F_n and C remain same as defined above and

$$I_p = \frac{F_n - F}{F_n - F_e} \tag{10}$$

Data

This study uses baseline data from the Measurement, Learning & Evaluation Project (MLE) for the Urban Reproductive Health Initiative (URHI). The Urban Reproductive Health Initiative (URHI) also referred to as Urban Health Initiative (UHI), is a multi-country program, including India, Nigeria, Kenya and Senegal. Focused at the urban poor, URHI is an attempt of The Bill & Melinda Gates foundation to promote ingenious family planning programs through various cost-effective interventions that enhance the demand as well as access to high-quality family planning programs. To pace the impact of URHI, the Measurement, Learning, and

Evaluation (MLE) Project was simultaneously initiated by The Bill & Melinda Gates foundation led by the Carolina Population Centre at the University of North Carolina in Chapel Hill. In India, baseline data were collected in 2010 from women in six cities of Uttar Pradesh using individual-level surveys and facility-based surveys in each of the six cities. At baseline, a representative sample of currently married women aged 15–49 was surveyed from each city. It was intended to survey about 3,000 women per city in order to facilitate a comprehensive evaluation of the programs at the city level. A total of 17,643 women were interviewed at baseline in the six cities of Uttar Pradesh namely Agra, Aligarh, Allahabad, Gorakhpur, Moradabad, and Varanasi.

Making use of fertility preferences data we deduced the information regarding the desired family size (consequently the nine stopping rules S1, S2,....S9) favoured by the respondents. The socio-demographic characteristics seemingly governing the study variable which have been considered in this study are as follows : residence (urban slum, urban non-slum), caste/religion (SC, OBC, general, Muslim SC/OBC, Muslim general), educational qualification (no or nominal education, primary, secondary, higher), age (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49), wealth index (poorest, poor, medium, rich, richest) and city(Agra, Aligarh, Allahabad, Gorakhpur, Moradabad, Varanasi).

Results and discussions

Distribution of respondents

Table 2 represents the general characteristics of women under study in both the age groups 15-29 years and 30-49. The age group 15-29 years consists of all the women with or without any living children and majority of women in this age group have not completed their family while the age group 30-49 years comprised of women aged 30-49 years and who have completed their family. Those women who were aged more than 30 years of age and yet not have completed their families have not been considered for comparing the fertiltiy desires and its realisation.

Distribution of stopping rules

Table 3 shows the popularity of nine considered stopping rules among the women in both age groups 15-29 years and 30-49 years in Uttar Pradesh. More than 53 percent of the women aged 15-29 years and about 38 percent among the women aged 30-49 years stated a family of one son and one daughter with maximum parity 4 to achieve the same(S5) as their preferred stopping rule. S2(favoured by 17.4 percent) and S6(favoured by 13.3 percent) were next two most popular stopping rules reflecting the desired family structures for the women aged 15-29 years. Whilst, among the women aged 30-49 years, S6 was second most desired family structure and favoured by one-fifth of these women, whereas, S7 and S8 were third most preferred stopping rules each favoured by 12.9 percent of them. Table 3 exhibits the declining popularity of stopping rules S6, S7, S8 and S9 among the younger age group, therefore, reflecting their desire for family structures of smaller sizes.

We have classified the women in two age groups of 15-29 and 30-49 years according to their reported age at the survey time. Majority of women in age group 15-29 years haven't completed their families yet and thus they can realise their fertility desires. Therefore, directing our gaze towards their normative aspirations about the desired family can provide an outlook of future fertility paradigm. But, the difference between actual family size and expected family size associated with the desired families of 15-29 years aged women, may not veritably reverberate the excess fertility as they are yet to complete their families. This purpose can be achieved if we

consider the women aged 30-49 years, who are through with their child bearing activities. Table 3 and Table 4 provide distribution of the women aged 15-29 and 30-49 years respectively, by different stopping rules associated with their desired family and socio-demographic variables under consideration. It can be observed from these two tables that elevation in socio-demographic stratum induces a reduction in percentages of women favouring desired families with large expected family sizes in both age groups. Looking for differences offered by residential classification, it is evident that in the age group 15-29 years (Table 3), the percentage of women desiring to have one son & one daughter(S5) was almost equal in the urban slum and non-slum areas. Stopping rules S6, S7, S8 and S9(having higher expected family sizes) were slightly preferred in urban slum areas as compared to urban non-slum areas while S1 and S2(stopping rules without any sex preference) were more favoured in urban non-slum areas for this age group. For the women aged 30-49 years residential differences were more apparent(Table 4). In this age group, more than two-fifths of the urban non-slum residents favoured S5 against 34.2 percent urban slum residents. The popularity of other stopping rules followed a similar pattern as it was observed for the women in age group 15-29 years. It is worthwhile to mention that the respondents in the two age groups reflected wide differences with respect to choices of stopping rules S5, S6, S8 and S9(Table 3 and Table 4). The variable caste/religion brought out the diversity in fertility desires across different caste/religious affiliations. Looking at Table 3(consisting women aged 15-29 years), it is evident that for the respondents belonging to general caste/religion group, 7 percent expressed one child of any sex(S1) as their desired family, whereas, for all the other caste/religion groups this percentage was around 3 percent or lesser. About three-fifths of the women belonging to general caste/religion stated one son and one daughter(S5) as their desired family while for the respondents belonging to Muslim SC/OBC, Muslim general, SC, and OBC the percentages were 44 percent, 47.8 percent, 51.5 percent and 57.4 percent respectively. Also, having a glance at the stopping rules S6 to S9 one can easily perceive that higher percentage of women from Muslim SC/OBC, SC, Muslim general and OBC caste/religion favoured these stopping rules. This suggests that stopping rules having greater expected family size are more popular among Muslim SC/OBC, SC, Muslim general and OBC women as compared to women belonging to general caste/ religion. Similar preferences for various stopping rules were observed across the different Caste/religious groups among the respondents aged 30-49 years. But, the gap in popularity of different stopping rules between general and other caste/religious affiliations widened for this age group, for example, the most popular stopping rule S5 was preferred by 52.4 percent of the women from general caste/religious affiliation, whereas, only 23.2 percent of women having Muslim SC/OBC affiliation favoured S5. Also, while the general-OBC gap in the popularity of S5 among the 15-29 years aged women was only of 1.7 percentage point for the women aged 30-49 years this gap was widen to 12.7 percentage points.

The variations in desired family structure become more pronounced as we move across the educational classification of women in both age groups 15-29 years and 30-49 years. Viewing at women aged 15-29 years the percentage favouring S1 i.e. one child only as their desired family, rises from 1.1 percent for no or nominal education group to 9.2 percent for the higher educational group. A substantial preference for S5(one son and one daughter with maximum parity 4) is observed among more educated females as more than 57 percent of the women having higher than secondary education expressed S5 as their desired family while 45 percent of the women having no or nominal education favoured this stopping rule. Increasing levels of education tend to reduce the proportion of women who elected the stopping rules S6, S7, S8 and S9 as their desired family. The popularity of S8 declined sharply from 8.4 percent among no or nominal educated respondents to 0.4 percent for higher education group of women. For 30-49 years aged women predilections for various stopping rules across the four educational groups remains more or less similar to that what was observed for the women in age group 15-29 years. There remained differences between two age groups in terms of preferred stopping rules by educational attainment

of respondents. In the comparison to women in age group 30-49 years, the percentage of women opting for S5 is higher in 15-29 years age group women by 19.8, 14.5, 10.8 and 2.8 percentage points for no or nominal education, primary education, secondary education and higher than secondary education groups respectively. With reference to the age of respondents at the survey time, it is observable from both Table 3 and Table 4 that popularity of S5, S2 and S1 plummeted in the older age groups and S6, S8 and S9 were preferred by a greater percentage of older women as compared to their younger counter parts.

Apropos economic status assessed in terms of wealth index, the choices of various stopping rules follow a similar pattern as observed for various educational group. Table 3 and Table 4 substantiate the existence of disparities in popularity of the nine stopping rules between the two age groups 15-29 years and 30-49 years, within the same wealth index quantiles. These variations are identical to that what we observed for the educational attainment groups. The six Uttar Pradesh cities being studied did not exhibit much variability with regard to desired fertility of their respondents; therefore, the popularity of the nine stopping rules was more or less comparable in each of these cities with few exceptions. For the women in age group 15-29 years, two non sex preferred stopping rules S1 and S2 were most popular in Allahabad(6.5 and 24.8 percent respectively), S5 was favoured by more than 57 percent women in Varanasi, while S8 and S9 (having greater expected family size) were most preferred in Aligarh as compared with rest five cities. Similar patterns were observed for the women in age group 30-49 years in six cities except the fact that S5 was most popular in Allahabad(43.7 percent).

Statistical analysis

For both 15-29 years and 30-49 years aged women, the chi-square analysis established the highly significant association of stopping rules symbolising the desired family, with the six socio-demographic variables(residence, caste/religion, age, education, wealth index, and city) considered as explanatory variables(Table 5). Further, using Table 1, Table 3 and Table 4 mean expected family size for each stratum of the six explanatory variables was obtained, for both 15-29 years as well as 30-49 years aged women. The mean expected family size varies from one stratum to another apiece the six explanatory variables. Furthermore, the two groups of 15-29 years and 30-49 years aged women differ widely with regard to mean expected family size but, they move in similar fashion from one category to another of the six socio-demographic variables under study. Table 6 reflects the higher mean expected family size for urban slum residents(3.71 and 3.05 for 30-49 years and 15-29 years age groups respectively) as compared to that for urban non-slum residents(3.36 and 2.9 for 30-49 years and 15-29 years age groups respectively). But, the residential difference narrows down to 0.15 in the younger age group from 0.35 observed for the older age group.

From Table 6 one can observe that in both the age groups, the mean expected family size for Muslim SC/OBC is highest among the five caste/religion categories, followed by Muslim general. Whilst, for caste/religious group general(which represents Hindu general) not only the mean expected family size is minimum, but also, it's values for the women in two age groups 15-29 years and 30-49 years, are quit close (2.62 and 2.89 respectively), which is not the case for other four caste/religious groups. Table 6also enables us to witness the sharp decline in mean expected family size with increasing educational level. For the women in age group 15-29 years, the mean expected family size is highest(3.38) for women having no or nominal education and that for higher education group is least(2.46). A similar pattern is discerned among the women in age group 30-49 years, no or nominally educated women have highest(4.05) and higher educated women have least(2.6) mean expected family sizes. Also, increasing levels of education constricted the mean expected family size in two age groups under consideration. Identical variations can be contemplated for elevating levels of wealth index in both the age groups(Table 6). The six cities under consideration are situated in Uttar Pradesh. Of the six cities, each has

almost equal mean expected family with few exceptions. In the age group 15-29 years, Allahabad had least mean expected the family size of 2.75 followed closely by Gorakhpur having 2.83 as mean expected family size. For rest four cities, the mean expected family size was close to 3.0. Next, for age group 30-49 years also, Allahabad had least mean expected family size(3.03) while for other five cities, mean expected family size was greater than 3.5, Aligarh having the highest value of 3.76.

One-way analysis of variance

Table 6 presents the result of one-way ANOVA performed to investigate the significance of the difference between different stratum of each explanatory variable with regard to mean expected family size, for both the age groups 15-29 and 30-49 years. An analysis of variance showed that effect of residence on mean expected family size was highly significant for both younger as well as older age groups under consideration(p value $\leq .01$). The variation among the five caste/religious groups with regard to mean expected family size was significant at 1% level of significance for both the age groups. Post hoc LSD test revealed that among 15-29 years age group, the mean expected family size for SC and Muslim general groups were not significantly different. Tha Table also shows that in both the age groups, higher levels of education induced a significant decline in the mean expected family size. Also, the Post hoc LSD test brought out that mean expected family size for each of the four educational levels differed significantly from other three. The mean expected family size declined slightly but significantly across the age wise subdivision of the women in the age group 15-29 and 30-49 years. Among 15-29 years aged respondents, the women aged 15-19 years did not differ significantly from those who were aged 20-24 years. The pronounced declination in the mean expected family size accompanied by increasing levels of wealth index was found to be highly significant(p-value $\leq .01$) in ANOVA test and Fisher's LSD test verified that, for both the age groups 15-29 and 30-49 years, women corresponding to each of the five wealth index groups are significantly different from rest four in terms of mean expected family size. The variation in the mean expected family size across the six cities was found to be significant in one way ANOVA, for both younger as well as the older group of women. Furthermore, conducting Post hoc LSD test discerned the cities which were not significantly different from each other with respect to study variable (Table 6).

Difference in mean expected and mean actual family sizes

Having a glance at the disparities between expected family sizes(associated with the desired family) and actual family sizes provide an approximation of extent to which the reproductive wishes have been realised. To recognise the women who realised their fertility desires, only the women in age group 30-49 years have been considered since this age group has been comprised of only those women who have completed their family formation. Table 7 provides the mean expected family size, mean actual family size and difference between mean expected and mean actual family size according to different variables under consideration. It can be observed from the fourth column in Table 7 that, in Uttar Pradesh for women belonging to urban slum areas, the difference between mean expected and mean actual family sizes is about half child more than that for women residing in non-slum areas. Among the five caste/religious groups, the mean actual family size for women belonging to Muslim SC/OBC exceeded their mean expected family size by more than one child while for caste/religious group general, this difference was negative. It leads us to infer that for general caste in Hindu religious affiliation, mean actual family size is less than mean expected family size for them. The discrepancies in mean expected and mean actual family size appear more pronounced while moving across the four educational groups. For the women having no or nominal education this difference is more than one child and with an increase in education, it narrows down. For women educated up to secondary levels, mean expected and mean actual family sizes are almost equal(3.26 and 3.34 respectively) and for higher education group the difference becomes negative. This ignites the

thought that educational trajectory seems to be shaping the realization of fertility behaviour among Uttar Pradesh women. Furthermore, with an increase in current age(reported by respondents at survey time), the mean expected and mean actual family size difference increased from 0.13 to 0.84 for the age groups 30-34 and 45-49 years respectively.

The economic status of women represented by wealth index makes the expected-actual difference more pronounced. For those women who belong to poorest wealth index quantiles, the difference was of more than one child and for rich the mean expected and actual family sizes were quite close (3.34 and 3.48 respectively). For the richest wealth index quantile, this difference was negative, which gives an inkling that in the state of Uttar Pradesh, the economically most privileged women went to have a family smaller than they desired. Moving across the six cities under consideration, the difference in mean expected and mean actual family sizes ranges from 0.63 for Allahabad to 0.18 for Gorakhpur.

Fertility preference implementation index

Table 8 gives the estimates of degree of preference implementation index(I_p) based on F, F_e and F_n as discussed in section 2.2. For each category of the six explanatory variables, values of F, F_e, F_n and I_p was calculated and assuming one of these categories as a reference, the percent change between this reference category and given category for each of the explanatory variables was obtained. As suggested by Table 8, though the degree of preference implementation appears to be appreciable, there exists underlying variation offered by different stratum of the explanatory variables. Moving from urban non-slum to urban slum residences, the preference implementation declined by more than 5 percent. Investigating the caste/religion wise variability for the same, we found that in Uttar Pradesh, Muslim OBC/SC women has largest percentage difference(-28.12 percent) in the degree of preference implementation as compared to general women. Also, large departures exist among general - Muslim general(-18.82 percent) and general - SC(-14.48 percent) caste/ religious groups. Educational ascent constricted the percentage difference in I_p values, higher education group being the reference of comparison. Among Uttar Pradesh women maximum percentage difference in the degree of preference, implementation index was between higher education and no or nominal education group(-22.25 percent). Furthermore, considering 30-34 years age group as reference, with progression in age, the percentage difference in I_p values widened being -17.14 percent for 45-49 years age group. Table 8 reflects that attainment of fertility desires in Uttar Pradesh is higher in economically privileged groups of women compared with those belonging to lower wealth index quantiles. As the women under consideration came closer in economic strata, the percent difference in preference implementation index slenderised from -18.75 percent for poorest to -5.14 percent for rich, richest being the reference. Probing the cities, Gorakhpur has highest value of I_p. Varanasi and Agra had least percentage difference in degree of preference implementation compared with Gorakhpur(-3.02 and -3.06 respectively) while, for Aligarh this percentage difference was maximum(-14.16)

Conclusion

A couple's desired family size is largely affected by preferred sex composition of children (Sheps, 1963). Therefore, probing the mere number of desired children, disregarding the sex preferences associated with them may not canvas the fertility desires accurately. Therefore, adopting a pragmatic approach, the authors first reckoned the expected family sizes associated with the nine stopping rules(S1, S2,...S9). Thereupon, this study attempted to examine expected family size, it's association with different socio-demographic variables and implementation levels

of these fertility desires for women in urban Uttar Pradesh. Findings in this study indicate the existence of noteworthy variation among women belonging to the different stratum of the six considered explanatory variables, with regard to expected family sizes as well as an implementation of their fertility desires. Most prominent variations were observed by caste/religious affiliation, educational qualification, and wealth index. Gazing only the discrepancies between mean actual and mean expected family sizes may not be sufficient to empathise the excess fertility, therefore, one also needs to look for the extent to which the reproductive wishes have been realised in the society under study and which rudimentary factors are governing these realisations. The degree of preference implementation index (I_p) and the percentage difference in these I_p values also vary within the residence, caste/religious affiliation, education, current age, wealth index and city of residence. However, most eminent variations were according to caste/religious affiliation, education and wealth index.

The outcomes of this study suggest that while, in Uttar Pradesh the women belonging to general caste/religious affiliation, higher educational group and those belonging to richest wealth index quantiles have implemented their fertility preferences, those belonging to socially, educationally or economically deprived part of the society are lagging behind. The authors, therefore, recommend the policy planners that efficient efforts should be made for regularising the fertility behaviour of these women so that the women and society both could be free from the burden of the excess fertility.

Table 1: Expected family size for different stopping rules

Upper limit (L)	S1	S2	S3	S4	S5	S6	S7	S8	S9
1	1	–	–	–	–	–	–	–	–
2	–	2	–	–	–	–	–	–	–
3	–	–	1.75	–	–	–	–	–	–
4	–	–	–	3.25	2.75	–	–	–	–
5	–	–	–	–	–	4	4	–	–
6	–	–	–	–	–	–	–	5	5.5

Table 2: Percentage distribution of respondents according to different socio-demographic variables

Socio demographic variables	Aged 15-29 years	Aged 30-49 years
Residence		
Urban slum	53.8	48.9
Urban non slum	46.2	51.1
Caste/religion		
SC	21.7	18.7
OBC	30.4	28.5
General	20.0	27.2
Lower Muslim	18.9	16.8
Upper Muslim	9.0	8.8
Education		
No or nominal education	32.0	42.5
Primary	11.6	10.6
Secondary	39.6	29.9
Higher	16.8	17.0

Age		
15-19	7.5	-
20-24	40.4	-
25-29	52.1	-
30-34	-	29.1
35-39	-	30.0
40-44	-	24.2
45-49	-	16.7
Wealth Index		
Poorest	22.2	20.8
Poor	20.8	19.7
Medium	20.0	20.4
Rich	19.5	19.8
Richest	17.5	19.3
City		
Agra	17.8	16.2
Aligarh	18.1	17.4
Allahabad	14.7	15.2
Gorakhpur	17.2	17.5
Moradabad	15.4	16.3
Varanasi	16.8	17.4
Total	**6,531**	**9,368**

Table 3: Distribution of women aged 15-29 years (incomplete family) according to stopping rules and different socio-demographic variables

Socio demographic variables	**Stopping Rules**								
	S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**
Residence									
Urban slum	2.6	15.4	1.0	0.9	53.4	14.5	1.6	4.6	5.9
Urban non slum	4.3	19.8	1.2	0.7	52.6	11.9	1.0	3.6	5.0
Caste/religion									
SC	2.6	16.5	0.8	0.8	51.5	15.1	1.8	4.6	6.3
OBC	3.1	16.8	1.2	0.8	57.4	13.0	1.1	2.6	4.0
General	7.0	20.8	2.0	1.3	59.1	5.6	1.2	0.9	2.1
Muslim SC/OBC	1.5	15.0	0.5	0.4	44.0	19.4	1.3	8.4	9.5
Muslim general	2.4	19.2	0.5	0.5	47.8	14.6	1.0	6.5	7.5
Education									
No or nominal education	1.1	11.4	0.5	1.0	45.2	21.9	1.7	8.4	9.0
Primary education	2.5	14.0	0.7	0.7	52.2	16.8	1.4	4.1	7.6
Secondary education	3.1	19.7	1.2	0.9	57.9	9.9	1.3	2.4	3.8
Higher	9.2	25.7	2.2	0.5	57.3	2.7	0.5	0.4	1.5
Age									
15-19	2.7	22.2	0.6	1.2	57.1	8.2	0.2	1.4	6.4
20-24	3.4	18.7	0.9	0.6	55.4	11.5	1.0	3.6	4.9
25-29	3.5	15.7	1.2	0.9	50.7	15.5	1.7	4.9	5.9

Wealth Index									
Poorest	1.6	12.8	0.7	0.7	46.0	20.0	1.8	7.4	8.9
Poor	2.2	14.2	0.4	0.9	53.3	16.3	1.8	4.2	6.7
Medium	3.5	17.7	0.9	0.9	56.6	11.9	1.2	3.4	4.0
Rich	4.2	20.5	1.9	0.9	56.1	9.3	0.8	2.9	3.4
Richest	7.4	26.0	1.7	0.7	55.9	4.1	0.5	1.1	2.5
City									
Agra	2.2	15.3	0.7	1.7	53.5	14.8	1.9	4.8	5.0
Aligarh	3.6	18.7	0.8	0.3	46.1	14.1	0.6	5.3	10.5
Allahabad	6.5	24.8	0.8	0.6	49.7	10.2	0.7	3.0	3.6
Gorakhpur	3.5	20.5	0.7	0.5	57.0	10.0	1.9	1.5	4.4
Moradabad	2.7	13.5	0.7	0.8	54.6	16.9	0.3	5.4	5.2
Varanasi	2.5	12.0	2.6	0.8	57.5	13.9	2.3	4.7	3.6
Total	**3.4**	**17.4**	**1.1**	**0.8**	**53.1**	**13.3**	**1.3**	**4.1**	**5.5**

Table 4: Distribution of women aged 30-49 years (completed family) according to stopping rules and different socio-demographic variables

Socio demographic variables	**Stopping rules**								
	S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**
Residence									
Urban slum	1.7	7.8	0.7	1.2	34.2	23.1	1.6	15.5	14.3
Urban non slum	3.6	12.8	0.8	0.9	42.0	16.8	1.2	10.5	11.4
Caste/religion									
SC	1.0	7.9	0.2	1.3	32.2	23.9	2.1	16.8	14.5
OBC	2.1	9.2	0.6	1.2	39.7	23.4	1.6	11.1	11.0
General	6.2	16.9	1.7	0.9	52.4	11.7	1.0	4.0	5.3
Muslim SC/OBC	0.5	5.3	0.1	1.1	23.2	23.8	1.1	23.5	21.2
Muslim general	1.1	8.4	0.2	0.5	30.3	18.0	1.0	18.2	22.4
Education									
No or nominal education	0.5	5.1	0.2	1.1	25.4	25.6	1.4	21.2	19.5
Primary	0.6	6.3	0.1	1.1	37.7	25.6	1.2	13.0	14.4
Secondary	2.5	12.8	1.0	9.0	47.1	17.8	1.7	7.9	8.3
Higher	9.9	21.8	1.8	1.1	54.5	5.7	1.0	1.1	3.1
Age									
30-34	4.0	11.7	0.8	1.2	43.4	18.0	1.2	9.9	9.8
35-39	2.5	9.9	0.9	1.1	38.9	19.6	1.9	12.8	12.3
40-44	2.2	10.0	0.7	0.9	33.5	21.6	1.1	14.1	16.0
45-49	1.3	9.2	0.4	0.9	34.4	21.1	1.2	16.7	14.8
Wealth Index									
Poorest	0.7	5.1	0.3	1.2	27.0	23.7	1.9	20.9	19.1
Poor	1.0	7.2	0.3	1.1	33.0	24.4	1.4	15.8	15.9
Medium	1.8	8.8	0.8	1.5	36.7	22.7	1.7	13.4	12.6

Rich	3.2	11.8	1.3	1.1	43.8	17.7	1.0	9.5	10.6
Richest	6.9	19.3	0.9	0.4	51.3	10.3	1.0	4.5	5.3
City									
Agra	0.9	8.6	0.9	2.4	36.6	20.8	2.2	14.4	13.3
Aligarh	1.9	9.3	0.7	0.9	31.9	20.5	0.6	17.1	17.1
Allahabad	6.7	18.6	0.4	0.6	43.7	15.2	1.1	6.3	7.3
Gorakhpur	2.5	10.8	0.4	0.2	40.5	18.8	1.8	10.3	14.7
Moradabad	2.0	7.2	0.7	1.1	36.7	23.8	1.0	17.4	10.1
Varanasi	2.4	8.1	1.3	1.2	40.4	19.9	1.8	11.7	13.8
Total	**2.7**	**10.3**	**0.7**	**1.1**	**38.2**	**19.9**	**1.4**	**12.9**	**12.8**

Table 5: Chi square values for association of stopping rules symbolizing desired family with different socio-demographic variables

Socio demographic variables	**Age group**			
	15-29 years		**30-49 years**	
	Chi square	**p value**	**Chi square**	**p value**
Residence	52.585	0.0	237.99	0.0
Caste/religion	429.041	0.0	1412.44	0.0
Education	797.318	0.0	2128.7	0.0
Age	86.675	0.0	187.33	0.0
Wealth Index	471.185	0.0	1121.94	0.0
City	330.694	0.0	552.37	0.0

Table 6: One-way ANOVA of mean expected family size among different strata of each socio-demographic variable

Socio demographic	**15-29 years age group**			**30-49 years age group**		
	Mean expected family size	**F-Statistic**	**p-value**	**Mean expected family size**	**F-Statistic**	**p-value**
Residence						
Urban slum	3.05	38.94	0.0	3.71	281.563	0.0
Urban non slum	2.9			3.36		
Caste/religion						
SC	3.06[a]			3.78		
OBC	2.91			3.5		
General	2.62	87.558	0.0	2.89	459.786	0.0
Muslim SC/OBC	3.32			4.13		
Muslim general	3.11[a]			3.92		
Education						
No or nominal education	3.38			4.05		

Primary	3.13	250.611	0.0	3.72	915.548	0.0
Secondary	2.84			3.25		
Higher	2.46			2.6		
Age						
15-19	2.85[a]			-		
20-24	2.91[a]			-		
25-29	3.05			-		
30-34	-	18.354	0.0	3.31		
35-39	-			3.52	51.835	0.0
40-44a	-			3.67		
45-49a	-			3.72		
Wealth Index						
Poorest	3.3			4.01		
Poor	3.11			3.79		
Medium	2.9	106.755	0.0	3.6	365.816	0.0
Rich	2.79			3.33		
Richest	2.56			2.87		
City						
Agra	3.05[a]			3.65[a]		
Aligarh	3.13[b]			3.76[b]		
Allahabad	2.75[d]	23.642	0.0	3.03	95.126	0.0
Gorakhpur	2.83[d]			3.52[c]		
Moradabad	3.07[a,b,c]			3.53[a,b]		
Varanasi	3.01[c]			3.54[c]		
Total	**2.98**			**3.53**		

a, b, c, d not significant difference

Table 7: Difference in mean expected and mean actual family sizes by socio demographic variables

Socio demographic variables	Expected family size (a)	Mean actual family size(b)	(b)-(a)
Residence			
Urban slum	3.71	4.43	0.72
Urban non slum	3.36	3.64	0.28
Caste/religion			
SC	3.78	4.63	0.85
OBC	3.5	3.86	0.36
General	2.89	2.82	-0.07
Lower Muslim	4.13	5.26	1.13
Upper Muslim	3.93	4.67	0.74
Education			
Illiterate	4.05	5.12	1.07
Primary	3.72	4.31	0.59

Secondary	3.26	3.34	0.08
Higher	2.6	2.32	-0.28
Age			
30-34	3.32	3.45	0.13
35-39	3.52	3.99	0.47
40-44	3.66	4.39	0.73
45-49	3.72	4.57	0.85
Wealth Index			
Poorest	4.01	5.1	1.09
Poor	3.6	4.64	1.04
Medium	3.47	4.08	0.61
Rich	3.34	3.48	0.14
Richest	2.87	2.75	-0.12
City			
Agra	3.65	4.04	0.39
Aligarh	3.76	4.53	0.77
Allahabad	3.03	3.66	0.63
Gorakhpur	3.52	3.7	0.18
Moradabad	3.64	4.17	0.53
Varanasi	3.55	4.02	0.47
Total	**3.18**	**4.03**	**0.85**

Table 8: Values of Ip and percent change in these Ip values across different strata of considered socio demographic variables

Socio demographic variables	F	Fe	Fn	Ip	% difference in Ip
Residence					
Slum	4.43	3.71	10.55717	0.894847	-5.32
Non slum	3.64	3.36	8.468661	0.945191	-
Caste/religion					
SC	4.63	3.78	11.33692	0.88752	-12.65
OBC	3.86	3.5	10.55914	0.949002	-6.60
General	2.82	2.89	7.248985	1.016059	-
Muslim OBC/SC	5.25	4.13	9.542332	0.793065	-21.95
Muslim general	4.66	3.93	8.968782	0.855124	-15.84
Education					
No or nominal education	5.12	4.06	10.73961	0.841308	-22.25
Primary education	4.3	3.72	10.68907	0.916775	-15.27
Secondary education	3.34	3.25	8.769627	0.983695	-9.09
Higher education	2.32	2.6	6.010986	1.082088	-
Age					
30-34	3.45	3.32	9.490537	0.978932	-

35-39	3.99	3.52	10.70566	0.934592	-4.53
40-44	4.38	3.68	9.327087	0.876042	-10.51
45-49	4.56	3.72	8.167067	0.811111	-17.14
Wealth index					
Poorest	5.09	4.01	10.43118	0.831807	-18.75
Poor	4.64	3.79	10.49631	0.873254	-14.69
Medium	4.07	3.6	9.842805	0.924713	-9.67
Rich	3.48	3.33	8.521058	0.971104	-5.14
Richest	2.75	2.86	7.501773	1.023698	-
City					
Agra	4.04	3.64	10.06828	0.937775	-3.06
Aligarh	4.53	3.76	8.295184	0.830216	-14.16
Allahabad	3.66	3.04	8.701027	0.890479	-7.94
Gorakhpur	3.7	3.52	9.014716	0.967241	-
Moradabad	4.16	3.64	10.39376	0.923006	-4.57
Varanasi	4.01	3.55	10.96947	0.938001	-3.02
Total	**4.02**	**3.53**	**9.465059**	**0.91744**	

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